

PROCEEDING

INTERNATIONAL SEMINAR OF HEALTH SCIENCES 2022

*“Strengthening Non-Communicable Diseases Education and
Practice in Healthcare”*

Malang, 10 January 2022



Penerbit Universitas Muhammadiyah Malang

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Universitas Muhammadiyah Malang

Preface

The Proceeding of Health Sciences 2022
Faculty of Health Sciences, University of Muhammadiyah Malang

Assalamu'alaikum Wr Wb

The honourable guests, all the participants



On behalf of University of Muhammadiyah Malang, it is my great pleasure to welcome all the authors on the proceeding of health sciences 2022. I believe this proceeding is a great purpose in order to develop knowledge, experiences and best practices that can be applied for the good, especially in the field of healthcare as a whole. The main objective of these proceedings is to bring together academics and professionals from around the world to encourage ideas that lead to health practice. All papers in the conference proceedings have gone through an intensive review process conducted by the Faculty of Health Sciences, University of Muhammadiyah Malang.

Finally, I would like to express my sincere acknowledgements to all the participants who have participated especially for the Faculty of Health Sciences, University of Muhammadiyah Malang for their hard work in organizing this Proceeding and wishing all success. As one of the leading universities in Indonesia, University of Muhammadiyah Malang is pleasure to welcome collaboration and cooperation with national and International universities.

Wassalamu'alaikum Wr. Wb

Rector,
University of Muhammadiyah Malang

Dr. Fauzan, M, Pd



Universitas Muhammadiyah Malang

Preface

The Proceeding of Health Sciences 2022
Faculty of Health Sciences, University of Muhammadiyah Malang

Assalamu'alaikum Wr Wb



Good morning Ladies and Gentlemen,

It gives me great pleasure to convey a very warm welcome on behalf of the Faculty of Health Sciences, University of Muhammadiyah Malang. The proceedings provide a broad platform that is useful for both scientific and practical health sciences.

The proceedings are a compilation of the accepted papers and represent an interesting outcome of the writer's effort. This proceeding covers three chapters related to pharmacy, physiotherapy and nursing.

We would like to thank all those who have supported the proceeding of health sciences 2022, especially the organizing committee for their valuable suggestions in this paper. The help of each individual and institution is critical to the success of this proceeding.

We sincerely hope that the proceeding of health sciences 2022 will become an excellent discussion forum that will provide new idea and promote collaborative research. Hopefully this proceeding can be a good literacy material for us.

Wassalamu'alaikum Wr. Wb

Dean of the Faculty of Health Sciences,
University of Muhammadiyah Malang

Dr. Yoyok Bakti Prasetyo, M. Kep., Sp., Kom.



Universitas Muhammadiyah Malang

Preface

The Proceeding of Health Sciences 2022
Faculty of Health Sciences, University of Muhammadiyah Malang



Excellencies, Distinguished Delegates, Ladies and Gentlemen,

The on-going global pandemic has shown that this crisis is fuelled by poverty, hunger, weak health systems and lack of clean water and sanitation, education, and global cooperation. Consequently, as a health academia and practitioners, we need to continuously improve ourselves in terms of knowledge and skills. Therefore, it is a pleasure for me to collaborate with the Faculty of Health Sciences, University of Muhammadiyah Malang.

The aims of the proceeding are as a mean for researchers, academia, professionals, and stakeholders to share information that can be used as an input to solve the current health issues or problems, especially in pharmacy related area. It also works as a mean for researchers to publish their findings and opens great opportunities to build collaborative networks between national and international scientists.

We strongly believe that this proceeding will become one of the essential resources for reference and knowledge improvements, which will not only lead to the current scientific findings but also the next discoveries.

Best Regards,

Ryad Moftah Alati, M.Pharm.Sci
Al Asmarya Islamic University, Libya



Universitas Muhammadiyah Malang

Preface

The Proceeding of Health Sciences 2022
Faculty of Health Sciences, University of Muhammadiyah Malang



Excellencies, Distinguished Delegates, Ladies and Gentlemen,

It is my pleasure to work together with the Faculty of Health Sciences, University of Muhammadiyah Malang. The main purpose of this proceeding is to bring academic researchers to exchange information and share experiences and research results on science and research related to physiotherapy.

It is also an excellent opportunity to share medical and health science research experiences with national and international experts and delegates.

We hope that this proceeding can be used for initial stimulation and useful information from speakers and writers from around the world. We hope that this proceeding can be used as a source of information to continue research related to the topic of physiotherapy.

We believe that this proceeding will become an important research resource for reference and knowledge, which will not only lead to scientific findings but also other new findings.

Sincerely,

Cheng-Feng Lin, PT, PhD
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Universitas Muhammadiyah Malang

Preface

The Proceeding of Health Sciences 2022
Faculty of Health Sciences, University of Muhammadiyah Malang



Dear fellow school nurse and participants,

On behalf of the nurse researcher of the University of Edinburgh, I would like to welcome you all to the proceeding of health sciences 2022, conducted by Faculty of Health Sciences, University of Muhammadiyah Malang.

The proceeding will provide all participants to share knowledge, exchange new ideas and their experiences in many research topics related to nursing science, for then it will enhance future collaborations.

I would like to express my sincere appreciation to all the authors for their papers. Furthermore, I would like to thank the organization's staff, program committee members and reviewers. They have worked very hard in reviewing papers and providing valuable suggestions for authors to improve their work.

Sincerely,

Dr. Fiona Cuthill
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The Impact of Knowledge on Practice of Masks Usage in Preventing the Spread of Covid-19 in PDA Malang City

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ABSTRACT

Introduction: the spread of Covid-19 infection globally has a detrimental impact on society. Indonesia is one of the southeast Asia countries that has been exposed slowly. It spreads not only impacted negatively on public health but also by instability in the economic, political, social, and cultural fields. Public mask usage is an effort to prevent transmission to combat the pandemic. **Objectives:** This study aims to determine the relationship between Knowledge and practice of mask usage among Regional Leadership of Aisyiyah (PDA) Malang City member to prevent the Covid-19 spreads. **Methods:** This crosssectional study was conducted through a questionnaire as an instrument among the member of PDA Malang city (n=28). Checking the completeness of the data is carried out before the data processing. Data were analyzed using SPSS by performing univariate and bivariate analyses. **Results:** 67.9% of participants had a high level of Knowledge of masks to prevent the spread. Moreover, 92.9% had a high level of practice in using masks among respondents. Based on bivariate analysis, marital status (p-value: 0.001) affects using a show to prevent the Covid-19 transmission. At the same time, Knowledge has not been significantly associated (p-value: 0.312) with $\alpha:0.05$. **Conclusions:** Knowledge was not associated with the practice of using a mask to prevent the Covid-19 transmission, but marital status was associated significantly with it.

1. Introduction

A coronavirus is a group of viruses that cause disease in both humans and animals that can cause respiratory tract infections with cough and cold symptoms to more severe conditions such as middle east respiratory syndrome (MERS) and acute respiratory syndrome (SARS) that occurred several years ago. Meanwhile, Covid-19 is a disease caused by a new coronavirus that was not previously recognized. Covid-19 is the cause of a world pandemic and was first discovered in Wuhan, China, in December 2019 (World Health Organization, 2020). This virus is transmitted directly through droplets of liquid that come out when the patient talks, sneezes, and coughs so that the virus will enter the body and cause an incubation period of 14 days (Universitas Airlangga, 2020). Transmission often occurs by direct contact with the patient either through a handshake, kissing the hand/cheek because this virus attaches to the hands and face. WHO has designated covid-19 as an airborne disease in which contaminated objects through the air can be a medium of transmission. The virus can last up to several hours depending on the type of material/media (World Health Organization, 2020).

The prevalence of COVID-19 on September 28, 2020, has reached 32.73 million globally and spread to 215 countries. While in Indonesia alone, it has come 278,722 cases and impacts 497 districts/cities very quickly (Kemenkes, 2020). The spread of COVID-19 in Jakarta as the epicenter of Indonesia reached 71,339 incidents, and East Java was ranked second after Jakarta with an incidence rate of 43,174 (SatgasCovid-19, 2020), where Malang City is one of the red zones in the easternmost province on Java Island, with a total of 1767 cases (Pemprovjatim, 2020). The increasing spread is influenced by various factors, one of which is public awareness and discipline in preventing transmission by always carrying out clean and healthy living behaviors (PHBS), namely washing hands with running water and soap/hand sanitizer, using

masks when doing activities outside the home and maintaining personal hygiene. Physical distance (physical distancing). Efforts to prevent transmission by carrying out PHBS have not been maximally carried out by the general public, especially the use of masks in daily activities which has become a new habit. This regulation is often ignored by the community, not only because they are not used to it but also because they are not comfortable or even the availability of masks for the community is low since the pandemic occurred. Mask or respiratory protective equipment is a tool that serves to protect respiration from mycobacteria and viruses in the air and chemical substances (Kemenkes, 2018). According to the task force for the acceleration of handling Covid-19 2020, medical masks are flat or folded surgical masks attached to the head with a rope. The masks are tested using a standardized test method (ASTMF2100, EN 14683, or equivalent) which aims to determine the balance of high filtration (filtration) levels, the user's respiratory facilitation, and possibly the level of liquid impermeability (liquid penetration resistance). Using a mask is an effective way of keeping the droplets from spreading so that the risk of transmitting COVID-19 can be reduced by wearing a mask. The level of risk of transmission is divided into four levels. First, if someone carrying the virus (asymptomatic person) does not wear a mask and has close contact with a susceptible person, the chance of transmission is 100%. Second, If the infected person wears a mask, while the vulnerable group does not, the potential for transmission is up to 70%. Third, if an infected person wears a mask while a healthy person does not, the transmission rate is around 5%. Fourth, if both wear masks, the potential for transmission is 1.5% (Kemenkes, 2020).

Study in America shows the prevalence of 80% of the use of masks is effective in preventing death in Covid-19 patients (Eikenberry et al., 2020). Another study on the use of face masks in the general public was carried out in Wisconsin, where more than 40% of respondents used masks, of which women were 1.5 times more likely to use them than men. In addition, people in urban areas are 4x more compliant than in rural areas (Haischer et al., 2020). The correct use of masks in the community has not been appropriately evaluated. Currently, the data that can determine the factors supporting or inhibiting the use of non-medical covers in the community is still limited (World Health Organization, 2020). Likewise, studies in Indonesia are still very limited in this regard. Therefore, this study aimed to determine the relationship between Knowledge and practice of mask usage among Regional Leadership of Aisyiyah (PDA) Malang City member to prevent the Covid-19 spreads.

2. Methods

This study used a cross-sectional design in August 2021 at the Regional Leadership of Aisyiyah (PDA) Malang City, ABA Kindergarten teachers in the Kedungkandang district. This study will be conducted to determine the practice of using masks in PDA Malang City, where this has never been done in previous studies. The target population for this study was members of the Regional Leadership of Aisyiyah Malang City, with the total number of samples being 28 respondents. The sampling technique used in this study was full sampling because this study recruited all PDA members, namely ABA Kindergarten teachers in Kedungkandang District, as respondents. The inclusion criteria for this study are members of the Malang City PDA, namely the ABA Kedungkandang Kindergarten teacher. Analysis of the influence of Knowledge on using masks by knowing the profile of socio-demographic factors as descriptive data. Meanwhile, Knowledge about masks as the independent variable and the practice of using masks as the dependent variable.

The research instrument used is based on several previous studies that have been validated by making some modifications to adjust to the respondent's character (Eikenberry et al., 2020; Haischer et al., 2020; I et al., 2020). The questionnaire was used to measure socio-demographic factors, Knowledge (3 questions), and experience using masks during the pandemic (3 questions). The questionnaire was asked to find out the socio-demographic profile, several questions regarding age, marital status, health conditions, Knowledge, and experience of using masks during the pandemic. In the research instrument, respondents were given several answer options that could be chosen according to their background. The questionnaire has been

tested to determine the validity and reliability of the instrument on ten respondents (Yunita et al., 2021) PCIA Taiwan members with valid results (r count for each item more than r table that is 0.632) and reliable (Cronbach's alpha: 0.95). In collecting data, respondents were asked for their consent to participate in the study to fill out the questionnaire according to what they understood and did. The data were analyzed using univariate and bivariate analysis to determine the behavioral profile of masks and the effect of Knowledge on their use practices. Grouping the level of Knowledge and behavior of using masks using the median as a cut-off point (Lienaningrum & Kristina, 2020). Both the level of Knowledge and behavior are grouped into low and high. The significance value used is 0.05. Ethical approval is obtained from the Ethics Committee of the University of Muhammadiyah Malang in research upholding research ethics with the number E.5.n/149/KEPK-UMM/VI/2021. Informed consent will be obtained given and signed by research participants, which will be used as a basis for ethical consideration in research that will be carried out by prioritizing the principles of anonymity, confidentiality, and voluntary data collection to processing research data.

3. Results and Discussion

Based on table 1, it was found that 28 respondents mainly were aged 40-49 years old (39.3%), followed by 30-39 years old (25%), while 17.8% were aged 29 years old and more than 50 years old. This result is in line with research in Wisconsin (Haischer et al., 2020). Moreover, most respondents are married (71.4%) with good health conditions (42.9%). Giving fines can increase masks; it was found that 89.3% of respondents answered yes. Based on Knowledge of masks in preventing transmission of COVID-19 infection, participants had a high level of Knowledge of 67.9%. This result is in line with previous research in Garut, West Java (Maulani & Supriyadi, 2021).

Table 1 Respondents Characteristic

Variable	N	%	$M \pm SD$
Age			
≤ 29 y.o	5	17,8	
30-39 y.o	7	25,0	
40-49 y.o	11	39,4	
more than 50 y.o	5	17,8	
Marital Status			
Unmarried	7	25,0	
Married	20	71,4	
Divorced	1	3,6	
Health Condition			
Very good	11	39,2	
Good	12	42,9	
Fair	5	17,9	
Fine impact			
Yes	25	89,3	
No	3	10,7	
Knowledge level			1,67±0,47
Low	9	32,1	
High	19	67,9	
Practice level			1,93±0,26
Low	2	7,1	
High	26	92,9	

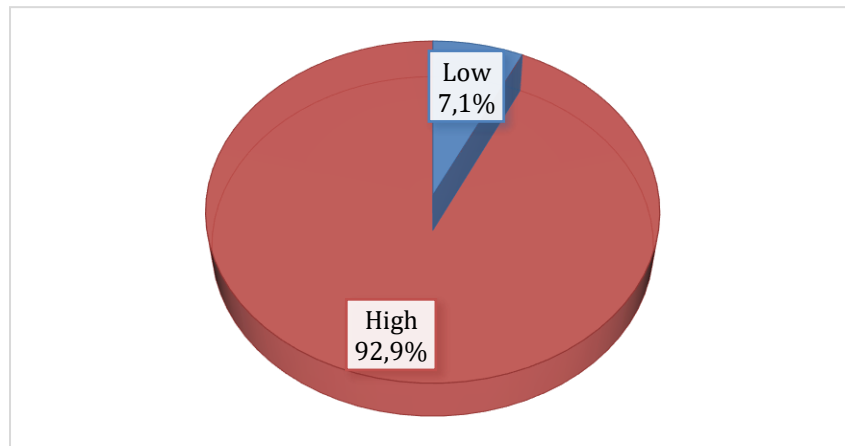


Figure 1 Practice of Mask Usage

The practice of using masks properly has a high level of 92.9%. This result is in line with research in several regions in Indonesia where the level of use of shows in the community is relatively high, which is more than 60% (Devi Pramita Sari & Nabila Sholihah 'Atiqoh, 2020; Siahaineinia & Bakara, 2020; Suhartiningsih et al., 2021). The use of masks is one of the efforts to prevent and minimize the transmission of Sars-Cov-2 virus infection with good effectiveness by using a double mask (medical inside and non-medical outside) and using a KN95 show (Eikenberry et al., 2020).

Table 2 Respondents Characteristic based on Knowledge

Variable	True N (%)	False N(%)
Using mask when leaving home (K1)	28 (100)	0 (0)
Period of mask change (K2)	15 (53,6)	13 (46,4)
Proper usage of non-medical mask (K3)	10 (35.7)	18 (64,3)

In table 2, 2 variables have correct Knowledge of more than 50%, namely: K1 and K2. While in K3, only 35.7% of respondents have the proper Knowledge. This factor can be influenced by inadequate literacy sources (Devi Pramita Sari & Nabila Sholihah 'Atiqoh, 2020; Maulani & Supriyadi, 2021). Therefore, a good education is needed by the community during this pandemic.

Table 3 Respondents Characteristic based on Practice of Mask Usage

Variable	The practice of Masks Usage		Sig
	Low N(%)	High N(%)	
Age			0,526
≤ 29 y.o	0 (0)	5 (17,8)	
30-39 y.o	0 (0)	7 (25)	
40-49 y.o	1 (3,6)	10 (35,7)	
more than 50 y.o	1 (3,6)	4 (14,3)	
Marital Status			0,001*
Unmarried	0 (0)	7 (25)	
Married	1 (3,6)	19 (67,8)	
Divorced	1 (3,6)	0 (0)	
Health Condition			0,789
Very good	1 (3,6)	10 (35,7)	
Good	1 (3,6)	11 (39,3)	
Fair	0 (0)	5 (17,8)	
Fine impact			0,611
Yes	2 (7,2)	23 (82,1)	
No	0 (0)	3 (10,7)	
Knowledge level			0,312
Low	0 (0)	9 (32,1)	
High	2 (7,2)	17 (60,7)	

* $p < 0.05$

Based on table 3, the results of bivariate analysis using chi-square, it was found that one factor that gave significant developments was the marital status with a significance value of 0.001. Someone married has a greater responsibility in the family, especially to the spouse and children. This factor can affect the increasing practice of using masks to prevent the transmission of Covid-19 infection to maintain health and safety during the pandemic. The correct use of shows during a pandemic can minimize morbidity and even mortality caused by Covid-19 infection; this is in line with research in New York (Eikenberry et al., 2020). However, there is no relationship between Knowledge and practice using masks (p-value: 0.312). Research in Garut has the opposite result where Knowledge is related to awareness in using masks (Maulani & Supriyadi, 2021). This difference can be caused by variations in the profile of research respondents. The limitation of this study is sample size was small. So in the future, the study will be better to carry out the appropriate sample size in the more significant population with a prospective cohort study design.

4. Conclusion

In this study, one factor can significantly increase the behavior of using masks in preventing the transmission of COVID-19 infection, namely marital status (p-value: 0.001). There is no relationship between the level of Knowledge with proper mask use behavior because the p-value: 0.321 is more than (0.05). This research is expected to be the primary data for further research with a more significant number of research samples so that multivariate analysis can be carried out to determine the odds ratio for each variable.

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Literature Review of Pharmacological Activities Genus Curcuma as Anti-Inflammatory Using NVIVO

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ABSTRACT

Introduction: The genus of Curcuma has several pharmacological activities, including anti-inflammation. The pharmacological action of the Curcuma genus caused the content of secondary metabolic of the plant. Several previous studies reported that the compounds of the Curcuma genus were potential as anti-inflammation agents. So that, the study conducted a literature review of the pharmacological and anti-inflammation activities of the Curcuma genus through NVivo analysis. **Objective:** The study aimed to determine the pharmacological action of the Curcuma genus and compounds that have potential as anti-inflammation agents reviewed from a literature study qualitatively. **Methods:** The study used NVivo 12 Plus analysis with auto and manual codes coding. The coding results were then analyzed using several features, including Hierarchy Chart, Cluster Analysis, and Word Cloud. **Results:** The study results showed that obtained from the Hierarchy Chart, the word 'activity dominated (30.93%) the results followed by observation of anti-inflammation (25.94%). The Cluster Analysis results showed a correlation between the genus of Curcuma and anti-inflammation with a correlation value of 0.733153. The correlation between anti-inflammation and secondary metabolic such as essential oil (0.46216 correlation value) categorize as a good correlation. However, the correlation with curcumin and flavonoid classifies as weak correlation with a correlation value of 0.377144 and 0.277934, respectively. **Conclusion:** The genus of Curcuma has pharmacological action as anti-inflammation. The secondary metabolic of the Curcuma genus that potentially anti-inflammation such as essential oil, curcumin, and flavonoid was reviewed qualitatively through a literature study.

1. Introduction

Inflammation, commonly called inflammation, is a symptom in several diseases, and generally, people who experience it feel uncomfortable. Inflammation is a protective action that plays a role in fighting against the causative agents of abnormal cells (Anwar K, Santoso BH, 2013). The absence of inflammation, injury, or infection will not improve. It can cause dangerous tissue damage (Egesie, Chima, & Galam, 2011). Inflammation can treat with anti-inflammatory drugs. Drugs commonly used are non-steroidal anti-inflammatory drugs (NSAIDs), but these drugs generally cause unexpected effects, namely gastric ulcers. Therefore, it is necessary to look for alternative therapies to overcome inflammation with relatively fewer unwanted effects (Anwar K, Santoso BH, 2013). One of the plants widely used for traditional medicine as an anti-inflammatory treatment is from the Zingiberaceae family of the Curcuma clan. This clan is famous and can use as traditional medicines, spices, dyes, perfumes, cosmetics. The rhizome is the most commonly used plant part (Dosoky & Setzer, 2018). The literature review is an analysis process of studies that have been carried out by previous researchers, which will be carried out using data from scientific articles, which are then processed using Nvivo 12 plus. A literature review was conducted qualitatively to determine the potential of pharmacological activity and compounds in the Curcuma genus as an anti-inflammatory by reviewing previous scientific articles. Therefore, a qualitative study of the literature was conducted to determine the pharmacological activity and compounds of the Curcuma genus plant as an anti-inflammatory using Nvivo 12 plus software.

2. Methods

This research was conducted by qualitative analysis using Nvivo 12 Plus software. This research belongs to the category of descriptive research and literature review.

The tools used in this study are HP laptops with specifications AMD A4-9125 RADEON R, 4.00 GB RAM, OS Windows 10. Software and applications needed are Harzing's Publish or 3 Perish, Mendeley, Nvivo 12 Plus Software, Microsoft Excel.

The materials used in this research are journals or scientific articles. Inclusion Criteria The inclusion criteria used in this study are scientific articles published in the last five years, the type of journal (research article), the methods used in the journal are in-vitro, in-vivo, and in silico and journals that discuss pharmacological activities in the form of anti-inflammatory drugs. -inflammation where this scientific article can access in full text in pdf format. Meanwhile, the exclusion criteria of this study consisted of scientific articles that could not be accessed entirely, and there were mixtures with plants other than the Curcuma genus.

3. Results and Discussion

Data analysis using Nvivo 12 Plus software showed from several parameters, including Hierarchy Chart, Cluster Analysis, and Word Frequency. This analysis carries out by entering data in the form of scientific articles of 26 scientific articles, which will get the appropriate keywords to be analyzed, which can see in Figure 1.

Name	Files	References
inflammation	13	35
compound	17	91
flavonoid	6	14
essential oil	7	33
curcumin	11	44
curcuma	22	112
anti-inflammatory	22	128
activity	25	171

Figure 1. Coding results related to the Curcuma genus as an anti-inflammatory

First, the coding process carries out, which uses scientific articles that have been input into the Nvivo 12 Plus software, then stored in the form of nodes. The coding process carries by auto code and manual code, and the results used include compound, inflammation, Curcuma, anti-inflammatory, and activity. The selection of this coding can help answer the problems in the research.

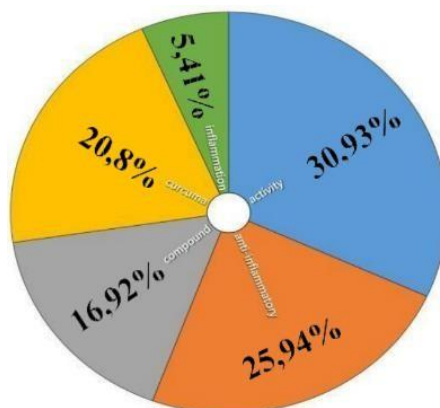


Figure 2. The results of the Hierarchy Chart diagram related to the Curcuma genus as an anti-inflammatory

The Hierarchy chart's next feature is a data analysis process that provides a diagram showing the most critical keywords in the hierarchy. The results of the Hierarchy Chart feature in Figure 2 show that the four activity keywords have the most significant percentage of 30.93%, followed by anti-inflammatory keywords of 25.94%, Curcuma of 20.8%, compound of 16.92%, and the last keyword is inflammation by 5.41%. The results of the data analysis show that the activity keyword is the word that appears most often in the article.

The next feature is Cluster analysis, where the data analysis process connects or correlates the contents of the text of scientific articles with one another so that in this study, several relationships obtain between nodes that could answer the problems in this study. These correlations were analyzed using the Pearson correlation, which indicates the validity of the coding results. The percentage requirement on the Pearson correlation coefficient (kappa coefficient) is if the kappa value is less than or equal to 0.40. It means that the relationship or agreement is weak, the kappa value between 0.40 – 0.75 means that the relationship or agreement can be said to be quite reasonable to sound, or if the kappa value is more significant than or equal to 0.75, it means that the relationship or level of agreement is excellent and brilliant (Fleiss et al, 2003). Apart from the correlation value of keyword linkages, it can also see in the connecting lines in the research diagram, where thick and thin lines showed, the thicker the line, the stronger the relationship, while the thinner the line, the weaker the relationship.

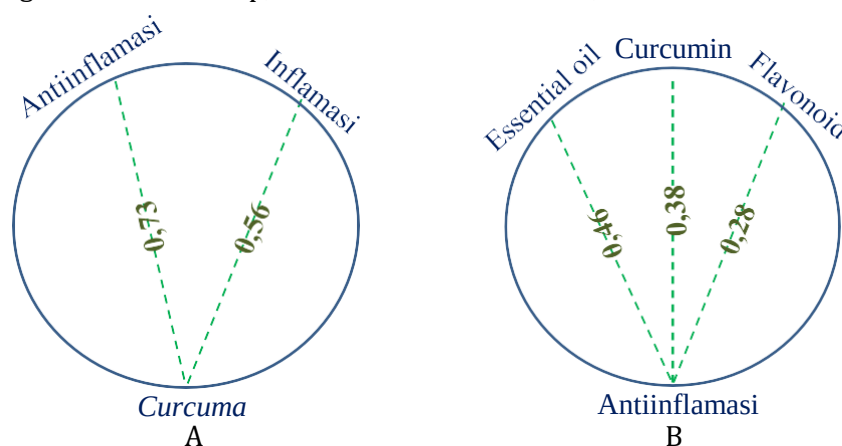


Figure 3. The results of Cluster Analysis are related to A) the relationship between the nodes of the Curcuma genus on anti-inflammatory and inflammation classified by the Pearson correlation coefficient B) the relationship between the anti-inflammatory nodes and the three nodes of the compound classified the Pearson correlation coefficient.

The following keywords are Curcuma and inflammation included in the excellent category, namely 0.560278, and the keywords are the clan Curcuma and anti-inflammatory with a correlation coefficient value of 0.733153, which is also indicated by thick lines connecting the keywords in the diagram results. It is supported by previous research that Curcuma has potential in anti-inflammatory activity in acute and chronic inflammation (Mujumdar, Naik, Dandge, & Puntambekar, 2015). The Curcuma genus has been widely used in traditional medicine as an anti-inflammatory. The compounds contained in Curcuma are effective inhibitors of producing inflammatory mediators (Lantz, Chen, Solyom, Jolad, & Timmermann, 2015). Several previous studies have shown that various Curcuma species have shown potential in anti-inflammatory activity, namely *C. longa*, which was tested in vivo, and in silico, which showed pharmacological activity as an anti-inflammatory (Meizarini, Siswandono, Riawan, & Rahayu, 2018). According to research conducted by Kumar (2018), it was found that *C. amada* in this study showed significant results and supported the use of *C. amada* as traditional medicine as an anti-inflammatory agent (Veeresh Kumar. P, Kalyani Jatoth, Ajmera Shanti Priya, 2015).

Swandari's (2019) research found that *C. aeruginosa* can develop as a natural anti-inflammatory agent (Paramita, Ismail, Marliana, & Moerad, 2019). Research on *C. caesia* states that this *Curcuma* species has potent anti-inflammatory activity and can be used to develop natural anti-inflammatory drugs (Borah et al., 2019). Pattreeya (2018) conducted a study on *C. zedoaria* and got the results that it was proven to have anti-inflammatory activity and support traditional use (Tungcharoen et al., 2018). Previous studies have shown that *C. xanthorrhiza* exerts anti-inflammatory activity (Rahaman et al., 2021).

The analysis results showed the relationship between the keywords of secondary metabolites that were the strongest, namely essential oil, curcumin, and flavonoids with an anti-inflammatory activity which had various correlation coefficient values, including anti-inflammatory and essential oil 0.46216 with a relatively good level of relationship. , whereas between anti-inflammatory and curcumin 0.377144 and between anti-inflammatory and flavonoids 0.277934 categorize as weak relationships. It can also show from the connecting line between keywords, which can show in the results of the research diagram where the thickness of the line shows the value of the relationship between keywords. The thicker the line, the stronger the relationship, while the thinner the line, the weaker relationship, and can be seen in Figure 6 on The results of this study are the thickest line between the keywords anti-inflammatory and essential oil curcumin and flavonoids. This weak correlation coefficient value is due to the lack of scientific articles discussing curcumin and flavonoids. However, the articles obtained have explained the mechanism of action of these metabolites as anti-inflammatory compounds seen in previous studies.

Previous studies have shown that essential oils or essential oils have anti-inflammatory activity that works by inhibiting the production of prostaglandin E2 and also reducing nitric oxide levels and COX expression (Dosoky & Setzer, 2018). Based on several previous studies, curcumin has anti-inflammatory activity that works by inhibiting the synthesis and release of inflammatory mediators such as prostaglandins, histamine, and serotonin (Nasruddin, Idrus, Mangarengi, & Putri, 2020). The mechanism of the anti-inflammatory activity of curcumin compounds by inhibiting cyclooxygenase-2, lipoxygenase, and curcumin inhibits inflammatory cytokines such as interleukins and chemokines (Belma et al., 2021). Other studies have also explained that curcumin acts as an anti-inflammatory agent by reducing sodium oxide levels and COX expression (Paramita et al., 2019). Based on several previous studies related to the activity of flavonoids as an anti-inflammatory which work significantly to inhibit several inflammatory mediators (Ullah et al., 2015).

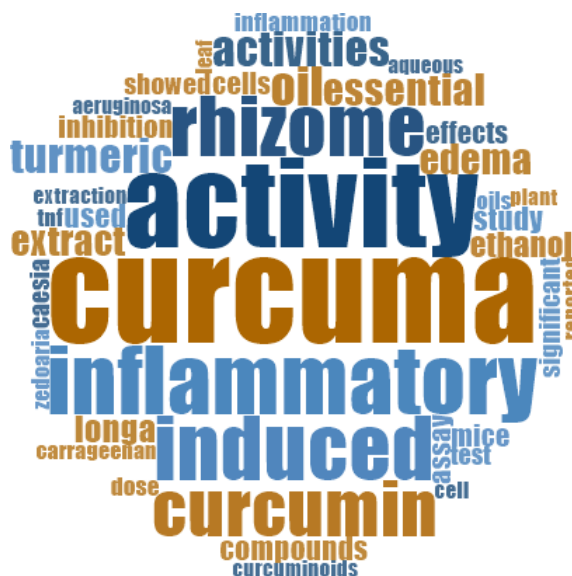


Figure 4. The results of the Word Cloud diagram of 27 words that most often appear in research related to the Curcuma genus as an anti-inflammatory (n-26 scientific articles)

This research is supported by other data, namely in visualizations that show the frequency of words in scientific articles used in qualitative analysis. The results of data analysis using the Word frequency query feature showed 27 words that most often appeared or dominated in 26 scientific articles related to the topic of the Curcuma genus plant with anti-inflammatory properties. The selection of 27 words is to get words that match the topic or theme to be discussed and reduce keywords that have no relationship but are detected by the word cloud feature. The larger the word size in the word cloud, the more dominant the words that appear most often in scientific articles. In this result, the dominant words were Curcuma, activity, inflammation, inhibitor, and curcumin, so that these words appeared large.

4. Conclusion

The Curcuma genus has potential pharmacological activity as an anti-inflammatory with its mechanism of action inhibiting the synthesis and release of inflammatory mediators such as prostaglandins, histamine, serotonin, and inhibiting cyclooxygenase-2 and lipoxygenase. The secondary metabolite compounds in the Curcuma genus that have the potential as anti-inflammatory consist of essential oils, curcuminoids in the form of curcumin, and flavonoids. This research, which was carried out by qualitative analysis with Nvivo 12 plus, is supporting research that requires laboratory data

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Formulation and Antioxidant Activity of Avocado (*Persea americana* Mill.) Seed Extract Sheet Mask Serum

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ABSTRACT

Introduction: UV rays are the leading cause of oxidative stress on the skin, which causes damage to the skin. Avocado seed extract contains flavonoids, saponins, and tannins which can overcome oxidative stress on the skin. It can be formulated into sheet mask serum with Occlusive Dressing Treatment (ODT) for better skin permeation. **Objectives:** To determine the physicochemical characteristics, antioxidant activity, stability, and irritation effect of avocado seed extract in sheet mask serum. **Methods:** Avocado seed extract was macerated by ethanol 96% solvent formulated into serum preparation and then packed in a sheet mask. The concentration of avocado seed extract was 3%, 4%, and 5%. **Results:** The results showed that this research was produced a good physicochemical characteristic and stability during storage using the freeze-thaw method chemically. It showed a significant antioxidant effect with the highest % inhibition in Formulation 3 ($80.53 \pm 5.32\%$). **Conclusions:** This preparation also had no irritating effect on Chorioallantois Membrane (CAM). It can conclude that the avocado seed extract was potent to be an antioxidant agent, which has good stability and is safe for skin when formulated into sheet mask serum.

1. Introduction

The sunlight, especially ultraviolet (UV) rays, have a beneficial effect on the human body in vitamin D synthesis but can also have a skin damage effect when exposed for a long time. It is also a source of free radicals that can cause sunburn, erythema, tanning, skin aging, spots, and even skin cancer (Indriarini et al., 2021; Rahmasari et al., 2021). Free radical damage in the body can be overcome with antioxidants. An antioxidant is defined as a substance that delay, prevent, or eliminate oxidative damage to target molecules, e.g., proteins, lipids, and DNA. It can avoid oxidative stress-related damage and break radical chain reactions. Naturally, the human body produces endogenous antioxidants capable of overcoming the effects of free radicals, but when the supply of free radicals increases, it has to take a collection of exogenous antioxidants. The antioxidants can come from natural ingredients (Hardiningtyas et al., 2014; Sharifi-Rad et al., 2020; Yadav et al., 2016). One of the medicinal plants with antioxidant properties is avocado (*Persea americana* Mill.).

The avocado seed is one of the under-utilized non-edible parts of the fruit, which become an organic waste and sometimes cause ecological problems (Bahru et al., 2019). The avocado seed comprises 13-18% of the whole fruit's size and has higher total phenolic content and antioxidant capacities than its peels and pulp. The seed of avocado becomes one of the phytochemical sources containing flavonoids, alkaloids, saponins, tannins, oxalates, phytates, phenolics, and antioxidant capacity (Setyawan et al., 2021). The other polyphenol compounds found in seeds of avocado are 3-O-p-coumaroylquinic acid, 3-O-caffeoylquinic acid, procyanidin trimer A(I), procyanidin trimer A(II), linoleic furan, abscisic acid, protocatechuic acid, vanillic acid, catechin, or epicatechin gallate (Dabas et al., 2013). The ethanol 70% avocado seeds extract has an antioxidant potential scavenging effect of $50.35 \pm 1.06\%$ using the DPPH method and reducing the power of $0.28 \pm 0.03 \text{ mg/mL}$ using the FRAP method (Folasade et al., 2016). Meanwhile, in another study, avocado seed extract has antioxidant activity with a value of IC_{50} of $65.28 \mu\text{g/mL}$ using the DPPH method and $2.767 \mu\text{g/mL}$ using the ABTS method (Alissa et al., 2020). Based on that study, avocado seed extract is a potent antioxidant agent which can be formulated into preparation.

Sheet masks are cosmetic preparation for facial skincare, generally made by non-woven tissues absorbed by active ingredients. It has benefits in hydrating the skin, providing moisture, giving skin texture, rejuvenating, and calming the skin, tightening skin pores, brightening skin tones, relaxing the facial muscle, slowing down wrinkles, fine lines, and aged spot, and curing acne with/without scars. The sheet mask can also prevent quick evaporation of the water phase and extend the ingredients required to penetrate deep into the skin. The mask is formulated as a cream, gel, lotion, ointment, or serum, which becomes a vehicle that delivers “actives” to the skin (Kusumawati et al., 2020; Nilforoushzadeh et al., 2018; Pierfrancesco et al., 2019). Compared to other masks, sheet masks have an Occlusive Dressing Treatment (ODT) mechanism, which has a good absorption and penetration profile, hygienic and efficient packaging, and does not need to rinse off after use (Reveny et al., 2016). Therefore, this study aimed to determine the physicochemical characteristics, antioxidant activity, stability, and irritation effect of avocado seed extract in sheet mask serum.

2. Method

2.1 Tools

The tools used were analytical balance (Metler Toledo), UV-Vis spectrophotometer (Shimadzu), climatic chamber (Mettler), pH meter (Schott), and viscometer (Brookfield).

2.2 Materials

The materials used where avocado seeds were macerated with ethanol in Materia Medika Batu, Malang; Propylene-glycol, glycerin, PEG-400, and Tween 80 were obtained from PT. Brataco; methanol pro analysis from PT. Smart-Lab; 2,2-diphenyl-1-picrylhydrazyl (DPPH) were purchased from Sigma-Aldrich. Other materials include dimethicone, sodium metabisulfite, Na-EDTA, methylparaben, glyceryl stearate, distilled water, sodium lauryl sulfate (SLS), sodium chloride, and hen's egg were in technical grade.

2.2 Serum Preparation

The preparation of serum was made according to the formulation presented in (Table 1). Serum was made in three formulations with avocado seed extract (3%, 4%, and 5%). Serum preparation was made by mixing all the ingredients in the formulation with the hot preparation method and stirred until homogenous. Lastly, after the preparation is cold, add avocado seeds extract and stir homogeneously. After avocado seeds extract serum was made, the characterization, antioxidant, stability, and irritation tests were conducted.

Table 1 Serum Preparation Formulation

	Formulation (%)		
	I	II	III
Avocado seed extract	3	4	5
Propylene glycol	15	15	15
Glycerin	15	15	15
PEG 400	15	15	15
Tween 80	2.5	2.5	2.5
Dimethicone	0.1	0.1	0.1
Sodium Metabisulfite	0.1	0.1	0.1
Na EDTA	0.01	0.01	0.01
Nipagin	0.1	0.1	0.1
Glyceryl Stearate	2	2	2
Aquadest	Ad 100	Ad 100	Ad 100

2.3 Physicochemical Characterization Evaluation

The physicochemical characterization test included organoleptic, homogeneity, pH value, viscosity, and dispersion test. The organoleptic test was carried out by visually observing the serum preparation's color, scent, and texture. pH value was measured using a digital pH meter, and viscosity was measured using a viscometer. The homogeneity of the preparation was observed for any coarse particle's presents, then the dispersion test was determined by applying in between two glass slides with some loads (Rahmasari et al., 2021).

2.4 Antioxidant Activity

Antioxidant activity was measured using the DPPH scavenging method for avocado seeds extract and avocado seeds extract serum. First, avocado seeds extract was prepared at 5, 10, 15, 20, and 25 ppm concentrations. The measurement was carried out using a UV-Vis spectrophotometer at 517nm wavelength and vitamin C as a positive antioxidant control. Then, avocado seeds extract serum was weighed 0.5g quantitatively and dissolved in methanol until 50.0mL, then sonicated. The sample was prepared in dilution series and added 2mL of 0.4mM DPPH solution. The solutions were incubated for 30minutes at 37°C then measured using a UV-Vis spectrophotometer (Chasanah et al., 2021). Antioxidant scavenging effect (%) was calculated by using this equation:

$$\text{Antioxidant scavenging effect} = \frac{A_0 - A_1}{A_0} \times 100$$

Where A_0 is the absorbance of free radical (DPPH solution), and A_1 is the absorbance of the antioxidant (sample).

2.5 Stability Test

The stability test was carried out using the freeze-thaw cycling method with six cycles. The preparations were stored at four °C (24 hours) in the refrigerator and 40°C (24 hours) in the climatic chamber and counted as one cycle (Fitriani et al., 2016). The examined parameters were organoleptic, pH value, viscosity, and antioxidant scavenging effect.

2.6 Irritation Test

The irritation test was carried out using Hen's Egg Test Chorioallantoic Membrane (HET-CAM) method. It was held by putting a sample of serum preparations into the egg CAM about 0.3g, then allowed to stand for 20 seconds and cleaned using sterile 0.9% NaCl. The observation time was carried out for 300 seconds and examined for irritant parameters (lysis, coagulation, and hemorrhages). Sodium lauryl sulfate (SLS) was used as a positive control, and the negative control was water (Yuliani et al., 2016). The score obtained is then calculated using the formulation and determine the irritation value using this equation:

$$T = \frac{301 - H}{300} \times 5 + \frac{301 - L}{300} \times 7 + \frac{301 - C}{300} \times 9$$

Where T is the irritation score, H is the time required for the hemorrhage, L is the time required for lysis, and C is the time required for coagulation.

3. Results and Discussion

3.1. Physicochemical Characterization Evaluation

The results of organoleptic observation of the avocado seed extract serum are brown, has an odor characteristic of avocado, and has a liquid texture. The color of the preparation is influenced by the color of the avocado seed extract, as seen in (Figure 1). The three formulation was homogenous with the absence of coarse particle. The measurement results of pH value, viscosity, and dispersion ability are shown in (Table 2).



Figure 1 Avocado Seed Extract Serum (a) Formulation 1; (b) Formulation 2; and (c) Formulation 3

Table 2 Physicochemical Characterization of Avocado Seed Extract Serum

Formulation	pH	Viscosity (cps)	Dispersion (cm)
1	5.38 ± 0.02	146.67 ± 1.44	5.28 ± 0.08
2	5.42 ± 0.06	155.83 ± 1.44	5.18 ± 0.08
3	5.56 ± 0.03	165 ± 2.50	4.88 ± 0.13

The use of different extract concentration in the serum preparation (3%, 4%, and 5%) produce another characteristic. As seen in (Table 2), the pH value increases significantly with avocado seed extract. Each formulation sheet mask serum has the same pH value as the skin's pH ranges from 4.5 – 6.5 (Firdaus Al Muazham & Husnani, 2017). The viscosity of the three formulations has a pseudoplastic flow type because it tends to increase in the presence of the addition of extract. This may be caused by the addition of sections, which can increase the viscosity of the preparation. This result aligns with the theory that the viscosity value is inverse to the dispersion ability—the greater the viscosity, the smaller the ability of a preparation to spread (Deuschle et al., 2015).

3.2 Antioxidant Activity

The results indicated that avocado seed extract showed DPPH scavenging activity, with an IC_{50} value of 19.88 ± 0.72 ppm. These results suggest that avocado seed extract has a potent antioxidant activity, which is categorized as a potent antioxidant (<50 ppm) (Molyneux, 2004). Table 3 shows the scavenging activity of avocado seed extract serum. Formulation 3 (avocado seed extract 5%) gave out the highest value in antioxidant scavenging DPPH activity compared with Formulation 1 (avocado seed extract 3%) and Formulation 2 (avocado seed extract 4%). The higher the avocado seed extract concentration, the higher the scavenging activity obtained. The freeze-thaw stability test implies that the antioxidant DPPH scavenging activity of avocado seed extract serum was decreased, but not significantly.

Table 3 Antioxidant DPPH scavenging activity (%) of avocado seed extract serum

Formulation	Before freeze-thaw (%)	After freeze-thaw (%)
1	55.77 ± 5.31	39.18 ± 3.62
2	66.53 ± 9.56	46.80 ± 0.39
3	80.53 ± 5.32	58.07 ± 3.49

3.3 Stability Test

The results of the freeze-thaw cycling test of avocado seed extract serum showed that all formulations did not change organoleptically and showed no phase separation. The pH value and viscosity measurement results of this evaluation are shown in (Table 4). The pH and viscosity values of the three formulations differed from before storage, but formulation 1 was more stable than formulation 2 or formulation 3, physically and chemically.

Table 4 The pH and Viscosity Value in Freeze-Thaw Stability of Avocado Seed Extract Serum

Formulation	pH		Viscosity (cps)	
	1 st day	12 th day	1 st day	12 th day
1	5.38 ± 0.02	4.93 ± 0.01	146.67 ± 1.44	160.83 ± 2.36
2	5.42 ± 0.06	4.95 ± 0.04	155.83 ± 1.44	165.83 ± 1.18
3	5.56 ± 0.03	5.16 ± 0.08	165 ± 2.50	198.33 ± 3.12

The viscosity value has increased after the stability test because when the storage process allows the water content in the preparation to decrease due to the evaporation process, causing the preparation to be more viscous (Irianto et al., 2020). Meanwhile, the pH value decreased from the initial pH before the stability, but the pH value obtained still met the requirements of skin pH (4.5-6.5) (Firdaus Al Muazham & Husnani, 2017).

3.4 Irritation Test

The results of the irritation test are shown in Figure 3. The avocado seed extract serum with various concentrations of avocado seed extract showed 0 irritation score (no change in coagulation, hemorrhage, and lysis), which indicates that this preparation did not irritate and was safe when applied to the skin.

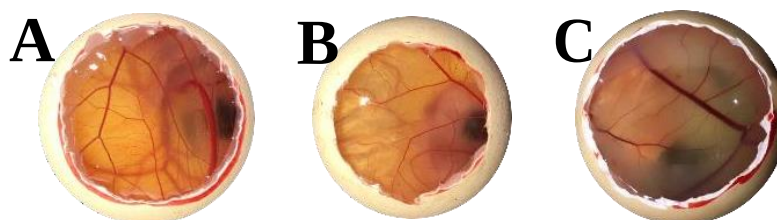


Figure 3 Irritation Test with HET-CAM Method Results (a) Formulation 1; (b) Formulation 2; and (c) Formulation 3

4. Conclusion

Formulation 3 (5% avocado seed extract) of avocado seed extract serum had the best physicochemical properties and excellent antioxidant activity. All formulations showed good stability, no change in organoleptic or visual phase separation, and no irritation against the hen's egg membrane. This study results demonstrated that the various concentration of avocado seed extract has excellent potential to be an antioxidant agent with no irritation effect and can be formulated into another cosmetic preparation.

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The Relationship of Anxiety to the Level of Multivitamin Consumption during the COVID-19 Pandemic in Pharmacy Students

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ABSTRACT

Introduction: COVID-19 spreads, infects quickly and easily through contact with sufferers. Anxiety that occurs during a pandemic is the emergence of preventive measures that make people more disciplined in maintaining their health and personal hygiene by using masks, hand sanitizer, taking vitamins and supporting drugs, and keeping a distance on the level of consumption multivitamins. **Objectives:** This study aims to seek the relationship between anxiety and multivitamins consumption level during the Covid-19 Pandemic among Pharmacy students. **Methods:** A cross-sectional study with a questionnaire, the sample was obtained using the purposive sampling method obtained 93 students, searched for the relationship with the Spearman correlation test. **Results:** The findings of the normal category of anxiety were 35.5%, mild anxiety was 47.3%, moderate anxiety was 15.1%, and severe anxiety was 2.2%. The multivitamins consumption level in the category was low 28% and good 72%, while the most consumed type of multivitamin was Vitacimin, 23.7%. A Correlation of age with anxiety values obtained Sig.0.034 <0.05. Spearman's correlation of anxiety indicates with the level of multivitamin consumption obtained sig.0,247 > 0.05. **Conclusion:** There was anxiety and the level of multivitamin consumption in students, but there was no relationship between anxiety and the level of multivitamin consumption during the COVID-19 pandemic in UMM pharmacy students.

1. Introduction

In early 2020, Indonesia was reported with news of an outbreak of coronavirus disease, which initially occurred in Wuhan, China, from December 18 to December 29, 2019. The first time this disease appeared was named the 2019 novel coronavirus (nCoV-19). WHO released the latest statement on February 11, 2020, regarding naming the condition Coronavirus Disease (COVID-19), a respiratory disease resulting from the Severe Acute Respiratory Syndrome Coronavirus-2 (Susilo et al., 2020). WHO declared COVID-19 as a pandemic on March 9, 2020. The transmission of the COVID-19 spreads and infects anyone quickly and easily through contact with sufferers (Mona, 2020).

Pandemic is a term for contagious disease and spreads to all broad areas, which means it has exceeded the boundaries between countries in the world (Sabriana and Indrawan, 2020). The long pandemic and the ever-increasing positive numbers have caused public anxiety. Anxiety in the community occurs because the government has taken a policy to stay at home in anticipation of the spread of the virus. There was also anxiety due to fear of being infected by COVID-19. According to the American Psychological Association (APA) (2021), anxiety is an emotional state characterized by anxiety, worrying thoughts, and changes in the physical body, such as increased blood pressure. Meanwhile, what is described by Annisa & Ifdil (2016) is an emotional state in a person by showing discomfort to himself, and a sense of anxiety arises accompanied by the emergence of feelings of helplessness and change because it is caused by something vague. It can be concluded from some of the explanations above that anxiety is an emotional feeling that arises because of worrying thoughts and extremely uncomfortable behavior in someone due to an uncertain or unclear situation.

Anxiety in the field of education resulting from the COVID-19 outbreak is influenced by distance learning facilities carried out by online methods. Many students are pressured to do distance learning by not providing excellent and supportive facilities and infrastructure (Purwanto et al., 2020). The students felt very disturbed due to schools and campuses being closed. From the results of research conducted by Livana, Mubin, and Basthomi (2020) it is explained about the anxiety experienced by students as much as 70% due to lecture assignments and 35% of students feel they cannot apply to learn in the form of laboratory practice because of the unavailability of supporting tools, especially for students where practical learning is prioritized. One of the majors whose learning is in laboratory practice is the pharmacy. Therefore, the University of Muhammadiyah Malang decision issued in letter Number: E.6.o/307/BAAIK-UMM/IV/2021 that offline learning for laboratory practice is limited and partly done online.

Anxiety that occurs during a pandemic is a preventive activity due to the length of COVID-19 and the occurrence of self-isolation—making people more disciplined towards maintaining health and personal hygiene such as using masks, hand sanitizer, taking vitamin supplements and supporting drugs, and maintaining a distance of 1 meter (Safrizal et al., 2020). Supplements contain more vitamins, minerals, amino acids, and other non-plant ingredients. Still, they can be combined by plants that function to meet nutritional needs, increase body resistance, and have nutritional value and or physiological effects, improving health functions. (Mukti, 2020).

The primary purpose of this study was to identify anxiety and consumption levels and the relationship between anxiety and multivitamin consumption levels that occurred during the COVID-19 pandemic in UMM pharmacy students.

2. Methods

2.1 Types of research

This research uses a descriptive-analytical survey research method. The approach used is the Cross-Sectional method using a structured questionnaire instrument.

2.2 Respondent

The population in this study were pharmacy students at the University of Muhammadiyah Malang with active status in college for the 2021 academic year, as many as 1169 students. Respondents were taken using a non-probability sampling technique with purposive sampling method by the inclusion criteria of active pharmacy students 2021 batch 2017, 2018, 2019, and 2020, taking multivitamins during a pandemic, willing to be respondents in good health. Respondents were calculated using the slovin formula for each number of forces—obtained respondents as many as 93 pharmacy students UMM.

2.3 Instrument

The instrument used in this study was a questionnaire taken from previous research with the title "How is the knowledge of people's attitudes and behavior regarding the consumption of multivitamins/supplements during the COVID-19 pandemic" (Yuliawati & Djannah, 2020) and "Generalized Anxiety Disorder-7 Scale (GAD). -7)" (Cao et al., 2020) (Spitzer et al., nd) which has previously been tested for validity and reliability on 30 respondents from Universitas Brawijaya pharmacy students. The validity test results of each question are >0.361 , and the reliability is 0.811.

2.3.1 Generalized Anxiety Disorder Scale-7

Generalized Anxiety Disorder-7 (GAD-7) adapted in Indonesian from <https://www.pfizerpcoa.com/> (Spitzer et al., n.d.). The GAD-7 is a generalized anxiety disorder scale measuring anxiety-related experiences experienced in the last two weeks. The level of anxiety was assessed with a score level of 0 = never, 1 = several days, two = more than half of the time referred to, 3 = almost every day, then grouped into four categories of anxiety 0-4 = not anxious (normal), 5-9 = mild anxiety, 10-14 = moderate anxiety, 15-21 = severe anxiety.

2.4 Multivitamin Consumption Level Scale

Adapted from an article entitled "How is the knowledge of people's attitudes and behavior regarding the consumption of multivitamins/supplements during the COVID-19 pandemic" (Yuliawati & Djannah, 2020), multivitamin consumption during a pandemic, how to get multivitamins and accuracy in multivitamin consumption. Assessed with answers 0=Never, 1=Rarely, and 2=Always, which are then grouped into two categories, namely 0-5=poor and 6-10=good.

2.5 Data analysis

In this study, the analysis was carried out on anxiety and multivitamin consumption in pharmacy students during the COVID-19 pandemic and data on respondent characteristics such as gender and age, family finances, and type of insurance. The analysis carried out is univariate and bivariate. This analysis uses the help of the Statistical Product for Service Solution (SPSS) computer program. Univariate analysis was carried out on each variable described as a percentage (Sari, 2021; Yunita et al., 2021). For bivariate analysis using Spearman-rho rank correlation coefficient analysis is used to test a relationship between variables if the data is the ordinal scale or ranked. It can be correlated from different data scales (ordinal with nominal) or the same data scale (ordinal with ordinal) (Akoglu, 2018). The relationship between the sociodemographic of respondents, the anxiety variables, and vitamin consumption was analyzed using Chi-Square with a significance of $<0,05$ (Atmadani et al., 2020; Putra et al., 2021)

2.6 Ethical Clearance

This research has obtained approval and ethical licensing issued by the Health Research Ethics Commission of the University of Muhammadiyah Malang (KEPK-UMM) with the number No.E.5.a/171/KEPK-UMM/VII/2021. This study also pays attention to the confidentiality of the respondents. Informed consent has also been obtained from each respondent.

3. Result and Discussion

3.1 Demographic Characteristics of Respondents

The characteristics of the respondents can be seen in Table 1 shows that most of the respondents are 20 years old (76.3%). The grouping of age <20 years is said to be late adolescence, and the period 20 years is said to be early adulthood (young people) (Jamison et al., 2017). Students <20 years old are in the 2nd and 4th semesters on average. Meanwhile, students 20 are average at the 4th, 6th, and 8th semesters, with the most gender being female (89.2%). According to research conducted by Yani (2019), it was found that the number of female pharmacy students was more since pharmacy majors were more in demand by women than men, and the influencing factors were the lecture process and employment in pharmacy that required high accuracy, and the existence of feminism, namely traits that show patience and thoroughness (Ismail, 2020).

The highest semester level was in semester 2 (29.0%), with the last education being SMA/MA (86.0%), similar to Arifin & Ratnasari (2017) that SMA/MA students with interest in continuing their education to college have a high-interest category. Meanwhile, vocational school graduates are not interested in continuing their studies to a higher level than high school students because SMK is a vocational education that prepares students to work in specific fields. (Efendi et al., 2017).

Table 1 The characteristics of the respondents

Variables	Respondents Characteristics	Frequency	Percentage (%)
Age	< 20 years old	22	23,7
	≥ 20 years old	71	76,3
Gender	Female	83	89,2
	Male	10	10,8
GradeLevel	2 nd Semester	27	29,0
	4 th Semester	22	23,7
	6 th Semester	25	26,9
	8 th Semester	19	20,4
Education	High school	80	86,0
	Vocational school	13	14,0
Insurance Type	BPJS PBI	17	18,3
	BPJS Non PBI	35	37,6
	General	8	8,6
	No insurance	33	35,5
Combined Family Income	≤ Rp 1.800.000	2	2,2
	Rp 1.800.001 – Rp 3.000.000	19	20,4
	Rp 3.000.001 – Rp 4.800.000	29	31,2
	Rp 4.800.000 – Rp 7.200.000	23	24,7
	> Rp 7.200.000	20	21,5

Most respondents' type of insurance is BPJS Non-PBI insurance (37.6%), in line with Law number 40 of 2004. BPJS is part of the National Social Security System (SJSN) organized using a mandatory social health insurance mechanism (Central Bureau of Statistics, 2018). The majority result of a combined family income was Rp3,000,001–Rp4,800,000 (31.2%), according to the percentage of household income based on regional classification and income adequacy in urban and rural areas. Most of the respondents feel that their household income is sufficient, and the highest percentage of household income feels sufficient in the income group of Rp. 3,000,001 – Rp. 4,800,000 (Badan Pusat Statistika, 2016).

3.2 Univariate analysis

3.2.1 Anxiety category

The results are shown in Table 2. 33 UMM pharmacy students in the normal category of 35.3% (33 people) and 60 pharmacy students experienced anxiety with the highest percentage of anxiety in the mild anxiety category of 47.3% (44 people) and the lowest in severe anxiety of 2.2%. (2 persons). This result is in line with research conducted by Cao et al. (2020) on students in the Chinese area. During the COVID-19 pandemic, anxiety data level was obtained for 1,776 students. Most students are included in the mild anxiety category, much as 21.3%, and the least in severe anxiety, 0,9%. Anxiety that occurs due to the circumstances of the COVID-19 pandemic caused mass quarantine, social restrictions, and fear of being infected (Liu et al., 2020). Another factor that causes anxiety in USA students was due to the rapid transition to online learning, followed by worry about grades and delayed graduation, while another factor for students who experienced a decrease in anxiety or mild anxiety stated that they could save time in going to campus, no need to be involved in extracurricular and organizational activities, and even spend free time by pursuing hobbies or activities, and proactive health behavior.

Table 2 Distribution of Anxiety Frequency and Consumption Level

Table 2. Distribution of Anxiety Frequency and Consumption Level								
Variable	Anxiety				<i>P value</i>	Consumption		<i>P value</i>
	No anxiety n (%)	Mild n (%)	Moderate n (%)	Severe n (%)		Good n (%)	Poor n (%)	
Sex								
Female	28(84,8)	42(95,5)	11(78,6)	2(100)	0,227	62(92,5)	21 (80,8)	0,100
Male	5(15,2)	2(4,5)	3(21,4)	0 (0)		5 (7,5)	5 (19,2)	
Age								
< 20 years old	10 (30)	8(18,2)	2(14,3)	2(100)	0,034*	17(25,4)	5(19,2)	0,532
≥ 20 years old	23(69,7)	36(81,8)	12(85,7)	0 (0)		50(74,6)	21(80,8)	
Smester Level								
2 nd Semester	13(39,4)	8(18,2)	4(28,6)	2(100)	0,131	21(31,3)	6 (23,1)	0,735
4 th Semester	9(27,3)	9(20,5)	4(28,6)	0 (0)		16(23,9)	6 (23,1)	
6 th Semester	8(24,2)	13(29,5)	4(28,6)	0 (0)		16(23,9)	9 (34,6)	
8 th Semester	8(24,2)	14(31,8)	2(14,3)	0 (0)		14(20,9)	5 (19,2)	
Education								
High school	29(87,9)	38(86,4)	11(78,6)	2(100)	0,784	58(86,6)	22(84,6)	0,808
Vocational school	4(12,1)	6(13,6)	3(21,4)	0 (0)		9(13,4)	4(15,4)	
Nsurance type								
BPJS (PBI)	8 (24,2)	9 (20,5)	0 (0)	0 (0)	0,104	13(19,4)	4 (15,4)	0,910
BPJS Non PBI	16 (48,5)	15 (34,1)	4 (28,6)	0 (0)		25(37,3)	10(38,5)	
General	3 (9,1)	4 (9,1)	1 (7,1)	0 (0)		5(7,5)	3 (11,5)	
No insurance	6 (18,2)	16 (36,4)	9 (64,3)	2(100)		24(35,8)	9 (34,6)	
Combined Family Income								
≤ Rp. 1.800.000	0 (0)	1 (2,3)	1 (7,1)	0 (0)	0,395	2 (3,0)	0 (0)	0,277
Rp. 1.800.001 – Rp. 3.000.000	10 (30,3)	7 (15,9)	2 (14,3)	0 (0)		16(23,9)	3 (11,5)	
Rp. 3.000.001 – Rp. 4.800.000	8 (24,2)	16 (36,4)	5 (35,7)	0 (0)		21(31,3)	8 (30,8)	
Rp. 4.800.001 – Rp. 7.200.000	8 (24,2)	11 (25)	2 (14,3)	2(100)		17(25,4)	6 (23,1)	
> Rp. 7.200.000	7 (21,2)	9 (20,5)	4 (28,6)	0 (0)		11(16,4)	9 (34,6)	

significant at p-value <0.05

3.2.2 Consumption Rate Category

The level of multivitamin consumption found that respondents rarely took multivitamins during the COVID-19 pandemic. This statement is in line with the research results of Merita et al. (2020). In the COVID-19 pandemic, the average respondent rarely consumes multivitamins, but they always intake vitamins and minerals by consuming fruits and vegetables. This statement follows the research of Noviasy & Susanti (2020).) conducted on nutrition students that there was an increase in vegetable and fruit intake during the pandemic. In the indicator of getting multivitamins, respondents get more by buying from pharmacies than those who do not. I Nengah et al. (2020) stated that these results show that students get the most multivitamins at pharmacies. And consult with experts, both doctors/pharmacists, before taking multivitamins. Meanwhile, on the accuracy indicators, respondents always look at the composition or content of the multivitamin packaging before consuming it, following the results of Nengah et al. (2020) that most students will look at the multivitamin packaging before buying.

Table 3 Frequency of Types of Multivitamins

Types of Multivitamins	Frequency	Percentage (%)
CDR	16	6,8
Cerebrovit	3	1,3
Enervon-C	22	9,3
Hemaviton	5	2,1
Neurobion	6	2,5
Sangobion	15	6,4
Vitacimin	56	23,7
Blackmores	7	3
Imboost Force	37	15,7
Becom-Zet	18	7,6
Becom-C	15	6,4
Caviplex	15	6,4
Renovit	4	1,7
Zegavit	2	0,8
Neurosanbe	3	1,3
Lainnya	12	5,1

Regarding the type of multivitamin consumption used during the COVID-19 pandemic, the most widely used multivitamin answer was Vitacimin, with a percentage of 23.7% (56 people) (table 3) with respondents choosing more than one answer. According to research conducted by Yilmaz et al. (2020), there was an increase in the consumption of multivitamin vitamin C among university students during the COVID-19 pandemic. In Indonesia, the Vitamin C brand is a brand that was nominated for the Top Brand Award in the Vitamin C category and ranked first in 2017 (Sujana et al., 2017). Vitacimin is considered a pioneer, as evidenced by the community's attitude to know more about Vitacimin (Wardayanti, 2006). In a study conducted by Isnaini & Rahmawati (2021), it was found that the purchasing factor for vitacimin is based on the influence of family, direct experience, peer groups, direct marketing, and exposure to mass media.

3.3 Bivariate Analysis

3.3.1 Relationship between Age and Anxiety

The significant value of the relationship between the age characteristics of the respondents listed in table 2 with anxiety obtained a deal of Sig. 0.034 <0.05, which means that the age characteristics of the respondents have a relationship with the anxiety of UMM pharmacy students during the COVID-19 pandemic. The results of this study are per Anindyajati

et al. (2021) that age significantly has a relationship with anxiety, especially at a younger age (especially young adults). Young adults in this study were at least 18 years old with an average of 26 years. Based on age, most anxiety occurs at the age of 20 years. This problem happens because young adults are in a transitional phase worrying about the future, such as delays in academic and future learning, delayed graduation, and even challenging job vacancies during a pandemic. (Atmadani, 2021).

Table 4 Spearman Correlation Test

Variable	Sig.	Correlation Coefficient	Conclusion
Anxiety	0,247	0,121	No correlation
Consumption level			

Meanwhile, anxiety with severe category occurs only at < 20 years. Based on research conducted by Oetomo et al. (2017) that 2nd and 4th-semester students are a transition period in which new students are said to be emerging adulthood, namely the transition from late adolescence to early adulthood. The transition from high school to college is based on different learning patterns, critical thinking, activities, and learning times. Early semester students have a process of adjustment both in academic, social, personal-emotional, and institutional attachment. The adjustments during the transition period could not be applied to early students due to the COVID-19 pandemic, which prevented new students from experiencing this.

In this study, severe anxiety was found in 2nd-semester students. Similar to the research conducted by Wang & Zhao (2020) that severe anxiety was more common in first and second-year students because it was academically related, complaining about the difficulty level of a rapid transition to online learning. They were followed by a worry about value (Wang & Zhao, 2020). Managing anxiety can be done with coping by maintaining a healthy diet, exercise, adequate sleep, keeping the mind from stress by getting support from friends and family members, and taking time to relax and enjoy the activities you like and assistance in the form of counselling. Psychological services from educational institutions either face-to-face or remotely (Sundarasan et al., 2020).

The anxiety that occurs among students can be reduced by: providing education to students related to coping in the form of maintaining a healthy diet, exercising, getting enough sleep, keeping the mind from stress by gaining support from friends and family members, and taking time to relax and enjoy activities—preferred as well as assistance in the form of psychological counselling services from educational institutions either face-to-face or remotely as an effort in the Institution's part in dealing with anxiety that occurs in students, especially in early semester students.

We hope that further research will be conducted on students majoring in pharmacy other than UMM to see the anxiety level in different institutions. We also suggest researching the factors that cause anxiety using another anxiety scale.

4. Conclusion

Anxiety that occurred during the COVID-19 pandemic in UMM pharmacy students found that mild anxiety was 47.3%, moderate anxiety was 15.1%, severe anxiety was 2.2%, and no anxiety (normal) was 35.5%. There was a consumption level of multivitamins during the COVID-19 pandemic in UMM pharmacy students with a percentage of good consumption levels of 72.0% and less than 28.0%. Still, there was no relationship between anxiety and the level of multivitamin consumption during the COVID-19 pandemic in UMM pharmacy students with Spearman bivariate analysis (α). $=0.247 > 0.005$). Meanwhile, there is a relationship in the bivariate chi-square analysis between the respondent's age variable and the level of anxiety during the COVID-19 pandemic in UMM pharmacy students. ($\alpha=0.034 < 0.005$).

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Evaluation of Usability, Knowledge, and Satisfaction of Drug-Herb Interaction Website

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ABSTRACT

Introduction: Drug-herb interaction website are an essential sources information to prevent the risk and problem occur related to the drug-herb interaction use. One of the drug-herb interaction website which provide an English language can be found in <https://drug-herb-interaction.netlify.com>. **Objectives:** The focus of this study was to evaluate the usability, knowledge, and satisfaction of drug-herb interaction in <https://drug-herb-interaction.netlify.com>. **Methods:** We assessed the usability, knowledge, and satisfaction of the drug-herb interaction website by questionnaire. The question was developed into four parts, general information, usability, knowledge, and satisfaction of the website. **Results:** Our results found that only 28.6% respondents know about drug-herb interaction website. The input method of the website <https://drug-herb-interaction.netlify.com> was easily to use. Knowledge about the drug-herb interaction is important to improve patients' safety. Most of respondents (92.9%) were satisfied when using the website. **Conclusions:** The website <https://drug-herb-interaction.netlify.com> appears to be an effective tool to search information related to the drug-herb interaction. The respondents were satisfied when using the website. In the future, the content and quality of the website need to be developed to reduce the interaction risks of drug-herb uses.

1. Introduction

Patients have an increasing number of turned to the internet for health-associated statistics for the end of the 20th century (Cline & Haynes, 2001). Proof suggests that healthcare customers have grown to be greater proactively concerned in the management of their very own health because of the considerable extent of statistics to be had. For the duration of the ten years of the net 1.0 technology, general net users had been without a doubt receiver of content and could only browse content created through specific organizations and published on websites with the aid of web admins. For the duration of the internet 2.0 technology (Mohammed et al., 2008) net usage has been modified. Consequently, specific websites offering literature on herb-drug interactions (HDIs) summarized utilizing specialists with pharmacy and scientific research backgrounds prevent readers from misusing informational content. Sizeable amounts of facts regarding Western medicines are available. Interactions between herbs and Western medication can cause undesirable results. However, these medications can also work collectively to enhance remedy efficiency while decreasing facet outcomes. The significance of considering the interaction results between herbs and Western medication cannot be overemphasized and cited in preceding research (T. J. Adam & J. Vang, 2015).

Consequently, the excellent and empirical validity of facts regarding interactions among herbs and Western medicinal drugs (Scarton et al., 2013) and verbal exchange between scientific specialists and the general public are essential. However, only a few studies (Raban et al., 2016; Scarton et al., 2013; Wong et al., 2009) have assessed the exceptionality of online HDI records, and none of those studies have evaluated websites meant for the customer. Similarly, fashionable open-access websites have numerous shortcomings because most statistics do not have to strictly reference the literature and relate to clinical packages (Taveira-Gomes et al., 2016). One of drug-herb interaction open access website is found in the website <https://drug-herb-interaction.netlify.com>. This website includes drug-herb interaction in two languages (Chinesse and English). This website contains the interaction, implication, study design, and case

population (Wu et al., 2019). The main objective of this study was to evaluate an easy-to-use search website with a proven drug-herb interaction database to find out whether there are interactions between herbs and medicine.

2. Methods

This study focused on the evaluation of usability of the drug-herb interaction website that can be found in the <https://drug-herb-interaction.netlify.com>. The evaluation of the drug-herb interaction website was conducted by questionnaire. The questionnaire was then distributed into respondents. The question was developed into four different aims: 1) General information and knowledge related to drug-herb interaction website; 2) How to use drug-herb interaction website in <https://drug-herb-interaction.netlify.com>. website. 3) Knowledge about the drug-herb interaction contents that was presented in <https://drug-herb-interaction.netlify.com>. website. 4) Satisfaction after using the website

3. Results and Discussion

Using questionnaire related to drug-herb interaction website, we reported 14 medical students who fulfill the questionnaire. All of the students were in the 4th year study. Our results found that only 28.6% respondents know about drug-herb interaction website. In the general information, most of respondents have not good enough skill in the English reading ability.

Table 1. General Information and Knowledge related to drug-herb interaction website

Questions	Percentage
1. English reading ability	
Not good enough	57.1%
Good	35.7%
Excellent	7.1%
2. Have you ever use drug-herb interaction website?	
Yes	28.6%
No (I don't know if there is a drug-herb interaction website)	28.6%
No (I don't think I should check the relevant information)	21.4%
No (I feel that the information source from internet cannot be validated)	21.4%

To address the easy and usability of the website, we assess the input methods questions to the respondents. Our results showed that the website content provides an easy access and search points. Most of the respondents know how to enter the name of drug and herb on the website. The input method to the website was easily to use according to 64.3% respondent which displayed in the table 2. Other study which evaluate drug-drug interaction website, showed the limitation of patients readability, so that need a further development website (Terrence J. Adam & Joseph Vang, 2015).

Table 2. Usability of drug-herb interaction website (<https://drug-herb-interaction.netlify.com>. website.

Questions	Percentage
1. When you use the website, do you know where to enter the name of drug on the website?	
Yes	64.3%
No	35.7%
2. When you use the website, do you know where to enter the name of herb on the website?	
Yes	64.3%
No	35.7%
3. Does the input method is easily?	
Yes	64.3%
No	35.7%

Table 3. indicated the knowledge about drug-herb interaction found in the website. The results showed that the most information which respondents want get from the website was

“when the herb and medicines are used together, the interaction which maybe occur” (57.1%). Better knowledge about drug-herb interaction is important to prevent the negative events occurs in the use of drug and herb in the same time (Kennedy & Seely, 2010). Then, we evaluated some knowledge related to the drug-herb interaction information which was provided in the website. The questions developed related to the risk, how to prevent the risk, and trial conducted between angelica-warfarin; ginseng-warfarin; and ginkgo biloba-ibuprofen. According to our results, the knowledge related to the drug-herb interaction was still under 50%. It is important to update knowledge related to the drug-herb interaction, because the interactions can significantly affect the circulating levels of drug, and alter clinical outcome (Chen et al., 2012).

Table 3. Knowledge about the drug-herb interaction contents that was presented in <https://drug-herb-interaction.netlify.com>. website

Questions	Percentage
1. When you use the website to check drug-herb interaction, what information do you want most to get in the website?	
When the herb and medicines are used together, the interaction between the two may occur.	57.1%
When the interaction between herb-drug occurs, the recommended way of treatment	21.4%
The result of the interaction between herb and drug, and its source (eg whether confirmed by animal experiments or human experiments)	21.4%
2. Can you get the information you want to know after using the website?	
Yes	42.9%
Maybe	50.0%
No	7.1%
3. After using the website, do you know that "the risk of bleeding may occur when using Angelica - WARFARIN"?	
Yes	57.1%
No	42.9%
4. After using the website, do you know that "the risk of thrombosis may occur with ginseng-WARFARIN"?	
Yes	50.0%
No	50.0%
5. After using the website, do you know that "the risk of bleeding may occur with Ginkgo biloba - IBUPROFEN"?	
Yes	35.7%
No	64.3%
6. After using the website query, do you know how to reduce the risk when the interaction with Angelica-WARFARIN occurs?	
Yes	28.6%
No	71.4%
7. After using the website to check, do you know how to reduce the risk when using ginseng-WARFARIN interaction?	
Yes	50.0%
No	50.0%
8. After using the website query, can you clearly determine whether the result of the interaction of Angelica sinensis-WARFARIN has been confirmed by human trials or only animal experiments through research design/research method field information?	
Yes	35.7%
No, because there are many sources of data, not everyone is marked, so it is impossible to make a clear judgment.	57.1%
No, because there is only a review of the literature, it is impossible to judge whether the source of the literature is animal or human.	7.1%

9. After using the website query, can you clearly determine whether the results of the interaction of ginseng-WARFARIN have been confirmed by human trials or only animal experiments through research design/research method field information?	
Yes	42.9%
No, because there are many sources of data, not everyone is marked, so it is impossible to make a clear judgment.	35.7%
No, because there is only a review of the literature, it is impossible to judge whether the source of the literature is animal or human.	7.1%
No, because unlabeled source	14.3%
10. After using the website query, can you clearly determine whether the results of the interaction of Ginkgo biloba-IBUPROFEN have been confirmed by human experiments or only animal experiments?"	
Yes	21.4%
No, because there are many sources of data, not everyone is marked, so it is impossible to make a clear judgment.	35.7%
No, because there is only a review of the literature, it is impossible to judge whether the source of the literature is animal or human.	14.3%
No, because unlabeled source	28.6%

Next, the satisfaction of the website usage was presented in the table 4. Our results showed that even though there were a difficulty to understand the website, a total of 92.9% respondents was satisfied with the website. They declared that the information provided in the website was helpful (42.9%). The assessment of the website related to the health information was important to improve the quality of the website (Ng et al., 2020). In the future, the quality and content of the website need to be developed.

Table 4. Satisfaction after Using the Website

Questions	Percentage
1. Do you think the information in the drug-herb interaction's website was helpful?	
Very helpful	21.4%
Helpful	42.9%
Enough helpful	35.7%
Not helpful	0.0%
2. After using the website to check, is it difficult to understand the information displayed?	
Yes	64.3%
No	35.7%
5. After you use the website to query, what is the overall satisfaction of the website?	
I am satisfied	92.9%
I am not satisfied	7.1%
6. Do you think developing website for drug-herb interaction can reduced the interaction risks of self-medication in general population?	
Yes	85.7%
No	14.3%

4. Conclusion

The website <https://drug-herb-interaction.netlify.com> appears to be an effective tool to search information related to the drug-herb interaction. The input method of the website was easily to use. Knowledge about the drug-herb interaction is important to improve patients' safety. The respondents were satisfied when using the website. In the future, the content and quality of the website need to be developed to reduce the interaction risks of drug-herb uses.

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Designs Therapy of NSAID in Postoperative Benign Prostatic Hyperplasia (BPH) Patients at Kediri General Hospital

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ABSTRACT

Introduction: Benign Prostatic Hyperplasia (BPH) develops in men entering old age and having testes that still produce the hormone testosterone. More than 50% of men over 60 years and 90% of men aged around 80 years tend to experience lower urinary tract symptoms (LUTS). The incidence of BPH is 25% in men aged 40-49 years and 80% in men 70-79 years. The first treatment options are activating (watchful waiting), medication (α 1-blockers, 5 α -reductase inhibitors, PDE5 inhibitors, combination therapy, physiotherapy), surgery, and special conditions. In the treatment process, especially in patients, patients will feel mild to severe pain. The treatment that can be given is a Non-Steroidal Anti-Inflammatory Drug (NSAID). **Objectives:** This study aims to determine the designs therapy of NSAIDs in patients with benign prostatic hyperplasia at Kediri General Hospital. **Methods:** The research design was carried out descriptively with retrospective data collection methods, namely, processing Patient Medical Records (RMP) at the Kediri District Hospital. The inclusion criteria were BPH patients with or without comorbidities who received NSAID therapy and were equipped with complete medical record data from January-November 2019. **Results:** In the research conducted at the Kediri District Hospital, a sample of 53 patients met the inclusion criteria. Patients aged 60-74 years were the group with the most (55%) experiencing BPH. These patients underwent length of treatment > 3 days. The single therapy pattern was mefenamic acid 3x500 mg PO (61%), in the combination pattern, the most widely used was Metamizole 3x1 g IV + mefenamic acid 3x500 mg PO (42%), the switching therapy pattern was Ketorolac 3x30mg IV Sodium Metamizole 3x1g IV (34 %). **Conclusions:** The use of NSAID analgesics consisted of single (71%), combination (7%), and switching (22%)

1. Introduction

Benign Prostatic Hyperplasia (BPH) is characterized by the proliferation of prostatic stromal and epithelial cells in the transition zone surrounding the urethra (Chughtai et al., 2016). The etiology of BPH is still not fully understood, even though many clinical and molecular studies have been carried out (Yustina et al., 2019). In general, BPH develops in men entering old age and have testes that still produce testosterone. In addition, the influence of other hormones, such as estrogen and prolactin, dietary patterns, microtrauma, inflammation, obesity, and physical activity are thought to be related to the proliferation of prostate gland cells indirectly (Mochtar et al., 2015). One of the BPH classification systems used is the International Prostate Symptom Score (IPSS), developed by the American Urological Association (AUA). The system is standardized by the World Health Organization (WHO) for symptoms of obstruction due to an enlarged prostate. This score helps assess and monitor the condition of BPH patients, which can be classified based on scores. Scores 0-7 are classified as severe degrees, scores 8-19 are moderate degrees and scores 20-35 are classified as severe degrees (Tjahjodjati et al., 2017).

Based on the study results, it is known that some of the 60 respondents (40%) are obese. Of the 20 respondents who suffered from BPH, most (65.0%) were classified as obese, while of the 40 respondents who did not suffer from BPH, most (72.5%) were not classified as obese (Egan, 2016). Some men with enlarged prostate with histologic benign prostatic hyperplasia do not complain of symptoms. However, more than 50% of men over 60 and 90% of men over 80 are likely to have lower urinary tract symptoms (LUTS). The prevalence is 25% in men aged 40-

49 years and becomes 80% in men 70-79 years (Mochtar et al., 2015). Therefore, therapy is needed that aims to improve the patient's quality of life.

In postoperative surgery, there is often a persistent inflammatory response and pain. These problems are one of the main reasons for the length of hospitalization for BPH patients. Constant postoperative pain persists for more than three months after surgery and requires pain medication (Chou et al., 2016). After surgery, the patient felt severe pain and had an unpleasant experience of pain scale scores due to pain management that did not meet the requirements (Aprina et al., 2017). Patients undergoing surgery experience acute pain after surgery belonging to the moderate to severe pain category (Wulandari, 2018). The therapy that can be given is a Non-Steroidal Anti-Inflammatory Drug (NSAID). Non-opioid analgesics are used to relieve mild, moderate to severe pain and are called mild-moderate analgesics. NSAIDs are one of the most commonly prescribed therapeutic classes for pain and inflammation. NSAIDs work by inhibiting COX-1 and COX-2. COX-2 is more involved in prostaglandin-mediated pain and inflammation, while COX-1 plays an important role in gastric mucosal protection and platelet hemostasis. The safety profile of NSAIDs against the gastrointestinal tract is known to be relatively high, and cardio-nephrotoxic side effects also have a significant potential (Stessel et al., 2016; Wongrakpanich et al., 2018). This study aims to determine the design therapy of NSAID in patients with benign prostatic hyperplasia at Kediri General Hospital.

2. Methods

The research method used is observational because the researchers did not directly treat the sample being studied. The research design was carried out descriptively with retrospective data collection methods, namely, processing Patient Medical Records (RMP). The selection of this study was BPH patients who received analgesics at the Inpatient Installation of the Kediri District Hospital for the period January-November 2019. Inclusion data included all BPH patients with or without comorbidities who received NSAID therapy and were equipped with complete medical record data.

3. Results and Discussion

In the research that has been conducted at the Kediri District Hospital, a sample of 53 patients was obtained. The sample met the inclusion criteria with complete RMP data in January-November 2019. Demographic data of patients included age, guarantor status, length of stay, and condition of hospital discharge.

Patients aged 60-74 years were the group with the most (55%) experiencing BPH. *Benign Prostatic Hyperplasia* is a disease that is often found in older men. The size of the prostate will gradually increase and cause BPH at the age of more than 60 years. The percentage incidence of BPH is more than 50% at the age of more than 60 years, and at the age of 85 years, as many as 90% of men will experience BPH (Harun, 2019). In a study conducted by Mulyadi (2020) regarding BPH prevalence in Cibirong Hospital from January 2017 - August 2019, as many as 287 cases (93.46%). With the most frequent occurrence in 2018, as many as 117 patients (40.76%). The distribution of the age group with the most cases of prostate hyperplasia is in the age group 65-74 years, with a total of 125 patients (43.55%) (Mulyadi & Sugiarto, 2020).

Table 1. Patient Demographic Data

Age Classification	Number of Patients	Percentage (%)
45-59 Years	8	15
60-74 Years	29	55
75-90 Years	16	30
Amount	53	100

Guarantor Status	Number of Patients	Percentage (%)
BPJS	39	74
General	14	26
Amount	53	100
Treatment Length	Number of Patients	Percentage (%)
Three days	27	51
4-7 days	23	43
> 7 days	3	6
Amount	53	100
Discharged condition	Number of Patients	Percentage (%)
getting better	52	98
Forced home	1	2
Die	0	0
Amount	53	100

The most data obtained are patients with BPJS status as much as 74%. The Social Security Administering Body (BPJS) is a health insurance institution program formed by following the insurance cost in Indonesia. The government seeks to achieve equitable public health welfare by providing a Health Insurance program (Khasanah et al., 2020). Factors related to the hospitalization in patients with benign prostate enlargement carried out by Bhayangkara Mataram Hospital, from 89 BPH patients, the most data obtained were 34 people (38.2%) of hospitalization for five days. Meanwhile, 38 people (42.7%) received four postoperative hospitalization days (Mahendrakrisna et al., 2016). The distribution of MRS duration in BPH patients is classified into three intervals.

The results showed that the single therapy pattern was the most chosen for NSAIDs in BPH patients (71%). The most widely used single therapy pattern was mefenamic acid 3x500 mg PO (61%). The use of this drug remains relevant for pain syndromes and some gynecological disorders (Cimolai, 2013). Meanwhile, the most widely used combination therapy pattern is metamizole 3x1 g IV + mefenamic acid 3x500 mg PO (42%). Based on research (European Medicines Agency, 2019), the results of the evaluation of Metamizole concluded that there are two doses (500 mg and 1,000 mg) that have different pain reductions (Schmitz et al., 2017). The drug's onset of action after intravenous administration is 30 minutes, with the duration of the drug in the body of 4 hours. Drug absorption after oral administration is fast and almost complete, with a bioavailability of 85% and a time of maximum concentration in plasma of about 1.2-2 hours (Ramadani et al., 2016). Mefenamic acid is given orally as an analgesic to treat mild pain in patients. This combination is used to reduce the patient's pain which sometimes appears on a moderate and mild scale. When the patient's pain is on a moderate-severe scale, the patient is given metamizole Sodium injection.

Table 2. Patterns of NSAID Use in BPH Patients

NSAID Usage Pattern	Number of Patients*	Percentage (%)
Single	214	71
Combination	21	7
Switch	67	22
Amount	302	100
Single Pattern	Number of Patients*	Percentage (%)
Metamizole 3x1 g IV	47	22
Ketorolac 3x30 mg IV	27	12
Mefenamic acid 3x500 mg PO	131	61
Diclofenac sodium 5x50 mg PO	8	4
Metamizole 3x500 mg PO	1	1
Amount	214	100

Combination Pattern	Number of Patients*	Percentage (%)
Metamizole 3x1 g IV + Ketorolac 3x30 mg IV	8	38
Metamizole 3x1 g IV + mefenamic acid 3x500 mg PO	9	42
Ketorolac 3x30 mg IV + mefenamic acid 3x500 mg PO	2	10
Mefenamic acid 3x500 mg PO + Sodium diclofenac 5x50 mg PO	2	10
Amount	21	100
Switching Pattern	Number of Patients*	Percentage (%)
Metamizole 3x1 g IV → Ketorolac 3x30 mg IV	7	10
Metamizole 3x1 g IV → Mefenamic acid 3x500 mg PO	20	30
Metamizole 3x1 g IV → Diclofenac sodium 5x50 mg PO	8	12
Ketorolac 3x30 mg IV → Metamizole 3x1 g IV	22	34
Ketorolac 3x30 mg IV → Mefenamic acid 3x500 mg PO	8	12
Mefenamic acid 3x500 mg PO → Metamizole 3x1 g IV	1	1
Metamizole 3x1 g IV → Metamizole 3x500 mg PO	1	1
Amount	67	100

*One patient can get more than one therapy pattern

The most common replacement therapy was Ketorolac 3x30 mg IV, then replaced with Metamizole Sodium 3x1 g IV (34%). The change in treatment was due to the patient's pain of the surgical wound has begun to decrease, and Ketorolac is a list of Automatic Stop Order (ASO) drugs, namely specific categories of drugs that are considered strong/potent drugs and drugs that require regular review. In Medication Reassessment Alerts (MRA), Ketorolac has a maximum dose of 120mg/day with a duration of therapy of 5 days to prevent adverse effects on the kidneys and gastrointestinal tract (Niu et al., 2020). Therefore, it was replaced with Metamizole Sodium, a potent analgesic and antipyretic with minimal anti-inflammatory activity so that there are no excessive side effects (Markman et al., 2018). Furthermore, most advanced analgesic therapy received analgesic therapy orally, namely Mefenamic Acid, as a follow-up therapy option for optimal pain management when discharged from the hospital (Schjerner et al., 2020).

4. Conclusion

Benign Prostatic Hyperplasia is a disease that is often found in older men. Patients aged 60-74 years were the group with the most (55%) experiencing BPH. These patients underwent length of treatment > 3 days. Analgesic use consisted of single (71%), combination (7%), and switching (22%). The single therapy pattern was mefenamic acid 3x500 mg PO (61%), in the combination pattern, the most widely used was Metamizole 3x1 g IV + mefenamic acid 3x500 mg PO (42%), the switching therapy pattern was Ketorolac 3x30mg IV Sodium Metamizole 3x1g IV (34 %).

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Anti-inflammatory Properties of *Curcuma longa* rhizome based on Network Pharmacology Approach

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ABSTRACT

Introduction: *Curcuma longa* has been studied for its pharmacological activity, but no one has clearly discussed the molecular mechanism that occurs, especially in anti-inflammatory activity. **Objectives:** This study was conducted to provide a simulative description of the anti-inflammatory activity of *C. longa* through an in silico approach. **Methods:** The research was conducted in silico simulation. Data collection was carried out using data sources from the Duke Phytochemical Data Bases, and Pubchem. Phytochemical screening with Swissadme, prediction of protein interactions with Swisstargetprediction.ch. Target protein network with string-db, Visualization of ligand and protein interaction data with Cytoscape version 3.8.2. Docking used PyRx software version 0.8 and visualization of docking results with Discovery Studio v21. **Results:** There are 14 proteins that are closely correlated with 5 metabolites of *C. longa*. The fourteen proteins are ADORA2A, ADORA1, PIK3CG, EGFR, ALOX5, ALOX15, AKT1, SYK, AXL, F2, NOX4, PTGES, APP, TLR9. The protein interacts closely with five metabolites of Caffeic Acid, Curcumin, Bisdemethoxycurcumin, Demethoxycurcumin, and Quercetin. **Conclusions:** *C. longa* has potential as an anti-inflammatory through the content of five metabolites namely Caffeic Acid, Curcumin, Bisdemethoxycurcumin, Demethoxycurcumin, and Quercetin and inhibits inflammatory activity through inactivation of receptors, inhibition of kinase enzymes and functional enzymes that trigger inflammation.

1. Introduction

The human body is always active in defense against infection with microorganisms that threaten cellular functions (Prasad et al., 2019). Inflammation is the body's natural response to infection. When the condition occurs, the inflammatory mechanism causes the accumulation of various components of the body's defenses at the site of infection. Leukocytes, plasma proteins, and multiple members of the body's immune system accumulate in it to eliminate infection as soon as possible. Inflammation is the body's normal response to infection. However, uncontrolled inflammation causes damage to the body that is sometimes more dangerous than the infection itself. Cytokine storms are widely cited as causing SARS-Cov-2 or COVID-19 infection (Ghosh & Weinberg, 2021). Cytokine storm itself is one of the inflammatory processes in which pro-inflammatory cells signal the infected cells to undergo massive apoptosis, causing enormous damage to tissues and organs where infection occurs. Optimizing anti-inflammatory activity by inducing certain compounds in the body is undoubtedly one of the alternative solutions to fight uncontrolled inflammation such as cytokine storms (Sechet et al., 2018).

Some plants are known to have anti-inflammatory activity due to their chemical content. *Curcuma longa* is one of the widely used plants for traditional medicine in Indonesia. *Curcuma longa* rhizome is known to contain many components of flavonoid compounds, terpenoids, and polyphenols that are beneficial for the body and can be used, one of which is an anti-inflammatory (Catanzaro et al., 2018).

Currently, screening candidate drug compounds with computerized methods have become an option due to extensive and accurate databases. With the availability of abundant databases and automated analysis tools (in silico), it is possible to screen compounds, their efficacy, and activity patterns at the molecular level at a meager cost and reduce the use of experimental animals and humans as volunteers in vivo and in vitro tests [5].

Curcuma longa has been studied for its pharmacological activity, but no one has discussed the molecular mechanism, especially anti-inflammatory activity. In this research, the anti-inflammatory activity of *C. longa* in silico will be addressed, including the interaction of target proteins and anti-inflammatory molecules that interact in it. Therefore, this study was conducted to provide a simulative description of the anti-inflammatory activity of *C. longa* through an in silico approach.

2. Methods

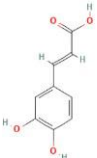
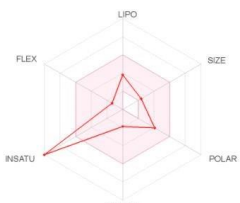
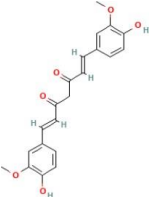
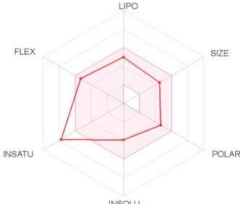
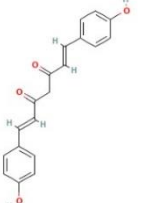
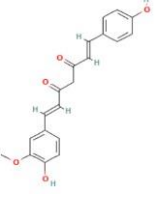
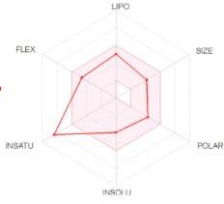
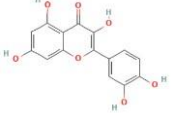
This research is an experimental, exploratory research using in silico analysis. Phytochemical data for *C. longa* was obtained from the plant phytochemical data bank Dr. Duke's Phytochemical Databases (Barlow et al., 2012). Phytochemical data was unified with canonical smile data and compound id obtained from Pubchem in a spreadsheet (Kim et al., 2016). Analysis was carried out using SwissADME software to find compounds with high drug likeness and potential as new drug candidates (Daina et al., 2017). A study was carried out using the www.swisstargetprediction.ch software to determine the target protein that interacts with all *C. longa* compounds (Daina et al., 2019). The results of the analysis of the total target protein of compound *C. longa* were then selected for specific proteins that interact with inflammatory proteins using the string-db.org software (Szklarczyk et al., 2019). Visualization of the interaction of potential compounds selected by SwissADME that interacts with specific anti-inflammatory proteins used Cytoscape software (Cui et al., 2020). The description of the interaction of the active compound *C. longa* with the target protein was simulated by docking compounds and proteins using PyRx and Discovery studio to visualize 3D and 2D docking images (Rachmawati et al., 2019; Toor et al., 2021).

3. Results and Discussion

Curcuma longa in this study, the rhizome was selected as an anti-inflammatory in silico analysis material. The rhizome was chosen because it contains more chemical compounds disclosed and listed in Dr. Duke's Phytochemical Databases. There are 146 metabolites contained in the rhizome of the *Curcuma longa* database. Based on the analysis results using the interaction prediction software for metabolites and proteins www.swisstargetprediction.ch The pharmacological network is known as shown in Figure 1. Within the pharmacological network, there are 14 proteins associated with inflammation. Some are receptor proteins such as TLR9, ADORA2A, ADORA1. Some are protein kinases like SYK, AXL, PIK3CG, and some are enzymes like ALOX5, ALOX15, NOX4. The predicted results of the ligand (*Curcuma longa* metabolite compound) with the target protein are in Figure 2. b. It appears that curcumin, demethoxycurcumin, bisdemethoxycurcumin, caffeic acid, and quercetin are five of the 146 compounds that closely interact with inflammatory proteins.

These predicted proteins have a close relationship with the inflammatory process. The interactions of selected ligands of *C. longa* with these proteins were further analyzed by molecular docking to confirm each ligand's role. ALOX5 is the rate-limiting enzyme for leukotrienes' biosynthesis, a family of pro-inflammatory lipid mediators derived from arachidonic acid (Sun et al., 2019). Based on the docking results, Caffeic Acid and Quercetin have the potential as competitive inhibitors of this enzyme because they bind to the enzyme's active site. The binding energy for Caffeic Acid with ALOX5 is -6.1 kcal/mol, and Quercetin with ALOX5 is -8.1 kcal/mol. Another enzyme that is quite important in the inflammatory process is ALOX12. ALOX12 was detected to interact with quercetin contained in *C. longa*. Many studies have demonstrated that ALOX12 and their eicosanoid metabolite 12-hydroxyeicosatetraenoate (12-HETE) have significant pathological implications in inflammatory diseases. Increased level of ALOX12 activity promotes stress (both oxidative and endoplasmic reticulum)-mediated inflammation, leading to damage in these tissues (Kulkarni et al., 2021).

Table 1. The content of compounds in anti-inflammatory candidate *Curcuma longa* has good drug-likeness and complies with Lipinsky Rule

No	Compounds (Pubchem CID)	2D Structure	Drug Likeness Radar	Lipinsky Rule	Anti- inflammatory effect protein interaction
1.	Caffeic Acid (689043)			Yes	ALOX5
2.	Curcumin (969516)			Yes	PTGES, APP, TLR9
3.	Bis-Demetoxy Curcumin (5315472)			Yes	PTGES, APP, TLR9
4.	Demetoxycurcumin (5469424)			Yes	PTGES, APP, TLR9
5.	Quercetin (5280343)			Yes	ADORA2A, ADORA1, PIK3CG, EGFR, ALOX5, ALOX15, AKT1, SYK, AXL, F2, NOX4

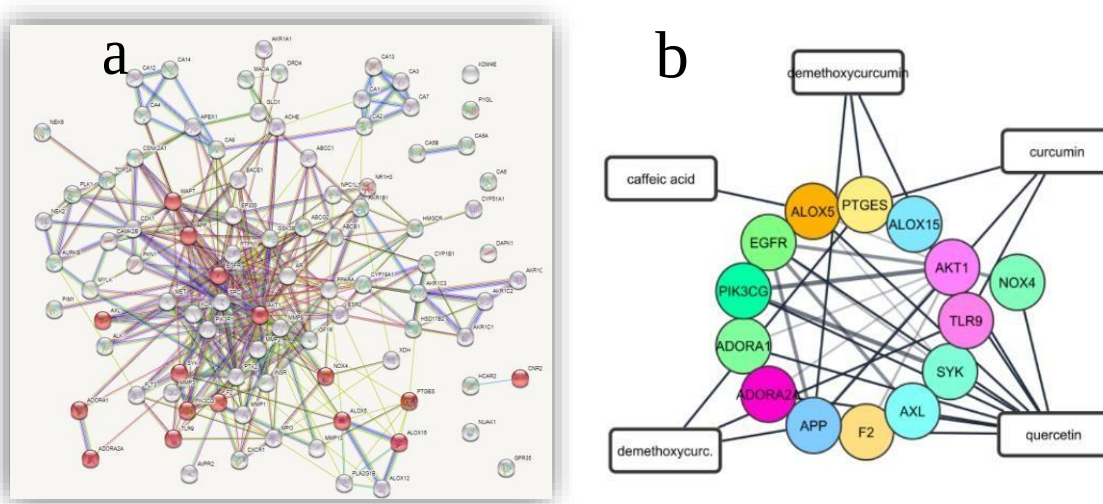
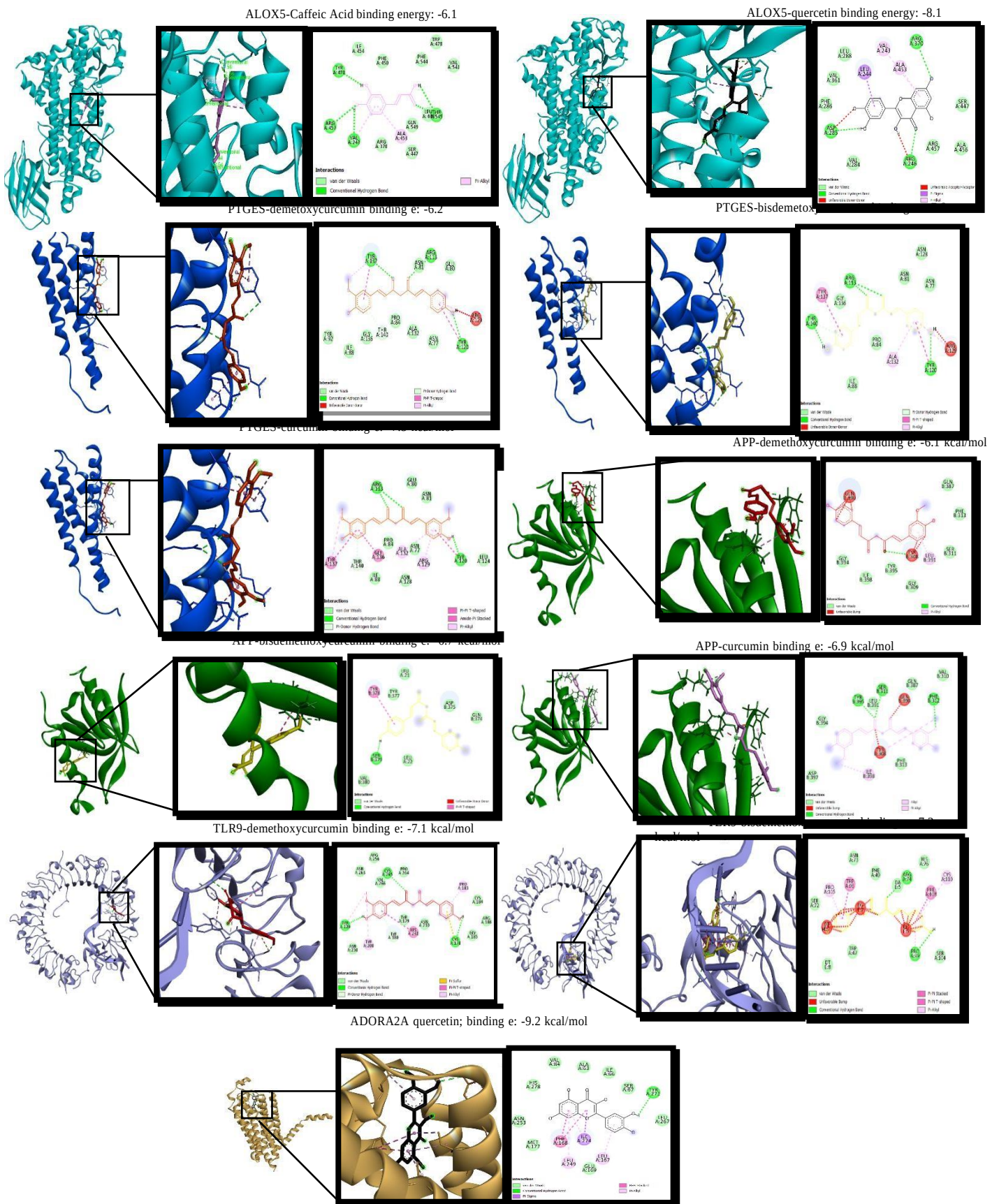


Figure 1. (a) The predicted protein-protein interaction pattern using www.swisstargetprediction.ch, where all the proteins present in the form of spheres are proteins with an interaction probability of more than 50% with 146 compounds contained in *C. longa*. Red indicates a protein correlated with inflammation; white is another protein not associated with inflammation. (b) the interaction of *C. longa* metabolites and proteins using Cytoscape Version 3.8.2 software showed that 14 proteins were closely correlated with 5 *C. longa* metabolites. The fourteen proteins are ADORA2A, ADORA1, PIK3CG, EGFR, ALOX5, ALOX15, AKT1, SYK, AXL, F2, NOX4, PTGES, APP, TLR9. The protein interacts closely with five metabolites of Caffeic Acid, Curcumin, Bisdemethoxycurcumin, Demethoxycurcumin, and Quercetin.

Two receptor proteins ADORA1 and ADORA2A, seem to closely correlate with immune reactivity, one of which is the inflammatory response. The presence of these two receptors increases immunological reactivity in glioma cells in cases of brain tumors(Huang et al., 2016). The TLR9 receptor protein is one of the typical receptors in the cellular mechanisms of the innate and adaptive immune systems. Activation of TLR9 will trigger the body's immune response by producing pro-inflammatory cytokines(Burgueño et al., 2016). Curcumin, demethoxycurcumin and bisdemethoxycurcumin are known to bind to TLR9. These three ligands can bind TLR9 with bond energies of -7.1 kcal/mol, -7.1 kcal/mol, and -7.2 kcal/mol. Based on the docking results, it is suspected that these three ligands can inhibit TLR9 activity as a receptor.

The EGFR protein is activated by numerous endogenous ligands that promote cellular growth, proliferation, and tissue regeneration. Its role in inflammation seems to be by eliciting pain mechanisms. Pain is one of the clinical manifestations of inflammation, and by inhibiting EGFR activity, the potential for pain can be reduced(Martin et al., 2017). The binding energy of the ligand molecule and the target protein is one of the determinants of the strength of the interaction in molecular docking. It is stated that the bond energy of -6.77 kcal/mol in the study has entered the category of significantly active interactions, and more lower the bond energy between the ligand and the target protein, the higher the interaction (Murugesan et al., 2021).



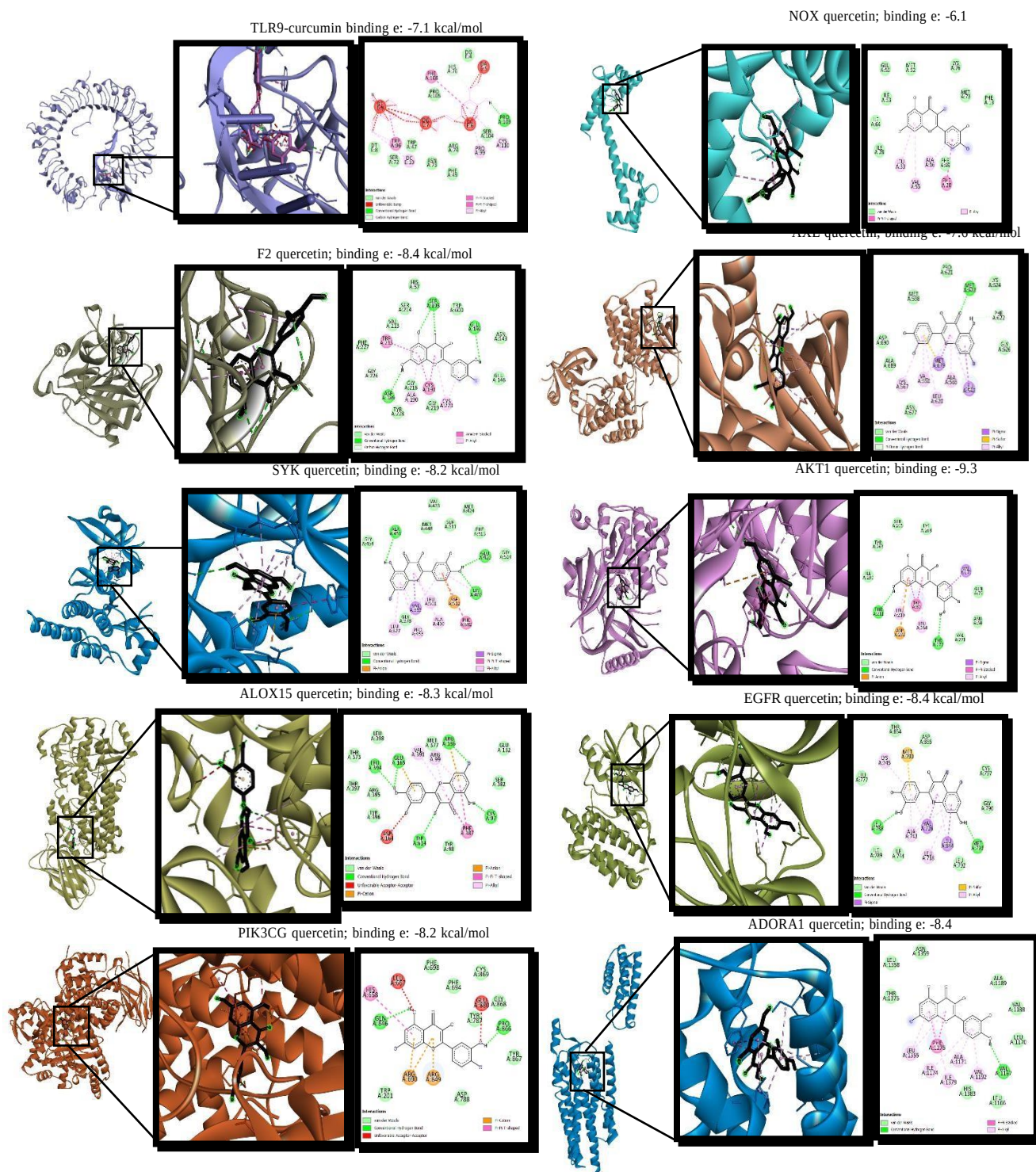


Figure 2. Docking results of protein molecules ADORA2A, ADORA1, PIK3CG, EGFR, ALOX5, ALOX15, AKT1, SYK, AXL, F2, NOX4, PTGES, APP, TLR9 with five metabolites Caffeic Acid, Curcumin, Bisdemethoxycurcumin, Demethoxycurcumin, and Quercetin.

There are some limitations to the use of in silico analysis and metadata-based pharmacological networks. The first limitation is the possibility of differences in the phytochemical databases taken due to several database sources, both dr. Duke, Knapsack, TCMSP, and others. Although the data can be verified further, the data from dr. Duke phytochemical database. Second, the data obtained for this study are data from previous studies and in silico simulations that have been carried out for some time because there may be new

studies that have not been included in the database so that a more definite mechanism cannot be displayed in this study. Third, in the form of extracts and pharmaceutical preparations, the drug candidates in this study will travel across the body through pathways, and various external factors may change their form and efficacy. Therefore, further research is needed at the in-vitro and in-vivo levels to confirm the results of this predictive study.

4. Conclusion

C. longa has potential as an anti-inflammatory through the content of five metabolites, namely Caffeic Acid, Curcumin, Bisdemethoxycurcumin, Demethoxycurcumin, and Quercetin, and inhibits inflammatory activity through inactivation of receptors, inhibition of kinase enzymes, and functional enzymes that trigger inflammation. This study is an in silico analysis, therefore to confirm the results further before being applied, it is necessary to continue with in vitro and in vivo studies.

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Cost-Effective Analysis of Antihypertension Usage of Amlodipine and Captopril In Outpatients

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ABSTRACT

Introduction: Based on the health profile of Malang City, Lowokwaru Subdistrict has a high incidence of hypertension of 10.310 patients in 2018. The price of antihypertensive drugs varies widely, so that the price of the drug is a factor in the decision-making for patients to use drugs. The burden of health care costs continues to increase; further studies should be evaluated pharmacoeconomically. The Pharmacoeconomics method used in this research is Cost-Effectiveness Analysis (CEA). **Objectives:** Understanding the cost-effectiveness of antihypertension usage of Amlodipine and Captopril in outpatients using the Cost-Effectiveness Analysis (CEA) method at Kendalsari Health Center, Malang City. **Methods:** This research uses a descriptive observational method. Data were collected retrospectively with the patient's medical records. The sample was determined by purposive sampling. **Results:** Sampling was carried out on hypertensive patients from January to December 2019. Amlodipine therapy effectiveness percentage (100%) greater than Captopril (60%). ACER value of Amlodipine (Rp. 151.68 / 1%) and Captopril (Rp. 122.01 / 1%). The ICER value shows a positive result (196.18 / 1%). **Conclusions:** Amlodipine was more cost-effective than Captopril.

1. Introduction

Hypertension is one of the factors of individual death in the world, increasing over time. According to WHO estimates, 1.5 billion people worldwide will suffer from hypertension each year in 2025 (WHO, 2013). Based on Riskesdas data in 2018, it was recorded that the prevalence of hypertension in Indonesia had increased by 8.3%. This figure has initially been 25.8% to 34.1% (Ministry of Health, 2018a).

Hypertension is one of the diseases with a high incidence. According to the Malang City Health Profile in 2018, the total number of hypertension patients was 41,591 people. In detail, the number of male patients (8.37%) or 15,320 people and women (10.37%) was equivalent to 26,271 people (Dinkes, 2018).

Hypertension is a disease that requires a very long and expensive therapeutic process. Based on the above considerations, the therapy carried out will be closely related to the cost burden incurred by the patient. A more comprehensive analysis is needed to see the effectiveness of the costs incurred by patients and improve patients' quality of life on antihypertensive therapy (Wijayanti et al., 2016).

The price of antihypertensive drugs varies greatly, so the drug's price is crucial in making drug use decisions for the patient. The burden of health care costs continues to increase in the public and private sectors, especially in the price of pharmaceuticals or medicines. Further actions and studies must start pharmacoeconomically from decision-makers in the national formulary system on the National Health Insurance (Tjandrawinata, 2016).

In Pharmacoeconomics, several analytical methods can be applied, including Cost-Benefit Analysis (CBA), Cost Minimization Analysis (CMA), Cost-Effectiveness Analysis (CEA), and Cost-Utility Analysis (CUA) (Ministry of Health, 2013).

Cost-Effectiveness Analysis (CEA) is a method of selecting treatment based on the discipline of Pharmacoeconomics. CEA analysis compares two or more of the best health or treatment programs with the same goal. This analysis compares the health benefits and resources of health care programs. The cost-effectiveness analysis is not seen from the cheapest cost for the therapy process, but the optimization of these costs can be seen from the patient's

effectiveness (Langi et al., 2019). Therefore, the aimed of this study was to understanding the cost-effectiveness of antihypertension usage of Amlodipine and Captopril in outpatients using the Cost-Effectiveness Analysis (CEA) method at Kendalsari Health Center, Malang City.

2. Methods

This research was conducted at the Kendalsari Public Health Center, Malang City, in August-September 2020. This research is a descriptive study, and data collection is retrospective. The data source used is secondary data, namely the patient's medical record.

The sample in this study were all outpatients who received Amlodipine or Captopril single therapy and common control (2 months in a row) in the January-December 2019 period at the Kendalsari Health Center Malang City. Sample data was taken after the existence of ethical feasibility according to register number No. E.5.a/217/KEPK-UMM/VIII/2020.

3. Results and Discussion

Tabel 1. Recapitulation of Kendalsari Health Center Patient Visits

Year	Hypertension Patient	Total Patient
2019	2.314	35.711

Ten hypertensive patients received a single antihypertensive and routine control from the data above, five people received amlodipine monotherapy, and five others received Captopril. The main obstacle in sample selection is patient compliance. The results obtained will represent the patient population on antihypertensive monotherapy. As for the patient population other than monotherapy, it cannot be represented in this study.

Tabel 2. Therapeutic Effectiveness Recapitulation

Therapy	Total (a)	Controlled (b)	%Effectiveness b/a x 100%
Amlodipine	5	5	100%
Captopril	5	3	60%

The target for controlling blood pressure in hypertensive patients in this study was 140/90 mmHg. The recapitulation of therapy effectiveness shows that amlodipine monotherapy has a higher percentage of therapeutic efficacy than Captopril. Furthermore, the therapeutic effectiveness data will calculate ACER and ICER in seeking conclusions from the CEA analysis

Tabel 3. Direct Medical Cost

Therapy	Average Cost	Service Cost	Total Direct Medical Cost
Amlodipine	Rp 15.168	Rp 3.500	Rp 18.668
Captopril	Rp 7.321	Rp 3.500	Rp 10.821

In the table of total direct medical costs, it can be seen that Amlodipine single therapy has a higher total direct medical cost than Captopril.

Tabel 4. Calculation of ACER (Average Cost-Effectiveness Ratio)

Therapy	Direct Medical Cost	%Effectiveness	ACER
Amlodipine	Rp 18.668,00	100%	Rp 151,68,00
Captopril	Rp 10.821,00	60%	Rp 122,01,00

ACER was calculated for each alternative therapy. The results are interpreted as the average cost per effectiveness unit (Fikriyah, 2016). The ACER value of Amlodipine obtained from this study was Rp. 151,68.00/1% effectiveness, greater than Captopril. This result means that for every 1% of therapeutical efficacy of Amlodipine received by patients, they need to allocate funds of 151,68.00. Although the ACER value of Amlodipine is greater than Captopril, its therapeutic effectiveness is higher (100%).

Tabel 5. ICER (Incremental Cost-Effectiveness Ratio) Calculation Results.

Therapy	Increment of Effectiveness (ΔE)	Increment of Total Cost (ΔC)	ICER [$\Delta C/\Delta E$]
Amlodipine	40%	Rp 7.874,00	Rp.196,18/1%
Captopril			

The interpretation of the ICER calculation results illustrates the number of excess costs that must be incurred if a transfer is made from standard to alternative drugs (Ministry of Health, 2013). If the ICER value is negative, medical therapy is more effective and cheaper than alternative costs. Meanwhile, the ICER value is positive, which means the price of alternative drugs is higher than the other, but the treatment is more effective (Nurhikma et al., 2019).

This result was obtained from the difference in the cost of alternative medicine (Amlodipine) and comparison drug (Captopril). Then, compared with the difference in the therapeutic effectiveness of Amlodipine and Captopril. The ICER value obtained from these calculations is positive, meaning a cost-effective therapy is an alternative therapy with a higher price than the comparison and a higher therapeutic effectiveness value. Another interpretation is the additional cost needed to shift standard drugs to alternative drugs to get a higher effectiveness value of Rp. 196.18/1% effectiveness.

4. Conclusion

Based on the analysis of the cost of using Amlodipine compared to Captopril in outpatient hypertension patients at the Kendalsari Public Health Center Malang City using the CEA (Cost-Effectiveness Analysis) method, it can be concluded that:

The ACER value for Amlodipine monotherapy is IDR 151.68/1% effectiveness. Meanwhile, ACER Captopril Rp 122.01/1% effectiveness. The ACER value of Amlodipine is greater than that of Captopril. The ICER value obtained from the research calculation is Rp. 196.18/1% effectiveness. Positive calculation results. Amlodipine is more cost-effective than Captopril because it has a positive ICER calculation result and a more excellent effectiveness value (100%). If there is a transfer of drugs from the standard drug captopril to Amlodipine to get higher effectiveness, it is necessary to increase the cost of Rp. 196.18.

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Characteristic and Stability of Peel-off Mask Soursop Leaves Extract (*Annona muricata* L.) as an Antioxidant

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ABSTRACT

Introduction: Photoaging is a problem for most people. One of the causes of photoaging is exposure to free radicals sourced from UV rays. Therefore, antioxidants are needed to reduce it. Flavonoids in soursop leaves (*Annona muricata* L.) are antioxidants to prevent skin aging. For ease of topical use, the soursop leaf extract made be peel-off gel. **Objectives:** This study determined the peel-off gel mask's physical characteristics and antioxidant activity from soursop leaves extract. **Methods:** The soursop leaves were macerated using 96% ethanol, and then the phytochemical screening, pH, and antioxidant activity were performed using DPPH (1,1-diphenyl-2-picrylhydrazyl) radical scavenging assay. The peel-off gel mask made contained 1.0%, 2.0%, and 3.0% soursop leaves extract. The masks were examined for their physicochemical characteristics (organoleptic, pH, Viscosity, dispersibility) and antioxidant activity. **Results:** The soursop leaves extract contains alkaloids, terpenoids, flavonoids, and steroids; it has a pH of 5.85 and potent antioxidant activity with an IC_{50} value of 41.50 μ g/mL. The peel-off gel mask made from the soursop leaves extracts had green color, aromatic smell, soft texture, and Homogeneity. The higher extracted content applied, the more robust color and fragrance obtained and the higher Viscosity produced. However, the dispersibility, drying time, and pH decreased, although meeting all requirements. The peel-off gel mask containing 3.0% soursop leaves extract had the most potent antioxidant activity. **Conclusions:** Peel-off mask, which contains 3.0% of soursop leaf extract, is the most optimal formula.

1. Introduction

UV rays (ultraviolet) are the primary sources of free radicals in the skin that harmful; as UV rays cause the skin to produce wrinkles faster (premature aging), black or white spots (Pande et al., 2013), and malignancy or skin cancer (Orazio et al., 2013). Photoaging is an accumulation of damage resulting from sunlight exposure to the skin. The sunlight is partially diffused and reflected on the stratum corneum, which will cause extracellular matrix changes in dermal skin, characterized by wrinkles, pigmentation changes, and skin tone loss (Pande et al., 2013). Antioxidants are chemicals that lessen or prevent the effects of free radicals by counteracting the adverse effects of oxidants and electron donors or reducing agents. Antioxidants benefit the body by inhibiting physiological damage due to the oxidation process (Birben et al., 2012). Antioxidant substances can be natural or synthetic. But using synthetic antioxidants causes side effects, ie BHA and BHT, which have already been responsible for the liver's adverse effects and carcinogenesis in animal studies (Lourenço et al., 2019). Therefore, the use of natural antioxidants is an alternative.

One natural antioxidant source that can protect the skin from UV rays is the leaves of *Annona muricata* L that commonly known as soursop belongs to the family of *Annonaceae*. It originates from Central America and has throughout distributed throughout the world's tropics. (Sanusi & Abu Bakar, 2018). The bioactive compound reported in leaves or soursop is alkaloids, acetogenins, phenols, Vitamin A, Vitamin C, and Vitamin C [6]. These are mainly phenolic compounds, namely, flavonoids as well antioxidants (Orak et al., 2019). A peel-off mask gel is an excellent cleanser for skin by removing the dirt on the skin surface. The peel-off mask gel can improve skin hydration due to its exclusivity, thus increasing the penetration of active

ingredients into the skin layer (Nilforoushzadeh et al., 2018). Therefore, this form is very suitable for soursop leaf extract as an antioxidant vehicle.

This study aimed to optimize the peel-off formulation of soursop leaf extract as an antioxidant. It is hoped that the results of this study will serve as the basis for developing a peel-off preparation of soursop leaf extract so that the wider community can use it.

2. Methods

This study prepared the peel-off mask gel from the soursop leaves extract and evaluated the mask characteristics and antioxidant activities. First, the soursop leaves extract was made and then determined its antioxidant activity was by DPPH radical scavenging assay. The peel-off mask gel containing 1.0%, 2.0%, and 3.0% leaves extract were prepared and then identified their characteristics based on the organoleptic, Homogeneity, dispersion capability, Viscosity, pH, and antioxidant activity.

2.1 Instrument

Rotary evaporator, Basic20+ (Crison) pH meter, digital analytical balance (Mettler Toledo), scatter power testing equipment, viscosity testing equipment (Brookfield Engineering Lab. INC), Steroglass hotplate, incubator, UV-V spectrophotometer. Serial No. A114550 10113).

2.2 Ingredient

The Soursop leaf obtained from Batu, Malang, Polyvinyl alcohol Grade PVA-217 (Kuraray Asia Pacific), Polyethylene glycol 1500 (PEG 1500) (CLARIANT PRODUKTE (Deutschland) GmbH), Propylene glycol (DOW Chemical pacific), Methylparaben (Yokaichi factory), Propylparaben (Yokaichi factory), DPPH (1,1-diphenyl-2-picrylhydrazyl) (Sigma-Aldrich), pure water, alcohol 96% (pharmaceutical grade), and methanol pro analysis.

2.3 The method of making soursop leaf extract

Fresh soursop leaves were washed thoroughly and then aired for one week without sunlight. The dried leaves blended until smooth, and then the powder dried in the oven for two days at 40°C. Soursop leaf fine powder weighed as much as 500g, then macerated by immersion method for 3 x 24 hours in 6.0 L of ethanol 96%. Separated the filtrate and residue, and the filtrate obtained was then concentrated with a rotary evaporator at 50°C until a thick extract formed.

2.4 Design specification of peel-off mask gel

The formula has a requirement of the specification to obtain a peel-off gel mask that is safe and comfortable to use. It must be homogenous semisolid preparation with a green color, aromatic, soft texture, having a viscosity in the range of 2,000 – 50,000 cPs, its pH in the range of 4.5 – 6.5, and drying less than 30 minutes.

2.5 The method of making peel-off mask gel

Preparation of peel-off masker gel soursop containing leaf extract started by developing a filming agent. The polyvinyl alcohol dissolved in pure water at 80⁰ C for 15 minutes and left overnight (A solution). In the other hand, polyethylene glycol 1500 and sodium metabisulfite dissolved in water (B solution), and the preservatives (methylparaben and propylparaben) dissolved in propylene glycol (C solution). Mixed the B, C, and A solution, then added soursop leaf extract until a homogeneous gel formed. The composition of the peel-off gel mask which the different extract concentrations is shown in Table 1. F0 is the peel-off mask gel without extract as control, while FI, F II, and F III is the peel-off mask gel containing 1.0%, 2.0%, and 3.0% of soursop leaf extract.

Table 1. Composition peel-off gel mask of soursop leaf extract

Ingredients	Composition (b/b%)			
	F0	F I	F II	F III
Soursop leaf extract	0	1	2	3
Polyvinyl alcohol	15	15	15	15
PEG 1500	5	5	5	5
Propylene glycol	10	10	10	10
Methyl paraben	0.18	0.18	0.18	0.18
Propyl paraben	0.02	0.02	0.02	0.02
Sod. Metabisulfite	1	1	1	1
Pure water ad	100	100	100	100

2.6 Evaluation of Peel-off Mask Gel

Organoleptic

Organoleptic examination of preparations is conducted by observation, including the color, odor, and texture formed.

Homogeneity

The sample was taken and smeared on transparent glass, covered with transparent glass other and observed. If it seems granules or particles are not dissolved properly, the preparation is not homogenous and vice versa.

Viscosity and flow properties

The test uses a Brookfield viscometer with a spindle size of 64, and the rotor runs at speeds of 3, 6, 12, 30, and 60 rpm (Daud & Musdalipah, 2018).

Spreading ability

One gram of sample was placed on a 20 x 20 cm clear glass with a millimeter of paper attached to the bottom, in the piece covered with glass which weights ± 150 g, left for 1 minute, then measured its spread diameter. Subsequently, a 50-gram load was added, left for 1 minute, and measured in diameter; the process was repeated until the constant diameter was obtained (Garg et al., 2002).

Drying Time

The amount of 0.7-gram samples were flattened on the slide to form a thin flat layer of approximately 1 mm thick; pieces were put in an incubator at $37 \pm 2^\circ \text{C}$ and observed until the preparations were completely dry (Beringhs et al., 2013a).

pH

The pH test was carried out using a pH meter. Before use, the pH meter was calibrated using a buffer of pH 4.01 or pH 6.46. Testing is done by dipping the electrodes into a peel-off gel mask and then waiting until the number that appears on the screen stops (World Health Organization, 2019).

Stability test

The stability test used the freeze-thaw cycling method. Samples that put in vials, stored at different temperatures, i.e., $4^\circ\text{C} \pm 2^\circ\text{C}$ / $50\% \text{ RH} \pm 5\% \text{ RH}$ (stored in the refrigerator) and $40^\circ\text{C} \pm 2^\circ\text{C}$ / $75\% \text{ RH} \pm 5\% \text{ RH}$ (kept in an incubator), each for 24 hours, which done in 6 cycles. Organoleptic observations were carried out in each process, while the pH and antioxidant activity tests were carried out after the stability test (Popp, 2014).

Antioxidant activity

An antioxidant activity test using the DPPH method was carried out on the soursop leaf extract, a newly made peel-off gel mask, and a peel-off gel mask that had undergone stability testing. As a control used vitamin C. Previously, the DPPH solution was prepared, making the sample with various concentrations. The concentration sample of vitamin C is 1.0 ppm, 2.0 ppm, 4.0 ppm, 6.0 ppm, 8.0 ppm, and 10.0 ppm. The concentration of soursop leaf extract is 10.0 ppm, 20.0 ppm, 40.0 ppm, 60.0 ppm, and 80.0 ppm. Meanwhile, the peel-off gel mask examined has been diluted 100 times. After that, all samples were incubated for 30 minutes at $37^{\circ}\text{C} \pm 2$. The absorbance of sample measurements was carried out using a spectrophotometer at 517nm wavelength (Molyneux P, 2004) (Fadda et al., 2014).

3. Results and Discussion

3.1 The Soursop leaves extract

3.1.1. Organoleptic

The extract of the soursop leaves obtained had thick green-blackish color with a distinctive smell of soursop leaves.

3.1.2. Phytochemical screening

The phytochemical screening results showed that the soursop leaves extract contained terpenoids, alkaloids, flavonoids, sterols & steroids, saponins, and tannins, as shown in Table 2. The saponin phytochemical class has steroids or triterpenes, while phenol and tannin are included in flavonoids. These results were similar to the HPLC test results, which showed that the soursop leaves contained alkaloids, flavonoids, and steroids (Yadav & Yadav, 2019).

Table 2. The bioactive compound of Soursop Leaf Extract

No.	Component	Result
1.	Terpenoid	+
2.	Alkaloid	+
3.	Flavonoid	+
4.	Sterol & Steroid	+
5.	Saponin	+
6.	Anthraquinone	-
7.	Phenol % Tannin	+

3.1.3. pH

The pH meter's observation results showed that the soursop leaves extract had a pH of 5.85, which indicates an acidic property.

3.1.2. Antioxidant activity

The antioxidant activity measurement of soursop leaves extract using DPPH (1,1-diphenyl-2-picrylhydrazyl) reduction test found that the IC_{50} of soursop leaves extract was 41.50 $\mu\text{g/mL}$; meanwhile, vitamin C as control had IC_{50} of 3.61 $\mu\text{g/mL}$. These results were higher than Hasmila *et al.* (2019), who obtained the IC_{50} of soursop leaves extract at 141.127 $\mu\text{g/mL}$ (Hasmila et al., 2019). It could be due to the different thicknesses of the extract produced. The antioxidant activity extract in this study was potent because of less than 50 g/mL. This activity was mainly due to the flavonoid contents in the soursop leaves (Yadav & Yadav, 2019).

3.2. Peel-off gel mask evaluation

The formula of the peel-off gel mask made from soursop leaves extracts used Polyvinyl alcohol (PVA) and Poly Ethylene Glycol 1500 (PEG 1500) as the base; PVA as a film-forming, and PEG 1500 as a plasticizer. Other ingredients, namely, methyl and propylparaben, were used as preservatives, propylene glycol as humectant and cosolvent preservative, and sodium metabisulfite as an antioxidant.

3.2.1. The Physico-chemical characteristics

3.2.1.1. Organoleptic

Based on the organoleptic observation results, the peel-off gel mask had a thick texture, dark green color, and distinctive smell of soursop leaves extract. The dark green color of the peel-off gel mask is not a problem because this is a skincare product used only in certain conditions for a short time. Also, the fresh smell of the gel mask is served as aromatherapy.

3.2.1.2. Homogeneity

A homogeneity test was performed to ensure content uniformity. The homogeneity test results in FI, FII, and FIII showed no coarse particles and large granules, as seen in Figure 1. These results have met the dosage specifications. The Homogeneity of the peel-off gel mask indicates that the active ingredient and all additives are dissolved in the vehicle. It revealed that the formula of the peel-off gel mask containing 15% PVA and 5% PEG 1500 is in a good composition. The previous study reported that the 15% PVA/PEG 1500 resulted in a moist, soft, clean, adhesive, easily peeled mask gel (Beringhs et al., 2013b). The ratio of PVA and PEG 1500 must be correct to prevent phase separation (Falqi et al., 2018).

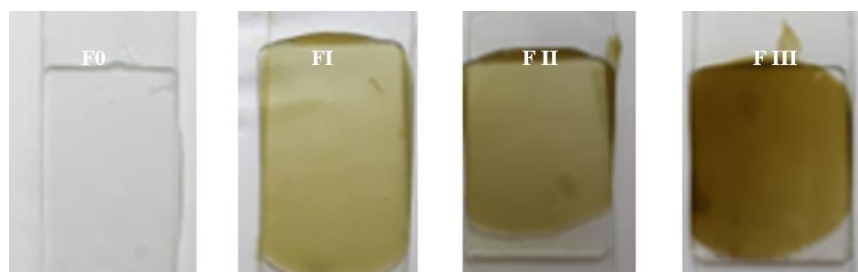


Figure 1. Homogeneity of the peel-off gel mask of the soursop leaves extract with no coarse particle or granule and homogenous color on FI, FII, and FIII.

3.2.1.3. pH

The pH of the peel-off gel mask can be seen in Figure 2. The pH of F0, FI, FII, and FIII significantly decreased along with the increased extract concentration level at 6.20, 5.87, 5.80, and 5.71, respectively (ANOVA One-way, $\alpha = 0.05$). This result was because the pH of soursop leaves extract was 5.85; therefore, all pH ranged from 4.5 to 6.5. The gel mask is safe to be used in the skin as the gel mask has higher pH than the skin, i.e., 4-6 (Ali & Yosipovitch, 2013), and remains not damaged in neutral pH substance (Proksch, 2018).

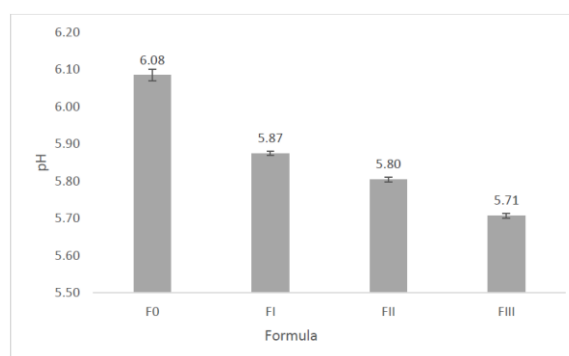


Figure 2. The pH of the peel-off of soursop leaves extracts decreased according to the increased extract concentration of extract.

3.2.1.4. Viscosity

The Viscosity of peel-off mask gel is shown in Figure 4. The viscosities of peel-off mask gel in FI, FII, and FIII at 3 rpm were 16233 cps, 16600 cps, and 16867 cps, respectively; at 6 rpm were 14467cps, 14833 cps, and 15100 cps, respectively; at 12 rpm were 12400 cps, 12567 cps, and 12933 cps, respectively; at 30 rpm were 9867 cps, 10600 cps, and 11000 cps, respectively; and at 60 rpm were 9500 cps, 9950 cps, and 10233 cps, respectively. This viscosity number means that the Viscosity of the peel-off mask gel increases along with the increased extract concentration (Two-way ANOVA, $\alpha=0.05$). Compared to the design specification, the peel-off gel mask has 2,000 – 50,000 cps viscosity, which is thought to be good to use.

The pH of the peel-off mask gel affects its Viscosity; the results are analogous to other studies that the Viscosity of kaolin flocculation based on PVA at pH four was higher than at pH 2 and 6 (Chaiwong & Nuntiya, 2008).

The Viscosity value of peel-off mask gel in F0, FI, FII, and FIII at 3.0, 6.0, 12.0, and 60.0 rpm is shown in Figure 3. Generally, the Viscosity of peel-off mask gel decreased as the speed of stirring increased (Two-way ANOVA, $\alpha=0.05$); therefore, the flowing property is pseudoplastic (Mitchell, 2013). The result means that the peel-off mask gel can be easily spread when applied to the skin. Gel has thixotropic property; it is thick or viscous under the static condition and will flow when shaken, followed by gradual recovery when stopped moving (Lee et al., 2009).

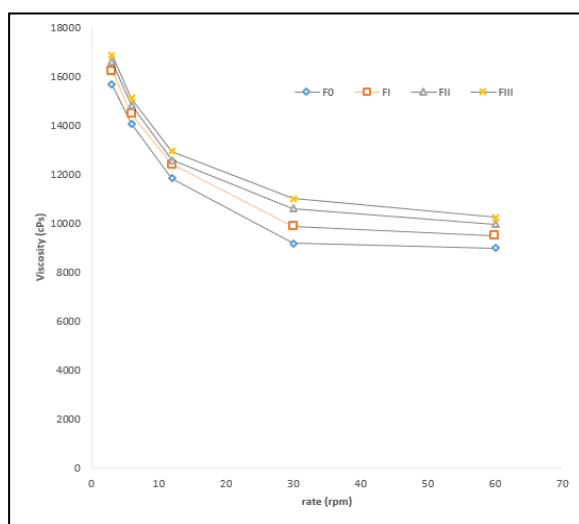


Figure 3. Rheogram stirring rate vs. Viscosity of the peel-off mask gel of soursop leaves extract.

3.2.1.5. Dispersion capability

The ease of distribution is one of the conditions that the semisolid materials must require. Figure 5 shows the dispersion capability in FI was 0.0030 cm²/ gram, FII was 0.0028 cm²/gram, and FIII was 0.0026 cm²/gram. The FII and FIII had the same dispersal capability and less than FI (ANOVA One-way, $\alpha = 0.05$).

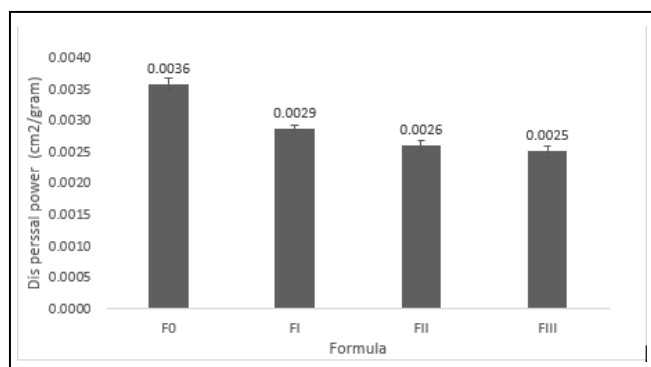


Figure 4. The dispersion capability of the peel-off gel mask made from the soursop leaves extract.

The dispersion capability of the soursop leaves extracts peel-off gel mask reduced. This result was contradictory to the viscosity test, which in general, the higher the Viscosity, the more complex the gel mask to spread.

3.2.1.6. Drying Time

The drying time is essential for the acceptability of the peel-off gel mask. The good drying time for peel-off mask should be less than 30 minutes (Priani et al., 2015), and all the peel-off mask gels meet the required; F0 had a drying time of 28.08 minutes, while F1, F2, and F3 had a drying time of 23.99, 23.00, and 22.02 minutes, respectively, as seen in Figure 5. All the peel-off gel masks (F1, F2, and F3) had a drying time faster than the control with no significant difference among F1, F2, and F3. Also, when the gel is dry, the peeling process is easy as the layer formed is elastic due to PEG 1500 as a plasticizer that maintains the film layer (Rowe et al., 2012). Soursop leaves extract speeds up the drying time because the consistency is thicker than the control, which peels off immediately.

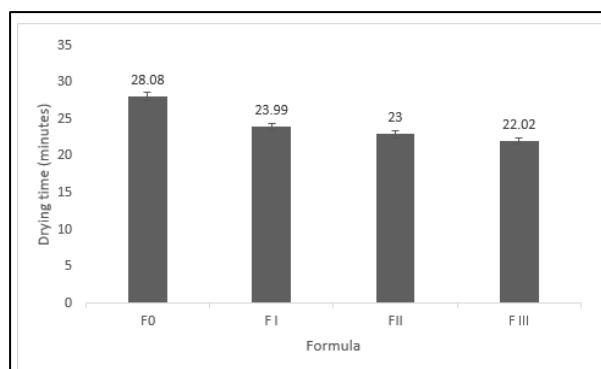


Figure. 5. The drying time peel-off mask gel of soursop leaves extract was faster than control.

3.2.2. Antioxidant Activity Gel Peel Off Mask

All gel masks were examined to ensure whether the peel-off gel has antioxidant activity, and the results of the antioxidant activity measurement in the peel-off gel mask with active ingredients extract of soursop leaves are shown in Figure 6.

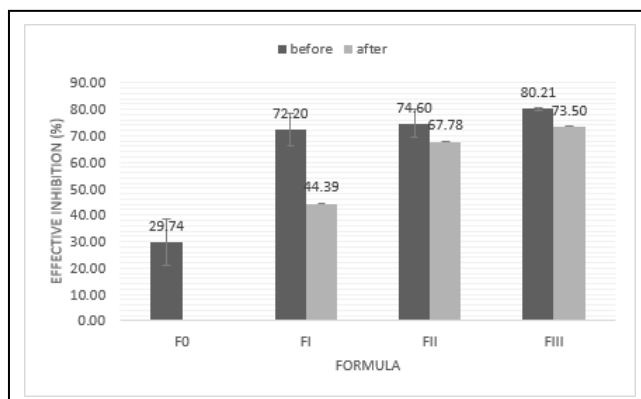


Figure 6. The antioxidant activity of peel-off gel mask.

The antioxidant activities of peel-off gel mask soursop leaves extract indicated by the inhibition percentage to reduce free radicals were insignificantly different (ANOVA One-way, $\alpha = 0.05$). This result may be because the sample concentration was too concentrated, as only 100 times dilution, whereas the base gel mask had the percentage inhibition of 20.48%; therefore, the antioxidant activity of all gel masks was influenced by antioxidants contained in the base. The statement was evidenced by the results of the antioxidant test conducted one month later that the inhibition percentages of the peel-off gel containing the extracts 1.0, 2.0%, and 3.0% were 44.9%, 67.78%, and 73.50%, respectively, while in peel-off gel mask base had no longer any antioxidant activity. The mask base lost its inhibitory capability due to the antioxidant damage, as the antioxidant used for the base was sodium metabisulfite. When exposed to heat, sodium and metabisulfite degrade due to the oxidation process and release sulfur dioxide (Malanchuk, 1971). The reduction in the inhibition percentage after the stability test was performed was due to the antioxidant damage found in the gel base and sulfur dioxide. The antioxidant activity of the peel-off gel mask increased following the increased extract concentration. Further studies are needed regarding the peel-off gel mask formula to obtain a longer antioxidant activity for the gel mask.

4. Conclusion

The extract of soursop leaves have potent antioxidant activity based on the IC₅₀ value of 41.5 $\mu\text{g/ml}$ and 5.8. The peel-off mask gel from the soursop leaves extracts semisolid, homogenous except that it contained 3.0% extract, aromatic, and dark brown mask gel with the 4.5 – 6.5 pH, 9,500 – 16,500 cps viscosity, pseudoplastic flow property, and quickly spread characteristics. The antioxidant activity increased following the increased extract level content. It is necessary developing of a peel-off gel mask of soursop leaf extract which meets the real-time stability requirements. Also, in vivo activity testing so that it can be mass-produced.

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The Effect of Knowledge Level on Awareness of Using Masks Properly in Preventing the Spread of Covid-19 on Lecturers and Education Personnel of Pharmacy Study Program, University of Muhammadiyah Malang

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ABSTRACT

Introduction: The use of masks can reduce the risk of contracting Covid-19 in public areas. However, the correct use of masks in the community has not been evaluated optimally. Where data about this is not yet available even though the information can be used to support the movement against the COVID-19 pandemic. **Objective:** This study was conducted to determine the profile of the use of masks in the Pharmacy Study Program, University of Muhammadiyah Malang, where this has never been done in previous studies. **Methods:** This study uses a cross-sectional study design. The sampling technique used in this study was total sampling with 18 respondents. **Results:** A high level of knowledge (72.2%) influences the level of behaviour in the use of appropriate masks is high (83.3%). **Conclusions:** The history of heart problems and hyperlipidaemia has a significant value in the behaviour of using the right mask.

1. Introduction

COVID-19 (Corona virus disease) first occurred in Wuhan at the end of 2019 (Unhale et al., 2020). Where the spread to 199 countries with a mortality rate that has reached 26,494 cases with a mortality rate of up to 4-5%. Most deaths occur in the elderly group (over 65 years of age). The first case that occurred in Indonesia on March 2, 2020, is predicted to be due to imported cases from visiting foreigners. The prevalence of COVID-19 in Indonesia continues to increase with a death rate of 9% which is a high mortality rate (World Health Organization, 2020). On May 28, the Government of Indonesia announced 24,538 confirmed cases of COVID-19, 1,496 cases died and 6,240 cases recovered from 412 districts/cities throughout the province. (Satgascovid-19, 2020). Data released by the Ministry of Communication and Information as of September 25, 2020 at 12.00 shows that East Java is cumulatively the second largest with 42,391 additional cases today, 293 cases, and in the City of Malang, there are 1,764 COVID-19 data updates as of the 26th. With the high incidence and the emergence of new clusters both at the family and workplace levels due to the patient's indiscipline in self-quarantining. Lecturers and education staff in the Pharmacy Study Program as part of the community must play an active role and become health agents to break the chain of transmission and prevent the spread of COVID-19. One of them is the correct use of masks.

The use of masks can reduce the risk of contracting Covid-19 in public areas. If without prevention the risk is up to 30.0% and when using a cloth mask, it drops to 16.5% and if accompanied by washing hands and keeping a distance the risk of contracting it drops to 1.6%. So that the use of the right and correct mask is the key to breaking the chain of the spread of Covid-19. However, the correct use of masks in the community has not been evaluated optimally. Where data about this is not yet available even though the information can be used to support the movement against the COVID-19 pandemic in the community (World Health Organization, 2020). In line with that, Indonesia also does not have accurate data on this matter.

This research was conducted to achieve several objectives, namely: 1) Knowing the pattern of using masks on lecturers and education staff of the Pharmacy Study Program, University of Muhammadiyah Malang; 2) Identifying the influence of knowledge on awareness of the use of lecturers and education staff of Pharmacy Study Program, University of Muhammadiyah Malang.

2. Materials and Methods

2.1. Study Design

This study uses a cross-sectional study design in August 2021 at the Pharmacy Study Program, University of Muhammadiyah Malang. This study was conducted to determine the profile of the use of masks in the Pharmacy Study Program, University of Muhammadiyah Malang, where this has never been done in previous studies.

2.2. Sample and Sampling Technique

The targets for this research are lecturers and education staff at the Pharmacy Study Program, University of Muhammadiyah Malang with the total number of research samples for this research is 18 respondents. The sampling technique used in this study was total sampling, because in this study recruited all lecturers and education staff at the Pharmacy Study Program, University of Muhammadiyah Malang as research subjects. Where the inclusion criteria of respondents are lecturers and education staff at the Pharmacy Study Program, University of Muhammadiyah Malang.

2.3 Research Variables

Analysis of factors that influence awareness of the use of masks with socio-demographic factors, knowledge, and experience of using masks.

2.4. Instrument

In this study, the research instrument used is based on several previous studies that have been validated by making some modifications to adjust to the character of the respondent (Eikenberry et al., 2020; Haischer et al., 2020; I et al., 2020). The questionnaire used to measure socio-demographic factors, knowledge (3 questions) and awareness of the use of masks (3 questions). The questionnaire asked several questions regarding age, occupation, marital status, health conditions, knowledge and experience of using masks during the pandemic. In this session, respondents were given several answer choices that could be chosen according to their socio-demographic background. The questionnaire was tested to determine the validity and reliability of the instrument with valid results (r count for each item more than r table that is 0.632) and reliable (Cronbach's alpha: 0.95).

2.5. Data Collection Procedure

Participants will be asked for their consent to participate in this cross-sectional study. Of the participants who agreed, they would be asked to complete a questionnaire.

2.6. Data analysis

The data obtained started from socio-demographic factors, knowledge and behavior of using masks by conducting univariate analysis for usage profiles and bivariate analysis to determine the relationship between variables. Grouping the level of knowledge and behavior of using masks using the median as a cut off. Where both the level of knowledge and behavior are grouped into low and high.

2.7. Research Ethics

In research, upholding the enforcement of research ethics, ethical approval was obtained from the Ethics Committee of the University of Muhammadiyah Malang with the number E.5.n/153/KEPK-UMM/VI/2021. And the informed consent was signed by the research participants. This is used as a basis for ethical consideration in research conducted by prioritizing the principles of anonymity, confidentiality, and voluntary in the data collection process to research data processing.

3. Results and Discussions

Based on table 1, 18 respondents were found, most of which were lecturers (72.2%), this is in accordance with the population at the University of Muhammadiyah Malang on the HR Management website, the number of lecturers is more than the number of employees. Based on age, the largest number of respondents aged 18-29 years was (38.8%), followed by 30-39 years (27.8%), and 40-49 years (27.8%), then those aged 50 years and over. (5.6%).

The marital status of most respondents is married (83.3%) with good health conditions (56.6%) and 5.6% of respondents have a history of disease who have heart function disorders and hyperlipidemia. In the variable item, fines can increase the use of masks, the results are that respondents answered YES as much as 83.3%. This is in accordance with Presidential Instruction No. 6 of 2020 concerning Improvement of Discipline and Law Enforcement of Health Protocols in the prevention and control of Covid-19, including regulating sanctions for violators of health protocols. The sanctions given can be social work sanctions to fines. Enforcement of the discipline of wearing masks with the imposition of fines launched in several areas can increase discipline in the use of masks.

Based on table 1 and Figure 5.1. The results obtained from the characteristics of knowledge on the use of masks in preventing the transmission of COVID-19 infection, participants had a high level of knowledge of 72.2% and the same for the proper use of masks had a high level of 83.3%. This shows that knowledge about the correct use of masks affects the awareness/behavior of using the right masks. This is in accordance with previous research conducted by Sari DP & 'Atiqoh NS, 2020, it was concluded that there is a relationship between public knowledge and compliance with using masks as an effort. prevention of Covid-19 disease.

Table 1. Population Characteristics (N = 18)

Variable N % M $\pm$ SD		
Type of work		
Lecturer	13	72.2
Education Personnel	5	27.8
Age		
18-29 years old	7	38.8
30-39 years old	5	27.8
40-49 years old	5	27.8
50 years and over	1	5.6
Marital status		
Not married yet	3	16.7
Marry	15	83.3
Heart Disorder		
Yes	1	5.6
No	17	94.4
Hyperlipidemia		
Yes	1	5.6
No	17	94.4
Health condition		
Very good	8	44.4
Well	10	56.6
Enough	0	0
Fine		
Yes	15	83.3
No	3	16.7
Knowledge level		1.72 $\pm$ 0.46
Low	5	27.8
Tall	13	72.2
Usage Rate		1.83 $\pm$ 0.38
Low	3	16.7
Tall	15	83.3

Based on table 2 Knowledge about when to use a mask all respondents answered correctly (100%) and the period when to replace the mask of respondents who answered correctly (72.2%), but knowledge about non-medical masks that can be used as an effort to prevent the entry of the Covid-19 virus. 19 only 4 people answered correctly (22.2%) so that more counseling is needed and educates on the correct selection of non-medical masks (cloth masks), which consist of 3 layers to effectively prevent the entry of the virus in accordance with Circular Letter Number 16 of 2021 concerning Provisions Domestic Travel During the Covid-19 Pandemic. In table 2 there are 2 variables that have correct knowledge of more than 70%, namely: K1 and K2. While in K3 77.8% of respondents have wrong knowledge.

Table 2. Characteristics of respondents based on Mask Knowledge (N = 18)

Variable	Right	Wrong
	N (%)	N (%)
Using a mask when leaving the house (K1)	18 (100)	0 (0)
Mask changing period (K2)	13 (72.2)	5 (27.8)
The right non-medical mask (K3)	4 (22.2)	14 (77.8)

Based on table 3, based on bivariate analysis using chi-square, there are 2 factors, namely heart disorders and hyperlipidemia which are risk factors for the occurrence of Covid-19 which significantly affects the behavior of using masks to prevent transmission of COVID-19 infection, and respondents fall into the category of low behavior.

A history of cardiovascular disease is a risk factor for mortality in Covid-19. This is explained from the research by Satria et al, 2020 which states that Diabetes mellitus (30.3%) (OR 4,348, P 0.000) and cardiovascular disease (10.6%) (OR 4,319, P 0.016) are the highest risk factors for death in COVID -19. Because the results of the research obtained by respondents who have a history of heart problems and hyperlipidemia are included in the low category of appropriate mask use behavior, so it is necessary to strive to educate more deeply about the dangers of being exposed to Covid-19 which can cause worsening of conditions to cause death.

Table 3. Characteristics of respondents based on the level of behavior in using masks (N = 18)

Variable	Use of Mask	
	Low(%) N=3	Tall(%) N=15
Job Type 0.814		
Lecturer	2 (11,1)	11 (61.1)
Education Personnel	1 (5.6)	4 (22.2)
Age 0.958		
18-29 years old	1 (5.6)	6 (33.3)
30-39 years old	1 (5.6)	4 (22.2)
40-49 years old	1 (5.6)	4 (22.2)
50 years and over	0 (0)	1 (5.6)
Marital status		
Not married yet	0 (0)	3 (16.7)
Marry	3 (16.7)	12 (66.6)
Heart Disorders 0.021		
Yes	1 (5.6)	0 (0)*
No	2 (11,1)	15 (83.3)
Hyperlipidemia 0.021		
Yes	1 (5.6)	0 (0)*
No	2 (11,1)	15 (83.3)
Health Condition 0.396		
Very good	2 (11,1)	6 (33.3)
Well	1 (5.6)	9 (50)

Enough	0 (0)	0 (0)
0.396 . fine		
Yes	2 (11,1)	13 (72.2)
No	1 (5.6)	2 (11,1)
Knowledge Level 0.814		
Low	1 (5.6)	4 (22.2)
Tall	2 (11,1)	11 (61.1)

*p < .05; **p < .01; ***p < .001.

4. Conclusions

A high level of knowledge (72.2%) has an effect on the level of behavior in the use of appropriate masks is high (83.3%). Knowledge of when to use the correct mask (100%), when to replace the mask who answered correctly (72.2%). Incorrect knowledge of the selection of non-medical masks (77.8%). The history of heart problems and hyperlipidemia has a significant value in the behavior of using the right mask.

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Matrix Metalloproteinase (MMP) Enzyme as a Diagnostic and Prognostic Biomarker Cancer and Therapy Target

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ABSTRACT

Introduction: There are some described human MMPs that most widely play a mediator in tumor invasion and metastasis by breaking down the connective tissue barrier. In cancer progression, MMP has a dual role by exerting effects on tumor progression such as growth and survival, angiogenesis, invasion, and modulation but also plays a role in the immune response where this occurs depending on the substrate on which the MMP enzyme works. In this paper, we will discuss the part of MMP in carcinoma. Carcinogenesis is a multi-step process in which changes in the cell environment result in converting normal tissue to tumors. Research showing the association of MMP with cancer has led to the development of drugs based on the inhibition of the proteolytic activity of this enzyme. MMP can be used as a biomarker for cancer, especially as a marker of malignancy or prognosis of cancer therapy. Among the strong candidates that can be used as biomarkers is MMP-2, whose expression is seen to be high in breast cancer, non-small cell lung cancer, ovarian cancer, and colorectal cancer. The development of specific MMP inhibitors that are responsible for the process of cancer progression should be further improved.

1. Introduction

Matrix Metalloproteinases (MMPs) are a family of extracellular matrix zinc-dependent remodeling endopeptidases that can degrade almost all extracellular matrix components and have physiological implications and importance during pathological processes. In this paper, we will discuss the role of MMP in carcinoma. Carcinogenesis is a multi-step process in which changes in the cell environment result in converting normal tissue to tumors. Proteinases for extracellular matrix remodeling such as MMPs are essential mediators in the changes observed in the microenvironment during the carcinogenesis process, and based on this concept, MMPs not only have a role in the invasion or late stages of cancer but also regulate the early steps of carcinogenesis in both desired and not. Research showing the association of MMP with cancer has led to the development of drugs based on the inhibition of the proteolytic activity of this enzyme (Yadav et al., 2014)

Despite the many effects of the presence of MMP enzymes, the most widely recognized consequence of MMP is its role as a mediator in tumor invasion and metastasis by breaking down the connective tissue barrier (Gong et al., 2014). However, in this extracellular matrix degradation process, MMP does not work alone but regulates other proteinases such as growth factors, cytokines, chemokines, and cell receptors. Among the biological activities mediated by MMPs are cell migration, differentiation, proliferation, differentiation, apoptosis, inflammatory reactions, angiogenesis, and platelet aggregation (Hadler-Olsen et al., 2013)

There are currently 23 described human MMPs. MMP enzymes are made up of different domains, modules, and motifs that form the basis of classification and are essential for substrate specificity, location of discovery, and interactions with other macromolecules. All MMPs contain an N-terminal signal peptide that directs the enzyme to the secretory pathway, a pre domain that interacts with the zinc ion at its active site. Most MMPs also contain a hemopexin-like C-terminal part linked to a catalytic domain in their active site region (Hadler-Olsen et al., 2013).

Most MMPs are synthesized in an inactive form and require proteolytic enzymes to activate them. However, the induction of reactive oxygen species (ROS), chaotropic agents that can interfere with hydrogen bonding, and organomercurials can activate these enzymes automatically. In cancer progression, MMP has a dual role by exerting effects on tumor

progression such as growth and survival, angiogenesis, invasion, and modulation but also plays a role in the immune response where this occurs depending on the substrate on which the MMP enzyme works.

2. MMPs in Breast Cancer

MMP-2 and MMP-9 are known to be involved in breast cancer invasion; thus, MMP-2 and MMP-9 have the prospect of being used as biomarkers to determine malignancy that occurs in breast cancer (Noh et al., 2012). So far, cytological tests measuring CA 15-3 from body fluids have become the most widely used marker as a biomarker for breast cancer prognosis (Duffy et al., 2000). Unfortunately, the specificity is still very low, so that other methods such as CEA (Carcinoembryonic Antigen) and telomerase activity are still unsatisfactory due to their sensitivity and specificity and difficulties in detection methods.

Noh et al. (2012) assessed the potential of MMP-2 and MMP-9 as biomarkers in body fluids. Body fluids were chosen because they have advantages over blood and tissue samples because of their easy availability and direct representation of contact with cancer tissue. This study used 36 test subjects who had been diagnosed with metastases in at least 2 locations and had been treated with systemic chemotherapy. The selected patient had at least one of the conditions between peritoneal ascites, pleural effusion, fluid from these two sites. The test was performed using Zymography and ELISA test, while to determine the cut-off that assessed whether a level of MMP-2 and MMP-9 showed a positive result or not, HT-1080 cultured cells and human fibrosarcoma cells were used. The results showed that MMP-2 was more specific in measuring malignancy and metastasis in body fluids than cytology, CEA, and MMP-9 tests. The MMP-2 and CEA levels increased the sensitivity to almost 100% in the combined pleural fluid.

Meanwhile, MMP-9 only showed high levels in the patient's pleural fluid but not in ascitic fluid, so it was not sensitive enough to measure breast cancer malignancy. This result may be related to the stringent regulation of MMP-9 in the body; after being involved in the initial invasion process, its levels will be rapidly degraded. At first, breast cancer will form a pleural effusion at a particular metastatic stage so that the level of MMP-9 in the pleural fluid is detected as high, and then invasion occurs, so that peritoneal fluid is formed in the abdomen where from this ascitic fluid, the MMP-9 level is not measured much.

3. MMPs in Ovarian Cancer

Ovarian cancer is cancer diagnosed in 25,500 cases annually in America, with nearly 16,000 cases of death. The poor prognosis of this disease is due to the asymptomatic early stage of the disease, the very rapid progression of chemoresistance, and the high rate of recurrence/relapse after therapy, which is why the condition is called the "silent killer." Patients with stage 3 ovarian cancer are estimated to have a 5-year survival rate of 35%. Meanwhile, so far, Cancer Antigen (CA125) is a biomarker widely used in diagnosing and prognosis of ovarian cancer. However, the CA125 biomarker has drawbacks, such as being less sensitive and specific for screening for ovarian cancer in the general population. For example, among women diagnosed with epithelial ovarian cancer, 20% had no increase in serum CA125. This population is targeted by Coticchia et al. (Coticchia et al., 2011) to obtain alternative biomarkers in monitoring the presence and status of the disease. Meanwhile, previous studies found that the increase in serum MMP-2 and MMP-9 in endometrial, ovarian tumors compared to control tissues, making these two types of MMP can be used to indicate tumor aggressiveness.

In this study, urine samples were collected from 178 women, of which 81 were healthy control subjects, while 97 were diagnosed with ovarian cancer (including 26 subjects with CA125 < 35 U/mL, which was within the normal range). MMP levels in urine are intended to obtain noninvasive, practical, and efficient biomarkers. Measurement of MMP content was performed using ELISA, and then the presence of MMP was reconfirmed using electrophoresis. The data obtained were then included in the statistical analysis.

ELISA test showed urine levels of MMP-2 and MMP-9 can accurately distinguish controls from ovarian cancer patients with normal CA125. Multivariate analysis showed that the most accurate combination of biomarkers in ovarian cancer patients who were not sensitive to the

CA125 biomarker was the combination of MMP-2, MMP-9, and patient age. The use of urine in monitoring ovarian cancer is straightforward and noninvasive and has proven promising. This method is more precise than shooting and surgery to perform at short intervals.

4. MMPs in Non-Small Cell Lung Cancer

Some MMPs are downregulated by $\alpha 2M$ ($\alpha 2$ -macroglobulin or tissue metalloproteinase inhibitors (TIMPs) produced by macrophages, fibroblasts, and other cell types) that causes a quantitative imbalance between MMPs and their inhibitors as causative factors for invasion and metastasis, including in Non-Small Cell Lung Cancer (NSCLC). Kanoh et al. (KANOH et al., 2012), in this case, looked at the relationship between serum MMP-2 levels with acute inflammatory biomarkers such as C-Reactive Protein (CRP) and serum amyloid A (SAA) in the course of NSCLC disease that has not yet been identified before.

The total sample was 37 test subjects, 13 were healthy, and 24 had been diagnosed with NSCLC. Twelve of them were diagnosed with localized NSCLC, while the other 12 had metastases. The test subjects were measured for MMP-2, CRP, and SAA from blood serum using a one-step sandwich immunoassay, and the results were then included in statistical analysis.

In this study, serum MMP-2 was increased in patients with metastatic NSCLC compared to localized NSCLC and healthy control subjects. Therefore it can be assumed that MMP-2 plays a role in the invasion and metastasis of NSCLC and other types of cancer, the presence of MMP-2 to predict tumor disease progression. Meanwhile, serum CRP and SAA also showed the same condition, increasing with NSCLC malignancy, and there was also a significant positive correlation between MMP-2 serum and biomarkers of acute inflammation in metastatic patients. In conclusion, measurements of MMP-2, CRP, and SAA can be indicators of tumor progression and prognosis of NSCLC.

5. MMPs in Colorectal Cancer

Colorectal cancer (CRC) is usually diagnosed at an advanced stage and has a poor prognosis in patients with poor living habits that may even lead to death. The significance of the increase in MMP-2 and MMP-9 gelatinase enzymes in metastatic conditions both in vitro and in experimental animal models is fascinating. Arujo et al. (Araújo Jr et al., 2015) conducted a retrospective study to determine the expression of MMP-2, MMP-9, and VEGF- α proteins in 180 cases of colorectal carcinoma in its diagnostic and prognostic implications.

The tissue samples were taken from the pathology results in the patient's medical record and then classified based on the TNM stage, treatment protocol, tumor location, tumor differentiation, Duke's modified criteria, severity stage based on the American Joint Committee on Cancer, as well as disease evolution over five years. From 180 patients' data collected retrospectively, it was found that the worst stage was stage 3, and stage 4 was the most populous at 35.6% and 27.1%, respectively. While the modified Dukes classification showed 44.1% and 37.3% of patients were in stages 3 and 4, respectively.

The CRC tissue was then tested with a tissue microarray (TMA) for immunohistochemical (IHC) staining. The cytoplasmic staining was then categorized, and further statistical analysis was performed. TMA expression results showed that 84.7% of marker expression for MMP-2 was positive or firm, while 15.3% showed negative results. This data indicates that MMP-2 had a significant association in advanced cancer stages. While MMP-9 did not show a positive correlation with patient mortality in advanced settings, a positive correlation $p < 0.042$ was indicated by the expression of MMP-2 and the patient's death due to CRC disease patients suffered. In this case, patients who showed intense staining for MMP-2, MMP-9, and VEGF showed a higher tendency to die after 60 months or five years of follow-up (Araújo Jr et al., 2015). The above data suggest that MMP dysregulation may initiate the process of colorectal tumorigenesis, which is associated with basement membrane degradation and malignant transformation. Meanwhile, data related to the correlation of MMP-9 staining intensity with patient mortality showed a close relationship between MMP-9 and the poor prognosis of patients.

6. MMP as a Cancer Therapy Target

Massive research on the role of MMPs in the process of metastasis and carcinogenesis makes this enzyme inhibition a promising therapeutic approach. For this reason, many MMP inhibitors have been explored and tested in animal models and even in human clinical trials (Gong et al., 2014).

However, unfortunately in clinical trials, the MMP inhibitor drugs that were created did not offer many benefits in increased patient survival, and some side effects have been reported (Hadler-Olsen et al., 2013). Furthermore, several explanations for the failure of the MMPI, which was widely developed in the 1990s, are assumed. One of the reasons is because the patients who were become the test subjects in clinical trials had a history of advanced disease and were not affected by MMPI because MMP is an enzyme that plays a role in the early phase of tumorigenesis, and MMPI drugs will have more effect on patients who have not had metastases. This result is evidenced by a successful preclinical trial when MMPI was administered to rats that had not yet metastasized. In addition, as the first generation of MMPI, the MMPI tested had a broad spectrum that could suppress tumor repression and tumor promotion activities. Furthermore, the presence of MMP in the test subjects was also not verified, and MMPI was used as the sole chemoprevention agent. MMPI has been used as adjuvant therapy in conjunction with conventional cytostatic drugs or radiation (Hadler-Olsen et al., 2013).

Learning from the mistakes of the first generation of MMPI, the subsequent MMPI development should also review the complexity of the MMP and apply it to the drug design that will be used. The specificity of the MMPI for tumor repression is also a challenge for researchers so that a more specific MMPI can be obtained not only for tumor-promoting MMPs but also specific for the types of MMPs associated with mediated cancer types. Another interesting approach is to take advantage of the increased expression of MMPs for targeted cytotoxic drugs by producing prodrugs that can be activated by the abundance of MMPs in cancer conditions.

In their research, Kaimal et al. (Kaimal et al., 2013) wrote about a preclinical test to selectively block MMP-14 in ovarian cancer patients using MMP-14 monoclonal antibodies. Previous studies have shown the success of MMP-14 monoclonal antibodies to inhibit the migration and invasive behavior of ovarian cancer cells in-vitro. Patients with ovarian cancer are usually diagnosed at an advanced stage and relapse after chemotherapy treatment. However, there has been no proven therapy until now, and it is preferable to use platinum agents. Abundant data indicate that MMPs, including MMP-1, -2, -9, and -14, are essential mediators of invasion, vascular penetration, and metastasis of all solid tumors, including ovarian cancer.

Meanwhile, MMP-14 (transmembrane collagenase) was very high in ovarian carcinoma patients and not in healthy patients. In a study of 92 women, 34 were healthy, 32 had benign ovarian tumors, and 26 had ovarian cancer; MMP-14 levels increased successively. MMP-14 levels even increased three times in patients with ovarian cancer than patients with benign ovarian tumors. This number indicates that MMP-14 can be detected in the patient's body and becomes a tumor biomarker in ovarian tumor malignancy.

Meanwhile, the test using the MMP-14 antibody was successful in reducing cell migration between 46%-69% in ovarian cancer cell cultures OVCAR-3 and OVCAR-4 compared to control immunoglobulin G. MMP-7, -8, TIMP-1 antibodies were also tested on cell culture but did not show suppression of cell migration. This result indicates that MMP-14 has a critical role in cell migration which later can induce metastasis. This statement was confirmed by experiments using RNAi silencing MMP-14. The research result showed a decrease in the migration of cancer cells in ascitic fluid. MMP-14 antibodies also showed a 50% reduction in OVCAR-4 cell culture invasion and a 40% reduction in OVCAR-3 cell culture invasion through the reconstructed basement membrane (Matrigel) compared to controls (Kaimal et al., 2013).

Research also shows that MMP-14 plays a role in angiogenesis that supports the process of metastasis. The administration of MMP-14 antibodies is known to reduce proMMP-1 and VEGF A, two other factors that play a role in forming new endothelium. The study was also continued in-vivo with mice where the MMP-14 antibody was shown to inhibit the invasion of metastases to the diaphragm and thorax when given concurrently with docetaxel therapy.

Kaimal et al. (2013) give hope by finding that selective inhibition of MMP-14 can inhibit ovarian cancer cells' migration and invasion potential to reduce the prevalence of metastasis.

7. Conclusion

MMP can be used as a biomarker for cancer, especially as a marker of malignancy or prognosis of cancer therapy. Among the strong candidates that can be used as biomarkers is MMP-2, whose expression is seen to be high in breast cancer, non-small cell lung cancer, ovarian cancer, and colorectal cancer. Meanwhile, as a therapeutic target, the development of specific MMP inhibitors responsible for cancer progression should be further improved, considering that in previous studies, the results of this MMP inhibitor therapy did not significantly improve the patient's clinical condition.

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Influenza Vaccine: History and Development

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ABSTRACT

Vaccination is the most effective method from a cost perspective to prevent influenza infection. However, the mutation rate of the influenza virus and its relatively conventional production techniques have resulted in the low availability of this vaccine during a pandemic. The future development of the influenza vaccine is a universal vaccine that can overcome various virus strains.

1. Introduction

Influenza is a disease that has long been known to humanity. This virus was first isolated in 1933, and the first inactivated bivalent vaccine was made in 1942 (Hannoun, 2013). Although it has long been known, the threat of influenza cannot be underestimated. The global H1N1 pandemic that occurred in 2009 and the highly pathogenic avian influenza case that had caused fear in the country in 2012 show that the burden of mortality and morbidity due to influenza is still substantial for the world. WHO noted that avian influenza A(H5N1) outbreaks in Indonesia occurred in 191 cases; 159 were fatal (WHO, 2012).

Vaccination is the most effective method from a cost perspective to prevent influenza infection. However, it turns out that the speed of the virus to change and production techniques that are still very dependent on the availability of eggs as a medium for virus breeding are the biggest challenges for the industry to produce effective vaccines, especially during pandemic conditions (Soema et al., 2015). This short article will outline the development of the influenza vaccine since it was first discovered, production technology that has been applied and accepted by the authorities, vaccine quality assurance based on WHO recommendations, and efforts to develop influenza vaccine preparations when viewed from the formulation technique.

2. Influenza Virus Overview

Influenza virus is a negative-strand RNA virus that belongs to the Orthomyxoviridae family. There are three types of viruses, each of which can be distinguished based on the matrix and nucleoprotein that composes it. All three types of viruses can infect humans, but the clinically significant ones are Type A and Type B because they are widespread in humans and are responsible for seasonal flu cases during winter in the Northern and Southern Hemispheres. In the viral envelope, there are two essential glycoproteins, haemagglutinin (HA) and neuraminidase (NA), which recognize and play a role in the infection process (Lamb and Krug, 2001); CDC, 2016). 18 known HA (H1 to H18) and 11 NA (N1 to N11) subtypes. Combinations of these subtypes are used in the nomenclature of influenza virus strains; for example, Influenza A(H1N1) virus means influenza virus type A with HA subtype one and NA subtype 1 (CDC, 2016b). HA and NA are the main glycoproteins distributed in the viral envelope. HA in the viral envelope is a trimer, while NA is a tetramer. HA is less than four times more than NA (Nicholson et al., 1998). In addition to HA and NA, the viral envelope also contains M2 protein. These characteristics will later be used in vaccine development.

Changes in antigens that always occur in influenza viruses are a significant challenge for researchers and vaccine manufacturers. Changes in antigen in the influenza virus are divided into two main mechanisms: antigenic drift and antigenic shift. Antigenic drift is a small change that occurs in viral genes over time as the virus replicates. The changes caused by this process are generally not too significant and are still similar or close to before the changes occurred so that, in general, the immune system is still able to recognize and respond to the virus as an antigen. Meanwhile, the antigenic shift is a more extensive and sudden change, producing new HA and NA; for example, the combination of HA and NA is found in animals and cannot be recognized by the human immune system. Swine Flu is an exciting example because pigs can be infected with flu viruses from pigs, birds, and humans at the same time. When the pig is infected with flu from other species simultaneously, it can mix antigens and form a new type of virus that was not known before (CDC, 2016b).

The mechanism of flu infection occurs through receptor-mediated endocytosis and fusion induced at low pH by endosomes in cells in the respiratory tract, such as in the nasal and throat areas. The HA protein on the virus's surface will bind to the CD8+ receptor on sialic acid on the surface of human cells, causing the virus to enter and infect cells. NA is in charge of helping release progeny viruses (child/replication results) from infected cells.

The immune system's response to the influenza virus can be divided into 3 (three) essential mechanisms. The HA antibody response, particularly in the 'head' region, is most applied to vaccines (Soema et al., 2015). In addition, some antibodies are specific to the 'stalk' (stalk). In contrast to the head that is constantly changing, the trunk tends to have a fixed structure to provide cross-protection against several virus subtypes at once. The second mechanism is an antibody to M2e (Protein Matrix 2 ectodomain). M2e is a tetrameric transmembrane protein that acts selectively on proton ion channels, thus playing cell acidification. This cell acidification will facilitate the process of releasing the genetic material from viruses to human cells. M2e-specific antibodies also have the potential to provide cross-reactive protection due to their well-preserved structure. The last mechanism of the immune response is the response of CD8+ T cells (CTL), which can eliminate infected cells through perforin-mediated cell lysis. CTL can also influence the activity of effectors such as Fas ligand and TRAIL-mediated cytotoxicity and cytokine secretion.

3. History of Influenza Vaccine Development

The influenza virus was first isolated in 1933, then developed into a live, attenuated vaccine used in Russia until recently. In 1940, the second strain was isolated and known as Influenza B, while the first strain isolated was called Influenza A. During the Second World War, the US Army succeeded in producing the first inactivated virus, and it was widely used in 1944 among soldiers. It was only in 1945, and its use was extended to civil society. In 1947, the vaccine was no longer used effectively, and it turned out that there had been a change in the viral antigen circulating in the community. In its development, later scientists recognized two protein proteins,

The influenza virus continued to change until, in 1958, a new strain of influenza A was discovered, so a trivalent vaccine was needed (2 influenza A and one influenza B). The ability to manufacture vaccines also continues to develop, so scientists can make a type of reassortant for live, attenuated vaccines that are used intranasally, however in 2016, the use of this type of vaccine is not recommended by the CDC because it is no longer effective. In 2013 WHO issued recommendations for the second strain of B so that a country can decide on licenses for trivalent or quadrivalent vaccines (Hannoun, 2013).

4. Production and Quality Control of Vaccine Products

To date, there are three influenza vaccine production technologies that the FDA has accepted, including (1) Egg-based flu vaccine, (2) Cell-based flu vaccine, (3) recombinant flu vaccine. Production techniques using standardized chicken eggs for vaccine production are the most widely used; this technique has been used throughout the influenza vaccine created since

the 1940s until today. At the same time, the recombinant technique is a cutting-edge technique that was only approved for the US market in 2013.

Technology using eggs requires a production time of up to 5-6 months and is highly dependent on the availability of suitable eggs. In general, the production phase begins with the WHO vaccine virus strain. Vaccine viruses (VV) are hybrids of wild-type and laboratory strains. The industry will propagate VV by culturing on fertilized eggs aged 9-12 days, then incubated for 2-3 days. VV is harvested from egg whites and processed and purified to obtain antigens. Before packaging the vial, quality control is carried out, including the content of HA and several other tests based on the provisions of the authority.

Subsequent vaccine technology uses mammalian cells as a breeding medium to reduce the need for eggs. However, the source of the virus used as the master seed still comes from eggs, so this technique cannot be considered 100% free from the use of eggs and the components contained in eggs. The FDA received a trivalent Flucelvax product manufactured using the cell culture method in 2012, and then in May 2016, its quadrivalent product was also approved for circulation.

Recombinant techniques have also been applied in the manufacture of influenza vaccines. This technique allows production without the use of eggs at all. FluBlok is a vaccine product of this type that the FDA granted a distribution permit in 2013. Vaccines are made by recombinant gene encoding techniques (e.g., HA) with genes from Baculovirus vectors. The genetically modified baculovirus was infected and incubated in insect cells for approximately 72 hours. Baculovirus is highly selective against specific insect cells, so it is relatively safe for human cells. Proteins will be produced from gene expression through these cells in a fermenter, then purified and formulated into vaccines.

There are two types of influenza vaccines currently available: the Inactivated Influenza Vaccine (IIV) and the Live Attenuated Influenza Vaccine (LAIV). An inactivated vaccine has been 'killed' chemically using formaldehyde or -propiolactone or physically by UV light. Vaccines are available in whole (Whole Inactivated Influenza Vaccine), virosomal, split, or sub-unit antigens. The live attenuated vaccine is made using a reassortment technique to obtain a virus that can induce an immune response like a natural infection but does not cause disease. Viral vaccines can replicate effectively in the upper respiratory tract but not in the lower respiratory tract because of their temperature-sensitive nature. So that immunity is obtained in the mucosa. The preparation is given in the form of a nasal spray. The CDC's Immunization Practices Advisory Committee (ACIP) does not recommend using this vaccine for the 2016-2017 flu season because it is considered ineffective (Krammer & Palese, 2015; Soema et al., 2015). WHO publishes recommendations for production and quality control IIV in the WHO Technical Report Series No. 927, Annex 3 of 2003. As for LAIV in the Technical Report Series, 977, Annex 4 of 2009.

In selecting viral strains for vaccines, the history of these strains must be well documented, including if any manipulations have been carried out. Obtaining a reassortant capable of producing large amounts of antigen possibly leads to antigenic changes. Therefore, it must be proven by Hemagglutination-Inhibition (HI) tests against reassortant and wild-type (WHO, 2003).

Control which is also very important is the culture medium in eggs and cell culture. For poultry that produce eggs as a medium for virus breeding, it must be monitored for livestock diseases that may infect, such as *Mycobacterium avium* infection, ALV, Newcastle disease, and other infections that have been mentioned in WHO technical reports No. 927 of 2003 (A.3.1.1). In addition, poultry should not receive a live Newcastle disease vaccine. Cell Culture in the form of Master Cell Bank (MCB) and Working Cell Bank (WCB) must have a standard number of passages accepted by the country's authorities.

The validation and testing strategy serves to ensure that the seed lots are free from outside agents. Emphasis for egg-based production is the validation strategy, while for cell-based production is testing. Validation must ensure that the production process has been able to remove or inactivate potential contaminants. If it cannot be implemented, a testing strategy is carried out with fast and accurate techniques such as PCR. If an external agent is found, the virus seed cannot be used in vaccine production. Meanwhile, in testing seed viruses cultured in

mammalian cells, it is necessary to test for possible contamination of pathogens that can infect mammalian cells, such as adenovirus, parainfluenza virus, and so on, which have been written in the 2003 WHO recommendation.

The following process is the production of monovalent virus pools involving harvesting, inactivation of the virus as the main ingredient of the vaccine, and testing for cell culture control. Between the virus pools derived from eggs and cell culture should not be mixed. Then in the inactivation process, critical parameters in the form of inactivation time and inactivation procedures must be consistent. Better inactivation time is shorter, thus reducing the risk of contamination. In the case of inactivation procedures using chemical methods such as formaldehyde or beta propiolactone, the concentration in each process should not exceed 0.1% by volume.

Control parameters for monovalent virus pools include Effective inactivation, HA content, presence of NA, Virus Disruption (in a split vaccine); Surface antigen (in subunit vaccines), identity testing, and antigenic identity with immunodiffusion or hemagglutinin inhibition and the presence of extraneous agents. Controls on Final Bulk include HA content, Sterility Tests, Total Protein, Ovalbumin Content (in vaccines produced with eggs), and adjuvant content (if indeed added). Furthermore, Final Bulk is included in the primary packaging, so that it is called the Final Lot. For the Final Lot, it is necessary to carry out quality control in identity tests, sterility, HA content, tests related to safety, endotoxin, and visual inspection of the final packaging.

5. Recombinant Influenza Vaccine

The advantages offered by recombinant technology in the production of vaccine preparations include: (1) recombinant Hemagglutinin (rHA) antigen produced free from protein in eggs, so it is safe for people with allergies to components in eggs; (2) The process of cloning, expression, and manufacturing of rHA does not take a long time so that it can provide a fast response to new viruses; (3) does not require live influenza viruses in the production process, so there is no need for biocontainment or inactivation processes; (3) the scaling process can be carried out in production; (4) it is not necessary to select strains capable of producing large yields so that the HA in viruses that are spread by vaccines are the same; (5) safety tests have been carried out with outstanding results against rHA produced by cell-line insect vaccines (McPherson, 2008). An example of a recombinant vaccine that has been circulating in the market is FluBlok®.

The process begins with manufacturing a baculovirus vector that will insert the HA gene from the influenza virus, processed using the RT-PCR technique because the flu virus is an RNA virus. The vector was also inserted with a polyhedrine promoter to obtain 100% recombinant virus efficiency. Characterization carried out on the master virus bank (MVB) included: identity testing, protein expression with western blot analysis, sterility testing, testing to ensure that cells were free from other viruses in vitro and in vivo. The recombinant virus was then selected by plaque assay. This selected virus will then be infected with the cell-line expressSF+ ® to obtain the stock virus (a derivative of Sf9 cells) in serum-free culture medium. (Cox & Hollister, 2009; Wang et al., 2006).

Qualification of the cell line needs to be done so that the production of rHA can be carried out consistently. Qualification refers to several guidelines, including: International Conference on Harmonization (ICH) document Q5A, FDA "Points to Consider in the Characterization of Cell Lines Used to Produce Biologicals," in 1993, and FDA (2006) draft guidance "Characterization and Qualification of Cell Substrates and Other Biological Starting Materials Used in the Production of Viral Vaccines for the Prevention and Treatment of Infectious Diseases." Master Cell Bank (MCB) qualification parameters include identity, morphology, growth, cell infectivity, and production capability. Protein, sterility, tumorigenicity, and must be free from foreign viruses proven in vitro and in vivo. Meanwhile (Cox & Hashimoto, 2011; Wang et al., 2006).

Throughout the manufacturing process, monitoring is still carried out regarding protein production in the bioreactor at a particular time. The analyses carried out included cell density, viability, distribution, rHA content with SRID, and hemadsorption assay. The final product of purified rHA protein must go through a characterization process in the form of authenticity with N-terminal amino acid sequencing and confirmation of purity with SDS-PAGE. Proof of structure by trypsin resistant-assay, Hemagglutination assay by the method described by Barrett and Inglis, and HA content by SRID (Wang et al., 2006).

6. Future Influenza Vaccine

Cross-protection is one of the essential characteristics expected of future influenza vaccines. Vaccines are expected to protect patients from viral infections without regard to the occurrence of antigenic shift or drift. As previously described, antibodies specific to non-volatile viral components such as HA-stalk and M2e can provide cross-protection. In addition, a vaccine capable of triggering CTL also has the potential to become a universal flu vaccine.

Future influenza vaccines may no longer use HA as an antigen but may also develop on other antigens. New antigens such as peptides and DNA require an adjuvant to enhance the desired immune response. The use of adjuvants has benefits, significantly increasing the vaccine's effectiveness so that the required vaccine dose is reduced. However, adjuvants can also induce unexpected immune responses, requiring special attention and monitoring when administered with complex vaccine components (Soema et al., 2015).

Future vaccines are likely to be conditioned in a solid form that requires a drying process to improve stability in distribution and storage processes. The possible drying process for this product is freeze-drying. It should be understood that freeze-drying itself is a revolutionary process with a high level of stress on the product, and there is a risk of damaging the product. Therefore we need an excipient that functions to maintain stability during the process, which is called a lyoprotectant. Lyoprotectants are mainly from sugar groups such as sucrose, trehalose, and mannitol. Stabilization occurs through several mechanisms, such as water displacement or the formation of a glass matrix around the stabilized material (Brito et al., 2013; Soema et al., 2015).

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Risk Analysis of Low Back Pain among Workers at PT. Pratama Citra Parama Ready Mix Benton and Precast Singosari

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ABSTRACT

Introduction: Non-ergonomic work attitudes such as slouching and static sitting and working for long periods of time will trigger musculoskeletal complaints such as muscle tension and pain in the lower back area. This complaint will have an impact on decreasing the functional ability of the lower back, thus causing a decrease in worker productivity. **Objectives:** The purpose of this analysis is to determine ergonomics and the risk of low back pain in workers. **Methods:** The examination in this analysis uses the Nordyc Body Map (NMB) questionnaire assessment method, with 26 population of workers in the company PT. Pratama Citra Parama is located in Toyomarto, Singosari District, Malang. The study was conducted in September 2021 for 2 weeks. **Results:** After meeting the inclusion criteria, 7 samples were obtained, and the employee's work duration was 8 hours in a non-ergonomic sitting position. **Conclusions:** There is a potential risk of Low Back Pain in workers at PT. Pratama Citra Parama Ready Mix Beton and Precast Singosari

1. Introduction

For employees who are located in the office, namely in a non-ergonomic sitting position, where the employee sits with the body position leaning forward or bending over. Health and safety analysis were carried out at a concrete company in Toyomarto, Singosari district, Malang. The sample taken amounted to 7 workers. The analysis was carried out by interviewing workers about their age, duration of work, work position, and complaints experienced. Occupational Health and Safety (K3) is defined as the science and application of preventing work accidents and occupational diseases. development, implementation, achievement, review and maintenance of OHS policies in the context of controlling work-related risks in order to create a safe, efficient and productive workplace (Pangkey et al., 2012).

Occupational Diseases are diseases caused by work and the work environment, K3 factors are very important and must be considered by workers and this is a shared responsibility, there needs to be cooperation between the government, companies and workers to avoid Occupational Accidents (KAK) and Occupational Diseases (PAK) (Salawati, 2015). Occupational diseases arise due to work relationships or caused by a job and attitude at work. One of the occupational diseases is spinal disorders or lower back pain, lower back pain that arises due to a static position at work and is continuous can result in loss of working hours so that it interferes with work productivity (Natosba, 2016). Low back pain is one of the complaints that can reduce human productivity, every year 15% - 45% of adults suffer from low back pain and generally occurs at the age of 35-55 years. One in 20 patients must be hospitalized because of an acute attack of low back pain (5% proportion) and the proportion of low back pain complaints reaches 30%-50% (Natosba, 2016).

One of the occupational diseases that is commonly found in concrete company workers, where the worker works in a sitting position and there are employees who work standing for a

relatively long period of time with a static position of the body tend to bend. Such work posture can be a risk factor for complaints of low back pain. Ergonomic static sitting positions such as sitting, standing in a bent position can cause continuous muscle contractions, so there will be obstruction of blood flow to the muscles and for a long time without sufficient recovery and obstructed blood flow to the muscles (Anggraika, 2019).

2. Methods

The analysis was conducted by interviewing the sample regarding age, working time, health complaints, and the muscles felt by workers at work. An assessment was carried out using the Nordyc Body Map (NMB) questionnaire to measure the muscle pain of the workers or to find out which parts of the body of the workers felt sore before and after doing work. All analytical procedures were approved, and all participants gave informed consent.

The population is workers who are in the PT. Pratama Citra Parama is a concrete company in Toyomarto, Singosari district, Malang in September 2021 with an age range of 23-40 years. The sample based on the inclusion criteria is that the subject is a worker, working period > 1 year, working duration > 4 hours, willing to be the subject of analysis, not experiencing, working in the office, not experiencing spinal problems such as HNP, working in a sitting position.

3. Results and Discussion

After meeting the inclusion criteria, 7 subjects were analyzed. It is known that the duration of the employee's work is from 08.00-16.00 WIB (8 hours) in a non-ergonomic sitting position, namely sitting in a bent and static position. The results of the assessment using the Nordic Body Map (NMB) were found in workers complaining of low back pain at the level of pain.

According to research conducted (Segita, 2020) Public Resources that are of sufficient quality if experiencing health problems can reduce work productivity, One of the problems that can reduce work productivity is Low Back Pain, LBP due to work is influenced by work factors in terms of These include workplace risk factors such as posture, body position, workplace design, repetition, length of work, static work, and work that requires exertion. Patients who have bad posture or a position where there is increased stress on each joint, excessive muscle activity to maintain posture so that this situation will make the point of weight fall forward, the habit of patients who have a habit of doing work in a sitting position that is too long, prolonged or heavy lifting activities that are too long then this will make the situation worse.

In a study conducted by (Dewi Zuniwati, 2021), ergonomic position errors are the main cause of Low Back Pain (LBP) which is pain in the lower back area in the spinal region, this is due to atherosclerosis or blockage of blood vessels due to the presence of atherosclerosis. continuous muscle work (repeated) so that the muscles become tense which causes a reduced supply of oxygen and nutrients, the buildup of lactic acid occurs due to prolonged muscle tension, causing pain. In this case study, employees work with a duration of sitting for 8 hours every day, according to research conducted by Dewi where workers who sit for 8-9 hours will affect the incidence of low back pain, the length of sitting makes the spine and tendons and muscle tissue forced to withstand excessively in the upper body, thus the muscle tissue in the back will experience fatigue, especially the lumbar muscles.

After sitting for about 15 to 20 minutes, the muscles in your back usually start to get tired and you start to feel lower back pain. Sitting duration > 4 hours has a relationship with LBP complaints and when someone with a job that requires a long time to sit with an not ergonomic sitting posture will cause the back muscles to experience tension and be able to damage the surrounding soft tissue (Dewi Zuniwati, 2021).

The longer a person sits, it will cause tension in the muscles around the back and there will be stretching of the back ligaments such as the posterior longitudinal ligament, because this ligament is the thinnest ligament among the ligaments in the L2-L5 area. Static sitting duration of 91-300 minutes has a risk of developing LBP 2.63 times greater than the period of 5-90 minutes (Arifianto et al., 2017).

In a study conducted by (Ni Made, et al 2014) the results showed that workers who sat ergonomically were 33.3% (16 people) with a sitting duration of <4 hours and a non-ergonomic sitting posture was 66.7% (32 people) with a duration of less than 4 hours. Sitting >4 hours and complaining of low back pain. So it is necessary to be given active rest to avoid static work for long periods of time, and relaxation is carried out to relax or relax muscle tension due to work, so that work saturation can be reduced, can restore mental freshness and finally can increase work productivity and will reduce complaints of problems musculoskeletal.

For the short term, education is carried out in the form of a good and correct sitting position so that an ergonomic work position arises and for the long term, namely education about how to stretch by giving posters containing procedures, doses, and benefits. So from this it can minimize the risk of low back pain in workers and musculoskeletal problems or diseases arise due to work.

4. Conclusion

From the analysis that has been done, it is found that employees at PT. Pratama Citra Parama have the potential to experience occupational diseases, namely musculoskeletal problems, Low Back Pain (LBP) due to non-ergonomic positions such as a bent and static sitting position with a working duration of 8 hours or more depending on the number of projects.

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Relationship between Working Mother and Child Development

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ABSTRACT

Introduction: In many countries, women are given the task of being the caregivers of their children. A mother has to consider the decision to work outside or spend most of her time taking care of her children. **Objectives:** To analyze the relationship between working parents to children's development through literature review. **Methods:** A literature search in this present study was using 4 databases i.e., Scient Direct, Pubmed, ProQuest, and Cochrane Library. The inserted keyword, as follows: (duration) or (occupation) or (type) and (working) and (mother) or (parent) and (children) and (development) or (cognitive) or (motoric) or (behavior). The inclusion criteria in this present study used the PICOS format. **Results:** A total of 87 articles were found based on determined keywords. Further, the screening process of full-text adjustment resulted from 4 articles that met our inclusion. **Conclusions:** The status of socioeconomic in family related to social and problem-solving skills. Parenting style can affect child development. The settled job among parents can predict overactivity in parenting.

1. Introduction

Starting from the 1960s, there was an increasing number of female employees worldwide and most of them left their homes to work outside (Fox et al., 2013). This condition interpreted that female has an important role as income generating-families, especially in developing country (Glick, 2002). The population of working mothers has increased in parallel with the increase in women's education levels, and so there is no limitation in mobility and restoration of a better standard of living made many women decide to work (Singh, 2019). Currently, women have the same opportunities as men in developing abilities and skills to earn money in helping the family economy (Unicef, 2011).

Not solely to improve the family economy, women play various important roles in the family, thus affecting health and welfare conditions. In many countries, women are given the task of being the caregivers of their children. Activities such as breastfeeding, cooking, feeding, cleaning the house, and watching children's growth and development are also carried out by women (Unicef, 2011). Not only as a special skill, but a woman who has become a mother will also spend more of her time than anyone else with her children (Kotila et al., 2013). Parenting is also a major issue in most countries in the world. It seems to be a universal truth that children need their mother's love the most (Handayani et al., 2015). A mother has to consider the decision to work outside or spend most of her time taking care of her children. Several previous studies showed lack of parental attention to children at an early age will be detrimental to child development. Compared with children who get enough attention from their parents, children with working parents have lower scores. A good relationship between mother and child is certainly not comparable to the relationship between mothers who get paid to care for their children (Craig & Mullan, 2011)(Edwards, 2009). From this phenomenon, people need to consider if work duration has a negative effect on children's development. The increase in work duration makes mothers spend less time accompanying their children (Zhou et al., 2017).

To maximize the growth and development of children in the golden age period, children need stimulation from their parents. The first interaction that children get comes from the mother (Handayani et al., 2015). Child development shows changes in behavioral and biological aspects (Balasundaram & darshini Avulakunta, 2021). One type of development that can be directly observed is physical and skill growth. Physical growth is a scale changes in the body at a

certain time, and motor skills are the body's maturation process. This is obtained along with the maturity of the brain and muscles. Several studies have shown that there was a relationship between a child's growth delay and the type of parental occupation. There is also a relationship between the symbolism of the child's growth and development with the social and economic conditions of the parents.

The previous study showed a significant negative effect among full-time working mothers with child development (Hill et al., 2005). However, the full-time working mother correlates with impaired cognitive function among children (Bernal & Keane, 2011). One study revealed, no negative effect was found with cognitive function, yet they suggest that working mother probably affects children's cognitive function (Ruhm, 2008)(Lombardi & Coley, 2017). Besides it, several studies proved the significant effects of a working mother with children's behavioral and emotional (W.-J. Han et al., 2010). The number was increased in mothers who work in the early morning or night and younger children have more significance in behavioral and emotional problems (W.-J. Han & Miller, 2009)(W.-J. Han & Waldfogel, 2007). In addition, several studies suggested that working mother has no direct significance to child development, yet influencing the reduction of the important time spent by mother to children (Hsin & Felfe, 2014).

From the variation of results found by several previous studies, this present study aims to analyze the relationship between working parents to children's development through literature review.

2. Methods

2.1 Data Sources

A literature search in this present study was using 4 databases i.e., Scient Direct, Pubmed, ProQuest, and Cochrane Library. Several keywords were used to find the literature be adapted to medical subject heading (MeSH), as follows: (duration) or (occupation) or (type) and (working) and (mother) or (parent) and (children) and (development) or (cognitive) or (motoric) or (behavior). At first, we investigated the abstract and the studied variable founded by the database to check whether has the potential to meet our criteria or not. Second, we checked whether the study had been published, available in the database, and has a full text to be reviewed.

2.2 Selection Process

The inclusion criteria in this present study used the PICOS format which identifies the population, intervention, comparison, outcome, and study design). The population in this present study is working mothers and children. Further, the intervention and comparison were not studied. The outcome is a relationship between working mothers and child development. The study design is descriptive-analytic, observational, and randomized control trial. The range of publication dates is between 2006-2021.

3. Results and Discussion

Figure 1 shows the result of the original article searched through Scient Direct, Pubmed, ProQuest, and Cochrane Library. A total of 87 articles were found based on determined keywords. The screening processes of abstract adjustment resulted from 20, while the remaining 57 articles were excluded because they weren't focused on our criteria. Further, the screening process of full-text adjustment resulted from 4 articles that met our inclusion.

Those 4 articles examined the effect of work duration among working mothers against child development. They observed the effect of maternal work duration on the cognitive function of their children (Hill et al., 2005). Others examined whether work hours in the early morning and evening has an association with children's emotion (W.-J. Han et al., 2010). Also, they studied the relation between working mothers on workdays and non-workdays with the frequency of communication (Zhou et al., 2017). Among the 4 studies we reviewed, 1 is conducted in China, 2 is conducted in Japan, and 1 is conducted in Europe.

Table 1 Article Summary

No.	Studied by.	Population and sample	Study design	Variable	Result
1.	(Zhou et al., 2017)	879 students grade 4-6 and their mother from two primary schools in Hebei and Shandong provinces China	Correlation study using multi-group structural equation model, cross-sectional study design.	Maternal work hours among mothers; frequency of mother-child communication (FMCC); maternal education	Highly educated mother with workdays as work hours has no relation with FMCC; non-workdays as work hours among working mother has no relation with FMCC as well; FMCC from working mother has a positive effect on children; there was a significant positive effect from FMCC among low educated mother; work hours among low educated mothers positively predicted negative effect on children.
2.	(Hosokawa & Katsura, 2017)	1604 preschoolers aged 5 and 6 years.	Observational study design	Socioeconomic status; marital relationship; parenting practices; child social competence; child adjustment	The family income and parental education were related to social skills, internalizing, and externalizing problems; while social skills inversely influenced internalization and externalization of problems.
3.	(Tong et al., 2009)	504 children from 41 center-based care in Japan and their mother	A longitudinal prospective cohort study	Parenting style and children development	Parenting style significantly influence the development of children after 2 years; the change of playing routine between mother and child influence the social competence; job differences among working mother associated with children's communication skill
4.	(Perry-Jenkins et al., 2020)	153 working-class couples	Longitudinal investigation with correlation study design	Working-class parents job autonomy; behavior problems; adaptive skills	Higher job autonomy predicted lower over parenting activity, while parents involved a significant link to adaptive behavior in children, yet not behavior problems.

Amount of the time owned by parent significantly affect child development and self-involvement with their children. Parents with longer work hours have a time limit spent with their children, thus preventing more interactions and the outcome of the developmental process (Gettinger & Guetschow, 1998). The previous study observed the relation between mothers' working hours, communication with their children, and positive-negative effect through children resulted that the frequency of communication positively affecting children and negatively related to negative affect in children (Zhou et al., 2017). The significant result was not higher between the variables they studied, the involvement from father roles, the use of baby care facilities, mother's working hours, and parental education may affect the result as well. In addition, more time spent among parent and child is not the golden standard in influencing children's behavior. Parents with good knowledge and skill have the same opportunity as their children despite the time limit they had. High-educated mothers relatively have great knowledge

and skill, they know how to solve the problem with their children by proactive communication (Walker et al., 2005).

The involvement of the mother's care and attention are important in the early year of child development. Many studies have been showing that mother has a responsibility to care for their children and spend longer time with their children than father or other members do. However, to fulfill all family's needs, most mothers decided to work outside. The previous study had been observed between the status of socioeconomic and children's development. As a result, family income correlated to child development, and so the level of parental education (Kohen et al., 2002)(Bøe et al., 2014; Castillo et al., 2011; Conger et al., 2010; Dearing et al., 2001; W. Han, 2005; Volling & Belsky, 1991). It was mentioned that parental conflict and parenting practices contributed to a negative dimension termed as a mediator that links to family economic status and child mental health (Hosokawa & Katsura, 2017).

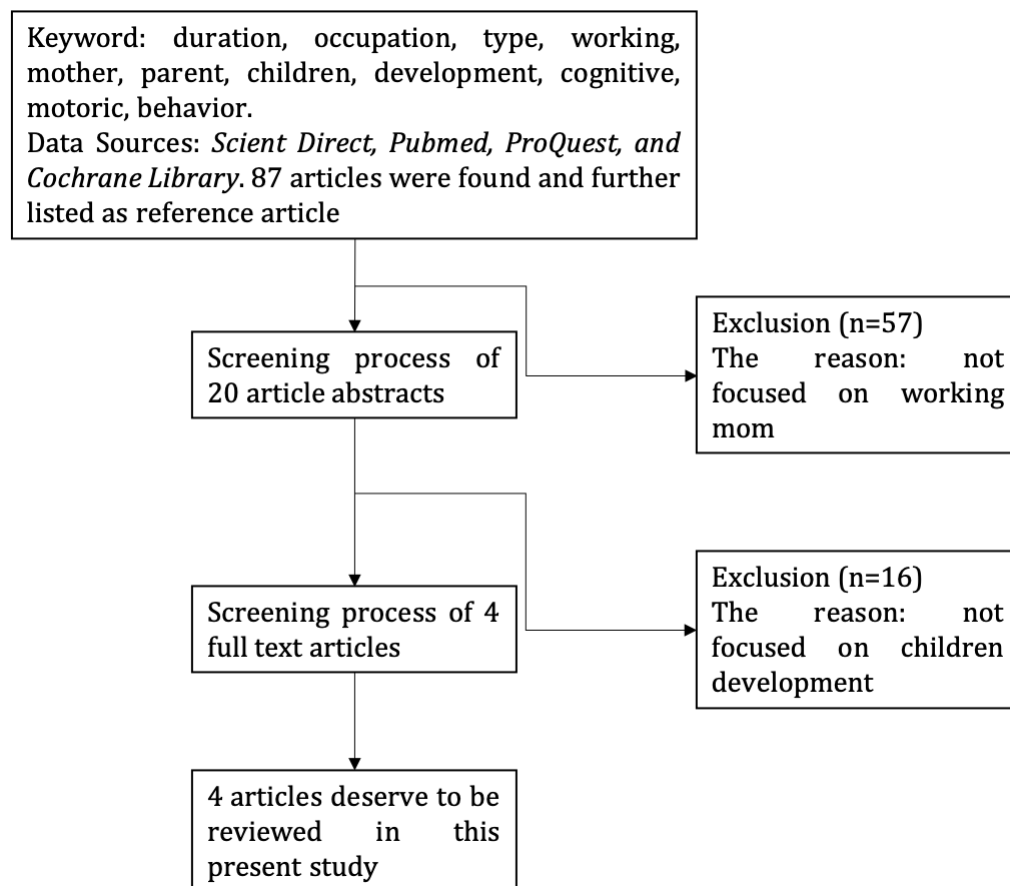


Figure 1 Article Selection Process

4. Conclusion

From the 4 articles we reviewed, we found that the status of socioeconomic in family related to social and problem-solving skills. The way child solves the problem is in accordance with their social skill as well. Further, parenting style can affect child development, the more times spent by parent and child to play will affect social competence and job differences among mothers related to child's communication skills. The settled job among parents can predict overactivity in parenting. However, we should acknowledge some limitations in this study, we found fewer articles to be reviewed concerning the variable we determined. Further, the cross-sectional study design is needed to observe a direct correlation between working mothers and child development.

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The Correlation between Work Period and Work Position to the Risk of Musculoskeletal Disorders (MSDs) on Online Motorcycle Taxi Drivers in Malang

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ABSTRACT

Introduction: Musculoskeletal Disorders (MSDs) are the first complaints of health problems related to work. From the hectic work of attracting passengers every day, online motorcycle taxi drivers range from occupational health to safety such as long working periods and non-ergonomic work positions that trigger health problems, especially complaints of Musculoskeletal Disorders (MSDs). **Objectives:** To determine the relationship between work period and position on complaints of Musculoskeletal Disorders (MSDs) on online motorcycle taxi drivers in Malang. **Methods:** The study used an analytic observational method with a cross sectional approach. The instruments used in this study were the Nordic Body Map as a measuring tool for work position and REBA as a measuring instrument for Musculoskeletal Disorders. Normality test using Shapiro-Wilk and hypothesis testing using Spearman test. **Results:** Based on the correlation test, it was found that both variables for the work period and work position variables had a p value <0.05 , which indicates that H_0 is rejected and H_1 is accepted, so it can be concluded that there is a relationship between work period and work position on complaints of Musculoskeletal Disorders in online motorcycle taxi drivers with a sufficient level of correlation. **Conclusions:** There is a relationship between work period and position on complaints of Musculoskeletal Disorders (MSDs) on online motorcycle taxi drivers in Malang.

1. Introduction

Online motorcycle taxi is a job that is currently booming in urban cities. The more deliveries they make, the more income they can earn. This motivates online motorcycle taxi drivers to work, but work that is carried out continuously has a risk of Musculoskeletal Disorders (MSDs) (Anggraeni, 2020; Ferusgel et al., 2020).

Musculoskeletal disorders (MSDs) are complaints that often occur in workers in the skeletal muscle section from very mild pain to very severe pain. MSDs are often experienced by workers on body parts such as the neck, back, wrists, feet, and elbows. Damage to ligaments, tendons, and joints is often caused by the body receiving long, continuous static loads (Evadarianto & Dwiyantri, 2017). Musculoskeletal complaints are usually felt by a worker such as cramps, stiffness, swelling, tingling, numbness, limited motion, and decreased flexibility. Injury to the musculoskeletal system in the form of damage to the joints is caused by a static load received by the muscles monotonously and for a long time (Baqar et al., 2016).

Factors that can lead to musculoskeletal complaints are non-ergonomic worker positions, excessive muscle stretching, and repetitive activities (Jalajuwita & Paskarini, 2015). Vigorous activity on muscles and bones can result in local stress on joints, muscles, and ligaments. Workers are also at risk for neck injuries, shoulder injuries, wrist injuries, and others (Mongkareng et al., 2019). Assessment of work posture using the REBA measuring instrument on motorcycle drivers with a final score of 9 (high level category) requires posture corrective actions that cannot be delayed, namely when the driver sits back too far about 54 cm from the tip of the saddle it becomes dangerous. So, the motorcyclist must change the sitting position towards the front with a distance of 34 cm from the tip of the saddle, so that it enters the medium level which is better ergonomically (Torik, 2016).

According to the International Labor Organization, the severity of work accidents in Indonesia is quite high, namely there are 20 fatal accidents out of every 100,000 workers who have accidents (Fahmi, 2013). Data from the Health Research and Development Agency Indonesia (2018) shows that 53.3% of the proportion of injuries that resulted in disrupted activities occurred in workers. The high rate of occupational diseases in Indonesia, especially for the problem of Musculoskeletal Disorders (MSDs) in workers is a source of concern. From a hectic job to attract passengers, online motorcycle taxi drivers are prone to deviating from occupational safety health, namely the working period and work positions that are not ergonomic can cause various musculoskeletal diseases that affect the work of online motorcycle taxi drivers to be disturbed and uncomfortable, thus attracting researchers to investigate further about the problem of Musculoskeletal Disorders (MSDs), which is related to whether or not there is a relationship between years of service and work position to MSDs complaints to online motorcycle taxi drivers in Malang.

2. Methods

This study used an analytical observational method with a cross sectional approach, namely data collection was carried out simultaneously at one time. Researchers analyzed work period and work position to find out the relationship to the risk of Musculoskeletal Disorders (MSDs) in online motorcycle taxi drivers.

This research was conducted in the Sigura-gura area, Malang in April 2021 using the REBA questionnaire to determine the assessment of work position and work period and the Nordic Body Map questionnaire to determine the risk of MSDs complaints.

The population in this study were online motorcycle taxi drivers who were working in the Sigura-gura area of Malang, who were willing to be respondents. In this study, 30 people met the inclusion criteria. The univariate analysis in this study consisted of age, work period, work position, and complaints of MSDs on online motorcycle taxi drivers, while the bivariate analysis used the Shapiro-Wilk test because there were 30 respondents and the correlation test used was the Spearman rho test because data is not normally distributed.

3. Results and Discussion

From the results of the study, it was found that the characteristics of the sample based on age can be seen in figure 1 below.

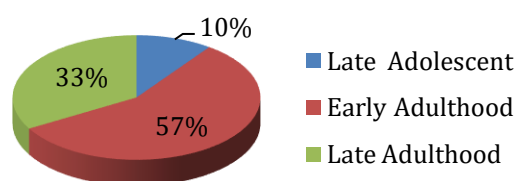


Figure 1 Sample Characteristics by Age

Based on research that has been carried out by researchers, it is found that the sample has a majority age of 26-35 years as many as 17 samples. This age is included in the category of early and productive adults. The optimal condition of muscle strength begins at the age of 20-30 years and will decrease with age. This declining condition will increase the complaints of MSDs (Tarwaka, 2011).

Based on the working period, the characteristics of the research sample can be seen in figure 2 below.

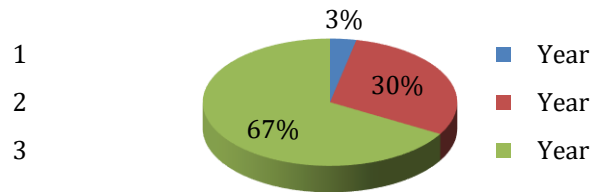


Figure 2 Sample Characteristics by Working Period

Most of the samples (67%) ie as many as 20 people, have been online motorcycle taxi drivers for 3 years, while 9 people worked for 2 years (30%) and 1 year worked for 1 person (3%). Besides that, the sample characteristic data based on work position can be seen in figure 3 below.

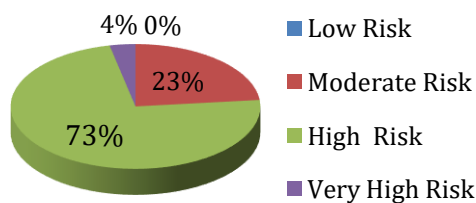


Figure 3 Sample Characteristics by Working Position

From the figure above, it can be seen that the working position of online motorcycle taxi drivers in the Sigura-gura area is the highest risk of 73% (22 riders), followed by moderate risk of 23% (7 riders), and very high-risk riders of 4 % (1 rider).

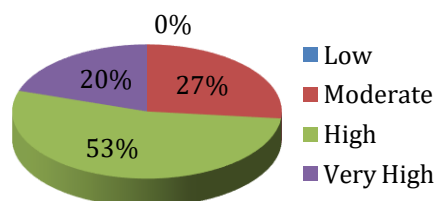


Figure 4 Sample Characteristics by the Complaint of MSDs

Based on figure 4, it is known that MSDs complaints that are moderate to online motorcycle taxi drivers are the most complaint, namely 27% (8 people), high MSDs complaints are 53% (16 people), and very high MSDs complaints are 20% (6 people).

Table 1 Normality Test Result

Variable	N	p
Work Period	30	0,001
Work Position		0,001

Ket : Shapiro Wilk test ; N= sample; p = significance value

From the results of the normality test, a significance result of 0.001 was obtained, which means that the data is not normally distributed or $p < 0.05$.

Table 2 Correlation Test Result

Variable		N	p	r
Dependent	Independent			
Work Period	MSDs	30	0,017*	0,432
Work Position			0,027*	0,402

Ket : Spearman rho; N= sample; p = significancy value; r = correlation value; *=significant

Based on the correlation test, it was found that both variables for the work period and work position variables had a p value <0.05 , which indicates that H_0 is rejected and H_1 is accepted, so it can be concluded that there is a relationship between work period and work position on complaints of Musculoskeletal Disorders in online motorcycle taxi drivers with a sufficient level of correlation.

A study conducted by Safitri & Prasetyo (2017) which is in line with this study, stated that one of the causes of MSDs complaints is the working period of finishing workers with 10-15 years of service being more at risk of experiencing MSDs complaints. Another study states that polishing workers after 10 years of work experience MSDs, while those who work 5 years do not experience MSDs complaints. Research also conducted by Ferusgel et al. (2020) said that the working period of online motorcycle taxis drivers that have worked for more than 2 years mostly experienced MSDs complaints compared to online motorcycle taxis who worked less than 2 years. This proved that the longer the working period of online motorcycle taxis drivers will often experience body vibrations that cause blood vessels to become narrow so that workers will experience muscle pain and MSDs complaints (Randang, 2017)

MSDs occur due to the accumulation of small damage that enlarges in the musculoskeletal system due to repetitive loads and injuries that are not treated and healed completely, causing greater damage and causing pain. Disturbance or damage to the muscular system never occurs directly, but from minor damage that occurs continuously and for a long time in a matter of days, months, or years, depending on the weight of the work done. Repeated loading causes extensive damage causing pain, tingling, swelling, and minimal and impeded movement of the traumatized body part. The longer a person works, the greater the muscle strength used, it will increase the complaints of MSDs (Tulus, 2012). Working for a long time and using the same muscles can cause fatigue in workers and can trigger work stress. The longer the working period, the higher the complaints of muscle fatigue and the length of recovery time. Fatigue occurs because of the burden on workers. The load received results in an imbalance of oxygen demand with incoming oxygen intake so that the energy used for muscle contraction and relaxation is not sufficient. As a result, aerobic metabolism will change to anaerobic because insufficient oxygen causes compensation by way of accumulation of lactic acid and causes MSDs complaints. So work period is a factor that can contribute to the burnout that workers are exposed to. The development of MSDs usually occurs gradually or progressively and is usually due to long-term loading. So the longer the working period, the higher the complaints of drivers experiencing MSDs (Icsal et al., 2016).

The results of this study supported by research conducted by Cindyastira et al. (2014) which showed a relationship between age, length of work, years of service, exercise habits, vibration intensity, and work attitudes with complaints of Musculoskeletal Disorders (MSDs) in paving block workers. The results of this study are also in line with research conducted by Octaviani (2017) which states that there is a relationship between work postures that affect MSDs complaints in inter-provincial bus drivers in Bandar Lampung. The more the driver's position or work attitude is not ergonomic, the greater the MSDs complaints felt by the driver (Safitri & Prasetyo, 2017)

The working position of online motorcycle taxi drivers is a sitting position with the feet placed on the slap on the motorcycle and holding the passenger's weight as a burden when the motorcycle stops, the hands also get a burden from running the motorcycle, and the head is focused upright and straight ahead looking at the road. The majority of non-ergonomic positions are carried out on the neck, back, and legs of workers. The work position of online motorcycle taxi drivers is a static work attitude and receives vibrations continuously for a long time. This

will cause a lack of glucose in the blood, lack of oxygen, and blockage of blood flow, as well as psychological risks or work stress due to pressure (Mutia, 2015). The working position that significantly deviates from the normal posture while working will result in mechanical stress on muscles, joints, and ligaments. This leads to neck, shoulder, spine, wrist injuries, and the risk of other neurological diseases such as HNP. Emphasis on muscles that will interfere with nerve function, nerve destruction and cause damage to nerve responses that cause muscle weakness. An unnatural position is the position of the limbs away from, for example, a bent back, the head is too bent or too raised, and so on. The farther the position of the body from the center of gravity, the greater the muscle complaints that will be experienced (Rahman, 2017). Work positions that have moderate risk need to make changes immediately so that the risk does not get bigger and complaints don't get higher (Lubis et al., 2021).

4. Conclusion

Based on the research that has been done, it can be concluded that there is a sufficient correlation coefficient between working period and working position to complaints of Musculoskeletal Disorders (MSDs) on online motorcycle taxi drivers in Malang. Researchers who want to do further research on Musculoskeletal Disorders suggested to expand the sample population and add variables that do not exist in this study such as length of work, exercise habits, and vibration intensity to complaints of Musculoskeletal Disorders (MSDs).

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The Effect of Circuit Training on Limb Muscle Strength in Swimming Athletes

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ABSTRACT

Introduction: one of the most important factors that provide most of the strength in swimming is the muscle strength of arms. The excellent of muscle strength will increase speed, movement, and frequency of swimming. In fact, there are still many athletes in Indonesia who have poor arm muscle strength. Poor arm muscle strength can also increase the risk of Swimmer's Shoulder. Circuit training can be used to increase the strength of an athlete's arm muscles. **Objectives:** the study aimed to determine the effect of circuit training on increasing arm muscle strength. **Methods:** the study was used quasi-experimental with one group pretest and post-test design. 14 participants were recruited by purposive sampling. **Results:** Normality test indicated normal data. The results of the paired t-test is 0.000. **Conclusions:** There is an effect of circuit training on increasing arm muscle strength in swimming athletes.

1. Introduction

According to Kurniawan & Arwandi (2020) swimming is a sport with an effort to float the body to the surface of the water that have benefits are elevating the body, building muscle, practicing breathing, burning calories, reducing stress, improving heart work, and giving relaxation. The development of swimming achievements in Indonesia at the regional and national scope is still fairly good, but not in the international scope (Aras *et al.*, 2017). The physical components that must be possessed by a swimmer are muscle strength, speed, agility, accuracy, coordination, balance, and endurance (Anwar, 2019).

Muscle strength is the ability of muscles to perform a strong movement (Sakti & Maidarman, 2019). Muscle strength is the key to good arm movement in swimmer. This arm movement is also influenced by the contraction of the muscles. The main arm muscle that act as propulsion in swimming are deltoideus, biceps brachii, brachioradialis, brachialis, triceps, latissimus dorsi, teres minor, infraspinatus, flexor carpi radialis dan ulnaris (Aras *et al.*, 2017). Good arm muscle strength can increase pedaling speed, movement and arm frequency, making it easier for the body to slide forward quickly (Sakti & Maidarman, 2019). Poor muscle strength in swimmers does not only have an impact on decreasing their performance. Low levels of muscle strength can also increase risk factors for injury in athletes (Setiawan, 2011).

Data shows that 40%-91% of swimming athletes experience shoulder pain or often called Swimmer's Shoulder. Actually, Swimmer's Shoulder are several shoulder pathologies that are common in swimmers such as impingement syndrome, supraspinatus tendinitis, scapular dyskinesis and neuropathy. According to Bak (2010) Swimmer's Shoulder is caused by an imbalance of core muscles, scapulothoracic articulation, rotator cuff muscles and glenohumeral mobility. Based on this, a strengthening exercise is needed that can increase arm muscle strength. One of strengthening exercise that can be given to athletes is Circuit Training.

Circuit Training is a form of exercise that is carried out with several posts, where each post has different exercises and functions (Putri *et al.*, 2020). Circuit training combines several types of exercises that have a specific purpose and are easy to do anywhere. Circuit training can stimulate mobility, build strength, increase stamina and bring about positive changes in all physical components (Saini, 2019). The main feature of circuit training is the use of alternating

body muscles such as arm muscles, upper body muscles, and leg muscles (Fardi & Risman, 2019).

Based on the problems above, it can be said that the average swimming athlete in Indonesia does not have good physical conditions and components, especially arm muscle strength. Poor arm muscle strength can cause injury to athletes and have an impact on the rate of improvement in their performance. If there is no action, it will be difficult for Indonesian athletes to catch up with other countries' achievements. Thus, it is necessary to give a form of strengthening exercise that can increase arm muscle strength in swimming athletes. From this explanation, the researchers wanted to examine "The Effect of Circuit Training on Increasing Arm Muscle Strength". It is hoped that the results of this study can assist swimming coaches and coaches in determining effective forms of exercise to encourage the rate of achievement in Indonesian swimming.

2. Methods

The study was used quasi experimental design with one group pre test-post test design approach that there is 1 group who is given circuit training exercise. In this study, the samples will be given a pretest and posttest where the results of the two will be compared later.

The population in this study are swimmers in Amarta Swimming Club Malang that compatible with criteria inclusion and exclusion. Inclusion criteria: (1) Respondents aged 16-22 years. (2) Approving the approval letter to become a respondent. (3) Willing to participate in training or research programs. Exclusion criteria: The subject had an injury to the lower limb (strain or strain). And dropout criteria: (1) Subjects withdrew during the study. (2) Subjects were injured during the study. (3) Did not follow the exercise 3 times.

This research was carried out at the Gajayana Swimming Pool, Tangkuban Perahu street, Kauman, Kec. Klojen, Malang City, East Java Province, which is the training center for the Amarta Swimming Club Malang athletes. The research time in this study was 4 weeks with 3 meetings every week so that the total meeting was 12 times in March - May 2021.

The instrument in the study that serves to measure the increase in arm strength is the Expanding Dynamometer Test. The equipment needed in carrying out the test is an Expanding Dynamometer tool. This test was carried out before giving the intervention and also after giving the Circuit Training exercise intervention.

3. Results and Discussion

3.1 Age Characteristics

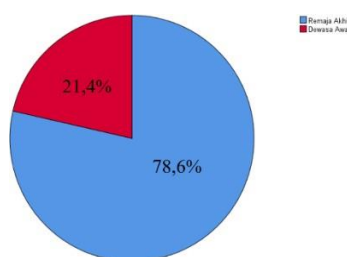


Figure 1. Age Characteristics

The distribution of the data above explains that of the 14 samples, 11 people (78.6%) are in the late teens category with an age range of 16-19 years and 3 people (21.4%) are in early adulthood 20-22 years. The distribution of the data above shows that most of the samples are in the late teens category.

The results of research that have been conducted on Amarta Swimming Club Malang swimming athletes found that the athlete's age ranged from 16-22 years with the highest average being at the age of 16 years. Muscle strength will continue to develop from birth to adulthood. At the age of 16-19 years, the growth of muscle mass will occur along with the high production of Growth Hormone (GH) in the body. Growth Hormone contains natural steroids that function to increase muscle mass in teenagers. In giving an exercise micro damage occurs in

muscle tissue. When this damage occurs, Growth Hormone functions to repair muscle tissue by increasing the amount of actin and myosin, thereby increasing the diameter of the muscle fibers. The increase in the amount of actin and myosin in muscle fibers greatly affects the size of the muscle contractile unit which has an impact on increasing muscle contractility (Soethama *et al.*, 2018).

The level of muscle strength will increase drastically in early adulthood at the age of 20 years. When humans touch adulthood, there will be maturity of cells and muscle tissue. At the age of 18-25, the growth peak of Growth Hormone occurs. This increase in muscle strength will be obtained maximally when doing regular exercise. Regular exercise will increase muscle mass. In addition, several contributing factors during exercise are the very large activation of the motor unit and the type of fibers that are activated. Activation of the motor unit greatly increases the diameter of the muscle fiber. This increase in muscle diameter will affect the magnitude of contraction and the resulting muscle strength. During exercise, adults tend to activate type 2 fibers. Activation of type 2 fibers will result in changes in the morphological structure of the muscle by increasing the diameter of the muscle fibers which are larger than the activation of type 1 fibers (Soethama *et al.*, 2018).

3.2 IMT Characteristics

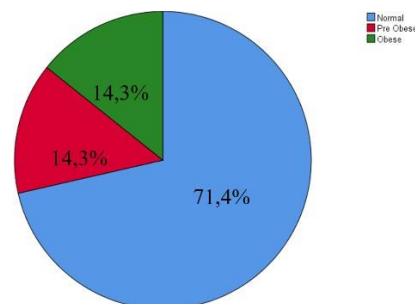


Figure 2. IMT Characteristics

The distribution of the data above explains that from the 14 samples, 10 people (71.4%) were in the normal BMI category, 2 people (14.3%) were in the pre-obese category and the remaining 2 people (14.3%) were obese. The distribution of the data above shows that most of the samples are in the normal BMI category.

The results of research that have been conducted on Amarta Swimming Club Malang swimming athletes showed that 10 samples had normal BMI and 4 others had pre-obese and obese BMI. BMI is used to measure the nutritional status of a person obtained from the calculation between weight and height. The increase in BMI is caused by several factors, such as poor lifestyle, poor food intake and infrequent physical activity or exercise. A BMI that is too high will affect a person's level of fitness and physicality. Someone with a high BMI tends to have a poor fitness level.

A person's muscle strength can not be known with certainty only by measuring BMI. There are 2 possibilities when a person has a high BMI, namely high muscle mass or excess body fat percent. According to research conducted by Baihaqi & Hariyanto (2020), showed that there was actually no significant relationship between BMI and arm muscle strength. This is in accordance with the theory proposed by Liana *et al.* (2017) that BMI is not necessarily able to increase the capacity of muscle strength, maximum muscle capacity and power in a person's body. This is in accordance with the theory proposed by Liana *et al.* (2017) that BMI is not necessarily able to increase the capacity of muscle strength, maximum muscle capacity and power in a person's body.

3.3 Gender Characteristics

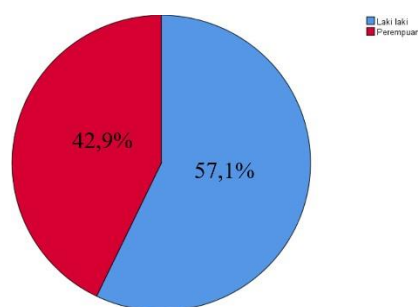


Figure 3. Gender Characteristics

The distribution of the data above explains that from the 14 samples, 8 people (57.1%) were male and 6 people (42.9%) were female. The distribution of the data above shows that most of the samples are male.

The results of the research that has been conducted on the Amarta Swimming Club Malang swimming athletes obtained samples of male gender 8 people (57%) and women 6 people (43%). At the age of 16, the mass ratio grows between boys and girls equally. This also affects the level of muscle strength in boys and girls which are almost the same before puberty. The difference will begin to become clear at the end of adolescence, namely in the age range of 17-19 years. When entering early adulthood around 21 years, men will experience a significant increase in muscle strength compared to women. Male muscle mass will increase 50% greater than female muscle mass. This happens because in men there is the hormone testosterone which one of its functions is to increase muscle mass and muscle strength. Differences also occur in muscle structure, where muscles in men contain less fat so they have the potential to have greater strength than women (Lesmana, 2012) & (Soethama *et al.*, 2018).

3.4 The Effect of Circuit Training on Increased Arm Muscle Strength in Athletes

Table 1. The Effect of Circuit Training on Increased Arm Muscle Strength in Athletes

	N	Sig
Arm muscle strength	14	0.00

Based on the results of the hypothesis test using the Paired t-test, the results obtained are sig. 2 tailed 0.000. This indicates that the significance value is $p < 0.05$ so that H_0 is rejected and H_1 is accepted, therefore it can be concluded that there is an effect of providing circuit training on increasing arm muscle strength in Amarta Swimming Club Malang swimming athletes.

Circuit training is a form of exercise that is carried out with several posts as a place of practice where each post has a different form of exercise and function. Circuit training combines strength, endurance, agility and cardiovascular training into one so that it can simultaneously improve the overall fitness level of an athlete or athlete's body. This exercise has a series of movements that can get the muscles to reach their maximum level in the least amount of time. Regular training will result in changes in muscle strength (Saputra, 2015).

Provision of circuit training in one repetition is required to perform all types of exercises that have been determined in each post. The training load that is carried out continuously will cause physiological adaptations in the muscles. The main muscle adaptation is the increase in muscle mass (hypertrophy). The occurrence of hypertrophy is caused by the number of myofibrils in each muscle fiber, increased capillary density in muscle fibers and increased number of muscle fibers. The development of hypertrophy is related to the maintenance of an increased number of actin and myosin filaments, sarcoplasm and other supporting tissues. Furthermore, muscle strength is increased through nervous system adaptations that drive the number of units of motion at a time of training. This causes an increase in automatic muscle

fibers, thereby increasing muscle cells (hyperplasia), in which there are additional mitochondria. Therefore, circuit training exercises have a significant effect on muscles in the form of hypertrophy, hyperplasia and an increase in the number of mitochondria so that there is an optimization of the work of the nervous system and muscle strength will increase (Ardika, 2015).

Good arm muscle strength is very important in swimming. The strength of the arm muscles greatly affects the speed in swimming. Arm movement is the key to fast, effective and free swimming. The greater the arm muscle strength of a swimming athlete, the better the movement and pedaling of the arm will be. The main arm muscles as the driving force in freestyle swimming are m. deltoid, m. triceps brachii, m. latissimus dorsi, m. teres minor, m. infraspinatus, m. brachialis, m. biceps brachii, m. brachioradialis, m. flexor carpi radialis and m. flexor carpi ulnaris. This arm muscle contraction produces external force to move the swimmer's body from one end of the pool to the other.

Circuit training can provide an effective increase in arm muscle strength for swimming athletes. Circuit training trains and demands alternately muscle groups such as arm muscles, shoulder muscles, legs and upper body muscles. Because the change in the use of this muscle causes the activation of muscle strength and the neuromuscular system continuously so that it can improve physical condition effectively, efficiently and practically. This exercise is also done regularly, continuously and repeatedly. Training that is carried out repeatedly will stimulate amino acids which result in an increase in the number of mitochondria in muscle cells so that the muscle fibers are enlarged. This change in muscle fibers results in an increase in the amount of energy in the muscles and tendons in the form of ATP which functions for stronger muscle contractions. In circuit training there is also an increase in muscle strength due to the increased amount of contractile proteins, myosin and actin filaments as well as connective tissue and increased ligament strength.

4. Conclusion

Based on the results of research and discussions that have been carried out, it can be concluded that there is an effect of providing Circuit Training on arm muscle strength in Swimming Athletes.

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Long Driving Relationship with Piriformis Syndrome Risk in Public Transport Driver at The Terminal Landung Sari Malang

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Long Driving, Piriformis Syndrome, Sitting Position

ABSTRACT

Introduction: Sitting for a long time will cause pain in the human body, one of which is piriformis syndrome caused by tension in the piriformis muscle so that the sciatic nerve is depressed. Driving is a sitting activity with a long duration of work. This position is one of the risk factors for piriformis syndrome. Piriformis syndrome is a neuromuscular disorder that occurs when the sciatic nerve (*nervus ischiadicus*) is compressed or irritated by the piriformis muscle, causing pain, tingling, in the buttocks area to the sciatic nerve. **Objectives:** Analyze the relationship between the length of driving and the risk of piriformis syndrome in public transport drivers at the Landung Sari Malang terminal. **Methods:** This study uses an analytical description with a cross-sectional approach. The population in this study were public transport drivers at the Landung Sari Malang terminal with a sample of 45 people who met the inclusion criteria and the sampling technique used purposive sampling. A questionnaire and a counter Patrick test used with spearman rank test to find out whether there was a relationship between the length of driving and the risk of piriformis syndrome. **Results:** From the spearman rank test, a significant value (p) = 0.00 means that H_1 is accepted, so it can be said that there is a significant relationship between driving duration and the risk of piriformis syndrome. **Conclusion:** There is a significant relationship between the length of driving and the risk of piriformis syndrome in public transport drivers at Terminal Landung Sari.

1. Introduction

Recently, technology has developed rapidly, bringing many changes in all fields in Indonesia, one of which is the transportation business (Central Bureau of Statistics, 2018). Wahyusetyawati (2017) transportation is a commonly used means to transport goods or people from one place to another. One group of workers who have a high risk of fatigue and health problems are drivers.

Driving is a sitting activity with a long duration of work. This position is one of the risk factors for piriformis syndrome (Fahmi, 2015). Piriformis syndrome is a neuromuscular disorder that occurs because the sciatic nerve (*nervus ischiadicus*) is compressed or irritated by the piriformis muscle, causing pain, tingling, in the buttocks area to the journey of the sciatic nerve. About 15% of the population of sciatica (*ischialgia*) cases are piriformis syndrome (Aji & Eko, 2018).

According to Ferri (2014), the risk of piriformis syndrome is more often affected in women than men with an incidence ratio of 6:1. Approximately 6% of patients with sciatica develop piriformis syndrome. The main cause of piriformis syndrome is trauma to the gluteal region resulting in inflammation and muscle spasm. This irritates the sciatic nerve. When a nerve or part of a nerve passes through the muscle, nerve compression is caused by stretching the muscle on internal rotation of the hip (Hochberg et al., 2014).

Hochberg et al., (2014) said that usually, patients with piriformis syndrome complain of pain in the buttocks area with radiation to the posterior aspect of the thigh. However, discomfort and paresthesias may occur along the sciatic nerve. Pain can be caused by a prolonged sitting position or by bending and lifting movements. On physical examination, pain can be elicited by

applying direct pressure to the gluteal region. Piriformis muscle tenderness or spasm may be found on rectal or pelvic examination.

The factors that cause piriformis syndrome are due to postural abnormalities, the occurrence of nervous disorders, blood circulation disorders, and bad position habits such as sitting for long periods. The duration of sitting is where you sit for more than 8 hours per day. A tense and stiff sitting posture due to a chair that is not by the user's anthropometry can increase the pressure that occurs and is the main cause of complaints in skeletal muscles such as the piriformis muscle that occurs due to sitting for more than 8 hours which is done continuously and continuously. cause muscle spasm in the piriformis (Mediastama, et al. 2015). Drivers who are in the terminal Landung sari Malang mostly drive more than 8 hours a day with a break of $\pm$ 1 hour per day. In addition to the factor of driving too long, there is also a bad driving position factor (not ergonomic) because the seats do not match the anthropometry of each driver.

2. Methods

This research is an analytical descriptive study with a cross-sectional approach. This study aims to analyze the relationship between the length of driving and the risk of piriformis syndrome in public transport drivers at the Landung Sari terminal in Malang. The population in this study were public transport drivers at the terminal Landung Sari Malang, amounting to 80 people. The sample in this study was taken from a population that met the inclusion criteria and amounted to 45 people.

Inclusion criteria in this study were (1) Respondents who are willing to fill out the consent form, (2) Driving time 8 hours a day, (3) Working mass 2 years, (4) Not having a side job. Exclusion criteria: (1) Have a side job (2) Online car driver. This research was conducted at the Landung Sari terminal office in Malang City and data collection took place on 22-24 April 2021.

Instruments in this study used a questionnaire and a physical examination of Patrick's counter test. Questionnaires are used to determine the duration of the respondent's driving time. Driving time is divided into 2 parts: driving duration <8 hours/day and driving time >8 hours/day. Before conducting the research, the questionnaire was tested for validity and reliability. Test the validity of 10 questions including 7 valid and 3 invalids. Reliability test on 7 valid questions obtained results of 0.785 which means reliable and can be used in research.

The physical examination of the Patrick counter test was used to determine the presence or absence of pain in the respondent's piriformis muscle. How to do this test is to move the knee flexion 90° passively accompanied by movements towards the hip end rotation and adduction, then the knee is pushed medially. This test is done to prove abnormalities in the sacroiliac joint. It is said to be positive if there is a pain in the buttocks area that radiates along with the lower limbs or is limited to the gluteus area (Sidharta, 2010).

3. Results and Discussion

3.1 Characteristics of Respondents Based on Age

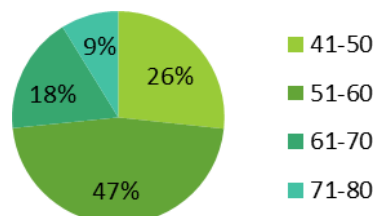


Figure 1 Characteristics of Respondents Based on Age

Based on the diagram above, from 45 respondents there were 12 people (26%) with an age range of 41-50 years, 21 people (47%) with an age range of 51-50 years, 8 people (18%) with an age range of 61-70 years, and 4 people (9%) with an age range of 71-80 years. According to Khuman et al, (2014), about 15% of the population of sciatica (ischialgia) cases and 6% of low

back pain cases are piriformis syndrome with a prevalence of 18-55 years (Khoeroh, Widodo, & Fis, 2018).

Progressive anatomical changes that occur naturally in the lumbosacral region over a long period can cause problems in the lower back. At the age of 50 years, more than 95% of humans will experience changes in the lumbosacral such as disc space narrowing, disk hardening, or marginal sclerosis which is identical to spondylosis (Ihsan & Anshar, 2019).

3.2 Characteristics of Respondents Based on Long Driving

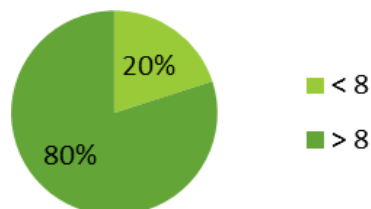


Figure 2 Characteristics of Respondents Based on Long Driving

Based on diagram 5.2 above, from 45 respondents there are two categories of duration of driving, namely duration of driving less than 8 hours/day as many as 9 people (20%), and duration of driving more than 8 hours/day as many as 36 people (80%).

Government Regulation of the Republic of Indonesia Number 44 of 1993 and Law Number 22 of 2009 regulate the working time for drivers of public transportation is 8 hours a day. After driving the vehicle for 4 consecutive hours, drivers of public transportation must be given a break of at least half an hour. In certain cases, the driver may be employed to deviate from the working time of 8 hours a day, but not more than 12 hours a day including 1-hour rest. Sitting for long periods can put too much strain on the waist muscles.

In the end, it will cause tissue damage in the lumbar spine which causes complaints of muscle pain. Sitting position, static sitting time, incorrect posture, and chair can aggravate muscle disorders (Putri, 2014).

3.3 Characteristics of Respondents Based on Piriformis Syndrome Risk

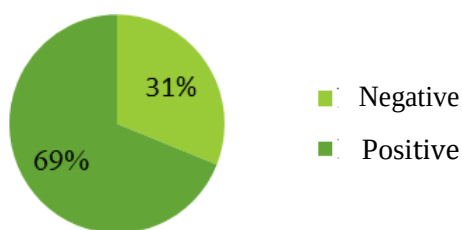


Figure 3 Characteristics of Respondents Based on Piriformis Syndrome Risk

Based on the diagram above, from 45 respondents there are two risk classifications of piriformis syndrome, namely no piriformis syndrome (negative) as many as 14 people (31%), and having piriformis syndrome (positive) as many as 31 people (69%).

Piriformis syndrome is a collection of symptoms caused by pressure on the nerves in the lower back by the piriformis muscle. This condition is characterized by pain and numbness that appears in the buttocks and back of the legs. A person with piriformis syndrome generally complains of pain that is aggravated when sitting for a long time or climbing stairs.

3.4 Long Driving Relationship with Piriformis Syndrome Risk

When a person is active for a long time and a sedentary position will cause the muscles to work continuously and in a static state so that there will be an adaptation to the tissue which results in the muscles experiencing tension or shortening and will suppress the nerves around them and will cause pain. in the area and radiates to the innervation collar of the nerve (Mediastama et al., 2015).

Sitting for a long time will cause pain in the human body, one of which is piriformis syndrome caused by tension in the piriformis muscle so that the sciatic nerve is depressed. One of the muscles that play a role in the sitting position is the piriformis muscle. The piriformis muscle is a flat pyramidal shape and is located in the buttocks near the hips. This muscle plays a role in maintaining a balanced posture when standing and plays a role in lifting and rotating the body's axis. Beneath the piriformis muscle is a long nerve, the sciatic nerve, which supplies the skin and lower leg. When the piriformis muscle is overcompressed which can cause this muscle to become inflamed, swollen, or stiff, resulting in compression of the nerve in the sciatica, it can affect and interfere with the function of sciatica itself. Sitting for long periods can cause a person to experience the risk of piriformis syndrome (Noviana et al., 2014).

Driving is an activity with a sitting position and a long working duration. This position is one of the risk factors for piriformis syndrome. The duration of sitting is where a person sits for more than 8 hours/day. A tense and rigid sitting posture due to a chair that is not by the user's anthropometry can increase the pressure that occurs and is the main cause of complaints in skeletal muscles such as the piriformis muscle due to prolonged sitting for more than 8 hours which is carried out continuously which causes muscle spasms. on the piriformis (Mediastama et al., 2015).

4. Conclusion

Based on the research that has been done, it can be concluded that (1) On average, public transport drivers at the Landung Sari Terminal in Malang have a driving time of > 8 hours/day; (2) On average, public transport drivers at the Landung Sari Terminal in Malang are at risk of piriformis syndrome; (3) There is a significant relationship between the length of driving and the risk of piriformis syndrome in public transport drivers at Terminal Landung Sari Malang.

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The Relationship between Physical Activity and the Risk of Knee Osteoarthritis in Terrace Farmers in Punten Village, Batu City

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ABSTRACT

Introduction: Indonesia is an agrarian country which means most of the Indonesian people work in agriculture or farming. The geographical condition of Batu City which is in the hills makes the surrounding community use the terracing pattern as land to continue to grow crops. Farming is a job that requires a lot of movement and workload on the body which will increase the occurrence of problems in the health of farmers. Physical activities carried out by terraced farmers on a daily basis such as squatting, hoeing, planting, going up and down mountains/hills, and lifting heavy loads will involve continuous loading on the knees, this can cause complaints of knee pain where pain is the main symptom of osteoarthritis. **Objective:** To determine the relationship between physical activity and the risk of knee osteoarthritis in terrace farmers in Punten Village, Batu City. **Method:** The research design used in this study is an analytical observational method with a cross sectional study approach. Respondents were taken using simple random sampling technique. Respondents were 32 people, namely teasing farmers in Punten Village, Batu City. The research instrument used the IPAQ and KOOS questionnaires and was tested using the spearman's rho. **Results:** Based on the hypothesis test of the relationship between physical activity and the risk of knee osteoarthritis in terracing farmers, Punten Village, Batu City, a significant value of 0.000 was obtained, where $p < 0.05$, it can be concluded that the H1 result was accepted. **Conclusion:** There is a relationship between physical activity and the risk of knee osteoarthritis in terracing farmers in Punten Village, Batu City.

1. Introduction

Indonesia is an agrarian country which means the most of the Indonesian people work in agriculture or farming. The existence of farmers is very helpful in improving the welfare of people's lives where with the presence of farmers, sources of food needs can be obtained without having to import from abroad. In farming, the condition of the land for farming is very influential on the process and results of agriculture (Di et al., 2014). The geographical condition of Batu city which is located in the hills makes some people who work as farmers make a pattern on their land in the form of terracing. Being on a land area with a slope of 45 to 65 degrees is used by farmers to form a pattern of terraced land which is not only used as farming land but also becomes one of the interesting tourist sights to visit because the beautiful terrace pattern forms like a bar line painting on a hill. According to the Head of the Regional Disaster Management Agency (BPBD) Batu City explained that floods and landslides are threats that occur in Batu City and by farming using a terracing pattern can minimize the occurrence of these two natural disasters (BatuTIMES, 2016).

The profession of a farmer involves a lot of body movements such as squatting, hoeing, planting and lifting heavy loads (Faujiyah, 2020). This work involves a continuous load on the knee so that pressure occurs for a long time, so this can cause complaints of knee pain (Rachmi et al., 2018). Pain is the main symptom of osteoarthritis in the joints, pain will usually arise after carrying out activities that involve movement in the affected joints (Pratiwi, 2015)

Osteoarthritis (OA) is the most common degenerative joint disease that affects many adults or the elderly. This occurs when there is damage to the joint cartilage or cartilage which functions as a protector of the ends of the bones, accompanied by reactive changes in the joint edges and subchondral bone (Khairani, 2012). Osteoarthritis attacks the joints that support the

body such as the hips, spine, shoulders, finger joints and knees. Osteoarthritis of the knee has an impact on the ability of a person's daily activities where there will be a gradual increase in the severity of the disease, therefore osteoarthritis is called progressive. This will lead to significant disability and impaired quality of life, and its development has an impact on the patient's capacity to perform daily activities including their ability to work (Mattioli et al., 2017).

Based on RISKESDAS data (2018), the prevalence of joint disorders in Indonesia is around 7.3% and osteoarthritis (OA) is the most common joint disorder. The prevalence of osteoarthritis in Malang at the age of 49-60 years reached 21.7% consisting of 6.2% in men and 15.5% in women. At the age of 55-64 years, men and women who experience knee osteoarthritis are 28%, and the number who experience hip osteoarthritis is 23%. At the age of 65-74 years the number of men and women affected by knee osteoarthritis was 39% and those affected by hip osteoarthritis were 23%.

Jobs that require physical movement involving repetitive and or excessive loads on the knee, the data show an increased risk of knee osteoarthritis, such as farming, floor laying and mining. In addition, physical activity at work including squatting positions, kneeling for long periods, climbing, lifting or carrying weights has been shown to be a risk for knee osteoarthritis (Wang, 2020). Occupational biomechanics epidemiological studies provide research results that the increased risk of knee osteoarthritis among farmers is due to biomechanical overload during activities (Mattioli et al., 2017).

Physical activity by the World Health Organization (WHO) is defined as a process when there is movement of limbs produced by skeletal muscles and requires energy expenditure. This term includes all activities carried out daily starting from competitive sports, physical exercise that also functions as a hobby or activities that are often carried out in daily life. In general, physical activity can increase the risk of osteoarthritis, this is evidenced from the results of studies where the risk of osteoarthritis increases in people who do too light physical activity or rarely do activities and in people who do too heavy physical activity (Megawati & Tjhin, 2017).

This study aims to determine the relationship between physical activity and the risk of knee osteoarthritis in isolated farmers in Punten Village, Batu City. The results of this study are expected to provide information and education to farmers to minimize the risk of knee osteoarthritis that can occur due to farming activities carried out.

2. Methods

This research uses analytic observational method with cross sectional study approach. The population in this study were all terraced farmers in the village of Punten Batu City. The sample in this study amounted to 32 isolated farmers and the sampling technique used simple random sampling. The instrument in this study used 2 questionnaires, namely IPAQ and KOOS. The IPAQ (International Physical Activity Questionnaire) questionnaire is used to determine a person's level of physical activity, be it light, moderate to heavy physical activity. The KOOS (Knee Injury and Osteoarthritis Outcome Score) questionnaire is a specific questionnaire that is used to determine the presence of disorders or problems with the knee. The data was tested using the spearman's rho.

3. Results and Discussion

3.1 Characteristics by Age

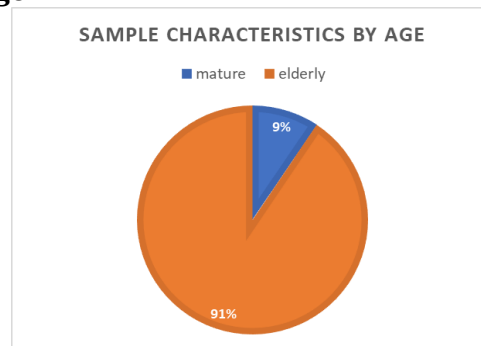


Figure 1 Sample Characteristics by Age

Based on the Figure above, it is known that the terracing farmers who are in the elderly category are 29 respondents with a percentage (90.6%) and terracing farmers who are mature are 3 respondents with a percentage (9.4%). The aging process in elderly people will experience a lot of decline in work ability and body functions, in the knee there will be changes in the joint surface where the capacity of chondrocytes to maintain the cartilage matrix slows down which will result in a decrease in joint flexibility and can increase the susceptibility to injury. In addition, cartilage itself has limitations in the regeneration process, so that degenerative changes in the knee will not be able to return to its original state considering that osteoarthritis is a progressive disease. Therefore, over 40 years of age there will be a process of increasing weakness in the joints so that it is very supportive for the occurrence of knee osteoarthritis (Khairani, 2012)

3.2 Characteristics by Gender

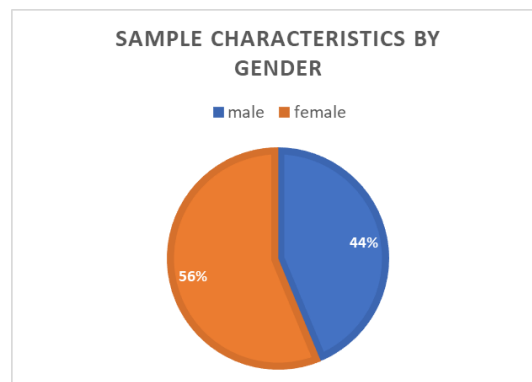


Figure 2 Sample Characteristics by Gender

Based on research data from 25 respondents who experienced knee osteoarthritis, 14 were male and 18 were female. According to (Khairani, 2012) women who enter menopause will experience a decrease in the hormone estrogen and other physiological functions of the body, while the function of the hormone estrogen is to help the production of chondrocytes in the bone matrix and if estrogen decreases, chondrocytes will also decrease, this causes the synthesis of proteoglycans and collagen. will also decrease while lysosomal activity increases, this is what causes osteoarthritis to occur in women.

3.3 Characteristics Based on Physical Activity Level

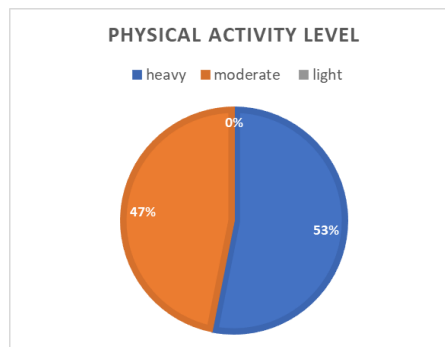


Figure 3 Sample Characteristics Based on Physical Activity Level

Based on the diagram above, it is known that terracing farmers who have a level of heavy physical activity are 17 respondents with a percentage (53.1%), and terracing farmers with a moderate level of physical activity are 15 respondents with a percentage (46.9%), while terracing farmers who have a moderate level of physical activity light physical activity amounted to 0 respondents. Strenuous physical activity causes the level of proteoglycans to eventually fall very low, causing the cartilage to become soft and lose elasticity, thus affecting the integrity of the joint surface. This will slowly result in the loss of cartilage in the joint space which functions as a damper for friction between bones. Therefore, strenuous physical activity that is received by the knee joint in excess and for a long time will damage the joint cartilage, causing knee osteoarthritis (Anggraini & Hendrati, 2014).

3.4 Characteristics Based on the Risk of Knee Osteoarthritis

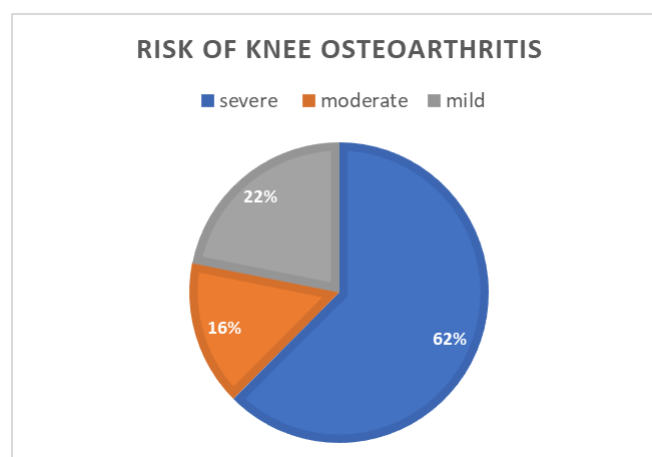


Figure 4 Sample Characteristics Based on the Risk of Knee Osteoarthritis

Based on the diagram above, it is known that terrace farmers who are at severe risk of experiencing knee osteoarthritis are 20 respondents with a percentage (62.5 %), terrace farmers who are at mild risk of experiencing knee osteoarthritis are 7 respondents with a percentage (21.9 %), and terracing farmers who are at moderate risk experiencing knee osteoarthritis amounted to 5 respondents with a percentage (15.6%).

3.5 The Relationship of Physical Activity to the Risk of Knee Osteoarthritis

The results of the research on data analysis that have been carried out then obtained a p value of 0.000 which means that there is a relationship between physical activity and the risk of knee osteoarthritis in terracing farmers in Punten Village, Batu City. Thus, it can be seen that the

heavier the physical activity, the greater the risk of knee osteoarthritis in terracing farmers in Punten Village, Batu City. The terracing pattern is a method of farmers in utilizing sloping land areas by making terraces or tiered patterns on farmers' gardens. Terracing patterns are commonly used as land for farmers who live in hilly or mountainous geographical areas (Pramudo et al., 2016).

The farming profession involves many body movements and daily physical activities while working in the garden such as squatting, hoeing, planting and lifting heavy loads (Faujiyah, 2020). The physical activity of farmers when working daily involves a continuous load on the knees so that there is pressure for a long time, this can cause complaints of knee pain (Rachmi et al., 2018). Pain is the main symptom of osteoarthritis in the joints, pain will usually arise after carrying out activities that involve movement in the affected joints (Pratiwi, 2015).

Pressure on the knee for a long time and repeatedly when doing strenuous physical activity causes meniscus degeneration and tears that trigger changes in the cartilage of the knee joint so that it can cause knee osteoarthritis (Anggraini & Hendrati, 2014). Strenuous physical activity can affect the cartilage, where the cartilage and subchondral bone will be damaged due to hard and continuous pressure (Sionel, 2017).

In osteoarthritis, there is damage to the cartilage proteoglycan structure caused by disturbances in the homeostasis of cartilage metabolism, decreased joint fluid and cartilage erosion. Joint cartilage or cartilage is formed by chondrocyte cells and extracellular matrix, proteoglycans, and collagenous tissue. The function of chondrocytes is to synthesize soft tissue collagen type II to strengthen joints, and the function of proteoglycans to make the tissue elastic and maintain the cartilage matrix so that the cartilage cushion is well maintained ((Katz et al., 2016); (Roos & Juhl, 2013)).

Strenuous physical activity causes the level of proteoglycans to eventually fall very low, causing the cartilage to become soft and lose elasticity, thus affecting the integrity of the joint surface (Anggraini & Hendrati, 2014). Changes in the level of proteoglycans lead to a high resistance of cartilage to withstand the forces of pressure on the joints. The decrease in the strength of the cartilage accompanied by the degradation of collagen results in excessive stress on the nerve fibers and this obviously results in mechanical damage. Then chondrocytes and cartilage matrix will experience functional abnormalities and damage.

Furthermore, the cartilage will be thinned and lost causing a narrowing of the joint cavity, at the edges of the joint there will be a response to the damaged cartilage with the formation of osteophytes. Osteophytes or new bone formation is considered an attempt to repair and reshape joints. When the process of osteophyte formation occurs, progressive erosion causes the surrounding bone to be involved. The loss of these bones is an attempt to protect the affected joint surfaces. So that the subchondral bone responds by increasing cellularity and vascular invasion, this causes the bone to become thick and dense (eburnation). In the end, joint cartilage becomes worn, damaged and causes symptoms of osteoarthritis such as joint pain, stiffness and deformity (Anandarajah, 2010).

4. Conclusion

Based on the results of the research above, it can be concluded that there is a relationship between the level of physical activity and the risk of knee osteoarthritis in the terraced farmers in the village of Punten Batu City. the level of physical activity carried out by terracing farmers in Punten Village Batu City consisted of heavy, moderate and light physical activity with the highest number being terracing farmers with heavy physical activity levels, in addition to physical activity, age with the elderly category and female gender were also risk factors for knee osteoarthritis in farmers are the most common in Punten Village Batu City, strenuous physical activity can cause knee osteoarthritis because the knee joint receives excessive load and physical activity that lasts for a long time will put pressure on the knee joint cartilage causing meniscus degeneration and tears that damage joint cartilage, causing knee osteoarthritis.

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The combination of PNF and Mirror Therapy to improve motoric function of upper extremity for patient with stroke hemiparesis

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ABSTRACT

Introduction: Hemiparesis stroke is an abnormality in the blood vessels, in one hemisphere of the brain which causes weakness on one side of the body. This weakness results in decreased motor function. Proprioceptive neuromuscular facilitation and mirror therapy are known as a physical therapy intervention to improve motor function. Therefore, combine both interventions will enhance the effect of each treatment and give positive result in motor function of patient with stroke hemiparesis. **Objectives:** The aim of this paper was to investigate the effect of combination PNF with mirror therapy to improve motor function of upper extremity in patient with stroke mirror exercise, stroke, hemiparesis hemiparesis. **Methods:** pre-experiment with one group pre-test and post-test design was used to investigate the effect of combination of PNF and mirror therapy to improve motor function of upper extremity in patient with stroke hemiparesis. Purposive sampling with inclusion and exclusion criteria was used in this research. Interventions were applied 3 times a week for 1 month with Action Research Arm Test (ARAT) to measure the motoric function. Wilcoxon test was used to assessed pre and post. All statistical analyses were performed using SPSS. **Results:** Wilcoxon test revealed the improvement of motor function with an increase of ARAT score after 12 times for a month of intervention ($p=0,002$). **Conclusion:** Combination of PNF with mirror therapy 3 times a week for a month has a positive effect to improve motor function of upper extremity in patient with stroke hemiparesis.

1. Introduction

Stroke is disturbance blood supply that result sudden onset of neurological sign and symptoms (Kessler., 2016). Stroke has symptoms with rapid development. The signs and symptoms of stroke itself depend on which part of the brain is damaged, with the nature and severity of stroke symptoms vary widely (Silva et al., 2014). Stroke treatment is done to prevent disability due to residual symptoms such as motor, sensory, and coordination disorders. Exercises that are repetitive are recommended for restoring movement function and can trigger cortical reorganization (Widjaja et al., 2015).

A number of therapeutic methods can be used in physical therapy, such as mirror therapy and proprioceptive neuromuscular facilitation (PNF) to restore movement function. Mirror therapy is a therapy that uses strong visual cues from a mirror to improve motor performance and perception of affected limbs (Rothangel & Susy, 2013). Even in absence of movement, mirror therapy has a capacity to elicit the activation of cortical in the hemisphere contralateral to the mirrored arm. Therefore, the varied change of cortical induced by mirror therapy can improve motor function (Colomer et al., 2016). Proprioceptive Neuromuscular Facilitation (PNF) is a therapy that uses all sensory stimuli such as proprioceptive, cutaneous, visual, and auditory to evoke and enhance motor responses (Kisner & Colby, 2014). It's technique originally developed by kabat in the 1950s. Through facilitation, inhibition, strengthening, and relaxation of muscles group, PNF promoted functional movements (Junior et al, 2019)

Sensory and motor disturbances caused by stroke, resulting in decreased motor function. Therefore, mirror therapy and proprioceptive neuromuscular facilitation methods can be used to increase the response to sensory stimuli so that a movement can be stimulated. Mirror therapy with sensory stimulation in the form of visual cues to perceive movement in weak limbs, and PNF with sensory stimulation from cutaneous, proprioceptive, auditory and visual to

activate motor function. motor and movement abilities are achieved more quickly (Kisner & Colby, 2014).

2. Methods

Pre-experimental one group pretest and posttest design by taking causal relationship between the dependent variable and independent variable. This design was used to compare the effect of combination *Proprioceptive Neuromuscular Facilitation (PNF)* and *mirror therapy* to improve motoric function in patient with hemiparesis stroke.

The population of this research was patient with hemiparesis stroke in Radjiman Wediodiningrat Lawang Hospital. 12 respondents of 20 were chosen using purposive sampling with inclusion and exclusion criteria. All the respondents were given a combination of PNF and Mirror Therapy 3 times in a week for 4 weeks. Action Research Arm Test (ARAT) was used to measure the motoric function. Wilcoxon test was used to assessed pre and post due to the failure of the number of rearing data in normality test. All statistical analyses were performed using SPSS.

3. Results and Discussion

Table 1. The effect of combination PNF with mirror therapy on upper extremity motoric function for patient with hemiparesis stroke

Groups		n	mean	p	α	df
PNF-Mirror Therap	Pre-test	12	34,08	0,002	0,05	12
	Post test		36,42			

Wilcoxon Test: PNF-Mirror Therapy= Combination of PNF and Mirror Therapy; n = number of samples; mean = mean of ARAT measurement result; p = p-value; α = significance level; df = degree of freedom

Data of the effect of interventions in PNF with Mirror Therapy group are presented in table 1. The mean score of ARAT was increase from 34,08 to 36,42. The Wilcoxon test revealed that interventions has significant effect to improve upper extremity motoric function with *p-value* 0,002.

The explanation positive result of combination of proprioceptive neuromuscular facilitation (PNF) and mirror therapy on motor function outcome in stroke patient relate to neuroplasticity effect. Both of intervention can increase neuroplasticity or improve motor repair in the brain (Chaturvedi et al., 2018). Neuroplasticity is the ability of the brain to continue to develop because of a stimulation, when the brain accepts sensory stimulation which then the brain modifies the structure and function of a particular brain that is stable (Demarin, 2014). The combination of proprioceptive neuromuscular facilitation and mirror therapy plays a role in the process of repairing the brain or neuroplasticity that enhance the ability of motor function.

Research conducted by Chaturvedi (2018), which compares the PNF with a specific task on acute stroke getting the results that PNF proved to be more effective to improve functional. PNF is a therapy with repetitive movements, therefore it can increase neuroplasticity in the brain. The improvement of neuroplasticity can cause by the increase of BDNF level after PNF is given (Chaturvedi et al., 2020). PNF with a diagonal pattern in the upper extremity movement is used to repair dysfunction caused by neurological disorders and the strong extremity muscles will produce irradiation to weaker muscles. The exercise with resistance helping contracts muscles to increase strength, hence improve motor control.

PNF is a neuromuscular re-education that increase sensory impulse where multiple sensory technique combines to improve functional outcome in stroke (Chaturvedi et al., 2020). This technique also lead to neural plasticity of the brain in cerebral cortex (Ezema et al., , 2018). Previous study by Cayco et al (2019) showed the great effect of proprioceptive neuromuscular facilitation program coupled with principles of neuroplasticity to improve the motor outcomes in chronic stroke. Another research also supports that training program based on PNF in stroke hemiparesis resulted in improvement of motor function (Ribeiro et al., 2014).

This beneficial of PNF then enhance by adding mirror therapy in intervention program. Mirror therapy is neurorehabilitation technique based on neuroplasticity to improve motor function (Gonzalez-Santos et al., 2020). The mechanism of positive effect of mirror therapy relates to mirror neuron system (Deconinck et al., 2014). The observation system through Mirror Neuron System (MNS) comes from the F5 area. Neurons in the F5 area are active when observing motor motion (visual information without active movement) in affected limbs. The activation of F5 in the Primary Motor Cortex area by observing a specific action is enough to induce strong stimuli in the motor cortex. Hence, it can help the brain plasticity process (Blessin & Hamzei, 2014).

Visual and proprioceptive feedback of the non-affected side of the body are the focus of mirror therapy. It has been demonstrated that mirror therapy show beneficial effect on motor function by activation of brain regions associated with mirror neuron system, recruitment of ipsilateral motor pathways and substitution of proprioceptive from the non-affected limb (Shih et al, 2017). The positive effect of mirror therapy are showed by research conducted by Khandera (2013) that combine mirror therapy and task specific to improve the upper extremity function in acute patients with strokes. This research show these two therapies can improve the upper extremity function. Mirror therapy in stroke patients can increase awareness and attention about a movement, illusion of a mirror that stimulates the primary motor cortex to make improvements (Khandera, 2013). This result also supported by Thieme et al (2018) that conclude that mirror therapy is effective for improving upper extremity motor function, motor impairment and activities of daily living.

4. Conclusion

The intervention of combination of PNF and mirror therapy 3 times a week for 4 weeks can improve motor function in patient with hemiparesis stroke. Further research with a large number of samples is needed to support this result.

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Brain Gym Effects on Level of Cognitive Function in The Elderly at Posyandu Elderly, Gunung Sekar Sampang

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ABSTRACT

Introduction: Cognitive function has a very important role throughout human life. The decline in cognitive function can be slowed down, it can even be maintained by continuing to train the brain, one of which is the brain gym which can improve memory and help brain concentration which can help the elderly to remember beautiful memories in the past so that maximum health status is achieved. **Objectives:** The purpose of this study is to determine brain gym effects on level of cognitive function in the elderly. **Methods:** This study used a pre-experimental method with one group pretest-posttest design. There are 30 elderly respondents in this study with data collection using the purposive sampling technique. The measuring instrument for measuring the level of cognitive function is the MMSE, data analysis using the Wilcoxon test. **Results:** The results of the Wilcoxon test in this study showed a significant value of 0.001 or $P < 0.05$, which means that H_1 is accepted and H_0 is rejected. **Conclusion:** There is an effect of brain gym on the level of cognitive function in the elderly at the Posyandu for the elderly, Gunung Sekar Village, Sampang Regency.

1. Introduction

Increasing age in the elderly will experience a process called the aging process or the aging process is characterized by changes in physical, psychological, and social conditions as well as a decrease in cognitive abilities and chronic senility. (Marlian, 2021). The country of Indonesia has increased from the previous one, which was about 24 million, and will increase by around 30-40 million in 2020. According to the World Health Organization (WHO) in 2012, it is estimated that 121 million people experience problems with cognitive decline (5.8%). (male and 9.5% female). In Indonesia, from about 5% of the elderly aged 65 years, it is estimated that cognitive impairment and the incidence will continue to increase by around 20% (Rahmah, 2020). Research on cognitive function in Sampang has been carried out by (Dalilah, 2019) that in Sampang Regency, the elderly have cognitive impairment as much as 30% of the total number of elderly aged 60-74 years.

Decreased cognitive function is one of the health disorders associated with increasing age. Under these circumstances from the age of 60 to 85 years or will experience an increase in impaired function and memory (Ezalia et al., 2020). The cause of the decline in the ability of cognitive function in the elderly is due to the biochemical and morphological changes in the nervous system, due to reduced brain weight in the elderly associated with reduced fat and protein content in the brain so that it is lighter. Many changes occur in dendrites, axons, and nerve cell bodies, the function of dendrites as a means of communication between nerve cells is that they lose contact between nerve cells and become thinner, nerve conduction decreases so that movement becomes sluggish (Anggraeni et al., 2020).

According to brain gym experts from the Institute of Educational Kinesiology in the United States, Although simple, Brain Gym can improve the cognitive abilities of the elderly. Brain Gym can help maintain existing cognitive abilities. Such exercises help memory and prevent further deterioration. In addition, offering exercise can also help maintain the quality of life of the elderly by making optimal use of existing abilities. One way to deal with this is to keep stimulating the brain. Currently, the brain gym or brain exercise is being introduced (Ana, 2018).

Brain exercise is carried out routinely once per week with a minimum duration of 10-15 minutes for 6 weeks (Hukmiyah et al., 2019). In improving cognitive abilities in the elderly, this brain gym exercise can help concentration and improve memory

2. Methods

Using quantitative research methods with pre-experimental research design with One Group Pre-Test Post-Test Design research design. In this study, there is one group, namely the experimental group. Observations were made before the intervention was given (pre-test) and after the intervention (post-test). This study aims to see the effect of brain gym on cognitive function levels in the elderly at the Posyandu for the elderly, Gunung Sekar Sampang village.

3. Results and Discussion

The results of this study are about the effect of Brain Gym on the level of cognitive function in the elderly at the Posyandu for the elderly. Data collection was carried out in August 2021. The research respondents were 30 elderly from a total population of 34 elderly at the Posyandu, Gunung Sekar Village, Sampang.

Table. 1 Characteristic of Respondents Based on MMSE Score
(Source: Primary Data, 2021)

MMSE	Pre	Post
Weight (0-12)	53%	24%
Medium (13-19)	47%	41%
Mild (20-24)	-	35%

Based on table 1 describes the characteristics of respondents based on the MMSE value before and after the Brain gym was carried out, with the conclusion that the average MMSE value that dominated in the Gunung Sekar Sampang village before the Brain gym was carried out was the heavy category (0-12) with a total of 16 elderly (53%) and the average MMSE score that dominates in Gunung Sekar Sampang village after the combination of Brain gym therapy is in the moderate category (13-19) with 14 elderly people (41%).

This result is in line with research (Ardian 2018) which states that changes in cognitive function of the female sex are more than the male gender. Women who have entered old age have a risk of senility of 1,393 times or three times compared to men. This is because the life expectancy of women is longer than that of men. The higher the life expectancy of women, the longer the opportunity for elderly women to live, so that the greater the possibility of experiencing impaired cognitive function decline. Women in old age are more at risk for decreased cognitive function due to the role of endogenous sex hormones in changes in cognitive function (Ardian 2018).

Brain gym (brain exercise) can improve language skills and memory. The decline in the brain and body in the elderly makes it the body easy to fall ill, senile, and frustrated. However, brain exercise can provide good in this decline. Brain exercise will not only facilitate the flow of blood and oxygen to the brain but also stimulate the two hemispheres of the brain to work (Anggriyani, 2010).

Table 2 Analysis Test Results
(Source: Personal Data, 2021)

Group	df	Sig.	α
<i>Brain gym</i>	34	0,001	0.05

Wilcoxon : df = Total Sampel; Sig.= Nilai Signifikan; α = p Value

Results of the test data analysis table 2, shows that the results of the hypothesis are accepted, namely that there is an influence of brain gym on the level of cognitive function of the elderly at the Posyandu for the elderly, Gunung Sekar Village, Sampang. Cognitive function can be defined as a process in which all sensory inputs (tactile, auditory, and visual) will be changed, processed, then stored, and then used for interneuron connections perfectly so that individuals can reason on these sensory inputs. Cognitive function concerns the quality of a person's knowledge (Lestari, 2019).

Cognitive changes that occur in the elderly include reduced ability to improve intellectual function, reduced efficiency of nerve transmission in the brain (causing information processing to be slow and a lot of information lost during transmission), reduced ability to accumulate new information and retrieve information from memory, and the ability to remember. past events are better than the ability to remember events that just happened. The overall decline in central nervous system function is believed to be a major contributor to changes in cognitive abilities and efficiency in information processing. These changes have been associated with changes in brain structure and function that have decreased brain volume and weight in the elderly (Dayamaes 2013).

Cognitive function is an important dimension of quality of life for the elderly in all countries. It is closely related to the ability to process information in everyday life and helps shape overall well-being throughout life. Therefore, early treatment is needed to prevent cognitive decline (Lestari 2019). Researchers in their research used brain gym exercises to improve cognitive function in the elderly and there were changes after the intervention. (Hukmiah et al., 2019) had previously researched the effect of brain gym exercise on changes in cognitive function, namely, there was an increase between before and after the intervention. Brain gym is a great and fun set of cognitive learning exercises for all ages. Brain gym exercise can stimulate the brain, deal with stress, increase learning concentration, improve memory and cognitive abilities. Movements in the brain gym can also provide stimulation or a stimulus to the brain. The movement that causes the stimulus can improve cognitive abilities (concentration, speed, perception, learning, memory, problem-solving, and creativity). This method activates the two hemispheres of the brain and activates all parts of the brain to improve cognitively (Wynter et al., 2013)

4. Conclusion

Based on the discussion, it can be concluded that Brain Gym can affect the level of cognitive function in the elderly at the Posyandu for the elderly, Gunung Sekar Sampang village. Thus, it is expected that the elderly can increase physical activity in the form of a brain gym and other exercises to improve cognitive function and fitness.

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The Correlation of Work Duration and Musculoskeletal Disorders Incident in Car Wash Worker

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Pain, Neck Pain

ABSTRACT

Introduction: The duration of work can affect work productivity. Duration is the length of time a person does a job. Some jobs have activities that use repetitive motions and static conditions for a long time can cause musculoskeletal disorders. Neck pain and low back pain are musculoskeletal disorders that are categorized as musculoskeletal disorder pain syndrome in the vertebral region that often occurs. **Objectives:** The aims of this paper were to analyze the correlation of work duration and musculoskeletal disorders incident like neck pain and myogenic low back pain in car wash workers. **Methods:** Observational design was used to investigate the correlation of work duration and musculoskeletal disorders incident like neck pain and myogenic low back pain in car wash workers. Purposive sampling with inclusion and exclusion criteria was used in this research. Nordic Body Map (NBM) instrument used to measure the incident of musculoskeletal disorders. Spearman test was used to assessed correlation. All statistical analyses were performed using SPSS. **Results:** Spearman test revealed the work duration is correlated with the incidence of neck pain ($p=0,012$) and myogenic low back pain ($0,035$) in car wash workers. **Conclusion:** Long working duration is correlated with the incidence of musculoskeletal disorders especially in cases of neck pain and myogenic low back pain in car wash workers. The longer the duration of work, the higher the potential for musculoskeletal disorder.

1. Introduction

Health and safety at work is a component that must be considered by workers. Accidents or health problems due to work can occur in every work environment due to non-ergonomic worker positions, and Occupational Health and Safety (OHS) problems (Sartika et al., 2019; Safitri, 2017). Health problems that often arise are musculoskeletal complaints caused by repetitive activities and excessive muscle stretching. The duration of work affects work productivity. Duration is the time span or length of time a person does a job. Because frequent and repetitive movements can cause muscle fatigue, which of course will have an impact on work productivity (Randang et al., 2017; Sartika et al., 2019; Nadhifah, 2019).

Some jobs involve activities that use repetitive motion and static conditions for a long time can cause musculoskeletal disorders. Neck pain and low back pain are musculoskeletal disorders that are categorized as musculoskeletal disorder pain syndromes in the vertebral region that often occur. Neck pain is one of the musculoskeletal disorders that can occur due to the condition of the head bowing for a long time and statically (Nadhifah et al., 2019).

Low back pain myogenic or back pain is a pain that is felt in the lower back, this pain can be in the form of local pain or radiating pain (Hadyan, 2015).

2. Methods

Observational design by taking causal relationship or correlation between the dependent variable and independent variable. This design was used to analyze the correlation of work duration and musculoskeletal disorders incident like neck pain and myogenic low back pain in car wash workers.

The population of this research was workers of car wash in Lowokwaru. 62 respondents were chosen using purposive sampling with inclusion and exclusion criteria. *Nordic Body Map*

(NBM) instrument used to measure the incident of musculoskeletal disorders. Spearman test was used to assessed correlation. All statistical analyses were performed using SPSS.

3. Results and Discussion

Table 1. The correlation of work duration and neck pain incident in car wash worker

Variable	n	p	α
Work Duration	62	0,012	0,05
Neck Pain Incident	62		

Spearman Test: correlation of work duration and neck pain incident; n = number of samples; p = p-value; α = significance level

Table 2. The correlation of work duration and myogenic low back pain incident in car wash worker

Variable	n	p	α
Work Duration	62	0,035	0,05
Myogenic Low Back Pain	62		

Spearman Test: correlation of work duration and myogenic low back pain incident; n = number of samples; p = p-value; α = significance level

From the results of the spearman rank test, it was found that the value of $p = 0.012$ and $p = 0.035$ with a sig value ($0.00 < 0.05$), then H_0 was rejected and H_1 was accepted, it can be concluded that there is a correlation of work duration and the neck pain and myogenic low back pain incident (musculoskeletal disorders) in car wash workers

Duration of work more than 7 hours can affect neck pain due to static work positions and repetitive movements, the longer the duration of a person's work, the higher the risk of neck pain, especially in static work positions for a long time which can result in muscle extension around the neck. Static positions and repetitive movements for a long time in addition to causing pain in the neck can also cause functional decline in the neck (Umami et al., 2014). The duration of work that is categorized as longer than 7 hours can affect myogenic low back pain because of the load on the spine due to a static work position, the longer the duration of a person's work, the higher the risk of myogenic low back pain, especially when working long in a static position. This will result in stretching of the muscles, fascia, and ligaments in the spine. The duration of action will also affect the mechanisms in the body in the long term. These mechanisms are the circulatory, digestive, muscular, nervous and respiratory systems. Muscles during contraction require oxygen, if the repetitive movements of the muscles become too fast so that oxygen certainly has not reached the tissues it will cause muscle fatigue (Susanti, 2015).

In a study of posture risk on subjective complaints of neck pain in leather craft industry workers, 7 respondents (16.6%) maintained the old category of posture who felt neck pain. A total of 6 respondents (14.2%) who maintain a short posture category who feel neck pain. This is because the longer a person works in an unnatural working position, it will cause contractions in the muscles so that circulation decreases and causes nutritional and oxygen disturbances to the muscles which can cause pain and spasm in the neck muscles (Wijayati, 2020; Kudsi, 2015). An unnatural work position is a body posture that moves away from its natural position, such as a bent position, a neck position that is too up or down, and other positions that are not in accordance with its natural position (Tarwaka, 2015). In addition, age, sitting position, and frequency are also factors that cause neck pain. A person's physical capacity reaches its peak at the age of 25 years. Muscle strength decreases at the age of 50-60 years by 20% and at the age of > 60 years a person's physical capacity decreases by 60% (Tarwaka, 2004). When working, someone will unwittingly do a bad body position depending on what the job is, but if left for a long time will result in stretching the muscles. Doing a lot of movements or can usually occur at work, because at work the body will move without repeated variations of movement (Koesyanto, 2013).

Research on work duration increases the incidence of low back pain in cigarette factory workers which suggests that workers in a static position for 420 minutes are proven to be a risk factor for LBP (85%). This is because the longer a person works in a bent position, the strain on the ligaments, especially the posterior longitudinal ligament, increases and muscle tension, especially in a bent position (Anggraini, 2014). Research on the relationship between years of work and duration of driving with complaints of low back pain on the CV base. Totabuan Indah Manado, revealed that there is a relationship between driving duration and complaints of low back pain in Manado-Kotamobagu city transportation drivers at CV base. Totabuan Indah Manado with a p-value of 0.004. The results of statistical analysis using the Chi Square test show that driving duration of more than 5 hours has a 4,950 greater risk of causing complaints of low back pain when compared to respondents whose driving duration is less than 5 hours (Sangadji, 2014).

Sitting, standing, and walking positions greatly affect body weight. Work that requires standing for long periods of time also has an effect on lower back pain, genu valgum, genu varum, and coxae valgum will appear when back pain is not treated immediately, these complications arise. Stiffness and muscle spasm occur when the spine does not move properly, causing the back muscles to be traumatized and cause pain. In a certain period of time muscle stiffness will subside by itself. In severe cases that occur, medical help is needed so as not to cause more severe disturbances (Idyan, 2008).

4. Conclusion

Long working duration is correlated with the incidence of musculoskeletal disorders in the vertebral region, especially in cases of neck pain and myogenic low back pain in car wash workers. The longer the duration of work, the higher the potential for musculoskeletal disorder.

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The Relationship of Online Learning to Physical Activity and Sitting Posture of 5th Grade Elementary School Children in the Pandemic Period

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ABSTRACT

Introduction: The COVID-19 pandemic has caused various limitations, especially in terms of learning. To break the chain of virus spread, the learning process is carried out online at their respective homes. On the other hand, learning at home also experiences limitations, where students must complete all curriculum demands and learning assignments but with makeshift facilities at home. This makes students stay in front of their computers and gadgets for hours. This unusual rhythm of activity allows a decline in habits for students, who usually run and jump with their friends to just stay at home. On the other hand, when students learn using makeshift equipment, especially when sitting, it creates problems, where there are many distributions of students sitting on the floor which makes the lumbar curve too lordotic and the gauze is uncomfortable if it is done for a long time. **Objectives:** The purpose of this study was to examine the relationship between online learning at home and the level of physical activity and student sitting posture. **Methods:** The study was conducted by measuring the level of physical activity with a baecke measuring instrument and measuring sitting posture with the REBA test. **Results:** From the results of the study, it was found that H1 was accepted, where the p-value to see the relationship between online learning and physical activity was 0.00 and a significant value for the relationship between online learning and sitting posture was 0.02. **Conclusions:** This study concludes that online learning during the pandemic affects decreasing physical activity and being at risk in a sitting position

1. Introduction

One of the policies of the Indonesian government towards efforts to suppress the spread of the Covid-19 virus is the implementation of social distancing, which means that all people must keep their distance from each other. With the implementation of this policy, all community activities that were previously carried out outside the home and required meeting and gathering with many people were changed to activities at home that did not involve many people. Including at all levels of education from school to university must also implement online learning policies (Dwi et al, 2020).

This pandemic has an impact on all life, including in the world of education. As a result of the outbreak of the Covid-19 virus, education in Indonesia is experiencing new challenges. The education system which initially used the face-to-face learning method directly between students and teachers carried out in schools was shifted to online learning methods or commonly called online which stands for in the network. In this learning method, it does not require direct face-to-face meetings between students and teachers (Argaheni, 2020).

Children do online learning activities with various sitting positions. The main problem found in learning activities in a sitting position is a health problem caused by an improper sitting posture for a long time. When sitting often for long periods of time and is done continuously, the first thing children feel is to feel fatigue in the neck and shoulders and then it also affects the spine. If you continue to feel this way, it will have an impact on the child's posture (Ulfa & Mikdar, 2020).

In addition to the problem of sitting posture, according to 2018 Basic Health Research (Risikesdas) data, the prevalence in Indonesia for children who lack physical activity in 2013 was 26.1% for around 10 years of age and increased to 33.5% in 2018. East Java the incidence of children who lack physical activity also increased from 23% in 2013 to 26% in 2018. Children

aged 10-14 years who have an inactive lifestyle, with a percentage of 67%. These data show that at school age children have less physical activity, especially grades 5 and 6 in elementary school.

Decreased physical activity causes people to spend more time on their cellphones, have irregular sleep patterns, and gain weight. Lack of physical activity has an impact on endurance which is closely related to the immune system. Physical activity such as exercise that is not done three days a week with a duration of 150-300 minutes per week can increase the risk of disease and death by 20-30% (WHO,2020)

COVID-19 causes people to do less physical activity such as sports. Lack of exercise has a negative impact on health, making it vulnerable to COVID-19. In addition, ongoing online learning has an impact on poor sitting posture. Based on the explanation above, the problem of COVID-19 is a new and interesting thing to review, so the author intends to conduct a literature review on the effect of online learning on changes in physical activity and sitting posture.

2. Methods

Research design; The type of research used in this research is using an analytical survey that is quantitative in nature with a cross sectional research design. Population and Sample: In this study the population was 5th grade students of MI Tholabuddin 1 Gandusari. Inclusion and Exclusion Criteria: Inclusion criteria: (1) Grade 5 students at MI Tholabudin 1 Gandusari (2) Age 11 – 12 years (3) Willing to follow research procedures Exclusion criteria: (1) Respondents who are sick (2) BMI underweigh, overweight, & Obesity (3) Subjects do not agree to be respondents

3. Discussion

3.1 Characteristics of Respondents by Age

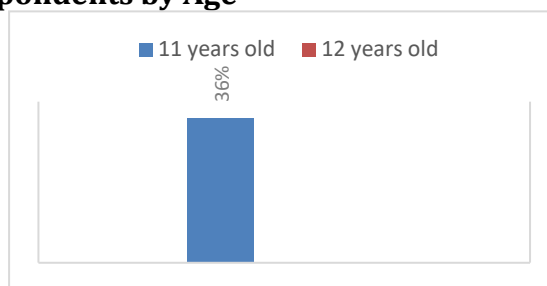


Figure 1 Age Characteristics

From a total sample of 22 people, 14 respondents were 12 years old (68%), and 8 respondents were 11 years old (32%). The conclusion obtained from the data above is that most of the respondents are at the age of 12 years.

3.2 Characteristics of Respondents by Gender

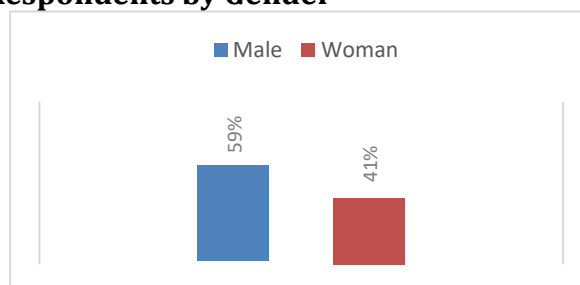


Figure 2 Gender Characteristics

Of the 22 samples of 5th grade students at MI Tholabudin 1 gandusari, it showed that 13 respondents were male or 59% and female respondents were 9 or 41%. The conclusion obtained from the data above is that most of the respondents are male.

3.3 Characteristics of Respondents Based on Sitting Attitude

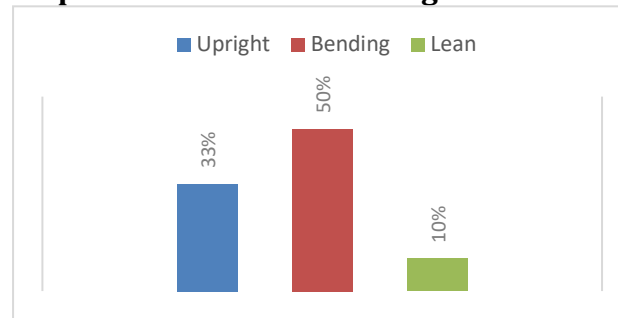


Figure 3 Characteristics of Sitting Posture

Of the 22 samples of 5th grade students at MI Tholabuddin 1 Gandusari who did online learning in an upright sitting position, 7 respondents (33%) 13 other respondents conducted online learning in a bent sitting position (57%) and 2 respondents sat back (10%). The conclusion obtained from the data above is that most of the respondents have a hunched posture.

3.4 Characteristics of Respondents Based on Sitting Posture Risk (REBA)

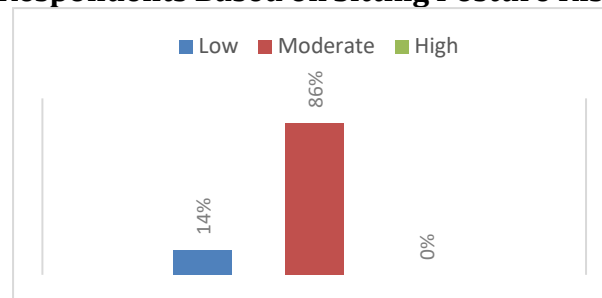


Figure 4 Sitting Posture Risk Characteristics

From the REBA measurement, it was found that 3 respondents had a posture risk in the 2-3 (low) category (14%) and 19 respondents had a posture risk in the 4-7 (moderate) category (86%). The conclusion obtained from the data above is that most of the respondents have a moderate posture risk when studying online in a sitting position.

3.5 Characteristics of Respondents Based on Physical Activity

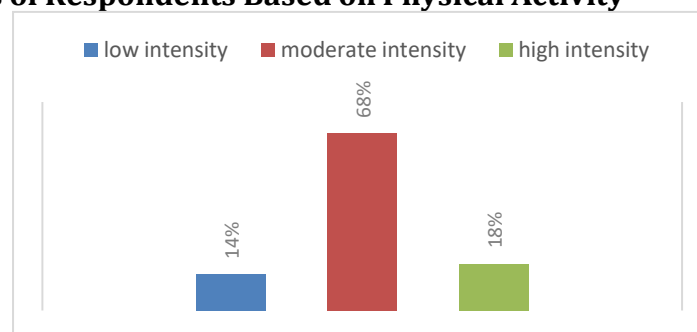


Figure 5 Characteristics of Physical Activity

Based on 22 samples of 5th grade students at MI Tholabudin 1 gandusari, 14% of respondents doing low-intensity physical activity, 18% doing moderate-intensity physical activity, and 68% doing high-intensity physical activity.

3.6 The Relationship of Online Learning with Sitting Stance

Table 1 Normality Test of Online Learning Relationship with Sitting Attitude

	n	Sig.
Sitting Stance	22	0,00
Sitting Posture Risks		0,00

Based on the results of table 5.1 normality test using the Shapiro-Wilk Test above, it is obtained that the significance value of the normality test is <0.05 so that the data is not normal.

Table 2 Test the Relationship of Online Learning with Sitting Position

	n	Sig.	r
Relationship between online learning and sitting posture	22	0,02	0,47

Based on these results, it is known that the Spearman's rho value between sitting posture when studying online and the risk of body posture is 0.478 so it is in the range 0.41 – 0.60, so it can be concluded that there is a moderate correlation.

3.7 The Relationship of Online Learning with Physical Activity

Table 3 Normality Test of Online Learning Relationship with physical activity

	n	Sig.
Physical Activity	22	0,74
Online Learning		0,65

Based on the results of table 5.1 using the Shapiro Wilk test above, it is obtained that the significance value of the normality test is <0.05 so that the data is not normal.

Table 4 Test the Relationship of Online Learning with Physical Activity

	n	Sig.	r
Relationship between Online Learning and Physical Activity	22	0,00	0,56

Based on the Pearson correlation value between online learning and physical activity is 0.567 or 56.7%, which means online learning affects physical activity by 56.7% and based on the table the Sig value. (2-tailed) is 0.006 where the mini value is below 0.05 which means that H1 is accepted

3.8 The Relationship of Online Learning with Sitting Attitude of Grade 5 Elementary School

Based on research data from these 22 respondents, the results showed that respondents who did online learning in an upright sitting position were 7 respondents (33%) 13 other respondents conducted online learning in a bent sitting position (57%) and 2 respondents sat back (10%) . From the data obtained, 16 respondents did online learning by sitting on chairs and tables, while 6 others did online learning in a sitting position only on a mattress or floor. From the research conducted, it can be seen that most of the respondents' body postures are not ergonomic.

Online learning activities for students require a relatively long time. The wrong sitting posture and allowed to continue can trigger problems in the spine and joints that can result in poor posture in school-age children because their bone growth is immature. Bad habits such as the position when reading, writing, and sitting will affect the growth of the body.

One of the important factors to consider in learning activities are tables and chairs. The use of chairs and tables must be adjusted so that users feel comfortable when doing learning and adapted to the child's anthropometry in accordance with ergonomic design principles. (Nilamsari et al, 2015).

When online learning is carried out at home, the use of ergonomic tables and chairs cannot be applied to all students due to many reasons, such as the absence of tables or chairs of the right size, using chairs that do not have a backrest, or the habit of studying at home does not use a chair or only uses floor mats or carpets. With environmental conditions that cause students to study online with bad body conditions, it is possible to risk bad posture (Nilamsari, 2015).

It can be concluded, there is a relationship between online learning and the sitting attitude of MI Tholabuddin 1 Gandusari students during the covid-19 pandemic. Although there is a relationship, it is not too significant because online learning is relatively new and at the age of MI/SD children, the bone structure is still good and there are not too many significant problems. However, if bad habits have been carried out from an early age, it is possible that health problems will arise, especially in his body posture in the future..

3.9 The Relationship of Online Learning with Physical Activity of Grade 5 Elementary School Students

Based on the correlation test conducted on 5th grade students of Tholabul Ilmi elementary school, it was found that there was a relationship between online learning and the level of physical activity. This is supported by research conducted by Afrilia & Festilia, (2018) which explains that there is a relationship between physical exercise and endurance due to preventing viruses from entering the body and increasing body immunity, namely by exercising and doing physical activity. In a pandemic like today, even though isolation at home doesn't mean you can't exercise and do physical activities at home (Setyani, 2020).

The relationship between exercise and cardiovascular endurance, which means good cardiovascular endurance will increase human work skills with greater sincerity and longer time. Good cardiovascular endurance will also allow you to build greater resistance to fatigue so you can carry out activities for a longer period of time (Febriyanti et al., 2015)

One of the factors that causes a decrease in physical activity experienced by 5th grade students of SD Tholabul is the limited facilities, infrastructure and facilities that exercise while studying at home. In fact, when the sports class is used by students to play. During the Covid-19 pandemic, it turned out that the use of facilities, infrastructure, and facilities was very limited.

Based on the data obtained, it shows that the impact of the Covid-19 pandemic for students is experiencing changes in physical activity patterns. These changes are a decrease in the pattern of exercise habits and a decrease in the frequency of physical activity in students. One of the factors causing the loss of physical activity experienced by students is the limited facilities and infrastructure, as well as the means to support physical activity. As is known, students who do physical activity at school during sports hours. Online activities are also a factor causing one of the declines in students' physical activity. It was conveyed by several students that when there are several subjects that require assignments to be done online and take time for physical activity.

4. Conclusion

This study concludes that online learning during the pandemic affects decreasing physical activity and being at risk in a sitting position

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Effect of CPR Training on Laypeople Performance: A Literature Review

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ABSTRACT

Introduction: Cardiac arrest is defined as loss of cardiac function and systemic circulation. Approximately 350,000 out-of-hospital cardiac arrests (OHCA) occur in adults each year in the United States. Survival after OHCA is low, with less than 10% of OHCA patients surviving. Successful OHCA outcomes require effective collaboration between the community, emergency services, and hospital staff. **Objectives:** The purpose of this study was to conduct a literature review to assess the effect of CPR training on layperson performances during CPR training. **Methods:** Four electronic databases were searched. The articles were reviewed according to the eligibility criteria. **Results:** Ultimately, 12 studies (five randomized controlled trials and seven quasi-experiments) were selected for this literature review. Three themes were derived from this review; This review found that CPR training significantly affects laypeople's performance during CPR training in terms of knowledge, skill, attitudes, and self-confidence. **Conclusions:** Overall, this review does find evidence of a beneficial effect of CPR training on layperson to improve their knowledge, skills, and self-confidence in performing CPR. However, the types of CPR training also play an essential role in achieving this goal.

1. Introduction

Cardiac arrest is defined as loss of cardiac function and systemic circulation (Mancini et al., 2015). Approximately 350,000 out-of-hospital cardiac arrests (OHCA) occur in adults each year in the United States (Kleinman et al., 2015). Survival after OHCA is low, with less than 10% of OHCA patients surviving. Successful OHCA outcomes require effective collaboration between the general public, emergency services, and hospital staff (Berdowski et al., 2010; Girotra et al., 2020). Therefore, providing immediate and appropriate cardiopulmonary resuscitation (CPR) to bystanders is an essential link in the chain of survival. However, it is well documented that fear and anxiety can make it difficult to perform high-quality CPR in real-life CPR situations, even for well-trained individuals. Providing CPR training to laypeople is very important so that laypeople who have not previously been trained can become trained to understand the ability to perform conventional CPR (Avisar et al., 2013).

On the other hand, trained lay people are needed when cardiac arrest occurs, and they can help the victims before health care providers treat them. Therefore, the role of the community is vital in recognizing the sign of cardiac arrest of the victims (Kardong-Edgren et al., 2020; Villalobos et al., 2019). Furthermore, the number of laypeople is larger than health care workers, which enables them to assist in the first place. Best survival is achieved when trained individuals perform cardiopulmonary resuscitation (CPR) on OHCA victims. However, it is estimated that only 25% of victims will receive CPR. CPR training is essential because 90% of victims die due to being left too long or the victim has passed the golden time when they are found (Whitfield et al., 2020). A study has found that first aid for cardiac arrest patients out-of-the-hospital can increase the patient's life expectancy by 26.3% (Farshidi et al., 2012; Yan et al., 2020). Therefore, this literature review aimed to examine the effect of CPR training on laypeople's performance during CPR training from the works of literature. Additionally, we also

investigated what types of CPR training which more effective at improving laypeople performances.

2. Methods

The literature review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (McInnes et al., 2018; Moher et al., 2009). There were three inclusion criteria for this review: (1) population: participants who were adult and laypeople, (2) type of study: primary research, and (3) publication available in the English and Indonesian language.

The electronic search strategy uses two steps to identify articles that meet the inclusion criteria: (1) electronic databases and (2) forward and backward. A comprehensive search was carried out through several databases and produced thirteen articles for review. The following electronic databases were searched between 2010 and 2020; PubMed, ScienceDirect, and ProQuest. The MeSH keywords for searching the databases were CPR training, performance, layperson, laypeople, effect, and CPR. We used Boolean functions, including "AND" and "OR" to guide the search. In this review, we only included articles written in English and Indonesian. The study designs included randomized controlled trials and quasi-experiments.

3. Results and Discussion

The literature search initially yielded 561 articles from three databases. Twenty-seven duplicated articles were excluded. The titles and abstracts of the remaining studies were reviewed according to the eligibility criteria. Finally, a total of twelve studies were selected for inclusion in this literature review. Out of twelve studies, five studies comprised a randomized controlled trial, and seven of them were quasi-experiments. All selected studies were both written in English and Indonesian.

3.1 Theme 1: Increasing laypeople's performances

After CPR training, the laypeople's performances has increased. This condition occurred because they were more confident in performing CPR after training (Jurisa, 2016). In addition, CPR training should be given to middle-class students who were able to perform CPR correctly and successfully (Wilks & Pendergast, 2017). Another study (Wingen et al., 2018) also suggested that the barriers to human motivation initiate CPR depending on viewer effectiveness and self-confidence. That way, if someone has both of these, there's no problem or worry about finding a victim of cardiac arrest. This statement is also supported by a research theory (Ngirarung et al., 2017) that junior high school students have biological development, are skilled, easy to push or motivate, and learn quickly. I am. Another theory also suggests that age is closely associated with a person's CPR performance and optimal age when practicing CPR behavior from school with practical theory and practice learning (Meissner et al., 2012; Wingen et al., 2018). Based on the above explanation, CPR training is critical to the community, especially the general public, as it has essential benefits in strengthening sensitive processes that help others with cardiac arrest. With the increasing bystander effect, it is hoped that more and more people will be able to provide better support to victims of cardiac arrest.

3.2 Theme 2: CPR conventional versus hands-only CPR

The type of CPR used or applied in the community also affects coping with cardiac arrest victims (Villalobos, 2017; Villalobos et al., 2019). Using traditional CPR has a positive impact over manual CPR in that it improves the performance of those who have not been trained to become previously untrained rescuers. This result is consistent with the theory that CPR is more effective in ventilation (Mancini et al., 2015). In addition, the effectiveness of traditional CPR has another factor in ensuring that health care workers behave in much the same way that they receive information about victims of cardiac arrest on the spot. An average person does as a trained helper works very well because there are no limits in ability and performance, as an average person does for an untrained helper (Hsieh et al., 2018). Based on the above

explanation, using traditional CPR as an effective form of CPR has significant community benefits and improves your status as a trained rescuer dealing with local victims.

3.3 Theme 3: Increasing skill, knowledge and attitude

CPR training itself has many implications for the participants involved. Community efforts as trained rescue workers are critical to reducing the incidence of OHCA, as people are afraid to find and meet cardiac arrest victims in their area. The benefits of CPR training are significant to the general public as they can improve their knowledge and skills (Qodir, 2020). This finding is consistent with a study (Sok et al., 2020) that suggested that CPR training effectively improves the skills and knowledge of basic life support such as police and security guards. In addition, the benefits of this training will have a significant impact on improving skills, knowledge, and self-confidence in performing CPR interventions. It also shows that providing a simulation of basic life support has a significant positive impact on ordinary people (Qodir, 2020). It matches. Therefore, the effectiveness of CPR training has another critical advantage; not only performance but also motivation, knowledge, attitude, and self-confidence (Prasetyo, 2019).

Table 1. Characteristics of the included studies (N=13)

Author, Year of Publication and Country of origin	Country of origin	Study Design	Sample	Intervention	Comparison	Results
(Godfred et al., 2013)	America	Rando mized Contro lled Trial	A total of 488 people. 143 people (control group), 202 people (intervention group one) 143 people (intervention group two) with inclusion criteria: laypeople at least 18 years old and willing to attend regular training. Exclusion criteria: attended CPR training the previous year and had been an assistant to the CPR emergency team.	In group one, video demonstration training and CPR compression-only practice were given to the participants. Meanwhile, the second group was given a demonstration instruction video and CPR practice but used conventional CPR for one month.	In the control group, only the CPR demonstration instruction video was shown to the participants.	The comparison between intervention group one (compression-only) had no significant results (-1.3 p= 0.2) while the intervention group two (conventional CPR) had significantly more competence and ability than group one (compression-only) with a p-value of p<0.0001.
(Jurisa, 2016)	Indonesi a	Quasi-Experi mental	44 students who meet the criteria.	CPR training was given to students using the lecture method for three weeks in August 2014	-	There is a significant increase in knowledge in some students, with a p-value of

Author, Year of Publication and Country of origin	Country of origin	Study Design	Sample	Intervention	Comparison	Results
						0.000. There was an increasing score from 12.59 to 21.05.
(Pangaribuan et al., 2018)	Indonesia	Randomized Controlled Trial	210 elementary school students with inclusion criteria: Agree to participate, have never received BLS or CPR materials, can attend training every Monday.	In the first group, the teachers received training in CPR material and practice by specialists for 50 minutes according to the 2010 European CPR guidelines. They also received training on how to teach directly to students.	The second group only received regular CPR training provided by uncertified health workers.	This training had a behavioral effect in the first group and could change BLS or CPR performance compared to the second group.
(Ngirarung et al., 2017)	Indonesia	Quasi-experimental	33 students who meet the criteria	Students are given training in a conventional CPR simulation for one month using a manikin and a mat.	-	The results showed that students experienced an increase in motivation, insight, and knowledge by 84.8%. And based on the results of the Wilcoxon test, the results obtained were 89.06 and $p = 0.000$, so that there was a significant effect on students.
(Wingen et al., 2018)	Germany	Randomized Controlled Trial	424 high school children aged 14-18 years with inclusion criteria were able to	The intervention group received 90 minutes of conventional	In the control group, no intervention was given.	After training, the intervention group had a higher score

Author, Year of Publication and Country of origin	Country of origin	Study Design	Sample	Intervention	Comparison	Results
			attend the study until the end and had never attended CPR training before.	CPR practice training per session according to the guidelines. In addition, they were receiving theoretical training and education on CPR for eight months.		in knowledge and confidence with a significant p-value <0.001 compared to the control group.
(Metrikayanto et al., 2018)	Indonesia	Quasi-experimental	104 students	The researcher provided training to the intervention group by showing a self-directed video and then creating a simulation for learning the practice of conventional CPR procedures using I-CAREER Cardiac Resuscitation Manikin.	The control group used the same method as the intervention group but with the usual manikins.	After being analyzed by the Mann Whitney test with $p = 0.468$, there was a difference but not significant between the two groups.
(Hsieh et al., 2018)	Taiwan	Randomized Controlled Trial	96 non-medical students with inclusion criteria: Students aged >18 years have never attended any previous CPR training or class. At the same time, the exclusion criteria have an unstable physical condition.	There was no control group in this study, so the intervention group was divided into three groups. The first group received conventional CPR training for three months using a Resusci Anne QCPR manikin and an additional intervention, namely a skill	The second (six months) and third (12 months) groups received only compression-only CPR training.	The first group (three months) had the highest score of 100% compared to the three groups. For the second result, the first group also had a significantly high score on the knowledge and performance scores of

Author, Year of Publication and Country of origin	Country of origin	Study Design	Sample	Intervention	Comparison	Results
				test. This training is provided for one year.		performing CPR, compared to the second and third groups of 17.60 with a p-value > 0.001
(Fabriana et al., 2018)	Indonesia	Quasi-Experimental	24 students X at SMAN 1 Karanganom according to the criteria	This training is provided with lecture and question and answer methods. This training is provided in the theory and practice of conventional CPR.	-	There is an increase in students' knowledge, and there was a significant change after the training
	Indonesia	Quasi-Experimental	102 samples of Sidodadi residents with inclusion criteria: 20-40 years old. Exclusion criteria: Working in the health sector and unable to attend training from start to finish.	Respondents received BLS or CPR training with a duration of one hour.	-	There were significant results in the aspects of knowledge and skills in the group with p = 0.0001.
(Khademi an et al., 2020)	Iran	Quasi-experimental	92 lay adults with inclusion criteria: Have adequate mental and physical, can read and write, and have 18-55 years. And the exclusion criteria: Participants have participated in CPR research	The intervention group was given vocal training and demonstration practice on how important CPR is, how to deal with an unconscious person, check response, and first aid for airway obstruction, and the researcher	The control group did not provide any education at all.	The result is that after being given training, including theory and demonstration of CPR, participants experienced a significant increase in knowledge and performance compared to before being given training

Author, Year of Publication and Country of origin	Country of origin	Study Design	Sample	Intervention	Comparison	Results
				added time to correct the error. This training is given for two hours for theory and the next two hours for demonstration, and this training is carried out for two months.		and the control group.
(Qodir, 2020)	Indonesia	Quasi-experimental	15 security guards at Widyagama Husada University Malang who met the criteria.	The training is given 90 minutes of theory and 45 minutes of practice using a phantom and metronome following the 2015 AHA guidelines for one month in August 2019. The materials provided include assessing safety, assessing the level of consciousness, opening the airway, checking the airway, calling 118 assistance, chest compressions, and recovery position.	-	The results of bivariate analysis using paired t-test showed significant results on knowledge with a p-value of 0.000 with a score of 76.3. As for skills, there are also significant results with a score of 85.07 with p = 0.000.
(Sok et al., 2020)	Korea	Randomized Controlled Trial	119 police officers with inclusion criteria: have attended CPR training a maximum of once in the last ten years and are	The intervention group received conventional CPR training according to the 2015 AHA guidelines. The emergency	The control group received compression-only CPR training.	The difference between the intervention and control groups was insignificant even though the control

Author, Year of Publication and Country of origin	Country of origin	Study Design	Sample	Intervention	Comparison	Results
			willing to attend training until the end.	medical team provided this training on a demonstration basis, and the study was conducted for three months.		group's score was slightly higher than the intervention group.

4. Conclusion

Overall, this review does find evidence of a beneficial effect of CPR training on layperson to improve their knowledge, skills, and self-confidence in performing CPR. However, the types of CPR training also play an essential role in achieving this goal. Therefore, future studies with larger sample sizes may be needed before concluding. Further, a study that compares conventional CPR and hands-only CPR may be needed as well.

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The Prevalence of Upper Respiratory Tract Infections in Areas with Air Pollution Exposure: Cases in Sugar Cane Factory Surrounded Areas

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ABSTRACT

Introduction: Air pollution is a global health threat and causes millions of human deaths annually. Living in the area around the sugar factory has health risks due to the waste and air pollution produced by the factory. ARI is an acute infectious disease that attacks one or more parts of the respiratory tract, a major health problem resulting from sugar factory industry activities such as smoke and dust from their air waste. **Objectives:** the objective of the study. **Methods:** This study was a cross-sectional comparative study comparing two regions with high and low-level exposure to sugar factory air pollutions. The data were collected in March-April 2015 at Bululawang Health Center and Karangploso Health Center. A total of 60 subjects with ARI consisting of 30 samples of each public health center using the purposive sampling technique. Data were analyzed using the Chi-Fisher test performed by SPSS 23. **Results:** The results showed significant differences in ARI levels prevalence due to air pollution in both regions as regions with high and low pollutants, which high pollutant area has approximately 17 times higher risk than lower. **Conclusions:** Air pollution caused by sugar factory waste increases the risk of ARI in the surrounding area. The factory must also consider processing and minimizing air pollution produced by the factory so that the surrounding community is not exposed to and at risk for more serious respiratory infections on an ongoing basis.

1. Introduction

Air pollution is a global health threat and causes millions of human deaths annually. Evidence suggests that the environmental effects of industrial activities have influenced many health problems (Reddy, 2013), which Shusterman (2011) suggests that environmental pollution has increased the risk of upper respiratory tract infections. The late onset of respiratory diseases in children and adults due to prenatal or perinatal exposure to air pollutants is emerging as a critical concern in human health (Kim et al., 2018). ARI (Acute Respiratory Infection) is an infectious disease that attacks one or more parts of the respiratory tract from the nose to the alveoli, including adnexal tissue such as sinuses, middle ear cavity, and pleura, lasts up to 14 days (Sukamawa & Sulistyorini, 2010). Acute respiratory infections based on the area of infection are divided into acute upper respiratory tract infections and acute lower respiratory tract infections (Kowalak, 2012; Khasanah & Trisnawati, 2013). Li et al. (2017) also found that PM_{2.5}, PM₁₀, NO₂, SO₂, and CO exposures were positively associated with outpatient visits for URTI. Acute upper respiratory tract infections include rhinitis, pharyngitis, tonsillitis, rhinosinusitis, and otitis media). Several risk factors underlie the course of acute respiratory tract infections, including age, gender, nutritional status, education, socioeconomic status, use of health facilities, and the environment (Pramudiani & Prameswari, 2011).

In Indonesia, based on the Indonesian Health Profile (2010), ARI was included in the top 10 diseases in outpatients during 2007-2010 with over 400 thousand visits each year. According to Maramis, Ismanto & Babakal (2013), acute respiratory infections are a significant health problem in Indonesia and are even the leading cause of morbidity and mortality of infectious diseases globally. Acute respiratory infections have attacked approximately 400-500 million people in developing countries (Yulaekah, 2007). Due to acute respiratory infections, morbidity rates are very high in infants, children, and the elderly (Maramis, Ismanto & Babakal, 2013). Acute respiratory infections are more common in developing countries than developed countries, with a presentation of 25%-30% and 10%-15%, respectively (Layuk, Noer &

Wahiduddin, 2012). World Health Organization (WHO) estimates that acute respiratory tract infections in developing countries are 30-70 times higher than in developed countries (Sukma & Ayu, 2010). The incidence of ARI tends to increase with increasing age. The incidence rate between men and women was relatively the same and slightly higher in rural areas (Maramis, Ismanto & Babakal, 2013).

Acute respiratory infections can be risks from the result of industrial activities such as the sugar factory industry. Industrial activities and having a positive impact also harm human health (Sari & Rahayu, 2014; Alamsyah & Muliawati, 2013). The negative impacts that may be generated can be waste problems or air pollution by smoke and factory dust, affecting people's health in the surrounding area (Halim, 2012; Alamsyah & Muliawati, 2013). Pollution can occur indoors (indoor pollutant) and outdoors (outdoor pollutant). Outdoor pollutant pollution comes from motor vehicle and industrial emissions (Sudrajat, 2005). Besides, air-borne heavy metals were also significant with lung health among communities living in surrounding factory areas (Onder & Dursun, 2006).

Factory smoke contains suspended harmful particles such as industrial dust. Some potential effects of the wasted or air pollutants were over the threshold of tolerated pollutant values (Joshi et al., 2015). These particles can irritate the respiratory tract because they can carry compounds such as acids and metals (Astra, 2010). Some particulate matter comes out of the factory chimney as thick black smoke, but the most dangerous are the fine particles that can penetrate the deepest part of the lungs (Sudrajat, 2005). The effects of air pollution in the form of smoke and dust on the respiratory tract not only irritate the respiratory tract but can also cause the movement of cilia to slow or stop, an increase in mucus production due to irritation of pollutants, damage to bacterial killer cells in the respiratory tract, swelling of the respiratory tract and stimulate cell growth so that the respiratory tract becomes narrow. As a result, it will cause difficulty in breathing so that foreign objects, including bacteria and other microorganisms, cannot be removed from the respiratory tract, facilitating the occurrence of acute respiratory infections (Mukono, 2008). Also, Li et al. (2018) suggest that air pollutants are significantly related to upper respiratory tract infection cases in patients who visit the outpatients' department in China, and also Tam et al. (2014) found it increased visits rates outpatients in Hongkong. Based on the preliminary study results conducted in February 2015, it is known that in 2014, at the Karangploso Public Health Center, Malang Regency, there were 3,690 patients with acute respiratory disease, including outpatients with new cases and in patients with new cases. Outpatient new cases in the last year were 171 patients (< 1-year-old), 530 patients (1-4 years old), 1,005 patients (5-14 years old), 1,050 patients (15-44 years old), and 839 patients (>45 years old). Based on the monthly report on Pain Data from Krangploso Health Center, there were 1,324 ARI patients from January to March 2015, of which there were 341 ARI sufferers in March 2015, consisting of 275 upper ARI patients and 66 lower ARI patients.

Due to that, we highlight that this area was close to the sugar factory (PG) Krebet in Malang. In the industrial process of PG Krebet, there was the use of diesel fuel and bagasse (residual of sugar cane) so that the emission output is in the form of NO₂ (Nitrogen Dioxide), SO₂ (Sulfur Dioxide), CO (Carbon Monoxide) and Matter Particles (dust). In addition, based on the emission and ambient testing of this factory, ambient air was also obtained in the form of CO (Carbon Monoxide), NO_x (Nitrogen Oxide), NO₂ (Nitrogen Dioxide), SO₂ (Sulfur Dioxide), H₂S (Hydrogen Sulfide), NH₃ (Ammonia), Ox (Oxidant), and Particulate Matter (Dust)) (BLH, 2014). If inhaled by humans, the above smoke and dust can irritate the mucociliary respiratory tract, facilitating acute respiratory infections. These conditions are supported based on the results of the preliminary study conducted at the Bululawang Health Center (a public health center in this area), Malang Regency, in 2015; it was known that in 2013 and 2014, there were 10,066 respiratory tract infections and 10,036 ARI patients. This data shows that ARI is a disease often experienced by the community around the Bululawang Health Center. Therefore, we want to identify and examine whether air pollutants from this sugar cane factory were related to ARI prevalence.

2. Methods

This study was a cross-sectional-comparative study with a case-control approach conducted in two public health centers in two areas. A total of 60 subjects with confirmed ARI in two Public Health Centers (PHC) in Bululawang and Karangploso area and willingness to participate in this study were recruited, which 30 subjects of each PHC. Bululawang was considered a region with air pollutants, and Karangploso was non-pollutant based on the results of ambients of air quality using gas analyzer compared to the threshold value determined by local government regulation (Peraturan Gubernur Jawa Timur No. 10/2009). Then, the data of levels of ARI were identified using self-developed questionnaires consisting of 13 questions related to the symptoms of ARI and categorized into mild and severe ARI. The instrument validity was used product-moment correlation, resulting in r items was ranged 0.5-0.9 indicating that the items were valid, and Cronbach alpha coefficient was 0.87 indicating the instrument was reliable.

This study obtained the ethical review boards, and the data collection procedures were conducted after the subjects confirmed participation and signed the informed consents form. Then, the data were analyzed using descriptive and bivariate analysis (Fisher-exact) performed by SPSS 23.

3. Results and Discussion

Out of 60 subjects who participated in this study, we grouped the subjects based on the ages group identified by WHO. The majority were adults over 26 years old ($n=32$, 53%), and the rest were 11 subjects (18%) who were 6-12 years old and 17 subjects (28%) 13-25 years old, respectively. The study findings indicate no significant difference in gender between subjects who live in pollutant areas (Bululawang) and non-pollutants areas (Karangploso), but there were significant differences in education levels and occupations (p -value < 0.05) (Table 1).

	Bululawang (n=30)	Karangploso (n=30)	p -value
Gender :			
Male	18	7	<i>ns</i>
Female	12	23	
Education level			0.001
Kinder garden	0	1	
Elementary school	11	10	
Junior high school	5	9	
Senior high school	12	4	
University	2	6	
Occupation:			0.000
Student	9	10	
Private employer	12	6	
Housewife	9	11	
Public employer	0	2	
Farmers	0	1	

Table 2 described that based on the crosstabs of ARI cases in two regions, indicates that the pollutant area has a higher risk on ARI prevalences than in non-pollutants area, which the odd ratio of severe ARI in pollutant area was 16.79 times higher than non-pollutants (p -value < 0.05).

However, this study's limitations were that we did not examine the relationships between variables, such as based on the clustered (each gender, education levels, and occupation). We also did not identify the weather as the confounding factor related to ARI risks.

Table 2 Crosstabs of ARI cases

	Mild ARI	Severe ARI	total	Odd ratio: 16.789 (p-value: 0.009)
Bululawang (pollutants)	19	11	30	
Karangploso (non-pollutants)	29	1	30	
total	48	12	60	

4. Conclusion

This study highlight that air pollution caused by the waste product of sugar cane factory has increased the risks of acute respiratory tract infection (ARI), particularly in the upper respiratory tract. This study's findings suggest that air pollutant area increase the risk of severe ARI compared to non-air pollutant area (the odd ratio of ARI in air pollutant area were 16.79 times higher than in non-air pollutants). We have controlled the subjects' characteristics such as gender to control the confounding factor and reduce the bias, which gender in two regions was non-significant different. Although education levels and occupation are significantly diferent between two areas, it might not significantly affect ARI prevalence. These findings highlight that factory management also needs to be aware of their waste products and think about how to treat them to minimize the pollutant spreadness to the environment full of communities. It will help control or reduce the risks of ARI or even more severe lung diseases caused by air pollutants in long-term conditions.

However, some limitations of this study, as mentioned earlier, might limit our findings. Thus, future research may be conducted with broader and robust data such as the different levels of air pollutants, controlling the other confounding factors, and comparing based on the clustered based on gender, ages, distances of living and exposure, frequency of ARI, comorbidities and predisposing factors and other significant related factors.

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The Association Between Anxiety and Sleep Quality among Heart Failure Patient in Hospital Setting: A Cross-sectional Study

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ABSTRACT

Introduction: The prevalence of heart failure patients is currently increasing with age, with 6-10% in people over 65 years of age. The majority of heart failure patients when receiving treatment at the Intensive Care Unit (ICU) experience feelings of anxiety about their disease condition. Excessive feelings of anxiety lead to a decrease in sleep quality. **Objectives:** The purpose of this study was to examine the relationship between anxiety and sleep quality in heart failure patients. **Methods:** This cross-sectional study included 22 patients in the ICU of a private hospital in Malang. Total sampling was performed and we collected the data by using sociodemographic questionnaire, Hamilton Anxiety Rating Scale (HARS), and Pittsburgh Sleep Quality Index (PSQI). **Results:** The majority of respondents in this study had moderate anxiety and poor sleep quality, 54.5%, 63.6% respectively. There was no significant relationship between anxiety and sleep quality among heart failure patients. **Conclusions:** In this study, we concluded that the majority of the respondents who suffered from heart failure experienced anxiety from mild to severe. Additionally, heart failure patients had poor sleep quality. We recommend to nurses to create nursing intervention to reduce the anxiety and improve patients sleep quality.

1. Introduction

Heart failure is a clinical illness characterized by symptoms and signs induced by structural and/or functional heart abnormalities, as well as high natriuretic peptide levels and/or objective evidence of pulmonary or systemic congestion (Bozkurt et al., 2021). Heart failure is caused by several previous diseases such as coronary artery disease, chronic hypertension, and repeated heart attacks. This disease cannot be treated so that the management of patients with heart failure is to improve the symptoms that appear to improve the quality of life, besides that support and management of the condition also affect the success of treatment.

The current worldwide prevalence of HF is 64.34 million cases (8.52 per 1,000 inhabitants), accounting for 9.91 million years lost due to disability (YLDs) and 346.17 billion US \$ expenditure (Lippi & Sanchis-Gomar, 2020). Patients with heart disease in East Java were 151,878 in 2018, this disease mostly occurs at the age of 75 years and over and is dominated by women (Indonesia, 2018). The increasing number of patients with heart failure requires patients to get proper treatment and care in a relatively long period of time.

The majority of heart failure patients when receiving treatment in the ICU experience feelings of anxiety, fear of what might happen, and fear of the threat of death. In individuals with coronary heart disease, poor sleep quality may be a modifiable predictor of outcome (Cheng et al., 2021). Excessive anxiety due to heart failure can cause disturbances in sleep quality, this happens because people with heart failure are too focused on problems and interfere with mental status. Sleep disorders can occur because a person's medical condition is disturbed, such as in heart failure patients who feel discomfort in the cardiorespiratory system due to shortness of breath and chest palpitations, as well as unstable mental conditions in patients who experience anxiety and depression (Banack et al., 2014).

We conducted preliminary research and that 15 respondents with heart failure assessed anxiety levels and sleep quality. The results obtained during the preliminary study, patients did not experience anxiety symptoms as many as 2 people (13.3%), patients with mild anxiety symptoms as many as 4 people (26.6%), and had moderate anxiety symptoms as many as 7 people (46.6%), severe anxiety symptoms 1 person (6.6%), and 1 person (6.6%) with very severe anxiety symptoms. A preliminary study on sleep quality of patients with heart failure showed that 6 people (40%) had good sleep quality and 9 people (60%) had poor sleep quality. The results of a preliminary study conducted by researchers in December 2020 found the fact that patients with moderate anxiety symptoms. Our study aimed to determine the relationship between anxiety levels and sleep quality in heart failure patients at a hospital in Malang.

2. Methods

2.1 Design

The research design used in this research is descriptive research with a cross-sectional research design. The implementation of this research will be carried out in the ICU and HCU rooms in a private hospital in Malang City. Data collection will be carried out in December – January 2021.

2.2 Participants

The sample in this study were 22 patients with a diagnosis of heart failure using using non-probability sampling with total sampling technique. The inclusion criteria in this study were patients with a diagnosis of heart failure and treated in the ICU or HCU, patients who were willing to become respondents voluntarily and signed the informed consent form, patients who could read and write, and The patient is conscious and can follow the study to the end. We excluded patients receiving pharmacological therapy in the form of sedatives or additional sleeping pills from doctors and heart failure patients who have complications such as chronic kidney failure, chronic lung disease and diabetes mellitus.

2.3 Instruments

2.3.1 Biosociodemographic characteristics

The independent variables in this study were anxiety and the dependent variable in this study was sleep quality. A predesigned information sheet was used to gather information relating to age, gender, and level of study.

2.3.2 Hamilton Anxiety Rating Scale (HARS)

Hamilton Anxiety Rating Scale (HARS) is a measuring tool to measure the level of anxiety. The HARS questionnaire consists of 14 indicators including: feelings of anxiety, tension, fear, sleep disturbances, impaired intelligence, feelings of depression, somatic (muscle) symptoms, sensory symptoms, cardiovascular symptoms, respiratory symptoms, gastrointestinal symptoms, urogenital symptoms, autonomic symptoms, behavioral in demand. Measurement of anxiety levels, respondents were asked to provide responses to statements according to symptoms 0, 1, 2, 3, or 4, where 0 indicated no symptoms or complaints were found and 4 indicated all or all of the symptoms present in the patient.(Hamilton, 1959).

2.3.3 Pittsburgh Sleep Quality Index (PSQI).

The Pittsburgh Sleep Quality Index (PSQI), a 19-item questionnaire, was used to assess sleep quality and disruptions during the previous month. The PSQI is divided into seven sections: Sleep latency, sleep length, habitual sleep efficiency, sleep disruptions, usage of sleeping medicine, and daytime dysfunction are all factors that affect sleep quality (Buysse, Reynolds, Monk, Berman, & Kupfer, 1989). To obtain a score, each question was scored on a four-point Likert scale (0–3) ranging from 0 (better) to 3 (worse). The global PSQI score was then computed by adding the scores of the seven components together. The overall score was 21, ranging from 0 to 21, with a value of >5 indicating poor sleep quality.

2.4 Data Collection

The researcher explained to the respondents the intent and purpose of this research, and asked for approval to be willing to become a respondent by using the inform consent sheet. After getting approval, the researcher distributed questionnaires to respondents to fill out. The filling time is 10 minutes and if there are difficulties in filling out, the researcher helps the respondent during the process of filling out the questionnaire. The researcher collected the completed questionnaires and rechecked the completeness of identity and completeness of filling out the questionnaires.

2.5 Data Analysis

SPSS v. 23.0 (SPSS Inc., Chicago, IL, USA) was used to analyze the data. Statistical significance was indicated by a P value of 0.05. For categorical variables, the results are reported as proportions, and for continuous variables, the mean SD. Bivariate analysis with use Spearman Rank test with significant results if the p value then H1 is accepted.

3. Results and Discussion

3.1 Characteristics of Respondents by Age

Characteristics of respondents based on age can be seen in table 1

Table 1. Characteristics of Respondents by Age in the ICU and HCU Hospitals in Malang City

No.	Age	Frequency (n)	Percentage (%)
1.	26-35	4	18.2
2.	36-45	3	13.6
3.	46-55	2	9.1
4.	56-65	8	36.4
5	above 65	5	22.7
Amount		22	100

Characteristics of respondents according to age based on table 1, the majority of respondents aged 56-65 years were 8 respondents (36.4%).

3.2 Characteristics of Respondents by Gender

The distribution of respondents by gender, namely male and female, can be seen in table 2

Table 2. Characteristics of Respondents by Gender in the ICU and HCU Hospitals in Malang City

Gender	Frequency (n)	Percentage (%)
Man	16	72.7%
Woman	6	27.3%

Characteristics of respondents according to gender based on table 2 can be seen that for male respondents as many as 16 people (72.7%) respondents, while women as many as 6 people (27.3%) respondents.

3.3 Characteristics of Respondents Based on Last Education

Characteristics of respondents based on the last education can be seen in table 3

Table 3. Characteristics of Respondents Based on Recent Education in the ICU and HCU Hospitals in Malang City

No.	Education	Frequency (n)	Percentage (%)
1.	Elementary school	3	13.6
2.	Junior high school	1	4.5
3.	Senior High School	8	36.4
4.	Higher Education	10	45.5
	Amount	22	100

Characteristics of respondents based on table 3 shows that of the 22 respondents, most of the respondents in this study were in the last education classification of higher education with a percentage of 45.5%.

3.4 Distribution of Respondents Based on Anxiety

The distribution of respondents based on physical activity can be seen in table 4 as follows:

Table 4. Distribution of Respondents Based on Anxiety in the ICU and HCU Hospitals in Malang City

Anxiety Level	Frequency (n)	Percentage (%)
No Anxiety	1	4.5
Mild Anxiety	4	18.5
Moderate Anxiety	12	54.5
Severe Anxiety	4	18.2
Severe Anxiety	1	4.5
Total	22	100

Table 4 above shows that the respondents in this study had severe anxiety as many as 1 respondent (4.5%), severe anxiety as many as 4 respondents (18.2%), moderate anxiety as many as 12 respondents (54.5%), and mild anxiety. as many as 4 people (18.2%), there is no anxiety as much as 1 respondent (4.5%).

3.5 Distribution of Respondents Based on Sleep Quality

The distribution of respondents based on sleep quality can be seen in table 5 as follows:

Table 5. Distribution of Respondents Based on Sleep Quality in the ICU and HCU Hospitals in Malang City

Sleep Quality	Frequency (n)	Percentage (%)
Good	8	36.4
Poor	14	63.6
Total	22	100

The majority of respondents have poor sleep quality as many as 14 respondents (63.6%).

3.6 Data Analysis of the Relationship Between Anxiety Levels and Sleep Quality in Heart Failure Patients

The data that has been obtained previously will be analyzed by cross tabulating data and then data analysis will be carried out using Spearman rank. The following will explain the cross tabulating of the level of anxiety with the sleep quality of heart failure patients through table 6

Table 6. Cross Tabulating Anxiety Levels with Sleep Quality of Heart Failure Patients in the ICU and HCU Hospitals in Malang City

Anxiety Level	Sleep Quality		Total
	Well	Bad	
No Anxiety	0	1	1
Mild Anxiety	1	3	4
Moderate Anxiety	6	6	12
Severe Anxiety	1	3	4
Severe Anxiety	0	1	1
Total	8	14	22

Based on table 6 above, it shows that of the 12 respondents with moderate anxiety, 6 people had good sleep quality and 6 people had poor sleep quality.

Table 7. Spearman Rank Correlation Data Analysis

Variable	r correlation	Significance	Conclusion
Anxiety Level with Sleep Quality	0.001	1.0	H0 accepted

Based on the results of the analysis in table 7 using the Spearman Rank test, the value (sig.) > or 1.0 > 0.05, while when viewed from the level of interpretation of the relationship (0.0001) is at a very weak relationship level. The conclusion from the analysis above is that there is no relationship between anxiety levels and sleep quality in heart failure patients.

Previous research by Cheng et al, (2021) stated that anxiety is one of the factors that causes poor sleep quality in patients with heart disease. The results of this study contradict the results of this study where there is no relationship between anxiety and sleep quality in heart failure patients in the ICU and HCU rooms in hospitals in Malang City. There are several factors that can influence this phenomenon, one of which is the form of family support and the coping mechanisms used by heart failure patients. Good family support and good coping mechanisms will have a good impact on the mental health of patients with chronic disease conditions.

Family support (family support) is an attitude, action, family acceptance of family members, where this support can be in the form of informational support, assessment support, instrumental support, and also emotional support (Friedman, 2013). Those who live in a supportive environment, will have a much better condition than those who do not get support. Family support is one of the factors that are considered capable of reducing the health effects of individuals. Family support can improve the coping mechanisms of heart failure patients because family support acts as a source of coping, so that patients have adaptive coping mechanisms to deal with the disease and undergo the treatment process (Ryandini, 2020).

In previous studies, anxiety levels had a strong and significant relationship with coping mechanisms in patients with congestive heart failure (Ihdaniyati & Nur A, 2008). Patients who have adaptive coping mechanisms are associated with anxiety levels where when coping is good, it will reduce anxiety levels (Ransun, Pijoh, Kanine, 2013).

Sleep quality is determined by how a person prepares his sleep patterns at night such as the depth of sleep, the ability to stay asleep, and the ease of falling asleep without medical assistance. Good quality sleep can provide a feeling of calm in the morning, feeling energetic, and not complaining of sleep disturbances. Good quality sleep is very important and vital for everyone's healthy life. According to Gardner et al, (2017), there are many changes in sleep duration and sleep quality in the elderly, these changes include the progress of the circadian rhythm phase. Changes in sleep can cause cognitive decline in the elderly, decrease sensory function and inhibit memory formation.

According to Hidayat (2019), a person's sleep quality is said to be good if he does not show various signs of sleep deprivation and does not experience problems in his sleep. Sleep quality can also be influenced by various things in the surrounding environment. Sensory stimuli from the environment such as sound, light, movement and smell can affect the quality of sleep in the bedroom. Other things that also need to be considered are socio-economic conditions and the surrounding environment such as humidity, cold temperatures, slums, population density and noise.

4. Conclusion

We concluded that The majority of patients with heart failure experience moderate anxiety. The quality of sleep possessed by heart failure patients in this study was also included in the category of poor sleep quality. Relationship analysis stated that there was no significant relationship between anxiety levels and sleep quality in heart failure patients. We suggest that heart failure patients can control the anxiety that is in themselves so that the quality of sleep is good, as a result it can increase the speed of healing and reduce the rate of recurrence. For further research, we suggest increasing the number of samples and adding criteria to the respondents.

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Predictors of Survival and Neurological Outcomes in Patient with Cardiac Arrest: A Literature Review

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ABSTRACT

Introduction: The use of several interventions such as extracorporeal cardiopulmonary resuscitation (ECPR) can improve patient's outcome after cardiac arrest. As a result, we looked into other predictors of survival and neurological outcomes in cardiac arrest patients. **Objectives:** this study was conducted to identify predictors of survival and neurologic outcome in patients with cardiac arrest. **Methods:** we searched Pubmed, Science Direct, and Google Scholar published between January 1, 2011, and September 10, 2021 that were related to predictors of survival and neurologic outcome in patient with cardiac arrest. Data on participant characteristics, study design, outcomes and predictors were gathered from the studies that were included. **Results:** of the initially identified 1,211 studies, 19 were included. Of these, all were observational studies. Patients included adult with out-of-hospital and in-hospital cardiac arrest. ECPR, prehospital cardiopulmonary resuscitation, and response time were found to be beneficial in improving survival and neurological outcome. However, it was discovered that people under the age of 70 had a better likelihood of survival. **Conclusions:** evidence suggests that ECPR, prehospital cardiopulmonary resuscitation, and response time are all good predictors of survival in adults with cardiac arrest.

1. Introduction

The most common cause of sudden mortality in developed countries, resulting in extremely poor patient outcomes, or in developing countries such as Indonesia (Jung et al., 2019). Cardiac arrest (CA) is a situation in which the heart's function abruptly ceases and the pulse is not felt, resulting in loss of consciousness and breathing (Colak & Tekten, 2020). Cardiac arrest is responsible for up to 60% of deaths in persons with coronary heart disease. Cases of cardiac arrest might result in death if not treated properly by medical staff. The prevalence of cardiac arrest instances is relatively high in many places of the world. Despite the fact that cardiopulmonary resuscitation (CPR) is commonly used to treat cardiac arrest (CA), it only restores 30 to 40% of normal blood flow to the brain when performed according to recommendations (Meaney et al., 2013). Patients with in-hospital CA (IHCA) and out-of-hospital CA (OHCA) have a bad prognosis (Goldberger et al., 2012; Reynolds et al., 2013) Because of the growing social and economic costs of CA, its treatment and recovery has become a serious public health concern.

Identifying survival and neurologic predictors could aid health care providers in predicting clinical outcomes, improving treating physician discretion, and increasing the efficiency of intervention for patient with CA. Therefore, the purpose of this review is to identify published article that evaluated the significance of predictors in terms of survival and neurologic outcome for patient suffering IHCA or OHCA.

2. Methods

The PRISMA statement was utilized to structure the review. We searched Pubmed, Science Direct, and Google Scholar for relevant papers from January 1, 2011 to September 10, 2021. The following are the basic conditions for inclusion: (1) included adult patients with cardiac arrest, and (2) gathered enough data to assess predictor of survival and neurological outcome. The usage of the English language was restricted. The precise search strategies, as well as the inclusion and exclusion criteria, are listed in Figure 1.

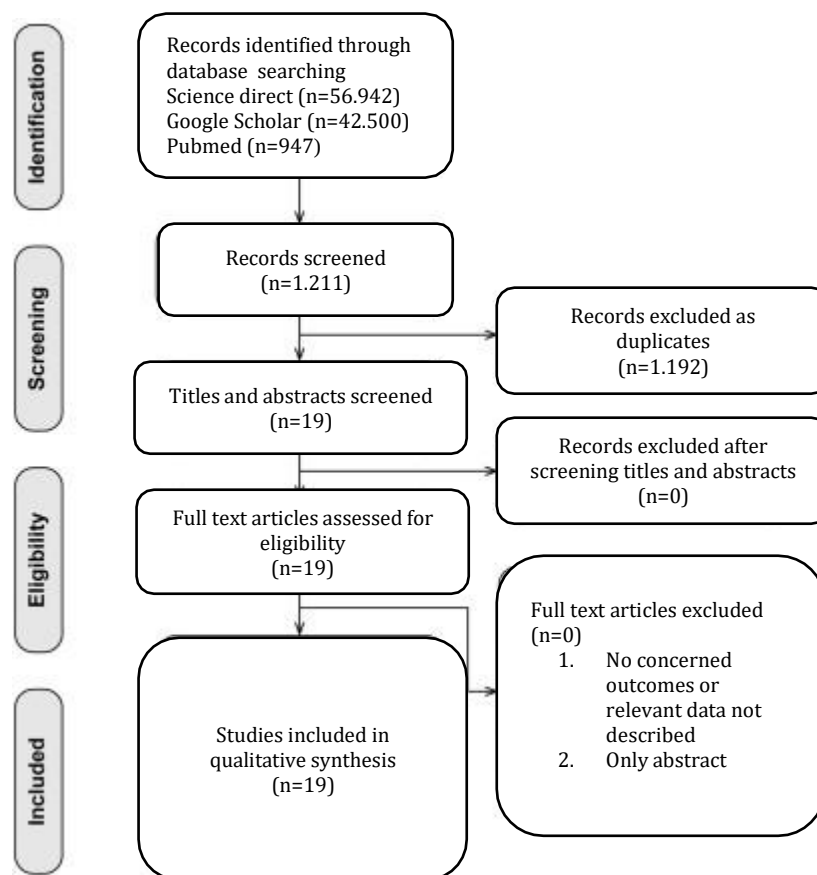


Figure 1 Flow diagram of study inclusion

The JBI's critical appraisal tool was used by writers to assess the risk of bias and applicability concerns of the papers that were included. We performed thematic analysis to evaluate predictor of survival and neurological outcome in patient with cardiac arrest.

3. Results and Discussion

3.1 Study Selection and Characteristics

Initially, a total of 1,211 published studies were found. We found 19 studies after deleting duplicate articles and reviewing the abstracts. Finally, our review covered 19 studies (Figure 1). The basic information and characteristics of the included studies are shown in Table 1. The majority of cardiac arrests occur outside of the hospital and are caused by non-trauma etiologies. Three studies had a sample size of greater than 20,000 patients, while sixteen studies had less than 1,000 patients.

Table 1. Characteristics of the included studies.

Country, Author (year)	Setting, Trauma patient?	Sample	Survival (%)	Neurological Outcome	Predictor
Slovenia (Marinšek et al., 2020)	OHCA, non-trauma	110	95.1	CPC	Therapeutic intervention (early percutaneous coronary interventions (PCI), therapeutic hypothermia, dual antiplatelet therapy), pre-hospital data (older age, cause of OHCA, and longer resuscitations),
Germany (Zwingmann et al., 2016)	OHCA, trauma	38.499	16.6	GOS	Preclinical resuscitation
India (Singh et al., 2016)	IHCA, N/A	127	7.1	GOS	ROSC during CPR, absence of comorbidities, shorter response time of code blue team
South Korea (Lee et al., 2016)	OHCA, non-trauma	36	43.5	CPC	ECMO implantation, findings on brain CT just after ECMO and subsequent image
Japan (Komeyama et al., 2019)	OHCA and IHCA, non-trauma	67	N/A	CPC	Early initiation of ECLS within 46 minutes
Japan (Funada et al., 2017)	OHCA, non-trauma	23.520	0.27	CPC	Prehospital ROSC, EMS-witnessed arrest
South Korea (Ro et al., 2017)	OHCA, non-trauma	37.924	6.1	CPC	Bystander CPR regardless of dispatcher assistance
China (Li et al., 2019)	IHCA, non-trauma	320	21.2	N/A	Age <70years-old, shockable rhythm, the duration of resuscitation (≤ 15 min and $16 \sim 30$ min), Killip $\leq$ II, and CCI ≤ 2
South Korea (Kim et al., 2016)	N/A	85	21.2	N/A	ECLS application within 60 minutes
South Korea (Lee et al., 2017)	OHCA and IHCA, non-trauma	111	18.9	CPC	age ≤ 56 years, no asystole as the initial arrest rhythm, CPR duration of ≤ 55 min, and any ROSC event before EPCR
South Korea (Ahn et al., 2018)	OHCA, non-trauma	930	18	CPC	prolonged cardiac arrest patients, initial shockable rhythm, age <65 years, or witnessed arrest
Perancis	OHCA and	113	16	CPC	initial shockable rhythm, arterial blood pH at the

(Daou et al., 2020)	IHCA, non-trauma				time of ECPR implantation ≥ 7.0
USA (Tolins et al., 2017)	OHCA and IHCA, non-trauma	114	40.4	CPC	Initial normocarbia
Germany (Jung et al., 2019)	IHCA, N/A	93	28	GOS	Lactate clearance at 6 h
China (Wang et al., 2020)	OHCA, N/A	262	43.51	CPC	Age, noncardiac etiology, non-shockable rhythm, bystander CPR, total epinephrine dose, APTT, and SOFA score
South Korea (Ryu et al., 2015)	OHCA and IHCA, non-trauma	115	59	CPC	Early institution of ECMO and a low threshold for blood transfusion
Germany (Jung et al., 2016)	OHCA and IHCA, non-trauma	117	23	CPC	Baseline serum lactate
Turkey (Colak & Tekten, 2020)	OHCA and IHCA, non-trauma	177	10.17	Modified Rankin scale	a shorter time period of CPR, shockable cardiac rhythm at the time of admission
Belgium (Vissers et al., 2019)	OHCA, non-trauma	337	7.4	Modified Rankin scale	No predictor was significantly associated

CPC: cerebral performance category; GOS: Glasgow Outcome Scale; ECLS: Extracorporeal life support; CCI: Charlson Comorbidity Index; ROSC: return of spontaneous circulation

3.2 Quality Assessment

Table 2 shows the summary results of the quality assessments by using JBI's critical appraisal tool. A total of 19 studies received a quality score ranging from 80% to 100%.

Table 2. Quality assessment.

Author (year)	Design	Quality Score
(Marinšek et al., 2020)	Retrospective study	10/12 (83%)
(Zwingmann et al., 2016)	Retrospective study	10/12 (83%)
(Singh et al., 2016)	Prospective study	10/12 (83%)
(Lee et al., 2016)	Retrospective study	11/12 (92%)
(Komeyama et al., 2019)	Retrospective study	10/12 (83%)
(Funada et al., 2017)	Observational study	10/12 (83%)
(Ro et al., 2017)	Cross sectional study	8/8 (100%)
(Li et al., 2019)	Retrospective study	10/12 (83%)
(Kim et al., 2016)	Retrospective study	10/12 (83%)
(Lee et al., 2017)	Cohort study	10/12 (83%)
(Ahn et al., 2018)	Retrospective study	11/12 (92%)
(Daou et al., 2020)	Retrospective study	10/12 (83%)
(Tolins et al., 2017)	Retrospective study	11/12 (92%)
(Jung et al., 2019)	Retrospective study	10/12 (83%)

(Wang et al., 2020)	Retrospective study	10/12 (83%)
(Ryu et al., 2015)	Retrospective study	12/12 (100%)
(Jung et al., 2016)	Retrospective study	10/12 (83%)
(Colak & Tekten, 2020)	Retrospective study	10/12 (83%)
(Vissers et al., 2019)	Retrospective study	10/12 (83%)

3.3 Results of the Synthesis

Two articles investigated the predictors associated with survival to discharge, while the rest of articles investigated the predictors associated with neurologic outcome at discharge. The predictors associated with survival to discharge are Age <70years-old, shockable rhythm, the duration of resuscitation (≤ 15 min and 16 ~ 30min), Killip $\leq$ II, and CCI $\leq$ 2 (Li et al., 2019), ECLS application within 60 minutes (Kim et al., 2016). And the predictors associated with neurologic outcome consist of several predictors such as therapeutic intervention (early percutaneous coronary interventions (PCI), therapeutic hypothermia, dual antiplatelet therapy), pre-hospital data (older age, cause of OHCA, and longer resuscitations) (Marinšek et al., 2020), preclinical resuscitation (Zwingmann et al., 2016). ROSC during CPR, absence of comorbidities, shorter response time of code blue team (Singh et al., 2016), ECMO implantation, findings on brain CT just after ECMO and subsequent image (Lee et al., 2016), early initiation of ECLS within 46 minutes (Komeyama et al., 2019), prehospital ROSC, EMS-witnessed arrest (Funada et al., 2017), bystander CPR regardless of dispatcher assistance (Ro et al., 2017), age $\leq$ 56 years, no asystole as the initial arrest rhythm, CPR duration of $\leq$ 55 min, and any ROSC event before ECPR (Lee et al., 2017), prolonged cardiac arrest patients, initial shockable rhythm, age <65 years, or witnessed arrest (Ahn et al., 2018), initial shockable rhythm, arterial blood pH at the time of ECPR implantation $\geq$ 7.0 (Daou et al., 2020), Initial normocarbia (Tolins et al., 2017). Lactate clearance at 6 h (Jung et al., 2019), noncardiac etiology, non-shockable rhythm, bystander CPR, total epinephrine dose, APTT, and SOFA score (Wang et al., 2020), early institution of ECMO and a low threshold for blood transfusion (Ryu et al., 2015), baseline serum lactate (Jung et al., 2016), a shorter time period of CPR, shockable cardiac rhythm at the time of admission (Colak & Tekten, 2020). One study stated that there was no predictor was significantly associated with survival and neurological outcome (Vissers et al., 2019).

3.4 Discussion

The use of Extracorporeal Membrane Oxygenation (ECMO) in cardiopulmonary attacks is known as extracorporeal cardiopulmonary resuscitation (E-CPR) (Ryu et al., 2015). ECMO is a treatment for refractory cardiogenic shock and respiratory failure. Because ECMO can swiftly restore circulation in individuals who have gone into cardiac arrest, it has been utilized to help with cardiopulmonary resuscitation (CPR). When a heart-lung attack persists, ECMO must be used for at least a few minutes in addition to traditional CPR. Because the brain is the organ most susceptible to hypoxia and poor perfusion, if ECPR is not administered promptly, it can result in serious neurologic impairments. Even in the event of severe heart failure or a heart attack, VA-ECMO pumps blood from the veins and returns it to the arteries, allowing oxygenated and decarboxylated blood to circulate throughout the body. Although there is no Return of Spontaneous Circulation (ROSC) during ECPR, start of extracorporeal flow can provide systemic organ perfusion (Inoue et al., 2020). The use of ECPR is most commonly covered in seven of the 19 journal papers.

Researchers determined in the article (Zwingmann et al., 2016) that prehospital trauma management had the most potential to enhance CPR and survival. When compared to ED resuscitation, pre-hospital resuscitation is associated with higher survival rates and improved neurologic outcomes. The survival percentage is low if resuscitation in the ED is required following prehospital resuscitation, albeit 56 percent of these patients had good or intermediate outcomes. Three of the 19 journal articles explain factors associated to prehospital resuscitation.

Patients in cardiac arrest can only tolerate short-term circulation abnormalities, and CPR that lasts longer than 15-30 minutes reduces the chances of survival (Lee et al., 2016). The time

between collapse and the arrival of the resuscitation team, as well as the period between collapse and discovery, were revealed to be predictive factors for survival in research published in 2002 by Huang et al. shorter response times, according to the AHA-ACLS guidelines, lead to better results, which our study's survival analysis findings verify (Singh et al., 2016). There are various reasons for this, including the timing of CPR (ECPR within 46 minutes (Komeyama et al., 2019), and ECPR within 60.5 minutes (Kim et al., 2016). Early restoration of circulation utilizing an on-site counter shock or ECLS within 35 minutes can result in a good recovery, according to the journal (Komeyama et al., 2019). However, only 38 out of 100 OHCA patients were treated with ECLS, according to their findings. As a result, it's possible that starting ECLS within 46 minutes is also linked to better neurologic outcomes in refractory CA patients treated with ECLS in the trial. Given the time it takes to prepare for ECLS, investigators will only have a few minutes to determine the indications for ECLS if they begin ECLS within 46 minutes of the CA event. As a result, as soon as multiple cycles of ACLS fail to restore circulation in CA patients, the indication for ECLS beginning should be assessed (Colak & Tekten, 2020; Kim et al., 2016; J. J. Lee et al., 2016; S. W. Lee et al., 2017; Singh et al., 2016).

According to the study, getting older and having specific comorbidities (malignancy and chronic kidney disease) were linked to a lower chance of surviving a heart attack in the hospital. Although younger patients had a lower mortality rate, some research claim there is no link between age and survival (Ahn et al., 2018). The SCAR database revealed a link between rising age and death from heart attacks in hospitals, according to the journal. Furthermore, this population has a higher prevalence of comorbidities, older patients receive fewer aggressive therapies, and survival from in-hospital cardiac arrest appears to deteriorate in a dose-response pattern. When compared to patients over 70 years of age, patients under 70 years of age had a >4 times higher likelihood of ROSC and discharge survival. However, because senior patients are more likely to decline CPR, the statistics may not be completely representative of the elderly community as a whole (Li et al., 2019).

4. Conclusion

We conduct a literature review to assess the predictors of survival and neurological outcome in cardiac arrest patients. Our data show that extracorporeal cardiopulmonary resuscitation, rescuer response time or administration of CPR/ECPR, prehospital resuscitation, and age can all be used as predictors.

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The Effect of Red Ginger Compress on Pain Reduction Among Patients with Gout Arthritis: A Literature Study

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ABSTRACT

Introduction: Gout Arthritis is one of the most common inflammatory joint diseases, which is characterized by the accumulation of monosodium urate crystals in or around the joints causing pain. The purpose of this study was to determine the effect of giving red ginger compresses to reduce pain in patients with gout arthritis. **Objectives:** the objective of the study was to identify the effect of red ginger compress on pain reduction among patients with gout arthritis using a literature study **Methods:** Using literature study research with a sample of 11 journals. The method used the red ginger warm compress method (8 journals), the red ginger jelly compress method (1 journal), the red ginger method mixed with salt (1 journal). In the study quality test using the JBI Randomized Controlled Trial and Quasi Experimental tools. **Results:** There is an effect of giving red ginger compresses on reducing pain in patients with gout arthritis. There are 3 methods of giving red ginger compresses, namely warm red ginger compresses, red ginger jelly compresses and red ginger compresses mixed with salt. Each method of giving red ginger compresses has significant results, but the most widely used method is a warm red ginger compress. **Conclusions:** Based on the results of journal analysis, red ginger warm compresses are proven to reduce pain in patients with gout arthritis. In addition, results from other methods are needed in order to produce wider results.

1. Introduction

Gout Arthritis is a disease that arises due to the presence of excess purine substances that cannot be processed by the body and also occurs because there are accumulations of monosodium urate crystals in the body (Jaliana et al., 2018). Gout arthritis disease or commonly known as gout occurs due to a purine metabolism disorder that results in excessive uric acid levels in the blood (hyperuricemia) (Nurhayati, 2018).

According to the World Health Organization (WHO), as many as 34.2% of gout arthritis cases occurred worldwide in 2017, in America 26.3% had gouty arthritis (Ilham, 2020), while in developing countries such as Indonesia, gouty arthritis sufferers. increases with age and population, from 18.3 million Indonesians it is estimated that around 12% -34% have gouty arthritis. In 2018, patients with gout arthritis in the province of Bali were around 19.3%, Aceh was 17.5% and Papua was 15.4% (Syahradesi, 2020). While in East Java it is 17%, Surabaya 56.8% (Nanda Masraini Daulay, 2017).

There are two factors that cause gout arthritis, namely: primary factors include: genetics, hormonal imbalance and impaired kidney function that can interfere with the process of releasing uric acid. While the secondary factors include: alcohol consumption, consumption of foods high in purines and drugs (Irfa & Suwandi, 2016). Gout arthritis occurs due to consumption of foods with excess purine levels, obesity (obesity), alcohol consumption, lack of physical activity, hypertension and heart disease (Jaliana et al., 2018). If not treated immediately, gout arthritis will cause complications such as lumps in the joints (tofi), kidney stones, severe degenerative diseases, secondary infections, coronary heart disease, diabetes and fractures in the joints (Rahayu et al., 2018).

Increased levels of uric acid in the blood is characterized by joint pain, tenderness, redness. Pain occurs due to the accumulation of excess purine crystals in the joint area because the kidneys do not function properly in removing uric acid through urine (Zahroh & Faiza, 2018). Crystals that accumulate in the outer tissue of the joint will form clear lumps (tofi) that

cause pain in the joints. Joint pain often occurs in the fingers, elbows, wrists, knees, heels and toes that occurs at night and in the morning when you wake up (Nurhayati, 2018).

Pain felt by gouty arthritis sufferers can result in decreased body functions and physical appearance due to physiological changes that affect the impact of gout arthritis, starting with complaints around the joints that feel stiff and achy in the morning and the emergence of continuous pain in the joints. at night (Liana, 2019). Pain felt by patients with gout arthritis is very disturbing, namely sufferers often experience sleep disturbances, impaired physical mobility and even impaired social interaction. So, it needs to get treatment as soon as possible (Zahroh & Faiza, 2018). If pain is not treated immediately it will result in decreased physical activity (Wilda & Panorama, 2020).

Pain management in gouty arthritis includes pharmacological therapy, namely by administering NSAIDs (Nonsteroidal Anti-Inflammatory Drugs) which can prevent swelling (Rahayu et al., 2018). However, NSAIDs have side effects in the form of increasing blood pressure and will be very dangerous if used in gout arthritis sufferers who suffer from hypertension (Imananta et al., 2018). In addition, there is a non-pharmacological therapy in reducing joint pain in gout arthritis, namely red ginger compresses. The red ginger compress technique can be done anywhere and anytime, it can also be accompanied by other activities and the ingredients are very easy to find in Indonesia. Red ginger has a spicy, warm taste and contains chemicals including gingerol, shogaol and zingeron which provide pharmacological and physiological activities such as antioxidant, anti-inflammatory, analgesic, anticarcinogenic and cardiogenic effects that relieve pain, stiffness and muscle spasms. At the physiological stage of pain, ginger compresses reduce uric acid pain at the transduction stage, where at this stage the gingerol content in ginger which contains cyclooxygenase is able to inhibit the formation of prostaglandins, resulting in a decrease in pain in gouty arthritis.

Giving ginger compresses is a method of treatment from the outside by rubbing the painful joints or body parts to provide a warm feeling. This is because the content of ginger which has heat can provide a warm response to areas of the body that feel pain so that it will cause dilation of blood vessels, reduce blood viscosity, reduce tension or stiffness in muscles and increase capillary permeability (Zuriati, 2017). In previous research, Red ginger compresses can reduce moderate pain scale and mild pain scale, which can be done once a day with a duration of approximately 15-30 minutes (Merliana et al., 2019; Virda Yuniarti et al., 2017; Yada & Ka'arayeno, 2019).

The content in red ginger includes 3.9% essential oil, 81% water, and 9.93% extract which is soluble in alcohol and has the advantage of a sharp aroma and very spicy taste compared to other gingers (Ilham, 2020). The red ginger compress method is more effective in reducing pain scale compared to other methods and has been widely applied in previous studies. Red ginger compress is a traditional method that is widely applied to reduce pain in patients with gout arthritis. Based on this background, the study aim to know the effect of giving red ginger compresses in reducing pain in patients with gout arthritis

2. Methods

The design of this study uses a literature review study. Identify articles based on Pubmed, Proquest, Scient Direct and Google Scholar databases. Search keywords using Effectiveness, Red Ginger, Pain, Gout Arthritis or Effects, Red Ginger, Pain, Gout. By using Boolean terms Effectiveness OR Effect AND Red Ginger AND Pain or Illness AND Gout Arthritis OR URIC ACID. The inclusion criteria in this study are as follows: 1) Accredited international and national journals; 2) Type of journal research articles and review articles; 3) Journal with research design Randomized Controlled Trials and Quasy Experiment, Pre Experimental; 4) A journal that discusses the effect of giving red ginger compresses to reducing pain in patients with gout arthritis; 5) Journal involving a population of gouty arthritis sufferers in reducing pain by using red ginger compresses; 6) To assess the quality of the journal, a critical appraisal will be carried out using JBI. The reason for choosing JBI (Joanna Briggs Institute) Critical Appraisal Tools is because JBI can help assess the reliability, relevance and results of published research (Joanna Briggs Institute, 2020).

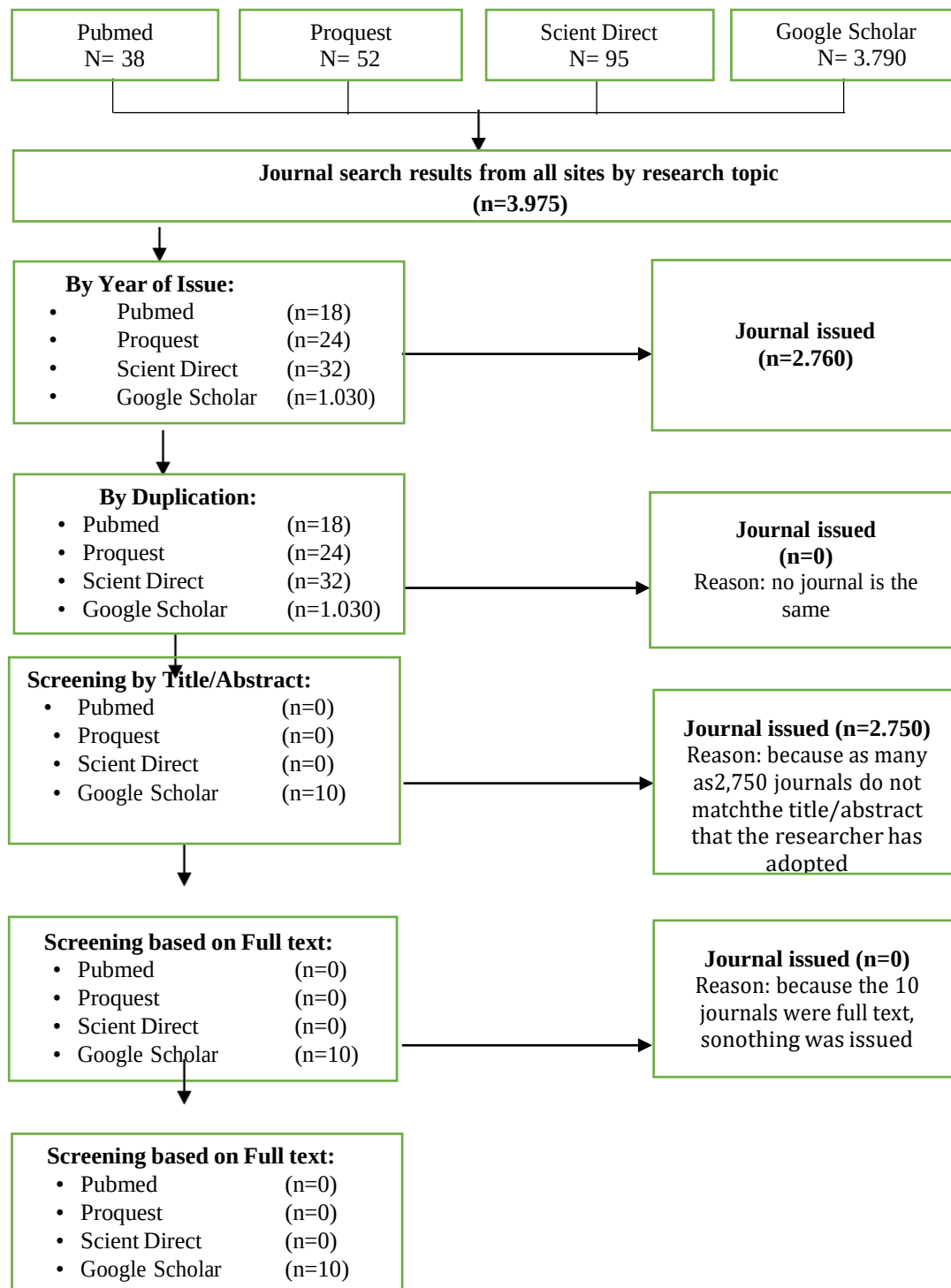


Figure 1. Workflow

3. Results and Discussion

In this study, 3,975 journals were obtained, 38 of which were obtained from the Pubmed database, 52 journals were obtained from the Proquest database, 95 journals were obtained from the Science Direct database, and 3,790 journals were obtained from Google Scholar. The journals that have been collected are then screened with the following criteria: (a) Journals published between 2016-2020, (b) Journal type experimental research methods (randomized control trial, quasi-experimental), (c) Fulltext.

3.1 Characteristics of Respondents

Table 1 Characteristics of Respondents

No.	Characteristics of Respondents	N	%
1.	Gender:	264	100%
	Male	95	36%
	Female	169	64%
2.	Age (years old):	264	100%
	36-59	80	30%
	60-74	82	31%
	75-90	102	39%
3.	Pain scale	264	100%
	Mild	37	14%
	Moderate	129	49%
	Severe	98	37%

Based on Table 1, it can be explained that the general description of respondents based on gender can be concluded that the majority of research respondents are female (64%). General description of respondents based on age, it can be concluded that the majority of respondents from this study were aged 75-90 years. The general description of respondents based on the pain scale, it can be concluded that the majority of respondents from this study had moderate pain.

3.2 Data Analysis

Table 2 Data Analysis

No	Author, Publication year	Study Design	Population/Sample	Intervention	Outcome
1.	(Anggraeni, 2019)	Quasy Eksperime ntal	The population in this study were 2 respondents, namely subject 1 (Mrs. S) and subject 2 (Mrs. M).	Both subjects were given an explanation about the SOP for warm red ginger compresses and pain assessment using a scale. The intervention was carried out every day for 2 weeks with the help of the subject's family. Furthermore, the researchers made observations by measuring the level of pain with a pain scale. Pain level measurements were carried out before and after the intervention with the	The results of this study indicate that the pain scale before the warm red ginger compress is for mother S experiencing pain on a scale of 3 (mild pain) and mother M experiencing pain on a scale of 4 (moderate pain). After compressing for 14 days, both of them experienced a decrease in pain. For Mrs. S, it decreased to a scale of 0 (no pain) on the 9th day, while Mrs. M decreased to 0 (no pain) on the 12th scale

				help of the subject's family.	
2.	(Ilham, 2020)	Quasy Eksperimen	The population in this study were 20 respondents in Lantora Village, Massenga Health Center Work Area, Polewali District, Polewali Mandar Regency.	The instruments used were warm compresses, red ginger, a water thermometer and a numeric rating scale (NRS) observation sheet.	The results of this study indicate that ginger compresses. Where the results of statistical tests using the Wilcoxon test obtained a p-value = 0.000, and a value of = 0.005, where $p < \alpha$ which means that there is an effect of warm compresses using red ginger there is a decrease in pain scale in patients with gout arthritis.
3.	(Navisah, 2018)	Pre-Experimen	The population in this study were 38 respondents in Karangcangkring Village, Dukun District, Gresik Regency.	Hot compresses grated red ginger	The results showed that most of the patients with gouty arthritis pain before being given a warm compress of grated red ginger experienced severe pain 21 patients (55.3%) and most of the patients who were given a warm compress as many as 21 patients (55.3) experienced moderate pain. The results of statistical tests using the Wilcoxon Signed Ranks test, the value of $Z = -6.164a$ and $p = 0.000$ where $P < 0.05$
4.	(Latulumamin & Aziza, 2018)	Quasy Eksperimen	The population in this study were 36 respondents at the Ambon City Health Center, Indonesia	In this study, the degree of pain and inflammation status was measured before being given red ginger compress. Both methods were carried out for 20 minutes, 2 times a day for 3 days. After that, post-test to measure the degree of pain and inflammatory status of the patient.	The results of this study indicate that red ginger jelly compresses at a dose of 4% for 20 minutes per day for 3 days can reduce pain and inflammation status in patients with gouty arthritis. Red ginger jelly compress reduces gout arthritis pain with a mean of 2.78 and p-value of 0.0011.

5.	(Arlina et al., 2019)	Pre-Eksperimen	The population in this study were 45 female respondents at the Tresna Werdha Lotus Social Home in Palembang	The intervention given was in the form of red ginger warm compress therapy to be given before and after warm compress therapy using grated red ginger.	The results showed that there was an effect of giving warm compresses using grated red ginger to reduce pain scale in elderly women with gout arthritis at the Tresna Werdha Teratai Social Home in Palembang in 2018 (p value = 0.001).
6.	(Anita et al., 2020)	Pre-Experimental	The population in this study was 25 respondents, who did not consume pharmacological therapy for anti-inflammatory drugs at the Guna Budi Bakti Foundation Nursing Home in 2020.	Red ginger warm compress	The results showed that prior to the red ginger compress, the majority of respondents experienced severe pain, as many as 14 respondents, 5 respondents experienced moderate pain and 6 respondents experienced mild pain. After the red ginger compress, the majority of 17 experienced mild pain, 6 respondents experienced moderate pain and 2 respondents experienced severe pain.
7.	(Virda Yuniarti et al., 2017)	Quasy Eksperimen	The population in this study were 24 elderly respondents with gout which were divided into two groups, namely the treatment group and the control group at the Mojopahit Elderly Hospital, Mojokerto.	Red ginger warm compress	The results of this study indicate that red ginger compresses can help reduce levels of prostaglandins and leukotrienes (inflammatory mediators) in the Mojopahit Elderly Care Unit, Mojokerto Regency, which is carried out routinely once a day for 15-30 minutes. The results showed that the respondent's pain scale in the treatment group was on a scale of 4-6 and 7-9, and after being given a ginger compress the pain scale became 1-3 and 4-6.

8.	(Yada & Ka'arayeno, 2019)	Pre-Experimental	The population in this study was 57 respondents in Merjosari Village, Lowokwaru District, Malang City on 22 May-18 June 2019.	Warm compress of red ginger and salt	The results showed that there was a decrease in the level of pain after the intervention was given. The average pain score was found to be in the median of 7 (min-max = 4-9). However, after being given a warm compress of red ginger and salt, the average value of pain was at a median of 4 (min-max = 2-7), where the pain in respondents decreased compared to before being given a warm compress of red ginger and salt..
9.	(Samsudin et al., 2016)	Pre-Experimental	The population in this study were 30 respondents in Tateli Dua village, Mandolang sub-district, Minahasa district	Red ginger warm compress	The results of this study indicate that before the red ginger compress was applied, most of the respondents were at mild pain level with a total of 16 respondents, after being given a warm compress, most of the respondents were at mild pain level with a total of 29 respondents
10	(Ani, 2018)	Quasi Eksperimental	The population in this study were 34 people with gout arthritis in the work area of the Alianyang Health Center, Pontianak City	Red ginger warm compress as many as 17 respondents	The results of this study indicate that ginger compresses are more effective in reducing pain compared to warm compresses

After conducting an analysis of 10 journals, it was found that red ginger compresses can relieve pain in patients with gout arthritis. The findings will be explained in the following explanation

3.2.1 Frequency of Red Ginger Compress

Sourced from a literature study from 10 journals showing that the frequency of warm compresses using red ginger which is widely used is with a frequency of 1 time a day for 14 days, 2 times a day for 7 days, 3 times a day for 21 days, 2 times a day. a day for 3 days, 2 times a day for 28 days.

In a study in the (Latulumamina & Aziza, 2018), 36 patients with gout arthritis received red ginger jelly compresses 2 times a day for 3 days and showed that compressing with red ginger jelly had a stronger effect in reducing the degree of pain. 57 people were given a combination of warm red ginger and salt compresses, given 2 times for 28 days. For other

studies, it is not explained about the frequency of giving ginger compresses (Yada & Ka'arayeno, 2019).

Using a warm compress method using grated red ginger which was carried out on 2 respondents every day for 2 weeks (Anggraeni, 2019). Research using a similar method is found in another study by (Ani, 2018). The total sample of 34 people was divided into 2 groups, namely 17 intervention groups and 17 control groups. The intervention group was given 3 red ginger compresses for 3 weeks. And the results obtained that red ginger compresses can reduce pain in patients with gout arthritis.

Anita's research (2020) as many as 25 samples were given warm compresses using red ginger 2 times a day for a week in a row showing a decrease in the pain scale of respondents (Anita et al., 2020). Research with a similar frequency is found in Navisah's research (2018), on 38 respondents who were conducted 2 times a day, morning and evening, for 7 days and got optimal results (Navisah, 2018). Based on the explanation above, it can be concluded that the provision of physical activity can be done with a frequency of 2 times a day for 7-14 days which is proven to be able to reduce pain in patients with gout arthritis.

3.2.2 Duration of Giving Red Ginger Compress

The results of research journals showed that most patients with gouty arthritis were given warm red ginger compresses with a duration of 20-30 minutes contained in 10 journals, namely, in the (Latulumamina & Aziza, 2018), 36 gout arthritis patients received red ginger jelly compresses for 20 minutes. , for 2 weeks and showed that compressing with red ginger jelly had a stronger effect in reducing the degree of pain. In Yada & Ka'arayeno's research (2019) using another method, as many as 57 people were given warm red ginger and salt compresses for 20 minutes for 28 days with the results of a combination of warm compresses using red ginger and additional salt proven to reduce joint pain complaints in children. gouty arthritis sufferers (Yada & Ka'arayeno, 2019).

In Arlina's research (2019), using a warm compress method using grated red ginger with a sample of 45 people (Arlina et al., 2019). Giving warm water compresses is carried out for 20-30 minutes and the results obtained are warm compresses using grated red ginger are able to reduce the pain scale in arthritis sufferers. The warm compress method using grated red ginger was also carried out by (Samsudin et al., 2016), carried out on 30 respondents with a duration of 20 minutes, this study is in line with research by (Ani, 2018) as many as 17 samples were given the intervention of red ginger compress therapy, compresses on painful areas during 20 minutes.

Giving warm compresses using grated red ginger to 38 respondents for 20 minutes for 7 days (Navisah, 2018). This study is in line with Anita's Research (2020) as many as 25 samples were given a warm compress using red ginger for 20 minutes, 2 times for a week in a row indicating a decrease in the pain scale in respondents (Anita et al., 2020). In Virda Yuniarti's research (2017), as many as 24 respondents gave red ginger compresses to reduce the pain scale of gout sufferers. and do it regularly once a day for 15-30 minutes (Virda Yuniarti et al., 2017).

3.4 There are differences regarding the method of giving red ginger compresses

Red ginger compress is a method of treatment from the outside by rubbing the painful joint or body to provide a warm feeling. This is because the content of ginger which has heat can provide a warm response to areas of the body that feel pain so that it will cause dilation of blood vessels, reduce tension or stiffness in muscles, increase tissue metabolism, increase capillary permeability and decrease blood viscosity.

Research that uses the red ginger warm compress method is found in (Navisah, 2018), for the method, 100 grams/12 cm of red ginger is grated, then placed on a washcloth that has been soaked in warm water at a temperature of 40-50°C and attached to the painful joint area. Compressing is done for 20 minutes 2 times a day in the morning and evening for 7 days in order to get optimal results. Based on the Journal Analysis used, it was concluded that giving

warm compresses using red ginger can reduce pain in patients with gout arthritis, this is supported by research conducted (Anggraeni, 2019; Ani, 2018; Anita et al., 2020; Arlina et al., 2019; Ilham, 2020; Samsudin et al., 2016; Virda Yuniarti et al., 2017).

3.5 Effect of Red Ginger Compress

Based on the literature journals obtained, researchers tend to use the red ginger warm compress method as many as 8 journals (80%), the red ginger jelly compress method 1 journal (10%), the red ginger compress method with salt 1 journal (10%). Red ginger compress is a combination of relaxation therapy and warm therapy that is beneficial for people with joint pain. The content of essential oils and aerosols in red ginger is much higher than other types of ginger, so it is very good for making medicinal ingredients. Red ginger has pharmacological and physiological effects such as providing heat, anti-inflammatory, antioxidant, analgesic, antidiabetic, antiobesity, antitumor, anti-inflammatory effects. In addition to providing a hot effect, ginger also has a spicy effect where the content of gingerol and shogaol is used to reduce gout arthritis pain which has been defined as a phenolic antioxidant component of ginger (Redi Aryanta, 2019).

Ginger placed in the joint area can vasodilate blood vessels so that blood flow becomes smooth so that pain is reduced. Physiological stages of pain with the transduction stage. According to (Pairul, 2017) assumptions, red ginger warm compress therapy has a physiological impact on the body. Where ginger contains gingerol which contains cyclooxygenase which can inhibit the formation of prostaglandins as pain mediators, so that it can help reduce pain (Nabila, Witri Setiawati; Mardison, 2020).

Gingerol in ginger has antioxidant, anti-cancer, antiangiogenesis, anti-atherosclerotic, anti-inflammatory, antipyretic, gastroprotective, cardiogenic, hepatotoxic and antipyretic effects. Red ginger compresses will provide a local response by sending impulses from the periphery to the hypothalamus. When heat-sensitive receptors in the hypothalamus are stimulated, the effector system signals the onset of sweating and peripheral vasodilation. Changes in the size of blood vessels are regulated by the vasomotor center in the medulla oblongata of the brain stem, under the influence of the anterior hypothalamic so that vasodilation occurs. This vasodilation causes blood flow to each tissue to increase, especially those experiencing inflammation and pain, resulting in a decrease in joint pain in inflamed tissues (Liana, 2019). The hot and spicy effect of ginger can cause vasodilation of blood vessels, resulting in decreased pain and increased blood circulation by removing inflammatory factors such as prostaglandins, histamine and bradykinin that cause pain. Heat will stimulate nerve cells to close so that the transmission of pain impulses to the spinal cord and brain can be inhibited (Saifah, 2018). Compress using red ginger is an alternative way to reduce pain in patients with gout arthritis because it can be done anywhere and allows patients to do other activities while doing red ginger compresses (Latulumamina & Aziza, 2018).

4. Conclusion

After a series of research processes were carried out, based on the results of research in 10 journals used, compresses using red ginger were able to improve the quality of life of gouty arthritis sufferers. research used in this literature study. The red ginger warm compress method is used more as an intervention to reduce pain than the red ginger jelly compress method and the red ginger compress mixed with salt.

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Psychological Symptoms Among Menopause Women with The Depression, Anxiety and Stress Scales

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ABSTRACT

Introduction: The assessment instruments used to evaluate the intensity and frequency of symptoms of psychological changes in postmenopausal women vary and depend on menopausal status, age, and demographic characteristics.

Objectives: To determine the intensity and frequency of psychological symptoms in postmenopausal women using depression, anxiety, and stress scale (DASS-21). **Methods:** This study was used a cross-sectional study. 372 participants were recruited by convenience sampling. **Results:** Mean age was 51.83 ± 3.84 years. Menopausal status was divided into three were premenopausal (124, 33.3 %), perimenopause (122, 32.8), and postmenopausal (126, 33.9). Generally, psychological symptoms, such as depression, anxiety, and stress for postmenopausal women are higher than premenopausal and perimenopause women. Which is mean of depression, anxiety, and stress of postmenopausal were 13.71 ± 7.19, 13.86 ± 9.44, 19.78 ± 7.23, respectively.

Conclusions: The prevalence of psychological symptoms in postmenopausal women is higher than in premenopausal and perimenopause women. The implication of this study can be used by health workers especially nurses for access to depression, anxiety, and stress using DASS-21.

1. Introduction

Menopause is the end of female reproductive capability, usually occurs in middle-aged women, during the late 40s or early 50s, signaling the end of the fertile phase of women's life (Bener & Falah, 2014; Gerber et al., 2015; Lampio et al., 2014). The change from a reproductive state to a non-reproductive state does not occur suddenly, but it does occur over several years, and the condition is the result of biological aging (Oppermann et al., 2012). And the psychological problem, such as depression, anxiety, and stress. According to the World Health Organization (WHO), depression is a mental disorder characterized by loss of pleasure or interest, depressed mood, feelings of guilt, decreased appetite, sleep disturbances, low self-esteem, and impaired concentration (American Psychiatric, 2015).

Previous studies have evaluated the relationship between age at menopause, depression, anxiety, and stress (Bener et al., 2012; Erez et al., 2012). Meta-analyses of studies reported that increasing age at menopause is associated with psychological disorders such as depression, anxiety, and stress. The Depression Anxiety Stress Scales (DASS) questionnaire was used as an instrument to assess a person's psychological changes such as depression, anxiety, and stress in menopausal women.

Several previous studies have revealed that there is an asynchronous relationship between psychological changes and menopausal conditions (Erez et al., 2012; Oppermann et al., 2012). However, journal published articles related to menopause in Indonesia still lack. Therefore, the purpose of this study was to determine the psychological symptoms among menopause women with depression, anxiety, and stress scales.

2. Methods

This study was used a cross-sectional study. And a total of 372 participants were recruited by convenience sampling. The inclusion criteria of this study were participants could speak and write Indonesian, work. Participants who had mental disease and hormone therapy users were excluded from this study. The instrument of this study was used scale of DASS-21, developed by Lovibond and the aim of this questionnaire was the access of psychological conditions in three factors, such as depression, anxiety, and stress. Each factor has seven questionnaires to evaluate every factor of DASS-21. These questionnaires were used a Likert scale between 0 and 3. 0 was never, 1 was sometimes, 2 was often, 3 was almost always. This study was evaluated by SPSS, 21.0 version, and used mean, standard deviation (SD). *T-test* was used to analyze the correlation between menopause status and psychological symptoms.

3. Results and Discussion

The total of this study was 372 women, which is the mean of age for menopause women was 51.83 with standard deviation was 3.84, 224 (60.2 %) where have kids less than equal two; the mean of BMI was 24.33 and standard deviation was 3.60. Most of them live with family about 87.71 %. 212 (57 %) women have lower education, 254 (68.3 %) women have income more than equal to 2 million, and around 206 (55.4 %) women had a history of the disease. The menopausal status in this study was divided to be three such as premenopausal, perimenopause, and postmenopausal were 124 (33.3 %), 122 (32.8), and 126 (33.9), respectively (Table 1). Table 2 showed depression, anxiety, stress scales on premenopausal, perimenopause, and postmenopausal. The mean and Standard deviation (SD) of depression, anxiety, and stress for premenopausal were 9.02 ± 7.15 , 10.55 ± 8.51 , 10.27 ± 6.58 ; Perimenopause was 10.6 ± 6.58 , 12.84 ± 9.26 , 13.64 ± 5.63 ; Postmenopausal was 13.71 ± 7.19 , 13.86 ± 9.44 , 19.78 ± 7.23 , respectively. Based on the results showed that very severe symptoms of depression, anxiety, stress for postmenopausal women with 1.6 %, 23 %, and 4 %, respectively (Table 3).

Table 1 The sociodemographic characteristics

Characteristics	Mean (SD)	n	%
Total number of women		372	100
Age (years)	51.83 (3.84)		
45 – 52		206	55.4
53 – 60		166	44.6
Number of children			
≤ 2		224	60.2
> 2		148	39.8
BMI	24.33 (3.60)		
≤ 24.99		224	60.2
> 24.99		148	39.8
Live with			
With family		315	87.71
With relatives		57	12.29
Education			
Lower		212	57
Higher		160	43
Family income(IDR/month)			

< 2 million	118	31.7
≥ 2 million	254	68.3
History of disease		
No	166	44.6
Yes	206	55.4
Menopausal status		
Premenopausal	124	33.3
Perimenopause	122	32.8
Postmenopausal	126	33.9

SD, standard deviation; IDR, Indonesian rupiah; BMI, body mass index.

Table 2 Depression, anxiety, stress scales on premenopausal, perimenopause, and postmenopausal

	Premenopausal	Perimenopause	Postmenopausal
	Mean (SD)	Mean (SD)	Mean (SD)
Depression	9.02 (7.15)	10.6 (6.58)	13.71 (7.19)
Anxiety	10.55 (8.51)	12.84 (9.26)	13.86 (9.44)
Stress	10.27 (6.58)	13.64 (5.63)	19.78 (7.23)

Table 3. The severity of psychological symptoms scales on premenopausal, perimenopause, and postmenopausal

		Premenopausal		Perimenopause		Postmenopausal		<i>P-value</i>
Subscales	Subgroup	n	%	n	%	n	%	
Depression	Normal	112	90.3	114	93.4	92	73	< 0.001
	Mild	5	4	2	1.6	13	10.3	
	Average	4	3.2	2	1.6	10	7.9	
	Severe	3	2.4	4	3.3	9	7.1	
	Very severe	0	0	0	0	2	1.6	
Anxiety	Normal	55	44.4	49	40.2	35	27.8	< 0.001
	Mild	4	3.2	4	3.3	15	11.9	
	Average	26	21	20	16.4	25	19.8	
	Severe	24	19.4	22	18	22	17.5	
	Very severe	15	12.1	27	22.1	29	23	
Stress	Normal	83	66.9	69	56.6	34	27	< 0.001
	Mild	38	30.6	40	32.8	37	29.4	
	Average	2	1.6	6	4.9	25	19.8	
	Severe	1	0.8	7	5.7	25	19.8	
	Very severe	0	0	0	0	5	4	

The mean age of menopause in this study was 51.83 with a standard deviation of 3.84 years. This means age was slightly higher in India that reported the mean age of menopause around 49.55 with a standard deviation of 4.69 years old (Karmakar et al., 2017). The mean of depression for postmenopausal women is higher than perimenopause and premenopausal women. Additionally, anxiety and stress for premenopausal and postmenopausal lower than for postmenopausal women.

This study was used the depression, anxiety, and stress scales (DASS-21) questionnaire. Some studies use questionnaires related to psychological changes such as The Profile of Mood State (POMS) (Ochiai et al., 2015), Beck Depression Inventory (BDI) (Erbi, 2018), but this study uses the psychological symptom rating scale (DASS-21), this questionnaire has been used in several studies in countries to evaluate psychological changes in menopausal women (Bener, 2017; Kannur & Itagi, 2018; Moghani et al., 2018; Soori et al., 2018). This questionnaire has been translated and validated in several languages such as Vietnamese (Le et al., 2017), Turkish (Sarıçam, 2018), Malay (Nordin et al., 2017), Korean (Jun et al., 2018). The DASS-21 questionnaire can also be used to assess the severity of symptoms of depression, anxiety, and stress.

In this study perimenopause, women were noted to experience more vasomotor symptoms when compared to another menopausal group of women, and this was also statistically significant. These results consistent with the previous study was explained that higher severe depression on perimenopause compare premenopausal (de Kruif et al., 2016). Previous studies reported that unpleasant life history, history of depression, somatic symptoms contributed to changes in depressive symptoms during perimenopause (Gibbs et al., 2013). It was explained that depression in postmenopausal women was caused by low concentrations of serotonin and estradiol and high concentrations of follicle-stimulating hormone. These hormones can cause changes in the function of areas of the nervous system and have a role in changes in depression in the postmenopausal period (Stojanovska et al., 2015). This study reports that there is a relationship between psychological changes in depression, anxiety, and stress with menopausal status during premenopausal, perimenopause, and postmenopausal. These results are directly proportional to previous studies (Aguilar-Zavala et al., 2012; Bener & Saleh, 2015; Ljubicic Bistrovic et al., 2012; Low et al., 2011; Wang et al., 2013).

This study has some limitations, firstly, this study was used a self-reporting questionnaire, which could be information biased. Secondly, this study did not access of menstruation cycle and regularly, so it may be a misclassification of menopause status.

4. Conclusion

The mean age of menopausal women in this study was used Depression, anxiety and stress scale (DASS-21) was 51.83 ± 3.84 years. This study showed that postmenopausal higher psychological symptoms of depression, anxiety, and stress compare to premenopausal and perimenopause women. Further research suggests that researchers can investigate factors related to affecting depression, anxiety, and stress for menopausal women.

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Husband Assistance and Anxiety Level of Primiparous Women During The 1st Phase of Labor

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ABSTRACT

Introduction: Unpreparedness in facing the labor process can induce anxiety in pregnant women. The anxiety inhibits the delivery progress, which affect the safety of pregnant women and their babies. Cervical ripening is one of the factors that cause pain and anxiety during labor. Pregnant women need their spouse who assistances them during delivery process. Lack of husband awareness about the importance of their presence and companion during childbirth can induce prolong labor and many others complication. **Objectives:** This study identified the husband assistance, anxiety level and its relationship during the first phase of labor in primiparous women. **Methods:** This descriptive correlational study applied a cross sectional approach. The 43 primiparous women in Private Hospital in Gresik Regency East Java Indonesia were recruited by using accidental sampling. The spearman correlation test was applied to identify the correlation of husband assistance and anxiety level. **Results:** The correlation between husband's assistance and anxiety levels (r) = 0.976 with a significance p value = 0.000. Almost half participants were less than 19 years old, graduated from junior high school and became housewife. The husband assistance was 79% and the anxiety level (severe) was 80%. **Conclusion:** There was a correlation between husband assistance and the anxiety level. Primiparous women in the hospital who had lack of husband assistance starting from delivery preparation induced severe anxiety. Therefore, it is expected that birth attendants can provide full assistance for primiparous women during labor duration to assist primiparous women cope with the critical situation.

1. Introduction

Lack of readiness to face the delivery process in primiparous women will cause fear and anxiety in primiparous women and resulting the delay of delivery progress which can endanger the safety of pregnant women and their babies. Conditions before delivery are one of the factors that can induce anxiety. The process of giving birth to a baby is not always somatic in nature, but psychosomatic because many psychological elements also affect the smooth or slow delivery process (Yulizar & Zuhrotunida, 2018). Labor is a series of processes that end with the expulsion of the products of conception by pregnant women. Labor is a process in which the baby, placenta, and amniotic membranes come out of the mother's uterus, a normal delivery occurs at 37 weeks of gestation or more without complications (Siti Fauziah, 2017). Some women think that pregnancy is a nature that must be passed, but some consider it as an event that determines the next life (Siallagan & Lestari, 2018).

It was estimated that 28.7% of 107,000,000 women have anxiety experience and in Java Island was estimated 52.3% or 355,873 women of 679,765 third trimester pregnant women who experienced anxiety in facing childbirth (Siallagan & Lestari, 2018).

According to East Java Provincial Health Office 2019, the level of anxiety is very influential on the welfare of pregnant women and the fetus in the womb. A low level of anxiety in pregnant women can reduce the complications caused so that it can indirectly reduce the maternal mortality rate (MMR) and infant mortality rate (IMR) in Indonesia, while a high level of anxiety can exacerbate complications that occur and increase MMR and IMR. This is in accordance with research conducted by Triasani & Hikmawati in 2016 with a sample of 45 pregnant women respondents who experienced moderate levels of anxiety experienced

hypertension by 52.7% while those who experienced high levels of anxiety experienced preeclampsia by 57.8%.

This anxiety condition is an inevitable event and always accompanies pregnancy due to physical and psychological changes (Siallagan & Lestari, 2018). These changes occur due to hormonal changes that will affect the fetus to grow and develop at birth. Anxiety in pregnant women can arise, especially in the third trimester of pregnancy until delivery, where during this period pregnant women feel anxious about various things such as normal or abnormal birth of the baby, pain that will be felt, and so on. With labor approaching, especially in your first pregnancy, it's natural to feel anxious or afraid because pregnancy is a new experience (Suhermi & Amirasti, 2020).

Anxiety will have a negative impact on pregnant women from pregnancy to delivery, such as a restless fetus that inhibits its growth, weakens uterine muscle contractions, and so on. These impacts can harm the mother and fetus. A study in Indonesia shows that pregnant women with high levels of anxiety have a risk of giving birth to premature babies and even miscarriages (Suhermi & Amirasti, 2020). The causes of fear of childbirth were stated as biological reasons (illness), psychological reasons (individual, past traumatic events, fear of becoming a parent) and lack of social assistance. It was reported in research that fear of childbirth can lead to long-term use of contraception where long-term use of contraception is used to delay, space out pregnancy and stop fertility which is used long-term by the mother so that she does not get pregnant and does not feel fear and anxiety in facing childbirth. Another complications of prenatal anxiety are childbirth, increased use of analgesia at birth, increased birth intervention, urgent and optional caesarean sections, postpartum depression, posttraumatic stress disorder, delayed mother-infant attachment (Richens et al., 2018).

First stage of labor is the onset of true labor contractions, which is characterized by progressive cervical changes ending with complete dilatation (10cm) in primiparas, 1st stage lasting about 13 hours, while in multiparas it lasts about 7 hours (Ayu & Supliyani, 2017). Husband's assistance or involvement is very much needed during the labor process, starting from the latent phase until delivery (Nikmah, 2018) The presence of the husband will bring peace to the mother, because the delivery process requires a birth attendant (Yulizar & Zuhrotunida, 2018).

The husband is said to accompany his wife during childbirth, namely when the husband provides all the physical and psychological care needed by the mother through continuous labor starting from the first stage of labor in the active phase or from opening 4 to opening 10 (Puspitasari, 2020). Based on preliminary research at a private hospital in a District of Surabaya city, from 28 mothers giving birth at midwifery, from January to March 2018, there were 24 pregnant mothers who were accompanied by their husbands and 4 pregnant mothers who were not accompanied by their husbands. The 28 pregnant mothers who were accompanied by their husbands felt calm when facing the birth process, while the other 4 mothers who gave birth alone experienced a high level of anxiety / felt anxious because the delivery process was not accompanied by their husbands, because most of the time their husbands were busy at work (Nikmah, 2018).

The presence of childbirth assistance/husband, can provide encouragement for mothers to reduce anxiety. The situation in the hospital can induce the anxiety and it is difficult to eliminate them. Pregnant women who are always thinking about environmental conditions both based on the risk of birth itself, for example death, thinking about administration, especially when she is pregnant. Listening to the delivery must be continued with surgery, then the mother's anxiety will be even more peaked. All hospitals, other health care services and husbands are less aware of the importance of the presence of a companion during childbirth (Ginting, 2019).

Based on an initial survey conducted by researchers in January 2021, at Public hospital Gresik, there were 9 mothers gave birth normally, and 7 mothers of them were experienced anxiety in facing childbirth. The maternal assistance to the pregnant mother who has lack of experience such as primiparous women can be the form of attention, giving love, a sense of comfort and security. The husband will often busy with his own activities such as being outside

the delivery room and does not provide assistance to the primiparous women. Meanwhile, 2 maternity mothers felt that they were ready and did not feel anxious because their husbands were always beside them and accompanied them to assist their mothers, such as a husband wiping his wife's sweat during childbirth.

2. Methods

The research design applied in this research was descriptive correlational research that applied a cross sectional approach. The population in this study were pregnant women who will experience normal delivery at labor room of a private hospital in Gresik. The accidental sampling methods recruited 48 primiparous women who meet the inclusion criteria like Normal vaginal delivery, Primiparous maternity, during 3rd trimester and agree to be a participant. The excluded participant will be the pregnant women who had a history of concomitant disease during pregnancy and did not get the consent from her husband to participate in this study. This study was conducted from September 2020 to August 2021.

The Husband's assistance instrument was applied to identify the husband assistance with 0.8 for validity and 0.94 for reliability. The Husband's assistance instrument is the form of closed 20 questions, with answer options for dichotomy questions, namely: if the husband accompanies his wife when she is about to give birth by taking action (score 1) and if the husband accompanies when his wife is about to give birth by not taking action (score 0). The Measurement resulted as Good (14-19), Enough (7-13), and Less (0-6).

Anxiety questionnaires facing childbirth were measured by questionnaires Zung Self-rating Anxiety Scale (ZSAS) with the validity is 0.818 while the reliability test is 0.829. ZSAS is a questionnaire used to measure symptoms related to anxiety. This questionnaire was designed to record the presence of anxiety and to assess the quantity of anxiety levels. This questionnaire contains 20 questions, consisting of 5 positive statements and 15 negative statements describing anxiety symptoms. Each question from the questionnaire instrument is given a score of 1-4 answer choices which have the following weighting: 1 = Never, 2 = Sometimes, 3 = Part of the time, and 4 = almost every time. The standard score for the degree of anxiety is 20-80, with the following groupings: Score 20-44 (Normal/no anxiety), Score 45-59: (mild anxiety), Score 60-74 (moderate anxiety) and Score 74-80 (severe anxiety).

After getting exemption from the ethical committee of Medical Faculty University of Muhammadiyah Malang, research ethics with ethics number No.E.5.a/118/KEPK-UMM/VI/2021, The researcher gave explanations/briefings to 2 research assistants who helped researchers when taking data, 1st assistant was in charge of documentation and assisted by a nurse in providing explanations to respondents. Data collection started by approaching respondents with the COVID-19 protocol, including Performing an antigen swab test on respondents and researchers before the study was conducted.

Researcher explained the purpose and objectives of the research to respondents by asking for approval from research respondents. Researchers distributed questionnaires to respondents as many as 6 sheets in the form of research questionnaires and informed consent sheets, the research was assisted by 1 assistant. One research assistance help the respondents read the questions in the questionnaire for 10 minutes by reading the questionnaire to the respondents. The total time for data collection is 15 minutes. The univariate analysis in this study was the respondent's characteristics in the form of age, education level, occupation, and level of anxiety in the first stage of primiparous women. The bivariate analysis identified the correlation between husband's assistance with the level of anxiety in the first stage of primiparous women.

3. Results and Discussion

3.1 Characteristics of Respondents

It is known that the results of the characteristics of the respondents from the table 1 below shown that the characteristics of respondents based on the percentage of age are the majority of respondents aged <19 years with 21 respondents with a percentage of 48.8%. Characteristics of respondents based on the percentage level of education is the majority of respondents education level was junior high school with 19 respondents with a percentage of 44.2%. Characteristics of respondents based on the percentage of work was the majority of respondents work as housewife with 29 respondents with a percentage of 67.4%.

Table 1 Characteristics of Respondents Husband's Mentoring with Anxiety Levels in Maternity Mothers in

Respondents Characteristics	f	%
Age (Years)		
< 19 Years	21	48.8
20-24 Years	13	30.2
>24 Years	9	20.9
Level of education		
junior high school	19	44.2%
senior High School	15	34.9 %
College	9	20.9 %
Occupation		
House wife	29	67.4%
entrepreneur	10	23.3%
civil servant	1	2.3%
Private employees	3	7.0%

the 1st Stage (n=43)

3.2 Frequency Distribution of Husband's Mentoring

From the results of table 2 below it was known that the distribution of husband's assistance to pregnant women in the first stage, namely in the good category, obtained 6 people (14.0%), 3 people (7.0%) had sufficient assistance, while 34 people (79.1%) percent have less assistance. From the results of the frequency distribution of husband's assistance to respondents, it can be concluded that on average the respondents in this study received less assistance from their husbands during childbirth.

Husband's assistance	n	(%)
Well	6	14.0%
Enough	3	7.0%
Less enough	34	79.1%
Total	43	100%

Table 2 Frequency distribution of husband's assistance (n=43)

3.3 Frequency Distribution of Maternal Anxiety in 1st Stage

From the results of table 5.3 it is known that maternal anxiety in the first stage is obtained by 6 (14.0%) respondents having no anxiety, 3 (7.0%) respondents having mild anxiety, 2 (4.7%) respondents having moderate anxiety, while 32 (74.4%) respondents have severe anxiety. From the results of the frequency distribution of anxiety in the first stage of labor, it can be concluded that the average respondent in this study experienced severe anxiety.

Maternal anxiety	N	Percent %
No anxiety	6	14.0%
Light	3	7.0%
currently	2	4.7%
Heavy	32	74.4
Total	43	100%

Table 2 Frequency distribution of maternal anxiety at stage 1

3.4 Tabulated results between the relationship between husband's mentoring and the anxiety level of primigravida mothers

The results of the relationship between husband's mentoring and anxiety levels in first-stage maternity mothers using the Spearman Rank Correlation test which has been presented in table 4.

Table 3 The relationship between husband's assistance and anxiety level of primigravida mothers at stage 1

Mentoring Husband	Anxiety level					R	P - value
	No anxiety	Light	currently	Heavy	Total		
Well	6 (14.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	14.0%	0.976	0.000
Enough	0 (0.0%)	3 (7.0%)	0 (0.0%)	0 (0.0%)	7.0%		
Not enough	0 (0.0%)	0 (0.0%)	2 (4.7%)	32 (74.4%)	79.1%		

The results of the cross tabulation between husband's mentoring and anxiety levels were obtained from 6 respondents (14.0%) who had good husband assistance and did not have anxiety, then from 3 respondents (7.0%) who had sufficient husband assistance, they had anxiety. mild, then from 34 respondents (79.1%) who had less husband assistance, there were 2 respondents who had moderate anxiety and 32 respondents (74.4%) had severe anxiety.

The results of the Spearman correlation between husband's mentoring and anxiety levels obtained a correlation coefficient (r) of 0.976 with a significance value of $p = 0.000$. These results indicate that the significance value is less than 0.05 ($\text{sig} < 0.05$) so it is stated that there is a significant positive relationship, so it can be concluded that the better the husband's assistance that is carried out will have a significant effect on reducing maternal anxiety levels with anxiety facing childbirth in mothers giving birth in the 1st stage have very strong closeness (0.80-1,000).

4. Conclusion

The results of the study can be seen that most of the respondents received assistance from their husbands in the less category as many as 34 respondents or 79.1% the presence of a companion in childbirth can change the condition of the mother in labor for the better and can minimize and reduce postnatal trauma. In maternity mothers who are accompanied by their husbands during delivery, they do not need much pain medication and other medical interventions. Thus also the feeling, after the baby is born, the mother feels more proud of herself and the baby who has been born (Yulizar & Zuhrotunida, 2018).

The results of the study are in accordance with the research (Hidayah et al., 2021) that the occurrence of anxiety stems from new experiences such as pregnancy, and the birth of a child or childbirth. That this means pregnant women who are experiencing their first pregnancy (primigravida) and experiencing more anxiety is a natural and common thing. As for pregnant women who have undergone pregnancy or childbirth more than once (multigravida) and experience mild anxiety, it is also a normal and natural thing to happen. There is a difference in the level of anxiety between primigravida and multigravida in the process of childbirth related

to the experience of childbirth, namely the more often they experience the process of delivery, the level of self-confidence increases so that the level of anxiety in maternity mothers tends to be less experienced by multigravida maternity mothers. Meanwhile, primigravida mothers who do not have experience in childbirth may have a very low level of self-confidence so that they tend to experience severe anxiety. In mentoring husbands or people closest to primigravida mothers, they really need someone who can strengthen and provide positive things and provide attention support so that the anxiety experienced by maternity mothers can be reduced.

The low level of education can worsen the anxiety level of the mother in facing the delivery process. In this case, women as candidates for a mother will give birth to offspring from a generation, so that to produce offspring from a quality generation, of course, it can be started from the time of pregnancy. Moreover, it was the first pregnancy. Because most primigravida mothers experience very heavy anxiety because they get information from bad stories about childbirth. With low education in maternity mothers and lack of correct information, mothers with low levels of education are easy to believe in unfavorable things about childbirth from information that is not necessarily true (Nikmah, 2018). Work is an activity that can be time-consuming so that pregnant women who are working experience less anxiety than mothers who do not work because work can divert the feelings of anxiety felt by mothers in dealing with the time of delivery (Notoatmodjo, 2018).

The husband's assistance during the delivery process had a very good impact on the mother's psychology and had a positive impact on the mother's physical readiness. Because the husband is someone who most often accompanies the mother during childbirth, by having a considerable influence on the success of a safe delivery which can reduce the occurrence of complications in the baby to be born and will facilitate the delivery process.

However, there were 32 maternity mothers (74.4%) who were accompanied by their husbands whose level of anxiety was moderate to severe. This is because she has just experienced her first pregnancy and also the husband does not give attention or support to his wife but the husband is outside his spare while the mother gives birth in the room alone. Where mothers who are pregnant for the first time have not experienced labor, causing the mother to be uneasy in the face of childbirth. Meanwhile, mothers who have experienced pregnancy and childbirth will feel calmer in the face of childbirth. With the experience of pregnancy or childbirth, mothers will be better able to adjust to pregnancy or childbirth.

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Relationship Between Knowledge Level and Family Caregiver Behavior in Preventing Pulmonary Tb Transmission Among Family Members

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ABSTRACT

Introduction: Knowledge cannot be separated from the formation of a behavior. It is very important for family members who live at home with pulmonary TB patients to have a good knowledge, so that family members can take precautions to prevent pulmonary TB transmission. **Objectives:** This study aims to determine the relationship between the level of knowledge with family behavior in the prevention of pulmonary TB transmission. **Methods:** This study used a cross-sectional design with a sample of 29 family members who live in the same house with pulmonary TB patients in the working area of Ciptomulyo Public Health Center, Malang City. The sampling technique used is total sampling with spearman rank test data analysis. A total of 21 (72.4%) respondents had a good level of knowledge and 19 (65.5%) respondents had good behavior in preventing pulmonary TB transmission. **Results:** Spearman rank test results show a sig. (2-tailed) value of 0.000. The correlation coefficient obtained is 0.664, meaning that there is a positive relationship with a sufficient level of strength between the level of knowledge and the behavior of preventing pulmonary TB transmission. There is a relationship between the level of knowledge with family behavior regarding the prevention of pulmonary TB transmission. So it is very necessary to provide health education to increase knowledge about TB transmission in the family. **Conclusions:** There is a relationship between the level of knowledge with family behavior regarding the prevention of pulmonary TB transmission. So it is very necessary to provide health education to increase knowledge about TB transmission in the family. There is a relationship between the level of knowledge with family behavior about the prevention of pulmonary TB transmission. So it is very necessary to provide health education to increase knowledge about TB transmission in the family.

1. Introduction

The burden of disease varies widely between countries, ranging from five to more than 500 new cases per 100,000 population per year, with a global average of around 130. In 2000 and 2015 the number of deaths from tuberculosis decreased by 22%, but in 2016 tuberculosis still occupies ranked the 10th highest cause of death in the world according to the WHO report. It is estimated that there were 1.2 million (range, 1.1–1.3 million) TB deaths in HIV negative people in 2018 (27% decreased from 1.7 million in 2000), and an additional 251,000 deaths (range, 223,000 –281,000) in HIV positive people (60% decreased from 620,000 in 2000). Therefore, tuberculosis is one of the goals in the SDGs (Sustainability Development Goals) and is still a top priority in the world.(Ministry of Health, 2018; World Health Organization, 2019). According to a report from the Malang City Health Office, the number of TB patients in the Malang City area, East Java, reached 1,852 cases during 2016, an increase from 2015 which recorded 1,123 cases (Dinkes Kota Malang, 2018).

Knowledge and behavior factors have a major impact on the health status of individuals and communities and play an important role in determining the success of a disease control program and prevention of transmission, including tuberculosis. According to the results of the study, individuals or communities who have low knowledge have a risk of contracting tuberculosis by 2.5 times more than people with high knowledge, while bad behavior has a risk of contracting 3.1 times more than people who behave well (Rahman et al., 2017). In other studies, it is considered that knowledge is important for changing behavior, so that individuals can acquire knowledge and skills through learning. Thus, patients and their families need to

actively receive knowledge, which can lead to the gradual development of healthy beliefs and attitudes that are reinforced by the adoption of healthy behaviors.(Florida R. Ayurti, Yasinta Betan, 2016). Behavior and habits will also determine a person's lifestyle, behavior can be seen from habits and the surrounding environment. Starting from how to prevent TB transmission, unhealthy lifestyles such as houses without ventilation or maybe not well ventilated will increase disease transmission easily. The density of the house reduces the distance between one person and another so that transmission is easy (Dukomalamo Muhammad Irsyad, 2019).

The prevalence of pulmonary TB in the community is still very high, but the prevention program with the Directly Observed Treatment (DOTS) strategy is still low, and the dropout rate for patients with pulmonary TB is still high, so controlling risk factors for transmission is important, especially in high-risk groups such as families of patients and their families. toddler (Lailatul et al., 2015). The results of the study on TB transmission by the World Health Organization in households revealed that 180 out of 282 (63.8%) children under 6 years old who had household contact with smear-positive TB patients were identified as infected.(World Health Organization, 2018). According to the United States Agency for International Development Health Care Improvement (USAID HCI) in 2009, the proximity and intensity of exposure is one of the factors that can cause infection transmission. Individuals who are at risk of exposure to bacilli are individuals who live close to people who are actively infected, this group includes family members of patients. Families of patients who are mostly elderly or infants, low in economy, and low levels of education are very susceptible to pulmonary TB transmission so that they become the main focus in preventing transmission (Florida R. Ayurti, Yasinta Betan, 2016).

The behavior of preventing transmission of pulmonary TB can be influenced by several factors. According to Notoatmodjo, (2014) factors of knowledge, perceptions, attitudes, desires, intentions, motivations, and intentions that influence prevention behavior. In theory Lawrence Green there are 3 factors that influence behavior, namely predisposing factors (knowledge, attitudes, beliefs, beliefs, values, and so on), supporting factors (physical environment, availability or unavailability of health facilities or facilities) and driving factors (attitudes and behavior of health workers or other officers who are a reference group of community behavior). Meanwhile, in Snehandu B. Kar's theory, the factors that influence behavior consist of intentions, social support, information and health facilities, personal autonomy and situation (Notoatmodjo, 2014).

Previous research conducted by Florida R. Ayurti, Yasinta Betan (2016) The relationship between knowledge and attitudes towards family behavior in preventing the transmission of tuberculosis in the work area of the Oesapa Public Health Center concluded that there was no relationship between the level of knowledge and family behavior. (Florida R. Ayurti, Yasinta Betan, 2016). Meanwhile, according to research Rahman et al., (2017) knowledge and attitudes of the community about tuberculosis prevention efforts are obtained ($p < 0.1$) it can be concluded that there is a relationship between the level of knowledge with tuberculosis prevention behavior (Rahman et al., 2017). So the purpose of this study was to determine the relationship between the level of knowledge with family behavior about preventing pulmonary TB transmission.

1. Method

This research method uses quantitative research methods using a correlational design with a cross sectional approach. The sampling technique used in this research is total sampling. The samples taken in this study were 29 family members who cared for people with pulmonary TB. Data were collected using a validated questionnaire.

A knowledge questionnaire on preventing pulmonary TB transmission was given to family members who care for pulmonary TB patients in the Ciptomulyo and Gadang areas, Malang City. The questionnaire in the form of multiple choice was taken from the research of Tiara Emilia Sari (2013) with 10 questions answered with multiple choice answers and consisted of 7 grids, namely understanding, causes, symptoms, transmission, complications,

treatment principles, prevention. The family knowledge questionnaire was divided into 2 interpretations, namely good knowledge score >7.86 , bad knowledge score 7.86 with a total score of 10

A behavioral questionnaire for preventing pulmonary TB transmission was given to family members who care for pulmonary TB patients in the Ciptomulyo and Gadang areas, Malang City. Questionnaire in the form of a checklist adopted from the research (Lailatul et al., 2015) then developed by the researcher with 10 questions answered with the answers "Always" "Sometimes" and "Never" consisting of 3 items, namely environmental modification, efforts to cut disease transmission, and drug consumption and routine control to the puskesmas. The highest score in this questionnaire is 30 and the lowest is 10. In the categorization using a Likert scale there are three categories, namely Good (21-30), Moderate (11-20), Poor (0-10) (Nursalam, 2017). Categorization is obtained from the following calculations adopted from The Self-Management Dietary Behaviors Questionnaire (SMDBQ). The research data were analyzed using the Spearman Rho . test

2. Result and Discussion

All families who care for pulmonary TB patients are in the age range of 18-65 (youth) as many as 29 (100%) with an average age of 35.45. The most recent education of family members who cared for pulmonary TB patients was high school with 21 people (72.4%). All family members have been exposed to information on pulmonary TB with the majority of health workers numbering 27 people (93.1%). The length of time patients suffered from pulmonary TB was the most in the range of 1-6 months as many as 20 people (69%) (table 1).

Table 1. Characteristics of Respondents

No	Characteristics	F	Percentage (%)
1	Age (years) according to WHO:		
	- 0 – 17 years	0	0
	- 18 – 65 years	29	100
	- 66 – 79 years old	0	0
	- 80 – 99 years	0	0
	- 100 and above	0	0
	mean	35.45	
	Standard deviation	10.23	
2	Gender		
	- Man	5	17.2
	- Woman	24	82.8
3	last education		
	- Middle/junior high school	3	10.3
	- SMA/SMK/SLTA/SMU	21	72.4
	- S1	5	17.2
4	Exposure to pulmonary TB information		
	- Health workers	27	93.1
	- Siblings or friends	2	6.9
5	The length of time the patient has had pulmonary TB		
	- 1-6 months	20	69
	- 6-12 months	3	10.3
	- 12-24 months	6	20.7

The majority of respondents have a high level of knowledge that is equal to 72.4% (n=29) (table 2).

0%)

Table 2 Description of Family Knowledge

Category	Level of Family Knowledge about prevention of pulmonary TB transmission	(%)	Total
Good	21	72.4	(100%)
Poor	8	27.6	

The frequency of the behavioral variables of family members caring for pulmonary TB patients in the work area of the Ciptomulyo Public Health Center Malang City was in the good category as many as 19 people (65.5%) and in the sufficient category as many as 10 people (34.5%) (table 3).

Table 3 Description of Family Behavior in preventing pulmonary TB transmission

Category	Behavior of Family Members regarding the prevention of pulmonary TB transmission	(%)	Total
Good	19	65.5	(100%)
Moderate	10	34.5	
Poor	0	0	

Table 4 shows the results of the cross-tabulation between the level of knowledge and family behavior regarding the prevention of pulmonary TB transmission, it is known that there are 21 (72.4%) respondents with a good level of knowledge, 18 (62.1%) respondents have good pulmonary TB transmission prevention behavior. and 8 (27.6%) respondents have a poor level of knowledge, of which 7 (24.1%) have adequate pulmonary TB transmission prevention behavior. The results of the study showed that there was a relationship between the level of knowledge and family behavior regarding the prevention of pulmonary TB transmission ($p=0.000$). The correlation coefficient (0.664) indicates the level of relationship between the variable level of knowledge and family behavior regarding the prevention of pulmonary TB transmission in the category of sufficient correlation.

Table 4 Knowledge Level with Family Behavior in Prevention of Pulmonary TB Transmission

		Behavior in Prevention of Pulmonary TB Transmission			Total	p	r
		Good	Moderate	Poor			
Knowledge level	Good	18 (62.1%)	3 (10.3%)	0 (0%)	21 (72.4%)	0.001	0.664
	Poor	1 (3.4%)	7 (24.1%)	0 (0%)	8 (27.6%)		
	Total	19 (65.5%)	10 (34.5%)	0 (0%)	29 (100%)		

Table 5 Detailed Information on Family Behavior in Prevention of Pulmonary TB Transmission

No	Question	Always	Sometimes	Never
1	Family members open their bedroom windows and doors every day	19 (65.5 %)	10 (34.5%)	0 (0%)
2	Drying the mattress used by pulmonary TB patients once a week	11 (38%)	9 (31%)	9 (31%)
3	Cleaning damp places	26 (89.7)	3 (10.3)	0 (0%)
4	Remind people with pulmonary TB not to throw phlegm in any place	16 (55.2%)	3 (10.3%)	10 (34.5%)

5	Remind people with pulmonary TB when coughing they must cover their mouth with their hands	16 (55.2%)	13 (44.8%)	0 (0%)
6	Remind people with pulmonary TB to wear masks wherever they are	16 (55.2%)	4 (13.8%)	9 (31%)
7	Remind patients with pulmonary TB to take medication regularly and check at the Puskesmas	18 (62.1%)	2 (6.9%)	9 (31%)
8	Family members never open the windows of the room and the door of the house	1 (3.4%)	0 (0%)	28 (96.6%)
9	Family members never remind people with pulmonary TB when coughing they have to cover their mouth with their hands	0 (0%)	13 (44.8%)	16 (55.2%)
10	Never dry the mattress used by pulmonary TB patients once a week	0 (0%)	17 (58.6%)	12 (41.2%)

Information that can be obtained from the questionnaire details about family behavior in preventing transmission of pulmonary TB is that most family members open their room windows and doors every day, clean damp places, and remind people with pulmonary TB to take medication regularly and control them at the Puskesmas. . Half of the respondents stated that reminding pulmonary TB patients not to throw phlegm in any place, reminding pulmonary TB patients when coughing to cover their mouths with their hands, and reminding pulmonary TB patients to wear masks wherever they are (table 5).

The results of the research conducted in the Ciptomulyo Health Center Working Area, Malang City, showed that the majority of respondents had a good level of knowledge. Respondents with a good level of knowledge will have the potential to behave according to their level of knowledge. All respondents have been exposed to information on pulmonary TB with the majority getting information from health workers. Respondents used in this study had education ranging from junior high school to undergraduate level with the majority reaching high school level. The respondent's experience factor in treating pulmonary TB patients determines their knowledge, this is in line with Notoatmodjo that the level of knowledge can be influenced by several things, such as education and one's experience (Notoatmodjo, 2014). The majority of respondents answered correctly on several question items such as signs and symptoms, modes of transmission, and principles of pulmonary TB treatment. This result is supported by Gendhis' research that families have high motivation to recover and are afraid if the disease continues and are afraid if they forget to take medicine and treatment must be started again. (Supriyono et al., 2013).

Research respondents who are in the Ciptomulyo Public Health Center Work Area, Malang City, it is known that family members who have a good level of knowledge have good pulmonary TB transmission prevention behavior as well. These results are supported by research Rahman et al., (2017) that the level of knowledge will affect attitudes and efforts to prevent pulmonary TB transmission. Education and experience possessed by a person is one that shapes a person's knowledge (Rahman et al., 2017).

The results of the study in the Ciptomulyo Public Health Center in Malang City showed that the majority of respondents had good pulmonary TB transmission prevention behavior. The data proves that family members have better pulmonary TB transmission prevention behavior than family members with low transmission prevention behavior. These results were obtained because the level of knowledge of family members about pulmonary TB was good. This result is reinforced by the research of Rizana, Tahlil, & Mulyadi who said that the factors that determine the prevention of pulmonary TB transmission are knowledge and attitudes. Knowledge and attitude factors are very supportive of a person in an effort to prevent the transmission of pulmonary TB (Novia Rizana, 2016).

The results showed that the highest education level of the 29 respondents was SMA/SMK/SLTA/SMU education. The level of knowledge of family behavior about preventing

pulmonary TB transmission is not only influenced by how high the level of education is, but also influenced by previous individual experiences. The experience of family members caring for pulmonary TB patients is the majority in the range of 1-6 months. This indicates that individual experience factors greatly determine preventive behavior. Previous research states that families move from fear to realizing the risk of TB transmission through fear of TB, seeking information, following God's will, and awareness of the risks of TB transmission (Rakhmawati et al., 2019).

The results of this study can be concluded that there is a relationship between the level of knowledge and family behavior about preventing pulmonary TB transmission, and the results of the Spearman Rank correlation strength test of 0.664 indicating that the strength of the relationship in research regarding the level of knowledge with family behavior about preventing pulmonary TB transmission is sufficient. The family said that they had been exposed to information about pulmonary TB from health workers and neighbors. The more families exposed to information, the more potential the family has good knowledge. This research was supported by Amelia, Nurbaeti, Baharuddin, & Sari who stated that the more information entered, the more information or knowledge gained about the disease and prevention of infectious pulmonary tuberculosis.(Amelia, 2019). Family knowledge gained from health workers and the surrounding area encourages local families to behave well. This study was supported by Rizana, Tahlil, & Mulyadi who said that the factors that determine the prevention of pulmonary TB transmission are knowledge and attitudes. Knowledge and attitude factors are very supportive of a person in an effort to prevent the transmission of pulmonary TB. The results of the tests that have been carried out can be concluded that the better the level of knowledge, the better the behavior of the family about preventing pulmonary TB transmission (Novia Rizana, 2016).

These results are supported by the research of Andika, Syahputrai, & Husna which concludes that there is a significant relationship between family knowledge and the behavior of preventing tuberculosis transmission in the work area of the Kuta Baro Health Center, Aceh Besar (Andika et al., 2016). The probability value obtained is significant, namely $0.006 < 0.05$. Families will behave well if they know the dangers of pulmonary TB transmission. Then strengthened by research Rahman et al., (2017), that the level of knowledge can determine whether the family will show a certain behavior, how the behavior of the family in preventing the transmission of pulmonary TB. Family behavior is very concerned about the consequences caused by tuberculosis, family behavior and awareness to check phlegm and use health service facilities(Rahman et al., 2017). This is in line with Yermi's research which states that there is a significant relationship between knowledge and attitudes with the role of the family in the prevention of pulmonary TB (Yermi et al., 2018). However, this is different from the research conducted by Florida R. Ayurti, Yasinta Betan which stated that there was no relationship between the level of knowledge and the behavior of preventing pulmonary TB transmission, which obtained p value = 0.204. The researcher concludes that the family is not aware of how dangerous the disease is, so they do not take precautions to anticipate the bad effects that will occur someday (Florida R. Ayurti, Yasinta Betan, 2016).

3. Conclusion

The majority of family members who care for pulmonary TB patients in the Malang City Health Center work area have high school education and the majority have 1-6 months of experience caring for pulmonary TB patients with a good level of knowledge. Family members who care for pulmonary TB patients in the work area of the Ciptomulyo Public Health Center, Malang City have good behavior to prevent pulmonary TB transmission. There is a significant relationship between the level of knowledge with family behavior regarding the prevention of pulmonary TB transmission. The better the level of knowledge of family members, the behavior of preventing pulmonary TB transmission will also be better.

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Mobilization of Stroke Patients during the Covid-19 Pandemic: A Qualitative Research

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ABSTRACT

Introduction: The Covid-19 pandemic has made it difficult for patients' families to access health services. This is because there is a feeling of fear and worry about being exposed to the COVID-19 virus. **Objectives:** explore family experiences in providing care mobilization for stroke patients at home. **Methods:** The design of this study was a qualitative study with a content analysis approach. The participants of this study were a family in rural Indonesia who cared for or one of their family members who suffered a stroke. There were three participants, namely the patient (P3), wife (P1), and children (P2). A purposive sampling technique was used in starting the interview. Data was collected using semi-structured interviews focusing on stroke survivors and their families. **Results:** There are two themes, namely exercise and taking care of food, which is family efforts to care for stroke patients during the Covid-19 pandemic, mobilization to prevent tissue damage, and do not require special facilities. **Conclusions:** Early mobilization is very important for early stroke sufferers through regular exercise such as walking around the house and light stretching every day, controlling the food eaten every day, and a high recovery rate.

1. Introduction

Stroke requires special treatment and the role of the family is very important. Families can encourage client motivation and participate in stroke treatment (Setyoadi et al., 2018). The Covid-19 pandemic has made it difficult for patients' families to go to health services. This is because there is a feeling of fear and worry about being exposed to the COVID-19 virus. The problem of family resilience as a result of the COVID-19 pandemic is stress, anxiety, depression (Rehman et al., 2020). The incidence of stress, anxiety and depression experienced by families during the COVID-19 pandemic is: 50.9% of families feel threatened and anxious, 67.4% show signs of stress and 58.6% lead to depression (Shah et al., 2020), psychological tension by 43.3%, 26.5% experienced depression, 20.3% experiencing anxiety, 21.2% experiencing stress (Traunmüller et al., 2020). One effort to overcome this condition is to provide care for stroke patients by providing mobilization interventions for stroke patients at their homes.

The World Health Organization (WHO) defines stroke as a rapidly developing clinical symptom resulting from focal or global brain dysfunction, which can result in death or disability lasting more than 24 hours. No other causes except vascular abnormalities (Afrida, 2018). The prevalence of stroke in various regions in Indonesia is South Sulawesi Province at 17.9%, followed by DI Yogyakarta at 16.9%, then Central Sulawesi at 16.6%. In southern Kalimantan, the prevalence of stroke sufferers is 9.2%, and the prevalence of stroke patients diagnosed by health workers and symptoms is 14.5% (Byna & Basit, 2020).

Mobilization exercises for stroke patients also aim to improve neurological function through physical therapy and other techniques (Xu et al., 2017). Bed mobilization is a stroke treatment plan that aims to prevent stiffness (contractions) and decrease stiffness resolution (hair loss), optimize treatment of health problems, and provide psychological support for patients and families (Wang et al., 2020). So that the muscles are not disturbed by muscle strength, it is necessary to mobilize stroke patients, for example by providing a range of motion (ROM) therapy (Anita Shinta Kusuma dan Oktavia Sara, 2020). This study will provide an overview and experience of families in providing mobilization exercises to stroke patients during the COVID-19 pandemic. It is hoped that the patient's physical condition will not

experience significant limitations of movement and can increase the independence of the patient and family. The purpose of this study was to explore the experience of families in providing care mobilization for stroke patients at home.

2. Methods

The design of this research is a qualitative study with a content analysis approach. The participants of this study were a family in rural Indonesia who cared for or one of their family members who suffered a stroke. There are three participants, namely the patient (P3), wife (P1), and children (P2). A purposive sampling technique was used in starting the interview. Data was collected using semi-structured interviews focusing on stroke survivors and their families. The time used for the interview is 45-60 minutes. Data analysis was carried out simultaneously with data collection. Data analysis was carried out with a content analysis approach including (1) transcripts of data from interview results, (2) reading the entire manuscript to get a comprehensive understanding of the content and determining the main unit and code, (3) abstraction of the main unit and code (Elo et al., 2014).

3. Results and Discussion

3.1 Sports and Taking Care of Food are Family Efforts to Care for Stroke Patients during the Covid-19 Pandemic

Efforts made by families to care during the pandemic using routine exercise such as taking walks around the house and taking regular medication. This can be proven by the statements of the three participants as follows:

P1: "One takes care of the food, the other is not too salty and not fatty, nor is it used, not given vaccines for the food, usually the second one takes the medicine because this father is due to cholesterol, so medicine for high blood pressure and cholesterol must be routine, already."

P2: "Maintaining his diet continues to routinely give medicine and is still told to do sports such as going for walks."

P3: "Yo wes it's just one thing to stay enthusiastic, you have to move a lot, don't sleep a lot, you have to keep moving a lot, what can you do, even if you're limping, up until now (pointing at your feet) I still couldn't walk at noon, it was walking -walking on the asphalt until my feet bleed, but the main point is that the main thing is that the important thing is to believe that the disease can be cured, you know."

In carrying out treatment during a pandemic there is no difference between before the pandemic and after the pandemic, it is the same. The patient only does physical activity around his house. This can be proven by the statements of the three participants as follows:

P1: "In terms of how to take care of it, there is no difference, it's the same during the pandemic but only from the sport, so your sport now usually goes outside the house, but because of this pandemic now you only exercise around your home environment, the roads are not too far away. "

P2: "If the difference isn't there, it's still the same, but yes, the exercise which is usually done outside the house is replaced by doing it inside the house and the time is also not too long, not the same as outside the house."

P3: "Yes, it's the same there's no difference."

The results of the study found that the type of mobilization carried out by clients during the pandemic was by doing sports such as walking and not forgetting to take care of the food consumed by the patient. Prevention efforts carried out by the first responder are by controlling the signs and symptoms, controlling their food patterns. according to (Setyoadi et al., 2018) Prevention is carried out by identifying symptoms and signs of risk to increase public awareness so that appropriate preventive actions can be determined. Promotional efforts to improve health and prevent recurrent attacks. Treatment and prevention of possible complications for patients with disabilities due to stroke, as well as rehabilitation to restore physical function. according to (Ouslan, 2018)lifestyle changes, especially those related to dietary factors or a healthy diet and a balanced diet, reduce or limit the consumption of processed foods, including colorful vegetables

and fruits that contain large amounts of antioxidants at each meal and increase fish consumption. Increase regular physical exercise to prevent an increased risk of stroke. The efforts of the second and third respondents through physical activity such as walking, according to (Wang et al., 2020). There is increasing evidence that organizing family sports such as travel is not inferior to special outpatient care. Combined cycles and supervised walking training at home improve walking ability, according to (Grau et al., 2015) Physical exercise can prevent ischemic and hemorrhagic stroke. Exercise is the most important form of physical exercise. Exercise is likely to specifically reduce the risk of stroke. Previous research has shown that exercise can prevent stroke.

The results of the study found that there was no difference in how to treat stroke patients during the pandemic, in doing care after and before the pandemic. The patient only does physical activities around his home. The results of the interviews of the three respondents stated that there was no difference in how to take care of them after the pandemic or before the pandemic by doing physical activities such as walking around their homes, according to (Wang et al., 2020) During a pandemic, physical activity can be done by doing light exercise (such as walking around the house). Generally, stroke patients cannot be given the same strenuous exercise because there is no pandemic, especially in the acute and subacute phases, to prevent patients from entering the optimal recovery stage, according to (Saunders et al., 2015) exercise for stroke survivors is safe and can improve fitness, walking speed, balance ability, and the global index of disability. Physical exercise can also provide psychosocial benefits. In addition, physical exercise can also reduce the chance of stroke recurrence.

3.2 Mobilization to Prevent Network Damage and Does Not Require Special Facilities

After doing mobilization, the family said that there was a benefit of mobilization, namely it can relax the muscles in the legs so that the legs do not experience shrinkage even though the walk can't be as normal as before. This can be proven by the statements of the three participants as follows:

P1: *"If that's the case, sir, the benefits are to relax your nerves, your nerves don't die, so even though you have a stroke, the limbs that have had a stroke don't shrink or say that, what is it? It's paralyzed, it's not there, thank God, even though your netting isn't normal, your limbs are still like the one on the left that didn't have a stroke."*

P2: *"Yes, you can relax your muscles so you don't die, because if a stroke person can't be lazy to move so that the muscles stay, what can you do? Still, the muscles don't die."*

P3: *"Yes, it's lazy, the body is stiff, after all, it's stiff so it can move again, that's relaxation, what is the term, what is that relaxation so that the movement remains like the robot of the stroke person."*

Mobilization is carried out by the family by doing sports such as walking around the house and moving other limbs such as the hands so as not to experience a decrease in muscle function. This can be proven by the statements of the three participants as follows:

P1: *"If you're mobilizing, then why don't you just walk and keep your right hand made to move as much as you can."*

P2: *"Going for walks, taking walks at home, learning to write and playing ball, squeezing a ball like that."*

P3: *"Yes, it's the same, just keep moving, just don't get discouraged, that's all, what's important is that you have to sweat one day. My feet were bleeding and I was walking on the asphalt, not wearing sandals, not wearing anything, it's hot at noon, ask my child that pingine recover."*

The results of the study found that there was a benefit in mobilizing, namely being able to relax the muscles in the patient so as not to experience shrinkage in the legs even though the walk could not be fully normal. The results of interviews from the first and second respondents are the benefits to relax the muscles so that they are not stiff and do not experience size reduction, according to (Xu et al., 2017). The benefits of mobilization are to improve muscle function in stroke patients and reduce complications related to mobilization. The third respondent said that in terms of the benefits of mobilization, apart from relaxing muscles, family support is very important, according to (Setyoadi et al., 2018). The benefits of mobilization in stroke patients are aimed at increasing the patient's mobility and self-care abilities. Stroke

sufferers need support from family members to demand rehabilitation to achieve the maximum functional effect.

The results of the study found that the action taken was by the patient doing activities such as walking around the house and moving all his limbs so that he was not stiff. The results of the three respondents' statements are doing light exercise by walking around the house. according to (Wang et al., 2020) growing evidence is that gymnastics at home is not inferior to outpatient courses. Home driving training with physical exercise can achieve the same target response efficiency as an outpatient course for stroke patients. according to (Setyoadi et al., 2018) Stroke sufferers cannot be completely independent, but if handled properly it will reduce the patient's burden, minimize disability and reduce dependence on other people's activities. according to (Sexton et al., 2018) its benefits are improvement of blood circulation, venous stasis, prevention of contractures, support of respiratory function, and immobilization in bed can cause serious complications such as pneumonia and venous thrombosis. In addition, long-term bed rest is associated with musculoskeletal problems, resulting in loss of muscle mass, cardiac respiration, and immune system dysfunction.

4. Conclusion

Early mobilization is very important for early stroke sufferers through regular exercise such as walking around the house and light stretching every day, controlling the food eaten every day, and a high recovery rate. The role of the family here is very important to help move or help control the food consumed by the client in daily food and motivate the client so that the client recovers quickly from illness.

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The Impact of Spiritual Intelligence, Social Support and Learning Motivation on Nursing Documentation to Evaluation Outcomes

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ABSTRACT

Introduction: The nursing care process is one of the competency standards that must be possessed by a nurse as a requirement to become a professional nurse. Currently the process of nursing care nursing care is still far from ideal, it is proven that nurses do documentation only about 50%, while the target of the ministry of health is <80%. The motivation for this documentation must be nurtured since college. **Objectives:** The purpose of the study was to determine spiritual intelligence and social support on the motivation to learn the nursing care process in students. **Method:** quantitative with a cross sectional approach, the type of method used in this study. The population of this study were students of the 2018 Nursing Science Study Program, University of Muhammadiyah Malang as many as 122 students. Test data analysis using Spearman's Correlation Test. **Results:** This study shows that there is a significant relationship between spiritual intelligence and learning motivation ($p\text{-value} = <0.001$; = 0.05), but for spiritual support there is no significant relationship ($p\text{-value} = 0.56$). **Conclusion:** Spiritual intelligence affects students in motivating to learn, especially studying nursing care documentation, while social support has no relationship to these variables.

1. Introduction

The nursing care process is one of the competency standards that nurses must master as a condition to become a professional nurse. Nursing care process is an activity that requires high analysis and critical thinking. The activities consist of 5 stages, including 1. Assessment, 2. Enforcing nursing diagnoses, 3. Intervention (nursing care plan), 4. Implementation (implementation of nursing care), and 5. Evaluation. Noorkasiani, Gustina, & Maryam (2015) in H. Kamil, Rachmah, & Wardani (2018) In Indonesian hospitals, nurses in carrying out nursing care and documentation are still far from ideal. The reality in hospitals for nurses who carry out nursing documentation is about 50% or <80% of what is determined by the Minister of Health. Not only in the world of work, even in education, it is very difficult for nursing students to understand doctoral subjects, especially understanding cases by applying the documentation process that goes through the five stages described above. Currently there are still no journals that examine the teaching and learning of nursing students. But there are many journals that expose the documentation carried out by nurses in hospitals.

Learning achievement is not only produced through intellectual intelligence, but also must be balanced with spiritual intelligence and social support. Someone who only relies on intellectual intelligence will focus on getting good grades by doing various ways, this will make someone tend to be unsupportive or dishonest during exams. Social support also has an important role in the learning process, someone who does not have social support tends to have low learning motivation and is lazy to study (Suciana & Rozali, 2014). Spiritual intelligence also plays a role in increasing motivation to learn and having difficulty concentrating.

Motivation is the most important element that must be owned by every individual in doing a job. Elements in motivation are related to psychological processes which are reflected through attitudes, needs, perceptions, and decisions in living life (Basuki, 2015). Krisna & Wilani (2018) learning motivation is a psychological factor that is non-intellectual in the form of internal and external encouragement that functions in fostering passion, feeling happy and enthusiastic to move and direct individual behavior to learn. The aims of this study to determine the relationship and how much influence spiritual intelligence, social relations and motivation to learn with the learning outcomes of nursing documentation courses.

2. Methods

The research that will be used by the researcher is a type of quantitative research using a Cross Sectional approach. Cross Sectional Design. Respondents in this study were 123 UMM nursing students. The instruments used are 1. Spiritual Intelligence Questionnaire, 2. Social support questionnaire and 3. Learning motivation. The validity and reliability of the instruments used have been carried out with cronbach alpha declared valid (0.93, 0.73, 0.80). while the reliability of each instrument (0.958, 0.932, 0.894). Data analysis to determine the correlation of each variable using Spearman rank correlation. Meanwhile, to determine the influence of each variable with linear regression, using SPSS 26.

3. Results and Discussion

The majority of the 2018 Nursing Science Study Program students at the University of Muhammadiyah Malang have a high SQ followed by high motivation to learn the nursing care process. Noerpratama & Indrawati (2019) states that SQ has a major influence on students' learning motivation. Every human being has intelligence, while the type of human intelligence is generally divided into three, namely IQ, EQ, and SQ. The three intelligences are one of the internal factors in influencing one's learning motivation. Goleman (2000) in Ulfa, Sinaga, & Jaya (2018) The percentage of a person's success in life is 20% influenced by IQ and 80% is determined by other factors such as EQ and SQ. The influence of SQ is not more than 45% in influencing one's learning motivation, while 55% is influenced by other factors (Noerpratama & Indrawati, 2019; Basuki, 2015).

Table 1 Demographic Data of Respondents by Gender and Age (n=122)

Items	Frequency	%
Gender		
Woman	95	78
Man	27	22
Age (mean, SD)	19.87	0.738
Spiritual Intelligence		
Spiritual life or reliance on the inner core		47.4
Understanding and communicating with the source/ of universe		52.6
Social Support		
Family		85.1
Friend		11.2
Lecturer		3.7
Motivation to learn		
Responsibility		24.8
Task Selection Risk		12.2
Creative – Innovative		23.5
Giving Feedback		
Task Completion		15
Time		24.5

The high SQ of Nursing Science Study Program students is dominated by the many religious activities organized by the university. This religious activity starts from semester 1 to semester 4, students are required to take part in the religious activities of the Sunday Subuh Lecture (KAS) which is held on Sundays at 04.00 – 06.00 4 times in semesters 3 and 4, and is followed by courses on religion Al-Islam Kemuhammadiyah (AIK). In addition to AIK courses, UMM students are required to take part in the Personality and Leadership Development Program (P2KK) for 7 days at Rusunawa Campus 3, University of Muhammadiyah Malang with a dormitory system.

3.1 Crastable results from this study are shown in the table. 2.

Cross tabulation analysis or crosstab is one of the procedures in statistical tests that serves to see the relationship between variables. Djaswadi, Wibawa, & Kunaifi (2017) crosstab is an analysis that is used to identify the relationship between one variable and another, and has ordinal or nominal scale data.

Table 2 Crosstab between Spiritual Intelligence, Social Support and Learning Motivation the Nursing Care Process for Students of the 2018 Nursing Science Study Program, University of Muhammadiyah Malang (n=122)

Spiritual Intelligence	Motivation to learn						Amount	
	Low		Currently		Tall			
	n	%	n	%	n	%	N	%
Currently	-	-	22	75.9	7	24.1	29	1100
Tall	-	-	33	35.5	60	65.5	93	1100
Amount	-	-	55	45.1	67	54.9	122	1100

Social Support	Motivation to learn						Amount	
	Low		Currently		Tall			
	N	%	n	%	n	%	N	%
Currently	-	-	15	62.5	9	7.5	24	1100
Tall	-	-	40	40.8	58	59.2	98	1100
Amount	-	-	55	45.1	67	54.9	122	1100

support owned by the 2018 Nursing Science Program students at the University of Muhammadiyah Malang mostly comes from the family, although family support has the highest contribution but has not been able to encourage and increase the motivation of these students to study the nursing care process diligently. Malwa (2017) the influence of family support on learning motivation is 19.5%, the remaining 80.5% is influenced by other factors. Witriani (2007) in Safitri & Yuniwati (2016) A person's success in completing studies is strongly influenced by the presence of other people, either in the form of friends who are able to be discussed or girlfriends, while according to Sugiasih (2015) The external factor that strongly encourages someone to increase learning motivation is social support from educators or lecturers, while the effect is 68.5%.

4. Conclusion

SQ has a positive and significant value on learning motivation in the nursing care process, this means that the higher a person's SQ, the higher his learning motivation. Social support does not have a relationship with the motivation to learn the nursing care process in students of the 2018 Nursing Science Study Program, University of Muhammadiyah Malang.

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Study on Nurse's Caring Behavior and Their Impact on Patient Satisfaction Reviewing from The Patient's Perspective

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ABSTRACT

Introduction: Nursing services are part of health services and have a very important role. Whether or not patients are satisfied with nursing services is an indicator of good or bad health services. Nurses must have caring behavior, because caring behavior that is raised by nurses correctly will affect patient satisfaction. **Objectives:** This study aims to find out whether there is an influence of nurse caring behavior on patient satisfaction and to find out the most dominant aspect of caring behavior in influencing patient satisfaction. **Methods:** This type of research is cross sectional. This research was conducted at the University of Muhammadiyah Malang Hospital in February – May 2021. The sample in this study was 70 patients. The research instrument used was a demographic questionnaire, Swanson's caring behavior and patient satisfaction. The data were analyzed descriptively by looking at the mean, SD and percentage values for each variable, as well as the Spearman correlation statistical test. **Results:** Most of the respondents were satisfied with the services of nurses with a low category of 9 people (13%), medium category 29 people (41%), high category 32 people (46%). Nurses in providing care (caring) to the majority of patients 49 respondents (70%), less caring 13 people (19%), and good caring 8 people (11%). The value of $p = 0.000$ means that there is a relationship between the caring behavior of nurses on patient satisfaction in inpatient care services. The highest dimension of caring behavior is knowing, namely nurses understand other people/patients. **Conclusions:** Respondents were satisfied with the services provided by nurses. Nurses in providing services (caring) to the majority of patients are sufficient. It is recommended to every health worker, especially nurses, to maintain caring behavior. So that it continues to increase patient satisfaction in the hospital.

1. Introduction

Quality health services are a determining factor for service quality and the image of health care institutions. Nursing services are part of health services and have a very important role. Nurses are health workers who have more time to interact with patients. So whether or not the patient is satisfied with nursing services is an indicator of good or bad health services. Nurses are also the spearhead of health services. Whether or not the patient is satisfied with health services is an indicator and one of the determining factors for the good or bad quality of nursing services. Professional and qualified nurses must have hard skills and soft skills.

The image of nurses in the eyes of most Indonesian people is currently not well developed. Many nurses do not reflect caring behavior in providing nursing care to clients, even though caring is an effort to improve the quality of nursing services and patient safety. Caring is part of the soft skills that are needed by nurses in their work and affect their success in the world of work. Research at RSU dr. H. Koesnadi Bondowoso, 50% of nurses have not applied caring and 43.5% have less knowledge about caring. Research in Bandung Hospital, it was found that 52.64% of nurses did not have caring behavior. Study results (Rachmawaty, Ilkafah, & Erfina, 2020), patients are not satisfied with the caring behavior of nurses, especially in aspects of *maintaining belief*. Though caring behavior that is raised by nurses correctly will affect patient satisfaction (Ariani & Aini, 2018). Nurses have quite good caring behavior, but the communication aspect is still lacking, rarely discusses with patients and does not provide health education (Helty, 2015).

According to Swanson, the caring process is a behavior of how nurses understand meaningful events in a person's life, are emotionally present, do things to others as well as do things for themselves. SA nurse must have knowledge in carrying out nursing care actions and a good attitude about caring. According to Swanson. The basic concept of caring has five components which include maintaining trust, understanding others, being emotionally available to others, taking actions to become patient independent, providing support and understanding others (Aini, 2018; Andershed & Olsson, 2009).

From the results of observations and interviews with 10 patients and 10 patients' families by asking several items about questions about nurse caring on October 24, 2019 it was found that (55%) patients assessed that nurses were less friendly, did not respond to patient complaints. While the patient's family (45%) considered that nurses did not provide clear information. Meanwhile, in the level of patient satisfaction in the care of 7 people, 4 stated that they were not satisfied with the reason that nurses paid less attention to patients and 3 stated that they were satisfied with the services of nurses.

Based on the description above, the study aim to identify the caring behavior of nurses in terms of the patient's perspective, because some previous studies only looked at the perspective of nurses. So that nurses get input and can improve their caring behavior.

2. Methods

2.1 Research Design

This type of research is an observational analytic study with a cross sectional approach. This research has received ethical approval with the number E.5.a/018/KEPK-UMM/II/2021. This research was conducted at the University of Muhammadiyah Malang Hospital in February – May 2021. The independent variable is caring behavior, while the dependent variable is patient satisfaction.

2.2 Participant

Samples were taken by simple random sampling of 70 people which were calculated using G Power 3.1 software.

2.3 Instruments

2.3.1 Demographic Data

Demographic data in this study are age, gender, occupation, education level, MRS experience;

2.3.2 Caring behavior

The type of caring questionnaire in this study is an adaptation of Swanson's caring theory which consists of 5 components, because Swanson's model theory is included in the middle range theory level. The questionnaire consists of 20 positive negative questions using a Likert scale with a score for positive questions strongly agree = 5, agree = 4, sometimes = 3, disagree = 2, strongly disagree = 1, negative questions strongly agree = 1 agree = 2, sometimes = 3, disagree = 4, strongly disagree = 5. This caring questionnaire is to determine the caring aspects including knowing, being with, doing for, enabling for, and maintaining belief.

2.3.3 Patient satisfaction

The patient satisfaction questionnaire was adopted from the satisfaction questionnaire on excellent service which consists of 6 aspects (Nasution, 2009). Using a Likert scale with answers always, often, sometimes, never. As for the interpretation of the assessment, for positive statements the answer is always = 4, often = 3, sometimes = 2, never = 1; and for negative statements, the answer is never =4, sometimes =3, often =2, always =1. The aspects studied in this patient satisfaction questionnaire are ability, attitude, appearance, attention, action, responsibility.

2.4 Data analysis

The data were analyzed descriptively by looking at the mean, SD and percentage values for each variable. As well as the Spearman correlation test to see the relationship between caring behavior and patient satisfaction. In addition, the aspect of caring behavior that most dominantly influences caring behavior is also seen.

3. Results and Discussion

3.1 Characteristics of Respondents

In this section, the results of research on the characteristics of respondents will be presented which include gender, occupation, education, hospital admission experience and health insurance. Respondents taken in this study were patients who were hospitalized for 3 days of treatment. The results can be seen in table 1.

Table 1 Characteristics of Inpatient Respondents at UMM Hospital in February – May 2021

Characteristics of Respondents	Frequency	%
Gender		
Man	30	43
Woman	40	57
Work		
Not yet working	14	20
Farmer	7	10
Housewife	14	20
Private sector employee	31	44
civil servant	2	3
Etc	2	3
Education		
Elementary school	15	21
junior high school	14	20
senior High School	25	36
College	16	23
Previous MRS experience		
No	33	47
Yes	37	53
Health insurance		
Askes	25	36
Jamkesmas	36	51
General	9	13

Characteristics of respondents who have the largest percentage is the female gender, which is 40 people (57). Based on occupation, it is known that the majority of respondents have jobs as private employees as many as 31 people (44%). The most recent education level of respondents is SMA 25 people (36%). Based on previous hospital admission experience who said yes as many as 37 people (53%). The majority of respondents used Jamkesmas 36 respondents (51%).

3.2 Characteristics of Respondents Based on Age and Length of Treatment

In this section, the results of research on the characteristics of respondents based on age, and length of stay at the University of Muhammadiyah Malang Hospital will be presented.

Table 2 Distribution of Respondents by Age, Length of Treatment at UMM Hospital in February - May 2021

Characteristics	Number of Samples (N)	Minimum Value	Maximum Value	Average (mean)	Standard Deviation
Age	70	17 years	60 Years	40 Years	12.98 Years
Treatment time	70	3 days	9 Days	4 days	0.969 Days

Based on the table above, from the research data on the age characteristics of the respondents, the average age of the respondents is 40 years with a standard deviation of 12.98 years. The minimum age for respondents is 17 years and the maximum age is 60 years. Characteristics of length of treatment the average length of treatment of respondents is 4 days with a standard deviation of 0.969 days. The minimum length of treatment is 3 days and the maximum treatment is 9 days.

3.3 Overview of Caring Behavior

The research data obtained from respondents in terms of the caring behavior of nurses are presented in table 3:

Table 3 Caring Behavior at UMM Hospital in February - May 2021

Caring category	n(%)
Not enough	13 (19%)
Enough	49 (70%)
Well	8 (11%)
Total	(100%)

Based on the respondents in the Mawar and Seruni Room, the most caring behavior of nurses at the adequate level was 49 people (70%). While the description of nurse caring behavior based on each indicator is shown in Figure 1:

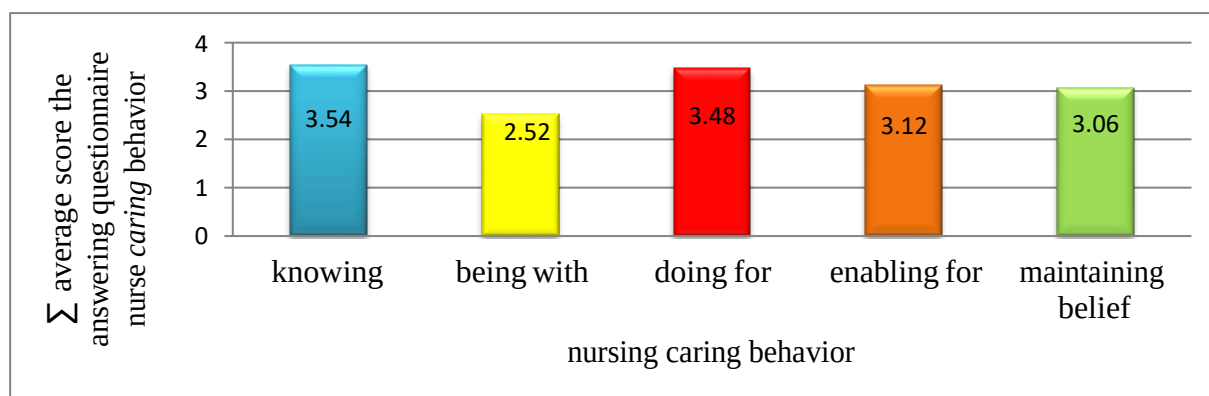


Figure 1 Graph of nurse caring behavior indicators at UMM Hospital in February - May 2021

Based on the results that shown in the graphic score above, an indicator of caring behavior that nurses know well is knowing(knowing). while the lowest is being with. This can be seen from the indicator scores, namely 3.54 (knowing) and 2.52 (being with).

3.4 Overview of Patient Satisfaction

Patient satisfaction in inpatient care services at the University of Muhammadiyah Malang Hospital as follows.

Table 4 patient satisfaction in inpatient care services at UMM Hospital in February - May 2021

Satisfaction Category	n(%)
Low	9 (13%)
Currently	29 (41%)
Tall	32 (46%)
Total	(100%)

Based on the data above, it shows that most of the respondents with patient satisfaction in inpatient care services have a high category as many as 32 respondents (45.7%). Meanwhile, based on the graph of the satisfaction indicator, it can be seen in Figure 2.

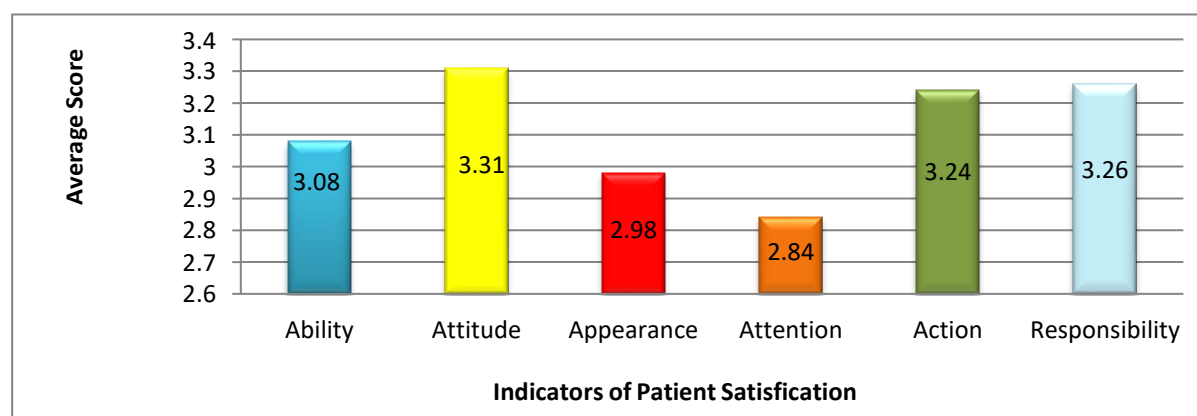


Figure 2 Graph of Patient Satisfaction Indicators at UMM Hospital in February - May 2021

Based on the graphic data above, it is stated that the indicator that causes the highest patient satisfaction is attitude and the lowest is attention as much as 2.84. This can be seen from the indicator scores, namely 3.31 (attitude) and 2.84 (attention).

3.5 Relationship of nurse caring behavior to patient satisfaction

The data from the research on the relationship between nurse caring behavior and the level of patient satisfaction in nursing services at the Muhammadiyah University Hospital Malang can be seen in table 5 below.

Table 5 the relationship of nurse caring to patient satisfaction in inpatient care services at the University of Muhammadiyah Malang Hospital in February - May 2021

Caring nurse	Patient satisfaction			Total	Spearman Rank Test Results	Information
	Low	Currently	Tall			
Not enough	8 (61.5%)	4 (30.8%)	1 (7.7%)	13 (100%)	Sig = 0.000 r = 0.606	Significant
Enough	1 (2.0%)	25 (51.0%)	23 (46.9%)	49 (100%)		
Well	0 (0.0%)	0 (0.0%)	8 (100%)	8 (100%)		
Total	9	29	32	70		

Based on the table above the results of the Spearman rank correlation analysis obtained a probability value or a significance value of $p = 0.000$, which means it is smaller than the alpha

value ($p < 0.05$) indicating that there is a relationship between 2 variables. Correlation results obtained 0.606** indicate that caring nurses in the strong category. While the direction of the positive correlation (+) which means that between the two variables studied goes in the same direction, where the caring behavior of nurses has increased, patient satisfaction in inpatient care services at the University of Muhammadiyah Malang Hospital will increase.

The results of this study conducted on respondents 3/4 majority of respondents said the caring behavior of nurses was in the sufficient category (70%). Based on the results of the study (Firmansyah, et al, 2019) showed the caring behavior of nurses viewed from the psychological environment the majority of clients assessed caring behavior as sufficient with a percentage of 60.6%. Research (Marmi, 2015) shows the difference in results with this study, it was found that the caring behavior of nurses according to the perception of the client or client's family was mostly in the good category, namely 13 people out of 18 respondents (72.2%). according to (Tiara & Lestari, 2013) said that nurse caring is highly valued by patients, because nurses can convince patients and their families so that nurses have full trust from patients and their families. With this belief, the patient will have a positive attitude towards the actions given by the nurse during treatment. According to (Potter & Perry, 2010) said that the service is considered good by the patient because the attitude shown by the nurse will make the patient decide to return to treatment at the hospital. Meanwhile, according to (Purwaningsih, 2015) about the concept of caring is an attitude, respect, care and respect for each other which means giving all attention to patients during health services, so that attention and study of one's preferences and how one thinks and acts will train therapeutic communication between patients and nurses. The researcher's analysis of the results of the questionnaires that have been distributed to respondents there are several factors that influence the caring of nurses in the sufficient category, namely the respondents said that they felt cared for, the nurses asked if they understood what had been explained, always reassured the patient's family, and gave brief and easy explanations. understood.

The results of the questionnaire measurements obtained, the highest average value on the knowing indicator is 3.54 while the lowest questionnaire measurement is on the presence or being with indicator with an average of 2.52. The results of this study are in line with research (Ulfa, et al, 2018) the indicator of knowing the majority of patients stated it was in the good category, which was around 58.8% as evidenced by the statement that nurses often or always asked complaints, gave patients the opportunity to express their complaints, nurses gave opportunities patients to meet their families, and nurses are able to communicate with patients well. At the lowest indicator is being with (presence or presence) the nurse is always beside the patient when needed, is polite in serving the patient, and also does not get angry easily. This is in line with the theory (Swanson, 1991) that the nurse cooperates with the client without forcing the will on the client in carrying out nursing actions. Similar research according to Flemming (2013, in Maryana, 2019) in his research found six themes studied by nursing students in caring learning with patients were reciprocal relationships with patients, developing strong interpersonal communication, being able to communicate well in emotional situations, respected by nurses, serving patients as advocates, observing caring attitudes. According to Kourkouta & Papathanasiou (2014), good communication between nurses and patients is at the core of the success of individual care for each patient. To achieve this the nurse must understand and help the patient, demonstrate courtesy, be kind,

From the data of this study, it was found that 1/2 of the respondents had patient satisfaction in inpatient care services in the high category or satisfied (46%). This is in line with research (Handayani, 2016) which states that patient satisfaction in care services is in the satisfied or good category (72.58%) which is indicated by nurses providing services in a friendly, courteous manner, paying attention to patient complaints, sincere, full of care. affection, communicate in a relaxed and open manner, and provide easy-to-understand explanations. Research conducted by Mailani and Fitri (2017) has different results, namely the majority of respondents have a poor level of satisfaction (59,

The results of the questionnaire measurement showed that the "attitude" indicator was the highest compared to other indicators, attitude indicators included nurses communicating well, always giving greetings, being confident, patient and always accompanying doctors during examinations. Patients prefer a nurse who is understanding, always helpful, and kind. This is proven in research (Karaca and Durna, 2019). Patient satisfaction will increase if nurses carry out their duties and responsibilities well where nurses must be able to understand the relationship between nurses and patients, habits and responses to health problems that have the potential to arise or already exist.

Based on the results of research on 70 respondents in the Mawar and Seruni rooms, there is a strong relationship between nurse caring behavior and patient satisfaction in inpatient care services at the University of Muhammadiyah Malang Hospital. A nurse must have caring behavior in her service to patients, because the relationship between service providers is a factor that affects the process of patient satisfaction and healing (Mailani & Fitri, 2017). In accordance with Herzberg's theory that one of the factors is to encourage someone to try to achieve satisfaction, so that individuals have the desire to act and get results in accordance with their goals. So the results of this study also show that high patient satisfaction from patients is one of the factors of high nurse caring behavior.

Jones (2008) explains that to create a patient's trust in nurses is to create time with nurses and patients. Therefore, a successful nurse is to build trust which makes the nurse's job easier because patients who already believe will accept all the activities carried out by nurses in providing nursing care services for patient satisfaction. The results of this study prove that the caring behavior of nurses will build patient trust and patient satisfaction in getting nurse services while at the General Hospital of Muhammadiyah Malang.

4. Conclusion

Caring given by the nurse in the Mawar and Seruni room at the Muhammadiyah University Hospital Malang in the sufficient category. Caring behavior that is already good is knowing, while what is still low is being with. Patient satisfaction, especially in the Mawar and Seruni rooms at the University of Muhammadiyah Malang Hospital in the high or satisfied category. An indicator of already high satisfaction is attitude. The behaviors shown by nurses include communicating well, greeting, confident, and patient. While what is still low is attention, namely nurses do not provide information.

There is a relationship between the caring behavior of nurses on patient satisfaction, with a strong correlation value and the direction of the positive relationship, which means that patient satisfaction will increase if the caring behavior of nurses also increases.

Ethics approval

This study was approved by the Commission of Research Ethics University of Muhammadiyah Malang, Indonesia (Number:E.5.a/018/KEPK-UMM/II/2021)

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The Relationship Between Academic Stress Levels and Quality of Life in Nursing Students During the Covid-19 Pandemic

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ABSTRACT

Introduction: Stress that is usually experienced by students is caused by the demands of life and academic responsibilities. Changes in the online learning system during the COVID-19 pandemic require students to get more assignments and busy lecture schedules which have a negative impact on students' quality of life. **Objectives:** This study aimed to determine the relationship between the levels of academic stress with the quality of life of nursing students during COVID-19 pandemic. **Methods:** This study used a cross sectional study. The sample was 88 nursing students in University of Muhammadiyah Malang Indonesia. Sample selected by random sampling technique. The independent variable is the level of academic stress and the dependent variable is the quality of life, both variables use the questionnaire instrument The Perception of Academic Stress Scale and (WHOQOL)-BREF. Data were analysed using SPSS Pearson correlation test. **Results:** The result of this study indicate that during the COVID-19 pandemic, nursing students in Indonesia experienced high stress (66,7%) and good quality of life (76,1%). Correlation of each variable was -0,469 and p-value (0,000). It means that stress levels have significance correlation with nursing student's quality of live. **Conclusions:** There is a relationship between academic stress levels and quality of life during the COVID-19 pandemic. Academic stress is included in domain 2 quality of life in psychological health. A negative correlation was found, meaning that the higher the academic stress, the lower the quality of life

1. Introduction

The COVID-19 pandemic that has occurred since 2020 continues to grow and spread widely. The spread is also accompanied by increasingly diverse viral mutations and prolongs the pandemic. It was recorded that in February 2021 the number of confirmed cases of COVID-19 in the world was 105,394,301 million cases. Meanwhile, the number of deaths has now reached 2.3 million cases. In February 2021, the number of COVID-19 cases in Indonesia was 1,157,837 cases, with 31,556 deaths and 949,990 recovered patients (WHO, 2020).

Education is a sector that has been significantly affected by the pandemic. The change of face-to-face learning methods directly to online which has been running for almost 1 year. According to many studies, changes in learning methods have an impact on the mental health of students and teachers. This problem occurs at all levels of education from elementary to tertiary education levels. The application of learning at home makes some students feel stressed, anxious and depressed. (Oktawirawan, 2020). Stress is a condition in which an individual is confronted with an obstacle or demand (Ermawati, 2010). Students often feel stressed because they have not been able to adapt to the COVID-19 pandemic (Oktawirawan, 2020).

Stress will produce physiological, psychological reactions and behavioral changes, confusion, frustration, anxiety, helplessness or powerlessness, depression and loss of enthusiasm. (Nasir, 2011). One of the factors that affect the level of stress in students is academic stress. Academic stress is caused by demands that arise when a person is in education, and occurs when students experience emotional tension when he fails to cope with these demands (Indriyani & Handayani, 2018). Study load is the biggest academic factor that causes academic stress (52%). Students are required to adapt to the academic process (face-to-face learning to online learning). Online learning allows students to get more assignments than usual,

such as weekly quizzes, independent assignments and group assignments (Hamzah, 2020). Lack of physical activity during the COVID-19 pandemic can also affect quality of life (Slimani et al., 2020). A study shows that physical activity and diet are important components of healthy lifestyle behaviors, not only related to sleep quality but also quality of life (Tao et al., 2019).

Quality of life and well-being consist of 3 complementary domains. The first is a balanced physical and mental health, the second is welfare in life and the third is the relationship with the environment (Barile et al., 2013). Quality of life is a condition that makes a person get satisfaction or enjoyment in everyday life (Fadlilah, 2019). Students often experience feelings of loneliness and isolation due to the lack of interaction with friends and lecturers, this can lead to a lack of social support and lead to a decrease in student welfare (Riiser et al., 2020). Student complaints include the unavailability of means to participate in the online learning process, lack of communication between fellow students and lecturers, the demands of the tasks given (Hasibuan, 2020). Previous research stated that there were several obstacles to learning during the pandemic. 37% of respondents admitted that they could not manage study time, 30% admitted that they had difficulty understanding the lesson and 21% admitted that they did not understand the instructions from the teacher (lecturer) (Siantoro et al., 2020). Therefore, this study aims to analyze the relationship between academic stress and the level of quality of life of nursing students during the COVID-19 pandemic.

2. Methods

This study used a cross sectional study design. The number of respondents in this study were 88 respondents. Respondents are nursing students at the University of Muhammadiyah Malang. the sampling method used is random sampling. Data were collected using a demographic questionnaire, The Perception of Academic Stress Scale (PASS) questionnaire to measure stress levels and the World Health Organization Quality of Life (WHOQOL)-BREF questionnaire to measure quality of life. Variables were analyzed by Pearson correlation using SPSS version 20.

The PASS questionnaire consists of 18 items that measure aspects of academic stress, including academic expectations, faculty work and examination and student's academic self-perception (Azmi, 2018). The type of answer used in this instrument is a Likert rating with a choice of answers, strongly disagree, disagree, agree and strongly agree (Azmi, 2018). The WHOQOL-BREF questionnaire consists of 26 questions. The questionnaire consists of physical, psychological, social relations, and environmental domains. All questions use a five-point Likert scale (1-5) (Koesmanto, 2013). Test the validity of the instrument with an r value of 0.390 to 0.798. So, it can be concluded that all of the question items are valid.

3. Results and Discussion

Table 1 shows that the average age of the respondents is 20.4 years, the age range is young adults, the majority of respondents are female and do not live with their parents or in a boarding house/rental house.

Table 1. Demographic Characteristics of Respondents (n=88)

Variable	n (%)
Ages (mean)	20,40
Sex	
Male	10 (11.4)
Female	78 (88.6)
living together	
Parent	17 (19.3)
not with parents	71 (80.7)

Table 2. Stress level and respondent's quality of life level (n=88)

Variable	F(N=88)	%
Tingkat Stres Akademik		
High Stress	59	66,7%
Low Stress	29	33,3%
Quality of life level		
Currently	6	6,8%
Well	67	76,1%
Very good	15	17,0%
Correlation ($\alpha=0,05$)	p value = 0,000	r= -0,469

Table 2 above shows that the majority of respondents experience high levels of stress and have good quality of life. The correlation test shows that the level of academic stress and the level of quality of life has a significant relationship (p value <0.05), the level of the relationship is quite strong and the direction of the relationship is negative (-0.469), thus it can be interpreted that the higher level of academic stress will affect the lower quality of life.

Table 3. Score Dimensions of Academic Stress and Quality of Life of Respondents

Variable	Mean	Std. Deviation
Academic Stress Domain		
<i>Academic Expectation</i>	12,66	2.050
<i>Faculty Work and Examination</i>	25,31	4.225
<i>Student's Academic Self-Perception</i>	14,74	3.502
Quality of life domain		
Physical Health	25,80	3.074
Physical Health	21,14	2.937
Social Relations	10,83	1.683
Environmental conditions	28,62	3.773

Table 3 shows that the highest dimension of academic stress experienced by students is Faculty Work and Examination. the quality of social relations is the lowest dimension of quality of life experienced by students during the COVID-19 pandemic.

Adulthood is a period of adjustment to new life patterns and new social expectations. Early adults are expected to play new roles, and develop new attitudes, desires and values according to these new roles. In addition, early adults are also expected to be able to adapt independently (Lybertha & Desiningrum, 2016). Women experience more stress than men. This is due to biological, psychological and social changes, resulting in the appearance of her feminine character in general. Women are more easily anxious, have eating disorders, sleep disorders and experience feelings of guilt when under stress (Kountul et al., 2019). This condition is related to the hormone estrogen in women more than men, so women are more susceptible to stress than men (Lubis et al., 2021).

The results of the analysis of the academic stress level of Nursing students during the COVID-19 pandemic showed that some experienced academic stress in the high category (67.0%), meaning that students felt heavy pressure during online learning during the COVID-19 pandemic. Stress is an unpleasant feeling caused by problems that are beyond the control of the individual, or the reaction, of body and soul to an action, where it can cause feelings of discomfort or excessive anxiety (Lubis et al., 2021). Stress is a response experienced by every individual and will have an impact, both positive and negative if the stress cannot be handled. The most common stress experienced by students is academic stress (Wulandari et al., 2017). The academic expectation dimension obtained an average score of 12.66, meaning that in this dimension students experience unpleasant psychological conditions. This condition can occur because of expectations in someone's academics that come from parents, teachers/lecturers, peers and other family members. Not only expectations, but also from parental pressure for

academic achievement, the education system, and being free from homework/independent tasks (Andiarna & Kusumawati, 2020).

The faculty work and examination dimension score is 25.31. this may affect their academic achievement. Students will have difficulty concentrating, have difficulty remembering the material, have difficulty understanding the material, often procrastinate completing assignments, and think negatively about themselves and their environment. In addition, it can also cause anxiety, irritability and frustration (Lubis et al., 2021). the average score of the student's academic self-perception dimension is 14.74. This shows that students are able to understand and manage their roles. Students have to do the assignments given, but during the COVID-19 pandemic, the demands to master the material and skills in a short time make students even more depressed. This condition triggers stress which is called academic stress condition. In accordance with research results that during the COVID-19 pandemic, students began to feel bored with online learning methods that were less interactive. If this continues, it will lead to a decrease in learning motivation which is then followed by a decrease in student academic achievement (Livana et al., 2020). During the COVID-19 pandemic, stress can occur due to the large number of subject matter that must be studied, the lack of feedback provided by the lecturers, the quality of the lecturers who teach, and the many assignments given by the lecturers. The lack of social communication carried out by students during online lectures during the COVID-19 pandemic can affect the high academic stress experienced.(Hasanah et al., 2020). Students who have problems with social communication have a high level of stress. This is caused by feelings of being unhappy, uncared for, and unloved by others. These negative feelings further strengthen the stressful condition of students (Lubis et al., 2021).

The results of the analysis of the characteristics of the quality of life of nursing students during the COVID-19 pandemic showed that 67 people (76.1%) had a good quality of life. According to WHO (2012) Quality of life is an individual's perception of his position in life, the cultural context, the value system in which they exist and their relationship to life goals, expectations, standards and other related matters. Problems that cover quality of life are very broad and complex including problems of physical health, psychological status, level of freedom, social relationships and the environment in which they live (Jacob & Sandjaya, 2018).

The dimension of quality of life for physical health obtained an average score of 25.80, meaning that students feel they are physically fit, can rest and sleep comfortably during the COVID-19 pandemic and can still maintain their physical and mental condition to complete tough tasks. During the COVID-19 pandemic, the quality of life has increased, this is in line with previous research that respondents experienced a change in their diet to become healthier and 30% consumed more fruits, vegetables and dairy products than before the lockdown. During home isolation, 75.2% of sleep quality was very good and 65% reported that respondents were satisfied with their quality of life (Wang et al., 2020).

In the psychological health dimension, how individuals have negative and positive feelings towards themselves and others when facing events that occur during the pandemic, how they worship comfortably in the midst of their busy lives and the limited conditions of the COVID-19 pandemic. The average score on the psychological dimension, which is 21.14, means that students feel happy in learning during the COVID-19 period when they get lots of opportunities to meet and be close to their family, some even feel happy when their parents accompany them when they are in college. In addition, also that the COVID-19 pandemic provides free time to be used positively. This is in accordance with research which states that during normal times he does not get free time, students can use their spare time to exercise, relax, and share other hobbies. So that when learning feels fresh and not burdened (Hasibuan, 2020).

Social dimension, the dimension of how students enjoy time with family and peers. Social support includes how the individual is, the sadness he experiences, the care from people he can rely on and the affection he gets from others. The COVID-19 pandemic has reduced the intensity of communication and interaction with peers. the average score on the social dimension is 10.83. this score indicates a lack of social support from peers and can worsen the quality of life of students. The results of previous studies also showed that peer conformity affects the quality of

life in students. Students who get social support from their peers will be more confident and have confidence in their abilities (Kountul et al., 2019). The average score of the environmental condition dimension was 28.62. this shows that during the COVID-19 pandemic, online learning makes it more cost-effective. Students do not need to pay for transportation, meals, and necessities while away from their parents. In addition, students who spend time reflecting and producing new works, worship and remembrance to calm themselves, reflect on themselves and are very grateful (Hasibuan, 2020).

Excessive and continuous stress has a bad effect on health and can be the beginning of the development of many diseases (Ribeiro et al., 2018). Increased stress negatively impacts sleep and lowers Brain Derived Neurotrophic Factor (BDNF) levels (Giese et al., 2013). Academic stress causes poor sleep quality in students. Therefore, improving student sleep quality can reduce academic stress (Maisa et al., 2021). The demands of modern life often cause somatic complaints in young people. this condition has a negative impact on academic achievement and student achievement (Ribeiro et al., 2018).

Based on previous research, academic stress and quality of life have a significant negative correlation. This means that students who have a high level of academic stress, the lower their quality of life (Awadh et al., 2013). Similar results were obtained from other studies, which stated that there was a negative relationship between stress and quality of life (Ribeiro et al., 2018). Other studies also showed similar results, which found a negative correlation between academic burnout and quality of life (Lyndon et al., 2017). Another study found that 33.9% of respondents had high stress levels and it was negatively related to quality of life ($p < 0.01$) (Kleiveland et al., 2015).

Quality of life is not only influenced by academic stress, but also physical activity, sleep quality and healthy living behavior. During the COVID-19 pandemic, students rarely do physical activity because of the physical distancing policy, this causes individuals to not be able to do physical activity regularly. Another study found that respondents who did regular physical activity had a better quality of life. (Slimani et al., 2020). Students often experience a lack of sleep duration caused by not being able to adapt to new habits, doing a lot of schoolwork at home and doing other work. Lack of sleep duration can increase appetite because there is an increase in the hormone ghrelin and a decrease in the hormone leptin. This hormone controls a person's appetite. This hormone serves to increase a person's appetite. Previous research has also found that decreased sleep is associated with an increased risk of overeating, which can lead to obesity (Fitri & Supriyadi, 2021).

In addition to causing obesity, people who have less than 5 hours of sleep for 8 days show a consistent decrease in insulin sensitivity without compensating the responsiveness of pancreatic B cells and will ultimately increase the risk of developing diabetes. (Fitri & Supriyadi, 2021). During adolescence and young adulthood, individuals are faced with many opportunities to engage in risky behavior and also they also gain freedom from their parents by following the role of adults, and establishing health patterns that can then improve their well-being (Olson et al., 2017). Healthy behavior is very important in everyone's life especially during young adulthood, because individuals move beyond the developmental period and move to stages of the life journey during which various behaviors become habits.

4. Conclusion

Stress levels are significantly related to the quality of life of nursing students during the COVID-19 pandemic. The results of this study can be used as reference material for health science and practice, especially in developing mental health nursing related to efforts to promote and prevent mental health disorders.

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Broken Home Family Relationship with Adolescent Behavior in East Tidore District, Tidore Islands City

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ABSTRACT

Introduction: Deviant behaviour is shown by committing crimes such as drinking alcohol, using drugs, smoking and behaviour that shows violence committed to harm others. Deviant behaviour occurs in adolescents because of a lack of affection and attention from parents towards their children and even occurs in adolescents who come from the Broken Home family.

Objectives: The purpose of this study was to determine whether there is a relationship between Broken Home family and deviant behaviour in adolescents in East Tidore Subdistrict, Tidore Islands City. **Method:** This research is a type of Correlation Study with a quantitative approach. The questionnaire taking technique uses a Likert scale. This research was conducted in February 2020 at Madrasa Aliya Dowora school and in the East Tidore Subdistrict, Tidore City. The subjects in this study were adolescents who came from the Broken Home family in East Tidore Subdistrict, Tidore City with 22 respondents and used total sampling. Data analysis using SPSS.

Results: After doing research and the results obtained that there is a relationship between families Broken Home with deviant behaviour in adolescents. This can be seen from the results of SPSS 25 which shows a significant <0.05 (equal to 0.001), the conclusion is that there is a relationship between the 2 variables of 0.657, which means it has a strong relationship and has a positive direction. **Conclusion:** Teenagers who come from broken home families are at risk of experiencing deviant behaviour, which occurs in the social environment, both in the home environment, the community and in the school environment.

1. Introduction

Social deviation is a behavior that is strongly disapproved by society. Deviant behavior becomes a source of problems in life because it can threaten the enforcement of the social system. Deviance is not only behavior, but also involves a person's moral judgment, because every action taken can be defined as deviant behavior (Banda & Mweemba, 2016). In social life there is a learning process to be able to adapt to group norms, morals, and traditions, unite themselves into a single unit and work together, but in social life there are many problems with adolescent deviant behavior, namely violating applicable norms. In social life, positive behavior is still found and there is also negative behavior carried out by teenagers.

In Indonesia, the results of a survey on the results of a seminar on adolescents by the health department. The survey results include: around 16 million girls aged 15-20 years give birth every year, and 45% are infected with HIV. From the results of the survey, it comes from the same problem, namely more than 50% of high school youth in Indonesia have had premarital sex or free sex. This has determined that promiscuity or deviant behavior in adolescents in Indonesia is already so severe (Kementerian Kesehatan Republik Indonesia, 2016). The tendency of family rift cases that lead to broken homes can be seen from two aspects, namely the first the family broke up because the family structure was not intact because the head of the family died or was caused by divorce.

Basically, children want attention and affection from their parents, but they don't get it. If explored further, there are still many children who have problems with fractured family relationships. So that people think of them as a social disease (Primasti & Dewi, 2017). Parents are the main institution where a person equips himself to grow and develop, having a healthy and happy family is everyone's dream, especially teenagers in their growth period according to Marui (1952) in (Saikai, 2017). In the journal entitled "The Role of Parents in the Education of Children" said that when parents participate in educating their children, the results are usually positive and encouraging. In this case, children are usually immediately connected and act under the attitudes of their own parents. The ability of children in the learning process as a whole directs adolescents to the path of success as long as they learn, education as a complex process. Therefore, parents are involved in supporting the children to do their homework. Because in this way they feel that there is support from their parents as the key to being successful (Saikai, 2017).

There are a total number of divorce cases that occurred in 2017 in Indonesia as many as 374,516 divorce cases. Reporting from the Central Statistics Agency (BPS) in "Indonesia Statistics 2018" North Maluku Province is ranked 27th. A total of: 735 divorce cases in 2015, 945 divorce cases in 2016 and 978 cases in 2017. Adolescents should grow up in healthy families and receive attention, affection, and care from their parents. Usually teenagers from unhealthy families (Broken Home) grow up in a bad way. They often create problems in the school environment and in youth groups with fellow Broken Home families. Therefore, deviant behavior arises in Broken Home teens because they grow up from an incomplete family without the love of both parents, while a healthy family has criteria consisting of children, fathers, and mothers who always give love, attention and care. Children or adolescents are the people who suffer the most when their parents' divorce, physically, emotionally, and socially children will experience disturbances (Saikai, 2017).

When teenagers fully get the care of their parents so that the personality formation and socialization of teenagers will be better. So traditionally parents play an important role in equipping teenagers to grow and develop properly. The type of family can also influence adolescents to grow and develop well, for example in the type of nuclear family consisting of children, fathers, and mothers (Saikai, 2017). This research preliminary study was conducted in East Tidore District, Tidore Islands City on adolescents from Broken Home families, according to the total population there are 22 teenagers from Broken Home families. From the results of interviews with several teenagers. The average teenager who comes from a Broken Home family has deviant behavior in people's lives, Teenagers often do things that violate existing norms or rules. They even do this because they need attention from others, especially parents and family. Thus, the research is interested in knowing more about the relationship between the Broken Home family and deviant behavior in adolescents in the surrounding environment. The purpose of this study was to identify the description of the Broken Home family, identify deviant behavior, and identify the relationship of the broken home family with deviant behavior in adolescents in East Tidore District, Tidore Islands City.

2. Methods

In this study, the type of research is Correlation Study with a quantitative approach, namely the type of research that produces findings that can be achieved or obtained using statistical procedures or other means of measurement. In this study, the researcher wanted to know the relationship between the Broken Home family and deviant behavior in adolescents. In this study, the population consisted of 22 respondents who experienced Broken Home. The sampling technique used in this research is total sampling. The questionnaire used in this study is a broken home and deviant behavior questionnaire. Analysis of the data in this study using Spearman correlation.

3. Results and Discussion

This study uses a sample of teenagers. from Broken Home families to assess the behavior level of adolescents. The results of this study there is a relationship between Broken Home family and deviant behavior in adolescents, the study involved 22 teenagers from Broken Home families. Some of the results obtained are as follows.

Table 1 Broken Home Family

Broken Home	Frequency	Percent
Broken Home	9	40,9
Not Broken Home	13	59,1
Total	22	100,0

In table 1, there are 22 (100%) teenagers suspected of having Broken Home. Of the data, 13 (59.1) respondents did not experience a Broken Home.

Table 2 Deviant Behavior

Behavior	Frequency	Percent
High	5	22,7
Middle	14	63,6
Low	3	.13,6
Total	22	100,0

Table 2 Explains that adolescent deviant behavior in the medium category is 14 (63.6%) respondents.

Table 3 Broken Home Family Relationships with Deviant Behavior

Variabel	Correlation Coefficient	Sig. (2-tailed)
Broken Home	1.000	
Perilaku Menyimpang	0.657	0.001

In table 3 there is a relationship between broken home family with deviant behavior in adolescents. The results obtained from the Spearman test that when adolescents experience Broken Home, there is an increase in adolescent deviant behavior. This can be seen from the results of SPSS 25 which show a significant <0.05 (0.001), so the conclusion is that there is a relationship between the two variables of 0.657, which means that it has a positive relationship and has moderate strength.

3.1 An Overview of the Broken Home Family in East Tidore District

The results of the study on the relationship of the Broken Home family with Deviant behavior in adolescents in East Tidore District, Tidore Islands City. That the number of respondents with a total of 22 who are suspected of having a Broken Home where there are 9 (40.9%) respondents who experienced a broken home. And 13 (59.1) respondents did not experience a Broken Home. This can happen to teenagers because of the lack of care, affection

and love for teenagers where teenagers still really need a parent figure who accompanies teenagers to grow up with the love of their parents.

This is supported by research by Swastika & Retnaningsi in (I Shalahuddin & Faijurahman, 2018) adolescents who come from Broken Home families due to parental divorce and lack of communication between family members. The role of parents in communication with adolescents is emphasized in several important matters such as education, lessons, health and finance. The father's communication role is more about career and financial matters. And for the role of mothers themselves, teenagers are more needed in terms of health and finances. Meanwhile, for social problems and how to choose a partner, especially sexual problems, they are more likely to ask their friends.

This is confirmed by Kusuma in (Wulandri & Fauziah, 2019) regarding the psychological condition of adolescents who come from Broken Home families that the impact felt by adolescents are: feeling insecure, a sense of rejection from the family, sadness, loneliness, anger, and feelings of sadness. to blame yourself. Based on the results of existing research, the majority of Broken Home victims have negative traits that lead to deviant behavior. This statement is supported by (Iwan Shalahuddin et al., 2019) in that a relationship between a parent and child family can turn into a Broken Home if there is no love, respect, communication within family members, and each family member tends to have a lot of conflicts. So, teenagers from Broken Home families do not have good attention and control from their parents. The effects of Broken Home have a major impact on children, especially for teenagers, where teenagers are still looking for self-identity in the transition from adolescence to adulthood, and also, they are still unstable and emotional so that teenagers will always show attitudes towards their parents and cause juvenile delinquency outside the home and in the school environment.

3.2 Deviant Behavior in Adolescents in East Tidore District

The results showed that the deviant behavior of adolescents in the High category was 5 (22.7) respondents. There were 14 (63.6) respondents in the medium category of deviant behavior, and 3 (13.6) respondents for the low deviant behavior category for adolescents. This deviant behavior in adolescents can be caused by lack of attention from the closest people to adolescents, especially both parents. As well as unstable adolescence and immature adolescent emotions. So that situations like this and also unpleasant circumstances will occur in the environment.

This statement is supported by (Sunarto, 2018) the emergence of this deviant behavior because teenagers are younger to be influenced by their friends. Means that the influence of parents was weakened. Teenagers behave defiantly and have different pleasures and can conflict with behavior and pleasure in their own families. Common examples are the way of dressing, hairstyles, music playing and shows that are all modern so that teenagers' attitudes towards the social environment are considered negative which leads to deviant behavior.

This is also supported by (Andriyani & Ardina, 2021). Deviant behavior in adolescents is an act that violates the norms that apply in community life. Juvenile delinquency is usually carried out by teenagers who fail in the process of mental development, whether they are children or teenagers. Psychologically juvenile delinquency is a form of conflict that has not been resolved properly in childhood or adolescence. Often these problems in adolescents cause trauma in the future. Deviant behavior occurs because there are deviations in behavior from various rules imposed in society.

This statement is also reinforced by (Sunarto, 2018). Deviant behavior in adolescents is due to parental disputes or conflicts (between family members) which causes parents to divorce. This has a major impact on adolescents so that adolescents experience weak self-control, where adolescents are unable to learn and distinguish what is good and what is bad so they get lost in deviant behavior.

This is also supported by (Xie et al., 2019) that unhealthy deviant behaviors are prominent in adolescents such as drinking alcohol, smoking, and an unhealthy diet. Deviant behavior in adolescents is caused by biological factors and psychosocial factors. From a biological perspective, adolescents experience hormonal changes and activate receptors in the

brain to encourage high-risk behavior. In adolescence the brain's reward system develops more rapidly than the control system, encouraging sensation seeking regardless of outcome. While psychosocial prospects are characteristics of adolescents, adolescents often assume personal stories, such as "bad luck will not happen to me" this assumption of immortality also encourages risky behavior in the digital era, and the media is another stimulus for teenagers to behave defiantly.

3.3 Relationship between broken home families with deviant behavior in adolescents

Based on the results of research on the relationship between broken home families and deviant behavior in adolescents using a questionnaire, P value = 0.001, then H_1 is accepted, which means that there is a relationship between broken home families and deviant behavior in adolescents in Tidore District, Tidore Islands City. Adolescents who experienced a broken home were 9 (40.9) respondents, while adolescents who did not experience a broken home were 13 (59.1) respondents. And for adolescent behavior, it is divided into 3 categories, namely high adolescent deviant behavior 5 (22.7) respondents, medium category deviant behavior as many as 14 (63.6) respondents, and for adolescents with Low deviant behavior category as many as 3 (13.6) respondents. From these data, there is a tendency that, when adolescents experience a broken home, the higher the adolescent deviant behavior.

This is supported by (Angger & Fuady, 2018) stating that the family is the closest social environment for raising, maturing, even in which children get their first education. The family is also a small community group, but it is the most powerful environment in raising children. Therefore, the family has an important role in the development of children. A good family will positively affect the development of children, while a bad family will affect it in a negative direction. Family can also be the cause of crime in the form of an abnormal family (broken home). In a broken home family, in principle, the family structure is no longer complete because the parents are divorced or one of the parents or both of them dies.

This is also supported by (Murdoko et al., 2017) stating that adolescents are starting to get interested in their attention from the family environment towards wider social behavior from their peer group. As teenagers get older, interactions with parents become less and less. Therefore, parents must get used to communicating well with teenagers. For example, parents who get used to saying thank you to their children will make them open and comfortable with their parents.

This statement is also reinforced by (Lim & Wong, 2020) that the family is the main key in caring for and educating children in the process of growing up from teenagers to adults. This can foster good morals in adolescents because the treatment given by parents shows good things in accordance with correct teachings to children in everyday life, both in the process of communicating or interacting, there is an opportunity for parents to instill values. values and behavior properly, explaining the reasons for complying with certain rules and the consequences of breaking those rules. When parents fail to play a role in facilitating the moral development of children, children tend to behave defiantly at home, school or in the wider community.

4. Conclusion

The description of the deviant behavior of adolescents who come from broken home families is at risk of experiencing deviant behavior that occurs in the social environment, both in the home environment, community and in the school environment.

Based on the results of the study, it was found that there was a significant relationship between broken home family relationships and deviant behavior in adolescents where teenagers who experienced broken homes had deviant behavior.

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The Effect of Progressive Muscle Relaxation (PMR) Exercise on Blood Pressure Reduction in Hypertensive Clients: A Literature Review

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ABSTRACT

Introduction: The compliance of taking antihypertensive drugs in clients with hypertension were low. Uncontrol of blood pressure will cause heart disease, kidney failure, diabetes, and stroke. It is necessary to have alternative support in controlling in blood pressure, namely by using progressive muscle relaxation exercises. **Objectives:** This study aims to determine the effect of progressive muscle relaxation on reducing blood pressure in patients with hypertension. **Methods:** The research design used was a literature study with a sample size of 20 journals, namely: Pubmed (n=2), Proquest (n=4), Science Direct (n=8) and Biomed Central (n=6). By using the keyword search data "Progressive Muscle Relaxation AND Blood Pressure AND Hypertension OR Hypertensive" using analysis techniques with thematic analysis. **Results:** 95% of the results of the study reported that there was a decrease in systolic and diastolic values in hypertensive patients before and after the progressive muscle relaxation intervention and 5% reported that there was no change. **Conclusion:** Progressive muscle relaxation is effective for lowering blood pressure in hypertensive patients.

1. Introduction

Hypertension is the main cause of heart disease and death in the globe. (GBD 2017 Causes of Death Collaborators, 2018). Global mean blood pressure (BP) has remained constant or reduced somewhat during the last four decades due to widespread usage of antihypertensive drugs (Mills et al., 2020). By contrast, the prevalence of hypertension has increased, especially in low- and middle-income countries (LMICs) (Mills et al., 2016).

Judging from the data on adherence to taking antihypertensive drugs, 32.3% did not regularly take hypertension medicine and 13.3% refused to take medicine. The reasons for the client not taking medicine include feeling healed 59.8%, not regularly going to health facilities 31.3%, taking herbal medicine 14.5%, often forgetting 11.5%, unable to buy medicine 8, 1%, unable to feel side effects 4.5%, and unavailability of drugs in health services 2.0%, others 12.5% (Risksdas, 2018).

Identify some of these reasons, therefore it is necessary to have alternative treatments that can support blood pressure control, in order to prevent complications. Treatment of hypertension is divided into two, namely pharmacological treatment using antihypertensive drugs such as diuretics, beta-blockers, ACE inhibitors, angiotensin II receptor blockers (ARBs), Angiotensin II receptor blockers (ARBs), calcium channel blockers (CCBs) alpha- blockers, clonidine, and vasodilators. Pharmacological treatment can cause side effects such as dizziness, drowsiness, cough, fatigue, increased urinary frequency. Reduces concentration and sexual dysfunction if consumed in the long term. This is what causes scientists to develop non-pharmacological therapies (Dimas Vironika, 2016).

Non-pharmacological therapy can cause a relaxing effect on the body that can reduce sodium levels in the blood, so that blood pressure is controlled (Ulfa Azhar et al., 2019). In addition, it can be done independently and does not cost much and does not cause long-term impacts. Many non-pharmacological therapies have been developed abroad as complementary therapies to conventional medicine. Some therapies are grouped in Complementary Alternative Medicine (CAM) which consists of Alternative Medical System, Mind Body Intervention,

Biological Based Therapy, Manipulative Body-Based Method and Energy Therapy (Resti Maiwandira, 2014).

Non-pharmacological therapy or known as complementary therapy is a traditional medicine that is complementary to conventional medicine. Complementary therapies that have been found and used to lower blood pressure include using herbal plants, acupuncture therapy, aromatherapy, meditation therapy, yoga, dance therapy, music therapy (Putri & Nurfitriani, 2020). In addition, there are several therapies that are believed to lower blood pressure, such as laughter therapy and progressive muscle relaxation therapy (Dimas Vironika, 2016).

Progressive muscle relaxation therapy is a therapy that focuses on muscle activity so that muscles relax and can reduce muscle tension (Damanik & Ziraluo, 2018). Progressive muscle relaxation is a systematic technique carried out to achieve a relaxed state by performing movements to tense and loosen tense muscles so that muscles relax and reduce stress levels and lower blood pressure (Ekarini et al., 2019). Relaxation exercises are useful to help reduce tense muscles, lower blood pressure, help increase tolerance during activities, increase immunity so that functional status and quality of life improve (Sri Suwarni, 2017).

The advantage of progressive muscle relaxation when compared to other therapies is that it does not require imagination, strength or suggestions such as laughter therapy, aromatherapy, meditation therapy, yoga and music therapy. Progressive muscle relaxation focuses on muscle activity by identifying tense muscles in a relaxed state by reducing muscle tension by performing relaxation techniques. Relaxation therapy can also reduce peripheral resistance, increase the elasticity of blood vessels, muscles and blood circulation throughout the body so that it can facilitate the process of circulating and taking oxygen. In addition, relaxation can widen blood vessels directly thereby lowering blood pressure (Dimas Vironika, 2016).

This study aims to determine the effect of progressive muscle relaxation intervention on reducing blood pressure in hypertensive patients based on a literature study. The benefit of this research is that it can provide an evidence-based view of nursing interventions.

2. Methods

The type of research used in this study is literature study research (literature review). This study aims to analyze the progressive muscle relaxation intervention as an independent variable that can increase the dependent variable, namely a decrease in blood pressure. Journal portal websites used by researchers in conducting data searches are Pubmed, Proquest Science Direct, and Biomed Central. The keywords used are "progressive muscle relaxation and blood pressure and hypertension or hypertensive". Inclusion criteria of journals were accessed, including: (1) international journals related to progressive muscle relaxation interventions to reduce blood pressure in hypertensive patients; (2) International journals published in 2011-2020; (3) English-language international journals; (4) Journals that can be accessed in full text. Journal quality assessment found using JBI (Joanna Briggs Institute). Journal data analysis using thematic analysis method.

3. Results and Discussion

search for journal data from 4 international web portals, namely *Pubmed*, *Proquest*, *Science Direct*, and *Biomed Central*. the keywords used are Progressive Muscle Relaxation, Hypertension, Hypertensive, Blood Pressure and modify with Boolean operators (AND and OR) for the specification of the findings of the journal. Based on the search, we found 21 articles from Pubmed, 49,642 articles from Proquest, 149,050 articles from Science Direct, 649 articles from Biomed Central. Furthermore, screening is carried out with the following inclusion criteria (a) Journals published within a period of 10 years from 2011 – 2020, (b) fully accessible journals (full text), (c) Journal type (quasi-experimental design), (d) English and Indonesian Journals. Then adjust to the PICO analysis method and the researchers screened the journals by reading one by one the journals related to the research topic. After the screening process is carried out, a quality test process is carried out using JBI tools such as Quasi-Experimental Studies so as to get quality journals and obtain journals that are used as literature in this research.

It was obtained about 17 international and local journals related to hypertension variables, there are 8 international journals and 9 local journals that discuss the effect of progressive muscle relaxation on reducing blood pressure in patients with hypertension. Based on Figure 4.1 (journal database) obtained journals from Pubmed (n=1), Proquest (n=4), Science Direct (n=7), and Biomed Central (n=5) sites.

Based on the thematic results of the analysis, it was found that there were two major themes found in the journal, namely, (1) The Effect of Progressive Muscle Relaxation on Blood Pressure in Patients with Hypertension and (2) the Progressive Muscle Relaxation Method used in the study.

3.1 Effect of Progressive Muscle Relaxation on Blood Pressure in Hypertensive Patients

Progressive muscle relaxation is a complementary therapy that has many benefits, one of which can lower blood pressure by focusing on relaxation activities that cause muscles to feel relaxed, this relaxed feeling can later affect the work process of the sympathetic nerves and severe sympathetic (Swing & Alie, 2016). In the research from Rahmawati et al., 2018, also mentioned that the movement in PMR causes the body to feel more relaxed so that it can inhibit the increase in sympathetic nerves and slow down the body's work so that there is a decrease in heart rate, breathing rhythm, blood pressure, muscle tension, and body metabolism.

according to (Fadli, 2018) mentions that when the body is relaxed and calm, the body will automatically ignore tension so that it can affect hormone production in the parasympathetic nervous system. Relaxation will reduce the production of the hormone's epinephrine and cortisol where decreased cortisol will affect the work of the heart by reducing cardiac output. In addition, the parasympathetics secrete acetylcholine which can affect the work of the heart so that blood vessels will experience vasodilation and cause blood circulation to be smooth so that blood pressure decreases.

Statements in research (Baharuddin, 2016) which states that progressive muscle relaxation can reduce blood pressure, anxiety, stress, muscle tension and difficulty sleeping. When the body is relaxed, the hypothalamus will automatically adjust and decrease the activity of the sympathetic and parasympathetic nervous systems. Sympathetic nerves have a function to stimulate or stimulate body organs such as increasing heart and breathing rates and constricting central blood vessels. While the parasympathetic nerves work to stimulate the increase in the function of organs that are derived by the sympathetic nerves.

Progressive muscle relaxation exercises can automatically stimulate the sympathetic nervous system so that it can reduce levels of catecholamine substances where these substances can cause constriction of blood vessels which can increase blood pressure. When activity in the sympathetic nerves decreases due to the effects of progressive muscle relaxation, the production of catecholamines decreases so that it can have an effect on lowering blood pressure (Alimansur & Anwar, 2017).

Based on research (Baharuddin, 2016) states that when the body performs progressive muscle relaxation in a calm and concentrated state for 15-30 minutes, the secretion of CRH (Corticotropin Releasing Hormone) and ACTH (Adrenocorticotrophic Hormone) in the hypothalamus decreases. The decrease in secretion of these two hormones can result in decreased sympathetic nerve activity, so that the release of adrenaline and non-epinephrine results in a decrease in heart rate, reduced blood vessel resistance, dilation of blood vessels and a decrease in heart pumping throughout the body so that blood pressure in the arteries of the heart decreases. .

Heart valves that experience stiffness during progressive muscle relaxation will cause the heart valves to not close properly and the flow of blood circulating throughout the body is obstructed. Therefore, it causes the activity of the heart to pump blood harder which causes high diastolic blood pressure (Herawati & Azizah, 2016). The statement is in accordance with the research results (Tyani, Utomo, 2015) who stated that hypertension appeared between the ages of 30-50 years and the incidence increased at the age of 50-60 years rather than the age of 50-60. Along with increasing age can cause systolic blood pressure to increase due to a decrease in the elasticity of blood vessels.

Progressive muscle relaxation produces a significant impact in reducing systolic and diastolic blood pressure in patients with hypertension, this is evident from the results of research (Misbah et al., 2019) that doing PMR exercises regularly and in accordance with the guidelines, namely doing relaxation 2 times a day, in the morning and evening for 5 days, shows that there is a greater decrease in blood pressure, namely 10-20 mmHg.

Progressive muscle relaxation carried out in a row can cause an increase in parasympathetic nerves, this is in line with the statement (Rahayu et al., 2020) which states that it can cause an increase in sympathetic nerve activity so that the neurotransmitter acetylcholine will be released, and that acetylcholine affects the activity of skeletal and smooth muscles in the peripheral nervous system. The released acetylcholine neurotransmitter will stimulate endothelium cells in vessels so as to synthesize NO (Nitric Oxide) which provides a signal to smooth muscle cells to relax so that the contraction of the heart muscle decreases then arteriolar and venous vasodilation occurs so that blood pressure decreases.

3.2 Progressive Muscle Relaxation Method used in the study.

In research journals used as literature, according to (Naufal, 2020) The procedure for progressive muscle relaxation is to inhale and stretch the muscles for 4-10 seconds, then exhale and relax and relax for 10-20 seconds before contracting the muscles again to continue the next series of movements. Progressive muscle relaxation where the intervention is carried out by performing several predetermined movements that aim to stretch the muscles so as to lower blood pressure. (Ilham et al., 2019) in his research journal states that progressive muscle relaxation therapy focuses on muscle activity by identifying tense muscles so that it reduces tension by performing progressive muscle relaxation techniques to reduce anxiety, pain and blood pressure.

4. Conclusion

Progressive muscle relaxation is a complementary therapy that has many benefits, one of which can lower blood pressure by focusing on relaxation activities that cause muscles to feel relaxed, this relaxed feeling can affect the work process of the sympathetic and parasympathetic nerves. Relaxation will reduce the production of the hormone's epinephrine and cortisol where decreased cortisol will affect the work of the heart by reducing cardiac output. In addition, the parasympathetics secrete acetylcholine which can affect the work of the heart so that blood vessels will experience vasodilation and cause blood circulation to be smooth so that blood pressure decreases.

Based on the results of the literature study, it was found that progressive muscle relaxation is effective for lowering blood pressure, this is caused by a decrease in the secretion of Corticotropin Releasing Hormone (CRH) and Adrenocorticotrophic Hormone (ACTH) in the hypothalamus which can result in decreased work activity on the sympathetic nerves resulting in the release of adrenaline. and noradrenaline so that blood vessels dilate, heart rate decreases, decreases resistance in blood vessels and decreases heart pump so that arterial blood in the heart decreases.

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Massage Therapy Towards Fatigue in Hemodialysis Patients: A Literature Study

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ABSTRACT

Introduction: Chronic renal failure was the main factor behind the patient undergoing hemodialysis. One of the effects of hemodialysis is fatigue in patients, which affects the patient's quality of life. Therefore, there needs to be an intervention that can be used in addressing the problem. The intended intervention is a non-invasive intervention so that it is easy to apply and does not cause side effects such as slow-stroke back massage, reflexology massage, aromatherapy massage, and acupressure. **Objectives:** to analysis massage therapy towards fatigue in hemodialysis patients through a literature study. **Methods:** The method used in this study is a literature review. The search for literature resources is done by accessing the journal databases of science direct, ClinicalKey Nursing, PubMed, and Proquest. In the early stages of searching journal articles with the keyword "hemodialysis patients" AND "relaxation massage therapy" AND "Nursing Intervention" AND "fatigue". In the search for journals, there were 3,209 journals published from 2011 to 2020. A total of 13 journal articles that are considered relevant are then conducted journal analysis using thematic analysis. **Results:** Literature review results from journals that have been analyzed state that the application of Evidence-Based Nursing in handling fatigue is the utilization of slow-stroke back massage, reflexology massage, aromatherapy massage, and acupressure. **Conclusions:** The application of Evidence-Based Nursing in handling fatigue is the utilization of slow-stroke back massage, reflexology massage, aromatherapy massage, and acupressure.

1. Introduction

Chronic Kidney Disease (CKD) has a disease process for a long time so that its function decreases and cannot return to its original condition (Siregar & Ariga, 2020). When CKD patients are in the final stage, the kidneys have a GFR (Glomerular Filtration Rate) below 15 ml/minute of normal function, hemodialysis will be carried out. Hemodialysis cannot cure the patient's kidney failure, but hemodialysis can improve the well-being of CKD patients. Hemodialysis is carried out in a fairly long period of 4-5 hours and must be done routinely 2-3 times a week because this action only replaces the decreased kidney function so that kidney failure patients feel better (Al Husna et al, 2019). The longtime of hemodialysis implementation often makes the patient tired (fatigue) and eliminates one's enthusiasm for life so that it affects a person's compliance in undergoing hemodialysis therapy (Brunner & Suddart in Rostanti et al, 2016).

Fatigue can be one of the reasons why CKD patients are reluctant to do hemodialysis because fatigue is one of the psychological barriers to compliance with patients undergoing hemodialysis (Juwita & Kartika, 2019). Fatigue conditions in hemodialysis patients can cause decreased concentration, mental and physical tension, malaise, sleep disturbances, emotional disturbances, and a decrease in the patient's ability to carry out daily activities, which in turn can reduce the quality of life of hemodialysis patients (Sudrajat, 2014). To overcome fatigue in hemodialysis patients, pharmacological therapy and non-pharmacological therapy can be carried out, some of the interventions that have been studied include non-pharmacological therapy by doing massage therapy.

2. Method

The method used in this study is a literature review. Search for literature sources is done by accessing 4 databases, namely Clinical Key for Nursing, Pubmed, Proquest, and Science Direct. In the early stages of searching the data with the keywords "hemodialysis patients" AND "massage relaxation therapy" AND "Nursing Intervention" AND "fatigue". In the data search stage, 3,209 journals were found with details of 350 journals from the Sciencedirect database, 2,669 journals from the ClinicalKey for Nursing database, 8 journals from the Pubmed database, 182 journals from the ProQuest database. All data/journals go through two screening stages. The first stage of screening is based on inclusion criteria and exclusion criteria. The following inclusion criteria have been determined in this study are international journals with the year published 2011-2020, Journals that can be accessed in full text, international journals in English, and Peer-reviewed journals. The exclusion criteria that have been determined in this study are international journals published under 2011, journals that cannot be accessed in full text, and international journals that do not use English.

After the first stage of screening, 315 journals were obtained, with details from the ScienceDirect database of 41 journals, from the ClinicalKey of Nursing database as many as 167 journals, from the PubMed database as 8 journals, and from the ProQuest database as many as 135 journals. The results of the first stage of screening carried out the second stage of screening by selecting the title and abstract which discussed massage relaxation therapy for fatigue in hemodialysis patients. After the second stage of screening, 13 journals were obtained, with details of 3 journals from the Sciencedirect database, 2 journals from the ClinicalKey of Nursing database, 4 journals from the Pubmed database, and 4 journals from the Proquest database. The results of the second phase of screening were assessed for data quality using JBI (Joanna Briggs Institute) critical appraisal checklist Randomized Controlled Trials and Quasi-Experimental Studies (non-randomized experimental studies). After assessing the quality of the data, the journals carried out data extraction and data analysis using the thematic analysis method.

3. Results and Discussion

Based on the results of journals collected and analyzed by researchers, it was found that fatigue is one of the main problems experienced by patients undergoing hemodialysis or HD. Fatigue or fatigue in hemodialysis patients can occur due to 2 factors, namely individual factors related to the period or length of time for hemodialysis and hemodialysis activity factors. Associated with the period or length of time hemodialysis action can cause fatigue because when hemodialysis is carried out for 4-5 hours and most patients are silent and do not do any activities, hemodialysis patients will experience feelings of boredom, tiredness, and saturation. Fatigue can also be caused by hemodialysis activities because almost all hemodialysis patients are anemic with Hb < 10 g/dl with an average Hb of 8.7 g/dl. Patients who have been on hemodialysis for a long time will have high levels of urea and creatinine. High urea will interfere with the production of the hormone erythropoietin. This causes the number of red blood cells to decrease or what is called anemia and as a result, the patient will experience fatigue, tiredness, lethargy which is a symptom of fatigue. The problem of fatigue or fatigue in hemodialysis patients can reduce the patient's quality of life. To achieve a good quality of life in hemodialysis patients, several efforts can be made to reduce fatigue by using non-pharmacological therapy. Some non-pharmacological therapies that can be done are slow-stroke back massage, reflexology massage, foot reflexology massage, aromatherapy massage relaxation therapy, and acupressure relaxation therapy.

Several journals that have been analyzed show that the age with high fatigue is at the age of 40-60 years, because at the middle adult stage there is a decrease in work productivity, physiological changes, decreased body functions, and lifestyle changes. So that at the middle adult stage several factors cause fatigue in addition to the hemodialysis process (Jumadi et al., 2019). Several journals explain that relaxation massage therapy is better done in early adulthood (18-40 years) with fatigue caused by the long hemodialysis process.

The implementation of Evidence-Based Nursing to overcome fatigue are (1) slow-stroke back massage, (2) reflexology massage, (3) foot reflexology massage, (4) aromatherapy massage therapy, and (5) acupressure relaxation therapy.

3.1 Slow-stroke Back Massage

Slow stroke back massage is a hand movement massage with a slow, gentle, and rhythmic tempo on the back of hemodialysis patients (Hasankhani et al, 2013). Slow-stroke back massage is performed after the patient has had a hemodialysis session. The duration of doing this slow-stroke back massage is 3-10 minutes. Based on Hasankhani et al's (2013) research on The Effect of the Slow Stroke Back Massage on Fatigue of Dialyzed Patients using 60 hemodialysis patients, it showed that slow-stroke back massage therapy can significantly increase the excretion of waste products such as lactic acid which will result in the release of energy and decrease fatigue (fatigue) in patients undergoing hemodialysis and can increase blood flow and nutrients to certain areas. Slow-stroke back massage also has positive effects, such as increasing comfort and tranquility, improving quality of life, and reducing uncomfortable effects such as pain, nausea, and muscle cramps. Slow-stroke back massage should be done regularly for a long period (1-2 months) after each hemodialysis session to get significant results in reducing fatigue.

3.2 Reflexology Massage

Reflexology massage is a strong massage in certain areas of the body with a massage duration of generally 20-30 minutes (Mavis & Bhattacharya, 2013). Reflexology massage therapy includes relaxation therapy with simple techniques that are safe and affordable so that it can be done by the patient or the patient's family. Reflexology massage can provide beneficial effects for hemodialysis patients, such as reducing and overcoming physiological disorders and can reduce fatigue in hemodialysis patients (Jumadi et al, 2019). Some areas on the body that are often used as reflexology massage points are the areas of the hands and feet.

3.3 Foot Reflexology

Foot reflexology is part of reflexology massage that focuses on the foot area. Foot reflexology/foot massage can reduce fatigue because when there is pressure on the skin of the feet that stimulates sensory nerve endings, the stimulation is sent to the central nervous system and the body can release endorphins and encephalitis, both of which function to stimulate relaxation and decrease fatigue (Jumadi et al. al., 2019). According to Zdemir et al (2013) foot reflexology also provides benefits for increasing relaxation, reducing tension, reducing pain, and the severity of cramps.

The duration of foot massage is generally carried out for 20-30 minutes, and the execution time is 10 minutes or as soon as possible after hemodialysis is complete. Foot reflexology can be accompanied or combined with several useful ingredients to facilitate the massage process. Complementary ingredients can be used in the foot massage process such as almond oil and chamomile oil (Habibzadeh et al., 2020). In addition to almond oil and chamomile oil, a complementary ingredient that is often and easily available for foot massage is baby oil (Unal & Balci Akpınar, 2016).

3.4 Aromatherapy Massage Therapy

An aromatherapy massage is a combination of massage therapy using aromatherapy oils that can be quickly absorbed by the skin and into the bloodstream with a duration for aromatherapy massage in general of 20 minutes (10 minutes for each leg) (Mohammadpourhodki et al., 2020). Aromatherapy massage relaxation therapy is a non-pharmacological therapy that can reduce fatigue and improve quality of life. According to Setyoadi & Kushariyadi (in Rohmah, 2017), the benefits of aromatherapy massage on the blood circulatory system are to increase surface circulation so that it can reduce the workload of the heart, lower blood pressure, accelerate metabolic and nutritional waste, increase blood circulation in tissues, increase circulation and stimulate blood flow. blood to the deeper veins. Other than that, the benefits of aromatherapy massage on the nervous system are that it can reduce insomnia, anxiety and fatigue, encourage endorphins or release natural painkillers.

Aromatherapy massage with essential oils can also have a beneficial effect on the patient's psychology, as well as a stimulating effect on the patient's immune system.

3.5 Acupressure Relaxation Therapy

Acupressure relaxation therapy includes non-pharmacological therapy that can reduce fatigue. Acupressure is a massage with pressure techniques on major acupuncture points K1, GB 34, ST 36, SP 6, BL 23, and HT 7. According to Sabouhi et al (2013) in their research on the Effect of acupressure on fatigue in patients on hemodialysis describes the duration of acupressure relaxation therapy for 20 minutes with details of 2 minutes for primary superficial stroke from acupuncture points and 18 minutes for acupressure from 6 acupuncture points and its implementation was carried out in the first 2 hours of hemodialysis. Stimulation of acupuncture points results in improved circulation of vital energy in the body and increases endorphins and enkephalins, which play a role in reducing fatigue in hemodialysis patients. According to Simatupang & Sinaga (2020) in their research on "The Effect of Acupressure and Deep Breathing Exercises on Fatigue and Sleep Quality of Hemodialysis Patients at Murni Teguh Memorial Hospital" show that acupressure therapy affects fatigue in hemodialysis patients, the results of this study are supported by Cho & Tsay (2012) with the results of his research which says acupressure is related to gate control theory by pressing the foot area through the nervous system, it induces an alpha wave stimulus in the brain, causing relaxation and reducing fatigue.

4. Conclusion

Hemodialysis carried out routinely for a long time can cause fatigue so that it can reduce the quality of life of hemodialysis patients. An understanding of various types of relaxation massage therapy for fatigue in hemodialysis patients is useful when preparing efforts to improve the quality of life of hemodialysis patients by reducing negative effects such as fatigue from the hemodialysis action. This literature study explains several conclusions and suggestions that are expected to be the basis or reference in research related to fatigue in hemodialysis patients. After the results of the literature study were explained by the researchers, the researchers concluded that various types of massage relaxation therapy can reduce fatigue in hemodialysis patients.

Various kinds of relaxation massage therapy are described in the results of the analysis of these journals are slow-stroke back massage, reflexology, aromatherapy massage, and acupressure. Various kinds of relaxation massage therapy are effective in reducing some physical disorders such as pain and psychological disorders such as fatigue. The various types of relaxation massage therapy are also simple therapies that can be learned and practiced by the patient's family so that it is more cost-effective. After knowing the various types of relaxation massage therapy, it is hoped that it can be an effort to improve the quality of life of hemodialysis patients.

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Stigma and Discrimination against People Living with HIV/AIDS: A Literature Review

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ABSTRACT

Backgrounds: The human immunodeficiency virus (HIV) is a virus that causes AIDS. People believed that HIV was a deadly disease and no cure threatened people living with HIV/AIDS, so there were various reactions to HIV/AIDS, including fear, rejection, stigma, and discrimination. This study aims to see how stigma and discrimination against people living with HIV/AIDS (PLWHA) are based on the literature. **Methods:** This study was a literature review. Journal searches use keywords and Boolean operators (AND, OR) in four databases: PubMed, ProQuest, Taylor & Francis, and EBSCO. Using selection criteria, a full-text and English on stigma and discrimination against PLWHA, published 2016-2020. Journal quality assessment using JBI and analysis using subject analysis. **Results:** Twenty-one journals have found that stigma and discrimination against PLWHA in the medical setting remains very high, especially in the area of invasive treatment. It is also known that the causes of PLWHA stigma and discrimination in society are determined by several factors such as age, educational background, place of residence, marriage history, sexual activity, and work. More than men (51.5%) experienced personal stigma in society compared to women (48.2%) ($P > 0.05$). With ten articles stating that stigma and discrimination are important to a quality life, PLWHA is scared, blamed, shunned, humiliated, emotionally stressed, and inconsistent in therapeutic behavior. **Conclusion:** There are forms of stigma and discrimination against PLWHA in health care and the community. HIV/AIDS stigma and discrimination are social determinants of advances in illness care, despite advances in medical care and increased awareness of the illness.

1. Introduction

Human Immunodeficiency Virus (HIV) is a virus that causes AIDS that belongs to the retrovirus group. A person infected with HIV will experience infection for life. Most people with HIV / AIDS (PLWHA) remain asymptomatic (without signs and symptoms of a disease) for a long time. However, they can infect other people (Yuliyanasari, 2017). HIV infection runs very progressively destroys the immune system, so the sufferer cannot withstand the attack of fungal, bacterial, or viral infections. Most people with HIV will die within a few years after the first signs of AIDS appear if no services and therapy are provided (Zicari et al., 2019).

Worldwide, 38 million people living with HIV, 25.4 million people are now on treatment, which means 12.6 million people are still waiting. New HIV infections have decreased by 23% since 2010, thanks mainly to a substantial 38% decline in eastern and southern Africa. But HIV infections have increased by 72% in Eastern Europe and Central Asia, 22% in the Middle East and North Africa, and 21% in Latin America. Globally, there were still 690,000 HIV/AIDS-related deaths in 2019 and 1.7 million new infections (UNAIDS, 2020). The high population of HIV/AIDS in Southeast Asia requires Indonesia to be more aware of the spread and transmission of this virus. The number of HIV cases in Indonesia reached its peak in 2019, which was 50,282 cases (Data and Information Center of the Indonesian Ministry of Health, 2020).

Stigmatization is formed through social cognitive processes, namely labeling/cues, stereotypes, prejudice, and discrimination (Varamitha, Noor Akbar, and Erlyani, 2016). Stigma is an attribute, behavior, or social reputation that is discredited in a certain way. Stigma has two perspectives, namely societal stigma and self-stigma. Community stigma occurs when the general public agrees with a person's lousy stereotype (e.g., mental illness, complainant), and

self-stigma is a consequence of stigmatized people applying stigma to themselves alone. HIV and AIDS are still considered taboo to be discussed openly with families, communities, and even health services. This situation makes PLWHA vulnerable to stigma and discrimination from society (Ardani and Handayani, 2017).

Several surveys report widespread stigma and discrimination among the general public in China, the US, Hong Kong, South Africa, Jamaica, Brazil, Thailand, Zambia, and Ghana. One study in Iran stated that the prevalence of stigma and negative perceptions of PLWHA was around 46-69%. While in Indonesia alone, there are around 62.8% in the 15-49 year age range who discriminate against PLWHA (Situmeang, Syarif, and Mahkota, 2017).

Stigma against PLWHA has a significant impact on HIV/AIDS prevention and control programs, including the quality of life of PLWHA. People living with HIV are afraid to reveal their HIV status and decide to postpone seeking treatment if they are sick, which will impact their declining health level, and HIV transmission cannot be controlled (Punjastuti, Health, and Husada, 2017).

People with HIV-AIDS (PLWHA) are often faced with complicated conditions, whether to tell others or hide the condition of the disease they are experiencing. Hiding this disease condition can result in mental suffering that is excruciating because of the burden of keeping secrets. On the other hand, revealing the condition of the disease can also cause problems such as rejection (Carsita et al., 2016).

This result is in line with the results of thesis research from (Aminudin 2017) with the title of the relationship of stigma to PLWHA with interest in doing VCT on housewives in RW 14 Sosmenduran Gedong Wetan in Yogyakarta, which states that out of a total of 32 respondents studied, 7 respondents received mild stigma (21.9%), moderate stigma amounted to 21 respondents (65.6%), and 4 respondents with severe stigma (12.5%).

From several previous researchers, PLWHA and struggling with their disease often have to face stigma and discrimination. PLWHA is considered a transmitter of deadly diseases and has a bad attitude. This condition makes people living with HIV not dare to open up that he is positive for HIV. So that researchers are interested in researching with the title "Stigma and Discrimination Against PLWHA" using a literature study approach. This study aimed to find out how stigma and discrimination against PLWHA are based on the literature.

2. Methods

The research method used in this research is the literature review. Literature study is an explicit and reproducible research method for identifying, evaluating and synthesizing research works and ideas that have been produced by researchers and practitioners (Okoli and Schabram, 2012). In literature review research, we conducted seven stages that must be carried out so that the literature study results can be recognized for credibility. The stages are described as follows:

Search data using keywords: "Stigma" OR "Social Stigma" AND "Discrimination" AND "HIV and AIDS".

Searches on the Ebsco site n= 950, Searches on the Pubmed site n= 1,154, Searches on the ProQuest site n= 15,501 and Searches on the Taylor & Francis site n= 7,395.

Identification and Screening of journals n= 4325. Issued (n= 20,675) namely Journals published in 2016-2021, English-language international journals, full text and per review journals and Research design: Cross-sectional and qualitative research

Fully accessed journal n= 1.347

Issued (n= 665) and abstract Screening was carried out using PICOS framework and Quality assessment: JBI

Article Data Extraction n= 21

Data analysis using thematic analysis.

Screening or data selection is the selection of data that aims to choose a research problem by the topic of the problem being studied. The topic studied is the stigma and discrimination experienced by HIV/AIDS patients. In this study, Screening was carried out four times, the first was a search for data using keywords, then the second Screening was carried out

using inclusion criteria, the third was checking for journal duplication, and the fourth was JBI quality assessment - PICOS framework, which consists of:

Population/problem is the population or problem that will be analyzed following the existing themes in the literature review.

Issues of interest is a management action for individual or community cases as well as an explanation of the management of the study according to the themes that have been determined in the literature review.

Comparison is an intervention or other management that is used to make comparisons.

The outcome is the results obtained in previous studies per the themes set in the literature review.

The study design is the research design used in the journal review.

The quality assessment carried out is to assess the titles and abstracts of all sources obtained from various relevant data (Hernani, 2019). Quality assessment in this study ($n = 21$) using JBI (Joanna Briggs Institute Critical Appraisal Tools) can also be done by determining inclusion and exclusion criteria for journals to be a literature review. (The Joanna Briggs Institute, 2016).

From the screening results, we obtained 21 journals that will be analyzed to obtain a theoretical basis that can support solving the problem being studied. The results of a literature review search were obtained from four databases (Pubmed, ProQuest, Taylor & Francis, and Ebsco) using the keywords ("Stigma" OR "Social Stigma" AND "Discrimination" AND "HIV and AIDS") and the inclusion criteria. The researchers found 1,347 journals that matched the word. The search results that have been obtained are then checked for duplication, found 163 journals from Pubmed, 221 journals from ProQuest, 108 journals from Taylor & Francis, and 190 journals from Ebsco, a total of 682 journals were obtained. There were 83 journals with the appropriate abstracts. After screening 83 journals, 21 were obtained, which will be analyzed to obtain a theoretical basis that can support solving the problem being studied.

The results of data extraction ($n = 21$) international journals obtained in this study are as follows: Journal published in 2016-2020: 2016 (2 journals; Chen et al., 2016, Ibrahim et al., 2016), 2017 (3 journals); Nithin et al., 2017, Charity et al., 2017, Agnes et al., 2017), 2018 (3 journals; Xiaomei et al., 2018, Rajiv et al., 2018, Kebebew, 2018), 2019 (7 journals; Leyanna, 2019, Mohit et al., 2019, Rhea et al., 2019, Dionius et al., 2019, Hilda et al., 2019, Mohammad et al., 2019, Hj Lee., 2019), and 2020 (6 journals; Soumya et al., 2020, Fatemah et al., 2020, Akua et al., 2020, Ozlem et al., 2020, Rahima et al., 2020, Eusebius et al., 2021); 2). The research locations of the journals were conducted on three continents, namely: Asia: China (2 journals; Xiaomei et al., 2018 and Chen et al., 2016), India (5 journals; Nithin et al., 2017, Soumya et al., 2020, Rajiv et al., 2018, Leyanna, 2019 and Mohit et al., 2019), Thailand (1 journal; Rhea et al., 2019), Indonesia (2 journals; Dionius et al., 2019 and Hilda et al., 2019), Iran (2 journals; Mohammad et al., 2019 and Fatemah et al., 2020), and Korea (1 journal; Hj Lee., 2019); Africa: Ghana (2 journals; Charity et al., 2017 and Akua et al., 2020), Ethiopia (1 journal; Kebebew, 2018), and Uganda (1 journal; Eusebius et al., 2021), Egypt (1 journal; Ibrahim et al., 2016); Europe: Belgium (1 journal; Agnes et al., 2017); Bosnia & Herzegovina (1 journal; Rahima et al., 2020); and Turkey (1 journal; Ozlem et al., 2020). The research design used from $n=21$ was 15 cross-sectional study journals (No.1 to 15), study and six qualitative research journals (No. 16-21). Population. There is one cross-sectional journal that uses a sample of <100 , namely the journal Hj Lee et al., In 2019, there were 81 respondents (24 nurses and 57 doctors), the other 14 journals had a range of 171 10,272 samples. The number of samples in qualitative journals is in the range of 3 to 71 respondents. In this cross-sectional and qualitative research, no intervention or comparison was carried out to find a relationship, and this study only used questionnaires, interviews, or observation research instruments.

Data analysis is the processing of data from research that has been obtained so that we can obtain the meaning or essence of the research results. Before analysis, the data must be checked or screened first (Aini and Inayah, 2019). Data analysis in this study using thematic analysis is one way to identify patterns or find themes through data that researchers have collected (Heriyanto, 2018).

3. Results and Discussion

3.1 Stigma and Discrimination against PLWHA in Health Services

Stigma and discrimination against people living with HIV/AIDS (PLWHA) in the health care environment is still relatively high, especially in the invasive treatment sector. There are six articles from Hilda et al., 2019; Mohit et al., 2019, Fatemah et al., 2020, Ozlem et al., 2020, HJ Lee et al., 2019, Ibrahim et al., 2021 which state that stigma and discrimination in the health environment are influenced by several factors including age, level of knowledge, experience/length of work, training, and hospital policies that do not support the HIV program. It was also found that the reaction was quite extreme as stated by the journal Xiaomei et al., 2018, saying that several health services in Guangzhou gave refusal of treatment to PLWHA (38.6%), carried out forced detection of patients (65.3%),

Factors that cause stigma and discrimination against PLWHA in health services include knowledge about HIV/AIDS, length of work, training, and institutional support. Knowledge about HIV/AIDS is very influential on health workers in behaving towards people with HIV/AIDS. Stigma and discrimination against PLWHA arise due to ignorance about the mechanism of HIV transmission, overestimating the risk of contracting through casual contact, and misinformation about how HIV is transmitted. There are seven articles, namely Ibrahim et al., 2016, Xiaomei et al., 2018, HJ Lee et al., 2019, Mohit et al., 2019, Hilda et al., 2019, Ozlem et al., 2020; and Fatemah et al. al., 2020, which states that education and training related to HIV should be carried out because most of them do not receive sufficient training. More than 86% of doctors and 69.3% of nurses did not have special education about HIV/AIDS. Good education and publicity will reduce the fear of infection so that the number of stigma and discrimination against PLWHA in health services will also decrease.

The length of work or length of duty of a health worker affects the development of behavior and attitudes of health workers in decision-making to lead to high self-confidence. Someone who has worked for a long time tends to have broader insight and more experience where this has a role in changing a person's behavior towards PLWHA. Four articles use the inclusion criteria of at least one year of work, namely Ibrahim et al., 2016, Xiaomei et al., 2018, HJ Lee et al., 2019, and Fatemah et al., 2020 concluding that fear-driven stigma to treat or interact significantly increased. There is 1 article, namely Hilda et al.,

The training will increase knowledge about HIV/AIDS and the desire of health workers (better attitude) to provide health services. There are six articles, namely Ibrahim et al., 2016, Xiaomei et al., 2018, HJ Lee et al., 2019, Mohit et al., 2019, Ozlem et al., 2020, and Fatemah et al., 2020 which said that training or workshops are needed to reduce stigma and discrimination related to PLWHA.

Institutional factors or health service institutions such as hospitals, health centers, and clinics affect the emergence of stigma and discrimination against PLWHA, including matters relating to policies, SOPs (Standard Operational Procedures), provision of facilities and infrastructure, materials and protective equipment. In the treatment of HIV/AIDS patients. Found three articles, namely Ibrahim et al., 2016, Xiaomei et al., 2018 and Fatemah et al., 2020 which stated that 86% of respondents reported not having guidelines for dealing with HIV patients, laws and regulations related to HIV should be refined/revised by the government to reduce HIV-related stigma in healthcare.

3.2 Impact of Stigma and Discrimination on PLWHA in Health Services

Different treatment for PLWHA is a reaction to the acceptance of the condition of PLWHA and the lack of information about HIV/AIDS. Discrimination occurs because of a feeling of fear of contracting HIV infection. Forms of discrimination such as separated goods in use, items touched by PLWHA are immediately cleaned and isolated. Found seven articles, namely Ibrahim et al., 2016, Xiaomei et al., 2018, HJ Lee et al., 2019, Ozlem et al., 2020, Akua et al., 2020, Agnes et al., 2017 and Leyanna, 2019 which stated that the frequency of stigma and discrimination against PLWHA increased significantly in health services including invasive treatment. Health workers carry out forced detection (65.3%), different treatment/treatment (51.0%), cognition and negative attitudes of health workers, hospital management systems, and government policies. The stigma and discrimination that arise in treatment are delayed or denied, excessive precautions, blame, and humiliation. 29.0% - 48.8% PLWHA have experienced verbal/symbolic violence.

The existence of "Labelling" against PLWHA is intended to distinguish a person. Labeling of PLWHA is given because it is considered to deviate from the general norm. found 1 article from Dionius et al., 2019 which said that it was moral judgments that considered PLWHA immoral so that they supported negative stereotypes about themselves or their stigma.

There is no guarantee of confidentiality of the test results. HIV test results must be kept strictly confidential. HIV test results are kept in confidential medical data. Results cannot be shared with others without the person's permission being tested. However, it was found from 3 articles, namely, from Nithin et al., 2017, Xiaomei et al., 2018 and Rhea et al., 2019, which stated that the confidentiality of HIV positive status was only about 14.4% of the total participants. Information disclosed (46.4%). Many participants said that fear of disclosing HIV status harmed medication adherence.

Refusal / Denial of Treatment. Health workers in hospitals tend to be discriminatory towards people with HIV/AIDS. Many cases occur in PLWHA Hospitals that do not receive good health services, even to the point of refusal of treatment. The refusal of the Hospital to PLWHA was carried out for various reasons, such as limited health facilities, not having specialist doctors, and others who seemed to be unwilling to provide care. There are 4 articles from Ibrahim et al., 2016, Agnes et al., 2017, Xiaomei et al., 2018. And Akua et al., 2020 which state that the form of stigma and discrimination committed by health workers in care is the treatment that is delayed or rejected. Health workers were worried about touching the clothes of PLWHA (21.3%), worried about closing wounds (26.4%) and 27, 4% were afraid to take blood samples from HIV patients. Discrimination is also common among men like men (MSM): 6.2% - 30.6% have been denied health services.

Stigma and discrimination against HIV/AIDS in the health care environment are influenced by several factors, including knowledge about HIV/AIDS, experience/length of work, training, and institutional support in providing services to PLWHA. It is becoming a major social determinant driving the epidemic, despite advances in medical care and raising awareness about the disease. Those who do not want to treat HIV/AIDS patients say that HIV patients should be ashamed of themselves. Therefore, several services from hospitals, health centers, and clinics must educate health workers and the community to reduce the emergence of stigma and discrimination. This can be done by: 1). Educational status, residence, marital status, sexual activity, and a healthy environment significantly correlate with stigma and discrimination. 2). The government, community, and stakeholders must conduct school socialization to create a correct understanding of HIV and PLWHA; 3). HIV/AIDS-related training and workshops should be implemented; 4). Laws and regulations related to HIV/AIDS should be perfected by the government; 5). The contradiction between referral and non-referral hospitals must be resolved to ensure that PLWHA receives timely and practical help and treatment; 6). Education and publicity to reduce fear of HIV/AIDS-related infections in health care.

Good knowledge of HIV and work experience of nurses affect the loss of fear to treat/interact with PLWHA. The frequency of stigma and discrimination against PLWHA has increased significantly in health services, especially in the invasive medicine sector. Fear of infection and lack of knowledge is related to stigma and discrimination related to HIV/AIDS by medical professionals. This stigma and discrimination is specific and is experienced at various levels such as individuals, families, communities, health care systems, and the media. This has an adverse impact on the health and quality of life of people living with HIV/AIDS. Because they also have the same right to access health services and a decent life.

3.3 Stigma and Discrimination against PLWHA in the Community

The causes of stigma and discrimination against PLWHA in society are influenced by several factors such as knowledge and education status, negative perceptions, negative attitudes, age, economic status, or occupation. Compared to women (48.2%), more than (51.5%) men had experienced personal stigma in society ($P>0.05$). There are 10 articles, namely Nithin et al., 2017, Mohammad et al., 2019, Akua et al., 2020, Rhea et al., 2019, Mohit et al., 2019, Agnes et al., 2017, Dionius et al., 2019, Chen et al., 2016, Leyanna et al., 2019 and Eusebius et al., 2021 which said that stigma and discrimination had a significant negative relationship to quality of life (QOL), PLWHA felt fear, blamed, avoided, humiliated, and emotional stress resulting in inconsistent behavior in treatment. By journal (Jahić et al., 2020) and (Kebebew 2018) Regarding the behavior of students at medical schools or universities in viewing PLWHA, it was found that the discriminatory rate was relatively high, namely around 61.4% (assuming that all patients in hospitals should be tested for HIV), 40% of students said PLWHA should be isolated and believed that PLWHA deserved suffer.

Factors that cause stigma and discrimination against PLWHA in society are public knowledge about HIV/AIDS, perceptions of PLWHA, negative attitudes towards PLWHA, economic status, and age.

3.4 Impact of Stigma and Discrimination on PLWHA in Society

PLWHA, besides having to fight against their illness, also have to survive the stigma and discrimination that develops in society, such as in the environment where they live, groups, and places of work. The stigma and discrimination have a negative impact on the quality of life of PLWHA, their families, and the government's efforts to tackle HIV/AIDS. There are 8 articles from Chen et al., 2016, Eusebius et al., 2021, Mohammad et al., 2019, Dionius et al., 2019, Agnes et al., 2017, Leyanna, 2019 and Mohit et al., 2019 who said that various negative impacts were found from the development of stigma and discrimination against PLWHA in society, such as: Emotional stress: depression (7.78%) and anxiety (31.08%); There is a significant negative relationship between several domains of stigma (discrimination and fear) and the Quality of Life (QOL) of PLWHA; Men like men (MSM) who have experienced sexual violence in their first male relationship are less likely to be tested for HIV; Inconsistent care-seeking behavior and does not disclose HIV/AIDS status to non-PLWHA; Abandonment, denial, avoidance, and burning of personal belongings by family, neighbors and health services.

Stigma and discrimination make PLWHA hide their positive HIV status and have inconsistent treatment behavior. This is because PLWHA feels anxious, depressed and depressed by the conditions. As a result, they will not receive treatment and care that can increase the risk of death of PLWHA and transmission of HIV/AIDS in the community.

4. Conclusion

Stigma and discrimination against PLWHA patients are still forms of stigma and discrimination against PLWHA both in the health care environment and in the community. Stigma and discrimination against HIV/AIDS are social determinants of progress in epidemic care, despite advances in medical care and increased awareness about the disease. Besides that, it can be concluded that it is essential to the government, policymakers, health services, and educational institutions to provide multilateral-multilevel education and training as well as publicity on matters related to HIV/AIDS to reduce stigma and discrimination against PLWHA.

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Analysis of Factors Affecting Stress Levels of Health Workers During the COVID-19 Pandemic: Study Literature

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ABSTRACT

Introduction: COVID-19 is categorized as a pandemic that causes many losses such as physical and mental health problems. Health workers are at the forefront of fighting COVID-19. The number of patients infected with COVID-19 has jumped dramatically, overwhelming health workers and experiencing mental health problems in the form of stress. **Objectives:** This study aims to identify the factors that affect the stress level of health workers during the COVID-19 pandemic based on literature studies. **Methods:** The design used in this study was a literature study with a sample of 18 journals, Pubmed (n = 3), Proquest (n = 4), SAGE Journal (n = 3), and Science Direct (n = 8). With keyword search "Factors AND Influence AND Stress Level AND Health Workers AND COVID-19" with data analysis techniques using thematic analysis. **Results:** As many as 38% of studies reported that the factor that most influenced the stress level of health workers was psychological factors due to fear of transmission of the COVID-19 virus. Then 33% of the research reported that the stress level of health workers was caused by physical factors, 22% was due to social factors, and followed by the results of 7% of the research reported that there were functional factors. **Conclusions:** The factor that most influences the level of stress on health workers is psychological, this is due to the fear of spreading COVID-19.

1. Introduction

A pandemic is a widespread disease outbreak. The World Health Organization (WHO) states that when a new disease spreads throughout the world it is categorized as a pandemic. The outbreak of COVID-19 (Coronavirus Disease 2019) has haunted the entire world, so the WHO has included this COVID-19 outbreak in the category of a pandemic. WHO revealed that confirmed cases of COVID-19 worldwide reached more than 67,780,361 cases, while the number of reported deaths due to COVID-19 reached 1,551,214 cases as of December 9, 2020 (World Health Organization, 2020). In Indonesia, the COVID-19 pandemic began with the discovery of patients with COVID-19 on March 2, 2020, and until April 16, 2020, the number of positive cases of COVID-19 in Indonesia was 5,516 people (Budiman, 2020).

There are many losses caused by the COVID-19 pandemic such as social inequality, economic inequality, physical health problems, and mental disorders. Mental disorders that may occur during the COVID-19 pandemic include fear, sadness, difficulty controlling emotions, anxiety, depression, stress, panic, or even frustration. This situation is not only felt by the community. However, it is also experienced by people in various professions, especially professions in the health sector such as doctors, nurses, pharmacists, midwives, nutritionists, and other health professions (Dinah, 2020).

There are several sectors affected by the COVID-19 pandemic, including the economic sector and the health sector. The economy is one of the important factors in human life. It is certain that in human life, it is always in contact with economic needs. The economy can provide opportunities for humans to meet their needs. However, with this pandemic, more than 1.5 million workers were laid off and laid off, there was inflation or an increase in the price of the necessities of life continuously (Hanoatubun, 2020). In addition, the health sector has also felt a huge impact due to the COVID-19 pandemic. The surge in patients infected with COVID-19 often overwhelms health workers in hospitals, because the group with a very high risk of exposure is

health workers who treat COVID-19 patients. Therefore, health workers are required to wear complete Personal Protective Equipment (PPE) to avoid exposure to COVID-19 infection. This makes services more difficult and can result in health workers experiencing excessive fatigue compared to previous conditions. In addition, the fear of being infected with COVID-19 is one of the triggers for psychological problems for health workers. Psychological problems that have the potential to arise are stress (Handayani, 2020). This makes services more difficult and can result in health workers experiencing excessive fatigue compared to previous conditions. In addition, the fear of being infected with COVID-19 is one of the triggers for psychological problems for health workers. Psychological problems that have the potential to arise are stress (Handayani, 2020). This makes services more difficult and can result in health workers experiencing excessive fatigue compared to previous conditions. In addition, the fear of being infected with COVID-19 is one of the triggers for psychological problems for health workers. Psychological problems that have the potential to arise are stress (Handayani, 2020).

Health care professionals are at the forefront of fighting COVID-19 so their mental health should not be neglected. As a result of a workload that is too extreme, a feeling of fear of transmitting infections to families due to work responsibilities with limited provision of personal protective equipment will lead to a decrease in the quality of mental health and can cause stress for health workers, which is characterized by physical, mental and emotional exhaustion. insomnia (Nainggolan, 2020). The response that most often appears in health workers who treat COVID-19 patients is feelings of anxiety and tension. High anxiety can trigger a decrease in body resistance so that health workers who experience anxiety and have a more extra workload than usual can experience stress (Dinah, 2020). Stress is the body's response that is not specific to any demands or burdens received. Stress can occur when someone receives a heavy task or burden that he cannot complete, the body will respond so that person can experience stress, health workers who experience stress can be at risk of contracting the COVID-19 virus (Mirani, 2020).

The COVID-19 pandemic that occurs will have a psychological impact on health workers who are working in hospitals and serving patients who are confirmed positive for COVID-19. This is because the COVID-19 pandemic is something that has never happened before. According to Si et al., (2020) as many as 40.2% of medical personnel in China showed symptoms of stress disorders, as many as 13.6% of medical personnel experienced symptoms of depression, as many as 13.9% experienced anxiety.

A study conducted by Nasrullah et al., (2020) involved health workers spread across 8 islands in Indonesia. In this study, the results showed that approximately 65.8% of the 644 health worker respondents in Indonesia experienced stress and depression due to the COVID-19 pandemic. As many as 55% of health workers experience stress, as much as 34.5% in mild stress levels and 0.8% in very severe stress levels. And 23.5% of health workers experienced depression, 11.2% at mild depression, and 0.5% at severe depression. According to research conducted by Fadli (2020) the causes of health workers experiencing stress include, among others, high job demands, such as relatively long working hours, the increasing number of COVID-19 patients,

Stress is a condition in which a person is in a stressful situation or when a person feels unable to cope with the demands he or she will face. Health workers are the group most vulnerable to this. Stress-related reactions include changes in concentration, anxiety, insomnia, irritability, interpersonal conflict, and reduced productivity. In the next case, health workers will experience mental disorders, in conditions of separation from family, abnormal situations, increased exposure, feelings of failure to handle a poor prognosis, fear of COVID-19 transmission, unsupported technical facilities such as limited Personal Protective Equipment. (PPE), will make it difficult for health workers to maintain physical and mental health conditions.

2. Methods

This research uses the literature study method. In this study, researchers examine the problem through international journals sourced from research reports. This study aims to analyze the factors that affect the stress level of health workers during the COVID-19 pandemic. Journal search websites used by researchers in conducting data searches are journal websites that can be accessed freely, such as Science Direct, PubMed, SAGE Journals, and Proquest. Based on the research title "Analysis of Factors Affecting Health Workers' Stress Levels During the COVID-19 Pandemic". So the researchers used the search keywords Factors, Influence, Stress Level, Health Workers, COVID-19 or Factors, Influence, Stress Levels, Health Workers,

Table 1 Search Keywords

Factors	Influence	Stress Level	Health Workers	Covid-19
-	OR	-	OR	-
-	Affect	-	Health Providers	-
-	-	-	OR	-
-	-	-	Health Professional	-

Researchers determine the inclusion criteria of the journals that will be accessed as a basis in the research process on the topic, including:

1. Journal of the Year (2019-2020)
2. The study design used is a cross-sectional and cohort study
3. Journal can be accessed full text
4. International Journal
5. A journal that discusses the factors that affect the stress level of health workers during the COVID-19 pandemic.

At the screening stage, researchers conducted two screenings. First, the researcher focused on journal abstracts. And in the second screening, the researchers specified whether the journals obtained were by the factors that affect the stress level of health workers during the COVID-19 pandemic. The researcher selects the material that will be used as literature and analysis and assessment of scientific quality is carried out for research on factors that affect the stress level of health workers during the COVID-19 pandemic, namely by assessing the accuracy of design and research methods from various literature. Researchers used the JBI (Joanna Briggs Institute) Critical Appraisal Tools instrument to help assess the reliability, relevance, and results of published research (Joanna Briggs Institute, 2020). This study assessed the quality with a cross-sectional study design.

3. Results and Discussion

3.1 Results

In this study, the researchers obtained 8,042 journals, after the full-text screening, the results were 1,415 journals, including a combination of 388 Sciencedirect journals, 866 ProQuest journals, 21 journals Pubmed, and 140 SAGE Journals. Journals collected at the time of the search were analyzed by JBI in advance to assess the quality of the study and obtain literature that was by the formulation of the problem raised by the researcher in the literature study.

Researchers conducted a journal search using the search keywords Factors, Influence, Stress Level, Health Workers, COVID-19 using the boolean operators AND and OR to specify search results. The results of the search for screening journals with journal criteria starting from 2019-2020, international journals, full text. After going through a series of screening processes and assessing the quality of the study, 18 journals were obtained which were then analyzed, based on Figure 4.1 (Journal Database) obtained journals from the Pubmed site (n=3), Proquest (n=4), SAGE Journal (n =3), Science direct (n=8), it can be concluded that the Science direct website portal is the portal that is obtained by many journals by researchers. The following is a diagram of the journal obtained:

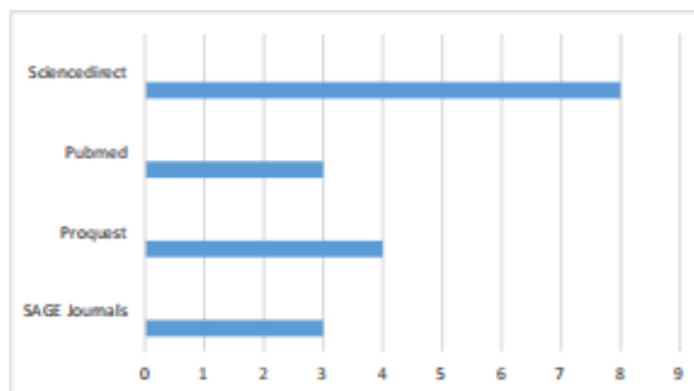


Figure 1. Journal database

3.2 Demographic Data

From the analysis of 18 journals with adjustment of inclusion criteria, which were included in this study, the researchers used demographic data in the form of gender, marital status, professional health workers, and regional distribution supported by data on factors that affect the stress level of health workers during the COVID-19 pandemic, along with the instruments used by researchers in the journal. As will be explained below:

Table 2 demographic characteristics

Demographics	f	%
Gender		
Man	5,277	27
Woman	14,283	73
Marital status		
Marry	6,089	62
Not married yet	3,277	34
Widower widow	398	4
Health Worker Profession		
Doctor	6,128	31
Nurse	9,334	48
Other health professions	4,089	21
Age (years)		
<25	2,296	24
26-36	3,631	38
36-45	2,479	26
>45 years old	1,072	12

Based on the analysis of 18 journals (table 2), it was found that 73% of subjects suffering from stress on health workers occurred in women with a sample size ($n = 14,283$). The marital status of the sample in the journal obtained groups who are married, unmarried, and divorced/widowed/widower. Based on the results, the largest percentage was 62% ($n=6,089$) of the respondents who were married.

The grouping of the types of health workers professions is divided into three namely doctors, nurses and other health professional professions, in the profession of pharmacists, physiotherapists, anesthesiologists, pathologists, nutritionists, etc. researchers include other health professional groups. But some journals do not explain the number of group divisions. Health professions with the largest percentage are nurses, which is 48% where there is a total sample of ($n=9,334$). In addition, the majority of respondents based on age from this literature study were 26-35 years old.

Based on the distribution of the area or location of the journal research, the results of the analysis show that the research was carried out in various regions as the distribution in each region can be seen in Figure 2 (Region Distribution). The distribution of the region above is measured based on the number of journals studied, of which 4 journals came from China, 3 journals from Saudi Arabia, Italy and Spain, 2 each and the United States, Serbia, Canada, Cyprus, India, England and the European Continent with 1 journal each so that 18 journals are collected based on regional distribution.

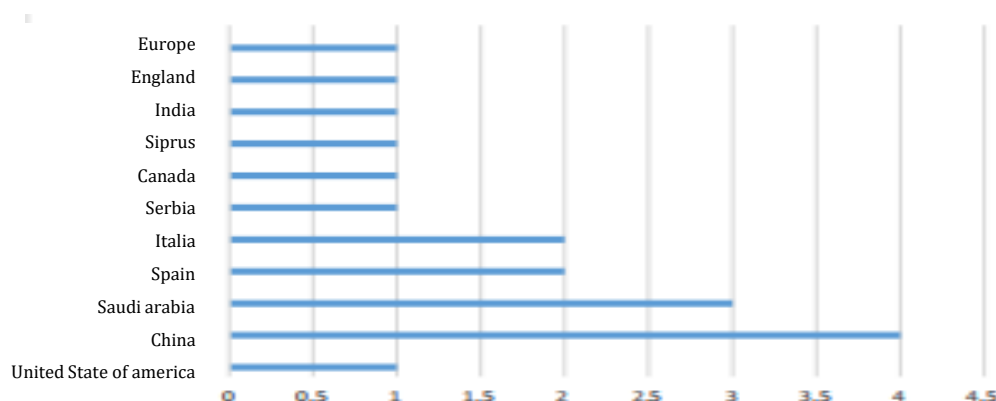


Figure 2. Area Distribution

Based on table 3 (Results of Journal Interpretation) it can be seen that physical factors that affect the stress level of health workers during the COVID-19 pandemic include increasing workloads due to the increasing number of cases of patients exposed to COVID-19 or health workers having to work more extra than usual, decreasing time to rest at work and discomfort when using PPE. The psychological factors that affect the stress level of health workers during the COVID-19 pandemic include the fear of transmission of the COVID-19 virus because health workers have to deal directly with patients exposed to COVID-19, the feeling of fear of transmitting the infection to the family due to work responsibilities with limited provision. personal protective equipment. Social factors that affect the stress level of health workers during the COVID-19 pandemic include concerns about transmitting the COVID-19 virus to families and the lack of social support from family and closest people. As well as functional factors that affect the stress level of health workers include the lack of training and preparation for work safety for health workers regarding the COVID-19 pandemic, as well as demands for service and professional responsibilities when caring for patients exposed to COVID-19.

Tabel 3. Journal Interpretation

No	Author (year)	Factor affecting			
		Physical	Psychological	Social	Functional
1.	(Shechter et al., 2020)		√	√	
2.	(Lai et al., 2020)	√	√		
3.	(Al-Hanawi et al., 2020)	√	√		
4.	(Luceño et al., 2020)	√	√		
5.	(Wang et al., 2020)				√
6.	(Babore et al., 2020)	√	√	√	
7.	(Antonijevic et al., 2020)	√	√		

8.	(Havaei et al., 2021)	√	√	√
9.	(Bassi et al., 2021)	√	√	√
10.	(Hummel, et al., 2021)	√	√	√
11.	(Gonzalo et al., 2021)	√	√	√
12.	(Chatzittofis A et al., 2021)	√	√	
13.	(Wilson et al., 2020)	√	√	√
14.	(Si et al., 2020)	√	√	
15.	(Wanigasooriya et al., 2021)	√	√	√
16.	(Zhang et al., 2020)	√	√	√
17.	(Temsah et al., 2020)		√	√
18.	(Qasem Surrati et al., 2020)	√	√	√

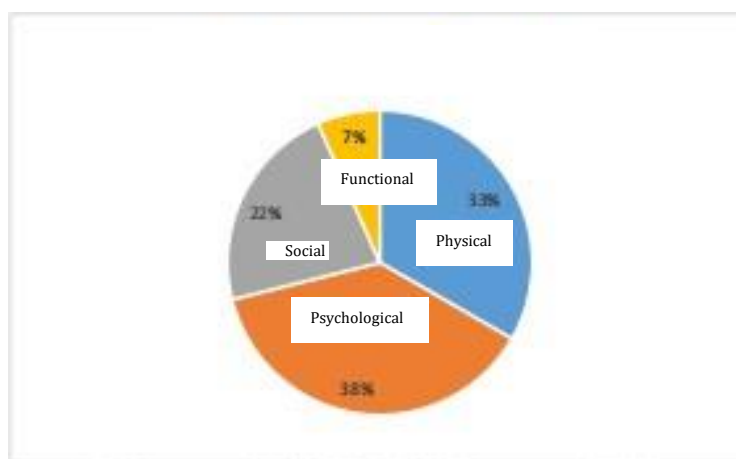


Figure 3 Factors that affect the stress level of health workers in the future COVID-19 pandemic

The factors that affect the stress level of health workers during the COVID-19 pandemic show that there are 4 indicators including physical, psychological, social, and functional factors. Several studies reported that 38% (n=17) of the factors affecting the stress level of health workers during the COVID-19 pandemic were psychological factors, then 33% (n=15) studies reported that the stress level of health workers was also influenced by physical factors, amounting to 22% (n=10) stress factors in health workers are caused by social factors and the percentage of 7% (n=3) is caused by functional factors.

3.3. Discussion

The current COVID-19 pandemic provides emotional stress and hurts the mental health of health workers, gender is a person's vulnerability to their mental health, without exception health workers can experience stress, stress is emotional or physical tension that can come from any event. or thoughts that make a person feel frustrated, angry, or nervous. In some studies, it is stated that the female sex experiences the most mental health problems and psychological

pressure is much higher. Gender affects stress levels, usually higher stress is often found in women (Nurfadillah, Arafat, & Yusuf, 2021).

The different stress responses between women and men are closely related to the activity of the HPA axis which is related to the regulation of the hormone cortisol and the sympathetic nervous system which is related to heart rate and blood pressure. HPA and autonomic responses were found to be higher in adult men than in adult women, thus affecting a person's performance in dealing with psychosocial stressors. In addition, hormones Sex in women will decrease HPA and sympathoadrenal responses which cause a decrease in the negative feedback of cortisol to the brain so that women tend to be more prone to stress.

Marriage is an inner and outer bond between a man and a woman to become husband and wife, which is intended to create a family or household which from this bond will lead to reciprocal relationships, both psychologically, materially, socially, and intellectually. Marital status will have an impact on family support because the family is the smallest social unit that often interacts with each other. The family is also a set of interdependent parts, the main task of the family is to maintain the psychosocial needs of its members and the welfare of their lives in general (Meidikayanti & Wahyuni, 2017).

Marital status is one of the factors that affect psychological quality. Other studies report that unmarried and divorced individuals have worse psychological qualities than married individuals. This is also reinforced by research conducted by Kusuma, (2016) that people with a married status will have better self-esteem so that they have adaptive and adequate coping sources from their partners so that they can organize coping due to stressors.

A health worker is any person who devotes himself to the health sector, has knowledge and or skills through education in the health sector that requires the authority to carry out health services. Health workers are responsible for the physical and administrative duties of the agencies where they work. Health services that are in health institutions, especially in hospitals, operate continuously for 24 hours with health workers as workers who are required to be willing and ready to carry out their duties for 24 hours. Various situations and work demand experienced can be a potential source of stress (Perwitasari, Nurbeti, & Armyanti, 2016).

Health workers have a high risk of experiencing psychological disorders in the form of mild to severe stress, it is caused by various pressures that increase and they have to face. The fear that occurs in health workers usually occurs due to the increased risk of exposure to COVID-19 and the possibility of infecting their loved ones is also a burden. Many health workers have to isolate themselves from their family and closest people even though they are not exposed to COVID-19, In addition to risk factors for infection, inadequate protection such as personal protective equipment (PPE) that is lacking and not up to standard, relatively more jobs, discrimination, frustration, self-isolation resulting in reduced contact with family or people around them as well as fatigue,

Age is the period since the existence of a person and can be measured using units of time from a chronological point of view, normal individuals can be seen in the degree of anatomical and physiological development. Age is also the length of time living or existing (since born or held). According to the Indonesian Ministry of Health, the age categories can be divided into several parts, namely: ages 0-5 years are toddlers, ages 5-11 years are children, ages 12-16 years are early adolescence, 17-25 years are old. late adolescence, 26-35 years old is early adulthood, 36-45 years is late adulthood, 46-55 years is early old age. age 56-65 years is the end of old age and someone with age > 65 years is elderly (Kartika, 2015). Age is one of the factors that can affect stress levels. The level of stress that occurs in health workers is mostly experienced by health workers aged 26-45 years, at which age a person has entered early adulthood - late adulthood.

The state is identical with the culture or customs of a society, governance, or public government in health services, as well as the economy of its people. This will affect the quality of existing health services in the country. If the country has good health governance, the facilities provided to health workers will be sufficient, the level of facilities provided to health workers

will have a good impact on improving the psychological conditions experienced by health workers (Hummel et al., 2021).

3.3 Physical Factor

Physical factors are indicators that can affect psychological conditions in the form of stress on health workers who are working during the COVID-19 pandemic. The results of the study show a percentage of 33%, this is evidenced by the existence of 15 journals that discuss physical factors that can affect the stress level of health workers during the COVID-19 pandemic. The physical factor that is mostly discussed in the journal is the increased workload due to the increasing number of cases of patients exposed to COVID-19 or health workers having to work more extra than usual. Stress conditions experienced by health workers can trigger feelings of irritability and unstable emotions. The hospital is an individual health service facility that provides facilities in the form of inpatient and outpatient care, which provides short-term and long-term health services consisting of observation, diagnostic, therapeutic, and rehabilitative measures for people suffering from illness, injury, or childbirth. Currently, the hospital is required to be able to realize a high degree of health. Therefore, the role of health workers in hospitals is very large. The demand to always give the best to these patients can trigger stress on health workers (Haniyah, 2021). The role of health workers in hospitals is very large. The demand to always give the best to these patients can trigger stress on health workers (Haniyah, 2021). The role of health workers in hospitals is very large. The demand to always give the best to these patients can trigger stress on health workers (Haniyah, 2021).

In line with research conducted by Minannisa, (2020) Health workers are required to always be physically ready to take care of the patients they are treating. Physically ready in the sense that health workers must be ready 24 hours to treat sick patients, monitor patient progress, refer patients when deemed necessary, and so on. Therefore, the researcher concludes that physical factors can have an impact on the level of stress that occurs experienced by health workers.

3.4 Psychological Factor

Stress is a condition in which a person is in a stressful situation or when a person feels unable to cope with the demands he or she will face. According to Rahardjo (2017), stress is a feeling of being tired or overwhelmed due to events that cannot be controlled by a person, and stress is also a physical and psychological response to demands and pressures on a person. The results of research from 18 journals obtained as many as 17 journals with a percentage of 38% discussing stress on health workers can affect their psychological condition. health workers.

According to Mirani (2020), Stress is the body's response that is not specific to any demands or burdens received. Stress can occur if a person receives a heavy task or burden that he cannot complete, the body will respond so that the person can experience stress, health workers who experience stress can be at risk of contracting the COVID-19 virus. In this case, the researcher concludes that psychological factors in the form of stress can affect the quality of mental health in health workers.

3.5 Social Factor

Social factors are factors that can affect the quality of mental health of health workers because social factors involve an individual's belief in the availability of support from family, friends, or those closest to him when he needs it (Caro, Costa, & Da Cruz, 2018). Fadli, (2020) said that health workers need family support so that health workers can carry out activities and it is hoped that families will be able to provide a support system while providing a calm and comfortable atmosphere. Social factors are also an interpersonal exchange in which an individual provides emotional assistance to another individual to achieve a level of quality of health high psychological. Based on the research, it was found that 10 journals with a percentage of 22% reported that social factors are factors that can influence the quality of psychological health in the form of stress on health workers.

Social support is defined as the availability or provision of relationships, information, or assistance that empowers a person to manage his daily life effectively in the presence or absence of a crisis. The family has an important role in providing social support to health workers who work under high pressure, this is because the family is the closest person to health workers. Family support is a process that occurs throughout life, the nature and type of support vary at various stages in the life cycle. Family support can be in the form of internal social support, such as support from husband, wife, children, or support from relatives biological (Abudi, 2020). However, this is in contrast to the spread of COVID-19 which has triggered a new stigma in the social environment. Therefore, the researcher concludes that social factors are one of the indicators that affect stress levels in health workers.

3.6 Functional Factor

The results of the study found 3 journals with a percentage of 7% discussing functional factors, disruption of functional status can hinder the productivity of health workers. Functional factors are directly related to the lack of training and preparation for work safety for health workers regarding the COVID-19 pandemic, the uncertainty of when the COVID-19 pandemic will end, and the demands for responsibility and professionalism when caring for patients exposed to COVID-19 (Havaei, 2021). Therefore, the researchers concluded that functional factors can cause health workers to experience mental stress in the form of stress.

4. Conclusion

COVID-19 has spread all over the world, therefore COVID-19 is categorized as a pandemic. Many losses have been caused by the COVID-19 pandemic, such as social inequality, economic inequality, physical health problems, and mental disorders. Mental disorders that may occur during the COVID-19 pandemic include fear, sadness, difficulty controlling emotions, anxiety, depression, stress, panic, or even frustration. This situation is not only felt by the community. However, it is also experienced by people in various professions, especially in the health sector. Health workers are the front line in the fight against COVID-19. As a result, the number of patients infected with COVID-19 has soared dramatically, making health workers overwhelmed and experiencing mental disorders. After the results of this literature study were presented by the researcher, Factors such as physical, psychological, social, and functional. The most influential factor on the stress level of health workers is psychological factors, this is because the conditions that affect psychology are mostly in the form of stress on health workers originating from the fear of transmission of the COVID-19 virus. After all, health workers have to deal directly with patients exposed to COVID-19 and the feeling of fear of transmitting the infection to the family due to work responsibilities with limited provision of personal protective equipment will lead to a decrease in the quality of mental health and can cause stress for health workers.

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Literature Study: The Influence of Physical Activity on Changes in Cognitive Status of Post Stroke Patients

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ABSTRACT

Introduction: The risk of cognitive function decline increases three times in stroke patient. The impaired cognitive function impacts psychological side, social isolation, economic, and decreasing the quality of living. Physical activities are believed to stimulate the nerve growth so that these activities can hinder cognitive function decline. **Objectives:** the objective of the study was to acknowledge the frequency, duration, and type of physical activities of cognitive status change of post-stroke patient. It is also to acknowledge the effect of physical activity toward the cognitive status change of post-stroke patient according to literature studies. **Methods:** Researcher uses literature study as research design with a sample of 13 journals, 6 journals of Pubmed, 2 journals of Proquest, 2 journals of Science Direct, and 3 journals of SAGE Journals. The steps of literature study of this research are problem identification, data collection, screening, main study quality assessment, data extraction, and data analysis. JBI Randomized Controlled Trial and Quasi Experimental are the tools used in study quality assessment. **Results:** Based on the result of the study of 13 journals shows that physical activity has significant effect toward cognitive status change of post-stroke patient with 5 times a week and 60 minutes duration of exercise. **Conclusions:** The study result of 13 journals shows that physical activity has significant effect toward the cognitive status change of post-stroke patient based on frequency, duration and types of physical activity.

1. Introduction

Stroke is the second leading cause of death and the third leading cause of disability in the world, causing a high individual and social burden. Data from the World Stroke Organization in 2019 shows that there are 13.7 million new cases of stroke every year and 5.5 million deaths due to stroke worldwide. Approximately 70% of strokes and 87% of deaths and disabilities due to stroke occur in low to middle income countries (WHO, 2019). Based on the results of Riskesdas in 2018, the prevalence of stroke in Indonesia increased compared to 2013, from 7% to 10.9%. The regions with the highest prevalence rates in Indonesia are East Kalimantan Province and DI Yogyakarta, namely 14.7% and 14.6%, respectively. Meanwhile, the regions with the lowest prevalence rates in Indonesia compared to other provinces are Papua and North Maluku, namely 4.1% and 4.6%.

The brain works closely with the heart and the vascular system in carrying out bodily functions. Neurotransmitters and blood cells that flow throughout the body also affect the metabolic activity of the brain. When there is a disturbance in the brain, it will cause problems in the motor, sensory, and cognitive function of the individual. This is what happens to people who have had a stroke (Bahrudin M., 2017). Cognitive function is the process by which sensory input (visual, auditory, and tactile) is modified, processed, stored and used for interneuron connections so that the individual can analyze the sensory input (Ekasari, Riasmini, & Hartini, 2019). Based on research, the risk of cognitive decline increases threefold if you have a stroke. As many as 50%-75% of stroke patients suffer from impaired cognitive function and the prevalence rate ranges from 23.5%-61% to experience dementia after three months after stroke (Yuwanda, Widyastuti, & Laksmidewi, 2020). The results of the study from Furmansyah (2007)

reported that of the 42 stroke patients studied, there were 21 stroke patients who experienced impaired cognitive function. Another research conducted by Sinaga at the installation of Medical Rehabilitation Prof. hospital. Dr. RD Kandou Manado reported that of 50 non-hemorrhagic stroke patients studied, there were 28 patients (56%) with a tendency to have cognitive dysfunction and as many as two people (4%) had cognitive dysfunction (Hanas, Lestari, & Asni, 2016).

Impaired cognitive function can be a serious health problem because it can cause psychological problems, social isolation, economics, and can reduce the quality of life of sufferers. Cognitive impairment caused by stroke depends on the location of the damage in the brain. Cognitive disorders that can occur such as decreased consciousness, impaired visuospatial, impaired nonverbal learning, impaired communication aspects, and reduced attention (Hanas, Lestari, & Asni, 2016). Stroke causes the patient's brain function to decrease. When the brain function of stroke sufferers decreases, the patient's cognitive function will experience disturbances. Although stroke is classified as a deadly disease, all stroke sufferers still have a life expectancy. Stroke can cause brain cells to not function properly, so patients are very susceptible to cognitive impairment after a stroke (Laksono, Widyastuti, & Trisnawati, 2019).

Physical activity is an inexpensive and easily accessible treatment to restore cognitive abilities of post-stroke patients. Research from Groot et al. (2016) explain that physical activity can improve cognitive function in populations prone to cognitive decline, namely the neurologically healthy elderly and those with dementia. Other research from Cummings et al. (2012) showed that physical activity had the effect of preventing cognitive decline and increasing cognitive activity in post-stroke patients. The positive effects of physical activity that may occur are increased blood flow to the brain, growth factors, such as brain-derived neurotrophic factors, increased arousal or wakefulness, and decreased symptoms of depression in post-stroke patients.

Physical activity can maintain optimal blood flow so that the brain does not experience a lack of oxygen and can send nutrients to the brain without interruption. Physical activity can also stimulate nerve growth, thereby inhibiting cognitive decline. During physical activity, the brain is stimulated to increase Brain Derived Neurotrophic Factor (BDNF). This BDNF protein has an important role in preventing damage from nerve cells. However, if BDNF levels are low, it can lead to dementia. In addition to producing BDNF protein, physical activity can also stimulate brain plasticity, so that it can maintain and improve cognitive abilities and long-term memory. Functional magnetic resonance imaging (fMRI) can show the effect of physical activity on improving brain structure and function (Sauliyusta & Rekawati, 2016; Voss, et al., 2010).

Research results of Moriya et al. (2016) showed that moderate-intensity aerobic exercise could improve the performance of working memory tasks. Post-stroke patients can respond more quickly, and also answer correctly more often after exercise. Near-infrared spectroscopy (NIRS) showed that physical exercise increased oxy-Hb concentrations in the prefrontal cortex (PFC) during a working memory task compared to the control condition, indicating that the increase in working memory task performance was not attributable to habituation. Research from Zheng et al. (2020) showed that physical activity which in this study was Baduanjin gymnastics could significantly improve cognitive function from moderate to high in patients with post-stroke cognitive impairment. There are some useful small improvements for memory, executive ability, attention, and Activity Daily Living (ADL). Research results from Yeh et al. (2019) proved that a sequential training program combining aerobic exercise sequences and computer cognitive training, in significant improvements in cognitive abilities and motor function. This improvement is characterized by an increase in general cognitive function and visuospatial memory.

2. Methods

The design of this research is a literature study. The journal portals that researchers use to search for data are Pubmed (6 journals), Proquest (2 journals), Science Direct (2 journals), and SAGE Journals (3 journals). Researchers used search keywords effect, post-stroke, after stroke, cognitive impairment, physical activity, physical exercise, cognitive function. Journal inclusion criteria in this study are 1) Journals published within the last 5 years (2015-2020); 2) Journal type of experimental research method (randomized control trial, quasi-experimental); 3) Full text; 4) International Journals; 5) Journal that discusses the effect of physical activity on changes in cognitive function of post-stroke patients.

The author carried out two stages of screening with the first being screening based on year, type of journal, and language. Then the author conducted a second screening, namely the title and abstract details. which discusses the effect of physical activity on changes in cognitive function of post-stroke patients. The researcher used the JBI (Joanna Briggs Institute) randomized control trial and quasi-experimental instrument to assess the quality of the journal. There are 13 journals that deserve to be used as research data with the average percentage obtained is 75%. The data that meet the inclusion criteria and have been tested for quality, are then extracted using a narrative method by grouping similar data based on the measurement results to answer the objectives. After completing the data extraction stage,

3. Results and Discussion

The research journals analyzed were 13 international journals. The characteristics of research journals are as described in table 1.

Table1. Characteristics of Research Journals

Journal Characteristics	N	%
Country		
Brazil	1	7.6%
China	5	38.4%
Italy	1	7.6%
Canada	3	23%
South Korea	1	7.6%
Norway	1	7.6%
Greece	1	7.6%
Research methods		
<i>Randomized control trial</i>	12	92.3%
<i>Quasi experimental</i>	1	7.6%

Result of analysis journals based on the frequency of physical activity in table 2.

Table 2 Frequency of Physical Activity Implementation

Journal Number	Execution Frequency
Journal 1	3 times per week for 12 weeks
Journal 2	48 weeks
Journal 3	5 times per week for 3 weeks
Journal 4	4 times for 24 weeks
Journal 5	72 weeks
Journal 6	36 weeks
Journal 7	5 times per week for 8 weeks
Journal 8	1 time per week for 2 weeks
Journal 9 and 10	3 times per week for 8 weeks
Journal 11 and 13	3 times per week for 24 weeks
Journal 12	3 times per week for 18 weeks

In table 2 the frequency of physical activity implementation shows that there are various frequencies of physical activity implementation in post-stroke patients. There are two kinds of research frequency that is most widely mentioned, 3 times per week for 8 weeks and 3 times per week for 24 weeks. Research article from Pang, et al. (2018) and Plowman, et al. (2019) was conducted 3 times per week for 8 weeks. Research article from Tang, et al. (2016) and Zheng, et al. (2020) conducted 3 times per week for 24 weeks.

The results of the analysis based on the duration of physical activity are in table 3.

Table2. Physical Activity Duration

Journal Number	Physical Activity Duration
Journal 10 and 12	30 minutes
Journal 13	40 minutes
Journal 4	45 minutes
Journal 1	50 minutes
Journals 3, 6, 7, 8, 9, and 11	60 minutes
Journal 5	90 minutes

In table 3 the duration of physical activity shows that there are various kinds of duration in the implementation of physical activity in post-stroke patients. Based on the table, the majority of the duration of physical activity is given for 60 minutes (Chung, et al., 2019; Liu-Ambrose & Eng, 2015; Manuli, et al., 2020; Morais, et al., 2017; Pang, et al., 2018; Tang, et al., 2016). There is one journal that does not explain in detail the duration of physical activity, namely journal 2.

The results of the analysis based on type of physical activity can be found in table 4.

Table 3. Type of Physical Activity

Journal Number	Type of Physical Activity
Journals 1, 6, 8, 10, 11, and 12	Aerobic exercise
Journals 2, 4, and 5	physical training
Journal 3	<i>Task-Specific Lower Extremity Training</i>
Journal 7	<i>Robotic gait rehabilitation + VR</i>
Journal 13	<i>Baduanjin exercise</i>

In table 4 the types of physical activity show that there are several types of physical activity given to post-stroke patients with the two most common types of physical activity, namely aerobic exercise as many as six research journals (Bo, et al., 2018; Liu-Ambrose & Eng, 2015; Morais, et al., 2017; Plowman, et al., 2019; Tang, et al., 2016; Yeh, et al., 2019) and physical exercise in three research journals (Cheng, et al., 2018; Fotakopoulos & Kotlia, 2018; Ihle-Hansen, et al., 2019).

Table 5. Outcome of the Research Journal of the Effect of Physical Activity on Changes in Cognitive Status of Post-Stroke Patients

Journal Number	Outcome
Journals 1, 2, 3, 4, 6, 7, 8, 10, 12, and 13	Take effect
Journals 5, 9, and 11	No effect

In table 5, the journal data extraction shows that of the 13 journals that carried out data extraction, there are 10 journals which state that physical activity has a significant effect on changes in better cognitive status in post-stroke patients. However, there are three journals which state that physical activity does not have a significant effect on changes in the cognitive status of post-stroke patients. The significant effect is shown by the results of SPSS data analysis in 13 journals that show an increase in cognitive status in post-stroke patients after being given

physical activity therapy (Bo, et al., 2018; (Cheng, et al., 2018; Chung, et al., 2019). ; Fotakopoulos & Kotlia, 2018; Liu-Ambrose & Eng, 2015; Manuli, et al., 2020; Morais, et al., 2017; Plowman, et al., 2019; (Yeh, et al., 2019; Zheng, et al., 2020).

3.1 Frequency of Physical Activity Implementation

A literature study from 13 journals showed that the frequency of application of physical activity which showed significant results was with a frequency of 3 times per week for 24 weeks, 4 times per week for 24 weeks, 5 times per week for 8 weeks, and 5 times per week. for 3 weeks. In the study of Zheng et al., (2020) post-stroke patients received Baduanjin exercise training for 24 weeks with a frequency of three days a week and all cognition-related outcomes were measured at baseline, 8, 16 and 24 weeks after the intervention and an additional 4 weeks after the follow-up period. further (28 weeks). The main finding was that Baduanjin gymnastics exercise for 24 weeks experienced a significant improvement of moderate to high effect on global cognitive function in patients with post-stroke cognitive impairment.

In addition to the frequency of applying physical activity three times, another study from Fotakopoulos & Kotlia (2018) implemented a physical exercise program in post-stroke patients four times per week for 24 weeks using a mini Mental Test (mMT) measuring instrument to measure the patient's cognitive function. . The results of this study showed that post-stroke patients experienced a higher recovery process with evidence of a better reduction in lesion size than the control group which in baseline data the average lesion size of patients was 7 cm to 3 cm. The patient's mMT score also increased from the initial mean patient score of 24 (mild disturbance) to 26 (no disturbance). In addition to the reduction in lesion size and improvement in the patient's mMT score,

Research from Manuli et al., (2020) shows that the application of physical activity with VR for 8 weeks with a frequency of 5 times per week can lead to significant improvements in global cognitive function, executive function, as well as in activities of daily living. The increase in cognitive function was indicated by an increase in the MoCA score which in the baseline patient data the average was 21.8 (mild impairment) increased to 26 (no disturbance) at the time of the final assessment. Exercise on a robotic weight-supported treadmill optimizes the relevant sensory input for stride exercise, with repetitive exercise for specific tasks can assist in the improvement of brain neuroplasticity.

Another study from Chung et al., (2019) explained that the application of physical activity for 3 weeks with a frequency of 5 times per week helped improve cognitive function in post-stroke patients by helping in reducing gray matter and white matter atrophy.) associated with age, and with increased gray matter density in the prefrontal and temporal regions and hippocampal volume. The increase in cognitive function of post-stroke patients is indicated by an increase in the MMSE score which is in the baseline data

3.2 Duration of Physical Activity

The results of the research journal showed that most patients with post-stroke cognitive impairment were given physical activity with a duration of 60 minutes. In the study of Chung et al., (2019) showed that post-stroke patients received one session of Task-Specific Lower Extremity Training (TSLET) for 30 minutes and one session of conventional physical therapy for 30 minutes. In another study conducted by Liu-Ambrose & Eng (2015), post-stroke patients with mild cognitive impairment were given one 60-minute aerobic exercise training session led by a certified fitness instructor. In line with research by Morais et al., (2017) apply aerobic exercise with the method of walking on the ground for 60 minutes which is divided into three parts, namely during the first 15 minutes of walking on the ground until it reaches the target heart rate, the next 30 minutes is to maintain the intensity and then gradually slow down, and the last 15 minutes is cooling activity. In the study of Manuli et al., (2020) the rehabilitation process for cognitive and behavioral disorders to improve the recovery process and patient autonomy using *robotic gait rehabilitation* with a combination of VR performed for 60 minutes per session. In a study conducted by Pang et al., (2018) explored dual- and single-task exercises to evaluate two domains of cognitive function in post-stroke patients with a duration of 60 minutes in each

exercise session. So giving physical activity with a duration of 60 minutes per session can provide benefits in increasing brain neuroplasticity by increasing BDNF levels to improve cognitive function in post-stroke patients.

3.3 Types of Physical Activity

In the type of physical activity in 13 research journals that were applied to post-stroke patients, there were five types of physical activity. Of the five types of physical activity contained in 13 research journals, the majority applied to post-stroke patients is aerobic exercise. In the study of Bo et al., (2018), it was stated that aerobic exercise increases the capacity of neuronal metabolism and oxygen delivery, decreases brain tissue loss, and increases the production of brain-derived neurotrophic factors. The main components of aerobic exercise in this study were endurance, strength, and balance training. The results of the study from Morais et al., (2017) also said that moderate-intensity aerobic exercise can increase serum BDNF. Other than that,

Research from Yeh et al., (2019) showed that aerobic exercise helped in improving general cognitive function as indicated by an increase in MoCA scores 2 times greater than that of anaerobic exercise. Aerobic training is performed using a progressive resistance stationary bicycle. Post-stroke patients warmed up for 3 minutes, followed by aerobic resistance training for 25 minutes, and ended with cooling down for 2 minutes for a total of 30 minutes. The target heart rate during the aerobic period is 40% to 70% of the patient's maximum heart rate. In a study conducted by Plowman et al., (2019) Aerobic exercise is performed on a treadmill that has body weight support (BWS) and the speed/incline is adjusted to maintain a target heart rate zone corresponding to 60% to 80% of peak oxygen uptake (VO₂peak). The result of this study is that aerobic exercise can increase serum IGF-1 from post-stroke patients. IGF-1 promotes recovery and repair processes such as angiogenesis, neurogenesis, synaptogenesis, and long-term potentiation.

Based on the description above, it can be concluded that the type of physical activity that can be applied to post-stroke patients is aerobic exercise because it can increase the capacity of nerve metabolism and oxygen delivery, reduce brain tissue loss, and increase the production of brain-derived neurotrophic factors. In addition, it can increase serum BDNF and IGF-1 which play a role in the recovery process and improve cognitive function.

4. Conclusion

Based on the results of research from 13 journals, it shows that physical activity has a significant effect on changes in the cognitive status of post-stroke patients. Researchers found that the effectiveness of physical activity was also influenced by the frequency, duration, and type of physical activity provided to improve and enhance cognitive function after stroke. The frequency of giving physical activity can be done with a frequency of 5 times per week with a duration of 60 minutes each session can improve the cognitive function of post-stroke patients. The type of physical activity that can be given to post-stroke patients to improve cognitive function of post-stroke patients is aerobic exercise. Physical activity affects the cognitive function of post-stroke patients as evidenced by an increase in the MoCA (Montreal Cognitive Assessment) and MMSE (Mini Mental State Examination) scores which are used as a measure of cognitive function.

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Literature Review: Stress Management in Emergency Nurse's

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ABSTRACT

Introduction: Stress management is an effort to prevent stress. Work stress management is a program of using human resources to control or manage stress. It aims to identify the causes of stress and know techniques for managing stress. **Purpose:** The purpose of this study was to determine how the stress management of emergency room nurses based on literature review. **Methods:** The research design used in this study was a literature study with a sample of 12 journals. The inclusion criteria included the journal in the last ten years, full text, and journal in English. Then we filter by reading the abstract and analyzing it using JBI. So that we get several journals from 4 data bases, Biomed Central (n = 3), Pubmed (n = 2), Proquest (n = 1), and NCBI (n = 6). **Results:** The results of this study are that the stress management of emergency room nurses that is often used is massage therapy, progressive muscle relaxation therapy and visual web-based education. **Conclusion:** Stress management was found in 12 journals, including using complementary and web-based visual therapy, then using stress management which includes (12 therapy journals), Swedish or foot massage therapy (7 journals), progressive muscle relaxation therapy (2 journals), and visual web-based therapy (3 journals).

1. Introduction

Stress is a lifestyle risk factor that can occur if the individual is not able to cope with an event in his life adequately. A national survey conducted by the Health and Safety Executive (2019) in the UK reported that the number of cases between stress, depression and work-related anxiety averaged 1380 out of 100,000 workers. Job stress is significantly related to nurses' caring behavior. The caring behavior of nurses will affect the quality of nurse services which will have an impact on patient satisfaction. Regarding physical problems, work stress causes health problems for nurses in the Emergency Room. Stress that lasts too long can also result in mental overload or burnout (Mallyya et al., 2017).

In Indonesia, based on the Decree of the Minister of Health of the Republic of Indonesia (2009), 1,319 hospitals in Indonesia consist of 1,033 general hospitals with a total of 33,094,000 visits, while data on patient visits to the ER are 4,402,205 (13.3% of the total visits). in general hospitals) and as many as 12% came from referral patients. In 2019, the number of emergency services level 1 with a total percentage of 100% from 296 general hospitals and for special hospitals is also 100% from 88 special hospitals in East Java. There was an increase in treatment days in East Java in 2018 with a total of 7,545,262 and an increase in 2019 with a total of 9,345,741. (East Java Provincial Health Office, 2020).

The Emergency Installation is referred to as the main gate in providing quality services in hospitals and must be fast and efficient appropriate. According to data from the Ministry of Health of the Republic of Indonesia (2019), the number of nurses in Indonesia reaches 237,181 people, thus the incidence of work stress in nurses is quite large, reaching 50.9%. Conditions in the ER with a large number of patients cause delays in services in the ER and will reduce the quality of the actions provided and especially will increase the burden that can create stressors for medical personnel in the ER, especially nurses. As for the sources of work stress, namely: workload, difficulty dealing with other staff, difficulty being a nurse in a critical care unit, patient treatment provisions, and difficulty dealing with hopeless patients (Kasmarani, 2012).

The risk of increased stress presented by Mo et al (2020), explains that feelings of anxiety or poor coping mechanisms can affect a person's quality of life, especially in the productive period of nurses who work in the ER. The quality of life in question can be in the form of work spirit among colleagues and psychological support Fajrillah & Nurfitriani (2016), as an emergency room nurse should have support from friends, family and the environment. This is similar to Keliat's research in Agustin et al (2020) that one of the cognitive responses of anxiety is fear of death. Psychological problems experienced by emergency room nurses can arise due to the lack of support from their closest people or family while carrying out their duties. So it takes stress management ER nurses.

Stress management has different meanings. One of the studies presented by Handayani, Kuntari et al (2020) defines that stress management is a process in which individuals attempt to control cognitive behavior to manage external and internal demands. Stress intensity and stress perception differ from person to person, over time, just as stress management strategies differ from person to person. Although there are differences in stress management, there are some common management practices that a nurse can do to combat the source of the stressor. In this case Mahakud (2013), states that stress management largely depends on a person's cognitive and behavior in managing his stressful condition or related emotional disorders.

The results of another study from Yueh Chi & Chieh Hsing (2012) explained that efforts that can be made are with an individual approach in the form of time management, relaxation training, physical exercise and also social support that has a positive impact on individuals, especially support from family, friends and the environment and research This is ideal for stress management in emergency room nurses. So, it is very important to have an appropriate stress management strategy in the workplace in improving the welfare of emergency care and services.

Based on the above phenomenon, the study aimed to identify a literature study on stress management of emergency room nurses. So, with this literature study, it is hoped that it can support practical nursing care in the future to reduce the prevalence of stress management in emergency room nurses.

2. Methods

In this study using the Literature Review (LR) research method. This study aims to identify what factors are associated with late arrival of acute ischemic stroke patients in the Emergency Room through a literature study with inclusion criteria: 1. Journal of the last 10 years (2011-2020), 2. Study Design (Crossectional Study, Cohort Study), 3. Full text, 4. English Journal. In this study, data collection and processing were carried out secondary to publications through searching published research articles. Articles were collected through the Google Scholar database, SAGE Journals, Science Direct, and Pubmed using the keywords factor, associated, delay, arrive, Acute ischemic stroke, Emergency Department. The articles reviewed were assessed for quality using the Joanna Briggs Institute (JBI) instrument and analyzed using thematic analysis techniques.

3. Result and Discussion

The results obtained, researchers obtained a total of 14 journals obtained from the database: Google scholar (n=7), Pubmed (n=3), SAGE Journals (n=1), and Science direct (n=3). Then all journals were analyzed to find the theme of the journal discussion. The research design used was a cross-sectional study of 8 journals, a retrospective study of 3 journals, a prospective study of 2 journals and a cohort of 1 journal.

3.1 Theme 1. Massage Therapy

Massage therapy is a therapy that is often found in the analysis of journals that researchers do. Based on the research of Mahdizadeh et al. (2019), explained that Swedish massage which was carried out twice a week for four weeks in the morning after the end of the work shift with each massage session lasting for 20-25 minutes had a significant effect on the stress experienced by nurses. In addition to the research of Moyle et al. (2013), explained that foot massage therapy which is carried out every session for 10 minutes, and is run up to 3

sessions a week, which is given for 4 weeks also has a significant effect or gives a good effect on the body of someone who is experiencing stress.

3.2 Theme 2. Web-Based Educational Therapy

This Web-Based Educational Therapy is the second therapy the researchers found in the journal's analysis. Web-based education or also known as Web Based Learning, is one type of application of electronic learning (E-learning). Or it can also be said as a learning experience by utilizing the internet network to communicate and convey learning information (Mulyati & Trimarlina, 2017).

Research conducted by Kim & Kang (2019), that the program uses visual media to recognize and manage one's own emotions, perform emotional relaxation, change environmental awareness, and adapt coping methods, this program is carried out twice a week, for 90 minutes one session, with a total of eight sessions and the results showed that the Visual Media Program can be an effective strategy to reduce work stress and fatigue.

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3.4 Interpretation

Nurses who work in the emergency room are required to have more abilities than nurses who work in other rooms. Therefore, emergency room nurses experience work stress. Nurses need an effort to adapt in the face of work stress which is called stress management. After analyzing 13 ED nurse stress management journals which include massage therapy, web-based educational therapy, progressive muscle relaxation therapy and spiritual therapy. Massage therapy is an indicator that is often found in the journal. Research conducted by Moyle et al. (2013), explained that massage therapy does not take long to do it around 10 minutes already has an effect on a person's body, but it needs to be done regularly will provide positive changes. The basic techniques that are often used in reflexology include: the thumb spread technique, rotating the hands and feet at one point, as well as pressing and holding techniques. Stimulation - stimulation in the form of pressure on the hands and feet can emit waves of relaxation throughout the body.

Swedish massage therapy uses 4 massage movements, namely effleurage (storking), namely gentle rubbing manipulation with pressure. relatively light to strong, this rubbing uses the entire surface of one hand or the surface of both hands, a perfect touch and the direction of rubbing is always towards the heart or in the direction of the flow of blood vessels back. Then the petrissage technique (kneading) is another word for lightning with a squeezing technique consisting of picking up, wringing, squeezing, kneading and rolling. Furthermore, the friction technique (rubbing) is a hand that has strong pressure, grinding using the thumb, fist, base of the palm or with the elbow, and the tapotement technique (tapping) which is massaging using one hand or both hands with alternating hitting movements. Nida Muslimah & Sidik Awaludin, 2019).

Reflexology that focuses on several points on certain body parts such as the feet, hands, and ears has the advantage of being able to overcome anxiety or stress that occurs in a person, make a person sleep more soundly, can reduce the feeling of fatigue that is felt and can increase a person's level of focus (Pasyar et al., 2018). Similar to the research of Nerolie Bost et al (2016),

explaining that massage therapy is beneficial for the health of nurses because it can reduce psychological stress levels.

Based on the stress management of other emergency room nurses, namely research conducted by Kim & Kang (2019), that the program uses visual media to recognize and manage one's own emotions, perform emotional relaxation, change environmental awareness, and adapt coping methods, this program is carried out twice a week. , for 90 minutes one session, with a total of eight sessions and the result is that Visual Media Program can be an effective strategy to reduce work stress and fatigue. However, this method takes quite a long time to run so it takes the nurse's time.

The research submitted by Bugse, Ozgundondua and Zehra Gok (2019), that nurses can do stress management, namely nurses receive every 20-minute session consisting of progressive muscle relaxation by tightening and relaxing the muscles in one part of the body at a time. to provide a feeling of physical relaxation and combined with music for a total of 8 weeks in the form of group sessions once a week. Because the accompaniment of music stimulates the auditory cortex which stimulates the brain and generates alpha brain waves so that it can relax the body. The time needed is quite efficient in explaining this therapy in dealing with stress.

The effectiveness of the three therapies in stress management is indicated by research by Nida Muslimah & Sidik Awaludin (2019), which stated that massage techniques, breath relaxation, progressive muscle tone performed regularly will provide a sense of comfort in the body. Especially breathing techniques that have a big effect on a person's level of focus when experiencing stress or anxiety.

3.5 Research Limitations

In this study, there are research limitations experienced by researchers. Researchers identify these limitations, among others, are:

1. The limitations of journals that are in accordance with the research objectives result in the length of the search process
2. Journals that are appropriate to the stress management of ER nurses are very limited, because the journals found to be very global do not refer to ER nurses.
3. The description of the stress management of emergency ward nurses that dominates the method with massage therapy, so that information about stress management with other therapies is less informative because there is no comparison journal
4. Lack of time in the data search process so that the sources obtained are few

3.6 Implications for Nursing

The results of this study found that the stress management of emergency room nurses mostly used massage therapy methods. Massage therapy method is the manipulation of soft tissue, generally by using the hands, to stimulate and relax and reduce stress and anxiety. Massage is a technique that can accelerate blood circulation, provide a sense of relaxation in the body, relieve stress, relieve fatigue and fatigue, by applying pressure to certain points (Rini, 2020). There are several reasons massage therapy is suitable for use in Indonesia, namely nurses can carry out stress management directly without having to wait for instructions from the health team, the actions taken do not drain the pocket because they are cheap and each individual can do it himself if he feels anxiety or stress and this action does not require quite a long time.

4. Conclusion

Based on the results of the analysis in 12 journals, the researchers found that stress management was carried out in the form of massage therapy, progressive muscle relaxation therapy and web-based education based on the literature review. Stress management that is often used by nurses is massage therapy, either foot massage or Swedish massage which has a duration of each session of 15-20 minutes which is more effective in combination with essential aromatherapy, breathing relaxation exercises and a quiet room so that it can have a significant effect. to a person's body under stress.

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The relationship between the type of family support and recovery of mental disorders patients who are cared at home: literature study

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ABSTRACT

Introduction Family support for family members who experience mental health problems is very important, the ongoing treatment process from the hospital must be passed on to home care. **Objectives** In this study, researchers will explore what types of support are provided by the family when caring for family members at home. **Methods** This research method uses the literature review method, researchers have screened 513 articles. Research articles have been obtained from databased EBSCO, Taylor & Francis. Furthermore, the researchers used inclusion criteria, the type of article is original research, a journal published in 2015-2020, the variables are related to family support and healing in mental patients. After screening, there are 12 articles that are most appropriate to the research objectives. **Results** From the results of the study, it was found that there were 4 family support, namely emotional support, information support, instrument support and assessment support, in several journals analysed it was found that family support is very important to help the patient's recovery process socialize again, create supportive environmental conditions, respect patients individually. personal and help solve problems. **Conclusions** From the data analysis conducted on 12 articles, the majority stated that there was an increase in the recovery of mental patients when they were treated at home. There is healing because the family provides various forms of support to improve the adaptive ability of mental disorder patients at home

1. Introduction

Mental disorders are syndromes of a person's behavior patterns that are typically associated with a symptom of distress or impairment in one or more important human functions, namely psychological, behavioral, biological functions, and the disorder does not only lie in relationships. between the person and also with the community. Therefore, this mental disorder is still a very important concern from various cross-sectors, both government and society, this is because mental disorders cost a lot of health care costs (Palupi et al., 2019).

In Indonesia, the prevalence of emotional mental disorders with symptoms of depression and anxiety for ages 15 years and overreaches around 6.1% of the total population of Indonesia. Meanwhile, the prevalence of severe mental disorders, such as schizophrenia, reaches around 400,000 people or 1.7 per 1,000 population. Riskesdas 2018 has a prevalence of depression with 4.53% while patients with mental-emotional disorders are 6.28%, and patients with schizophrenia are 2.23% of the population of East Java, (Riskesdas, 2018).

The prevalence obtained at Riskesdas 2018 for non-communicable diseases or mental health was 4.53% for the province of East Java with depression, and for the prevalence of emotional mental disorders, there was 7.5%. 15, 1% did not take medication, 48.9% took medicine regularly, 51.1% did not take medicine regularly and the reasons for not taking medicine regularly in the last month were 36.1% felt healthy, 33.7% did not regularly seek treatment, 23.6% can't afford to buy drugs regularly, 7.0% can't stand the side effects of drugs, 6.1% often forget, 6.1% feel the dosage is not appropriate, 2.4% drugs are not available, and around 32, 0% for other reasons (Riskesdas, 2018).

In the process of healing for people with mental disorders, not only medical treatment is needed but also the family roles is very important in patient care. The main reasons for the

importance of the family in mental care are 1) The family is the sphere that has the most contact with the patient, 2) The family is considered to know the most about the patient's condition, 3) Mental disorders that arise in the patient may be caused by the way of care that is not suitable for the patient, 4) Patients with mental disorders will later return to society; especially in the family environment, 5) The family is the main care provider in achieving the fulfillment of basic needs and optimizing peace of mind for the patient, 6) Mental disorders may require a long period of therapy, so understanding and family cooperation are very important in treatment (Pela, 2018).

The phenomenon that occurs in the community itself, the patient's family feels that it is not too important. One of the family members who experience mental disorder is treated at the hospital or the primary care feels hopeless in caring for the reason that the patient has been caring for a long time but the patient's condition remains and there is no change in the maximum. The family also feels bored because the efforts that have been made to the patient so far have been in vain. The family also has heavy responsibilities such as the burden of monitoring drugs and the family also has to prepare the patient's medication. If strict supervision is not carried out, the patient will not take the medicine, and the economy is not supportive (Setiawan, 2018).

Based on several phenomena that occur in the community and families who care for one of their family members who have mental disorders, the researchers are interested in researching the relationship between the type of family support and recovery of mental disorders patients who are cared for at home: a literature study.

2. Methods

This research method uses the literature review method, a sample of 12 research articles obtained from two EBSCO databases, Taylor & Francis. With the inclusion criteria, the type of article is original research, a journal published in 2015-2020, the variables are related to family support and healing in mental patients. The scientific articles obtained are then reviewed and analyzed.

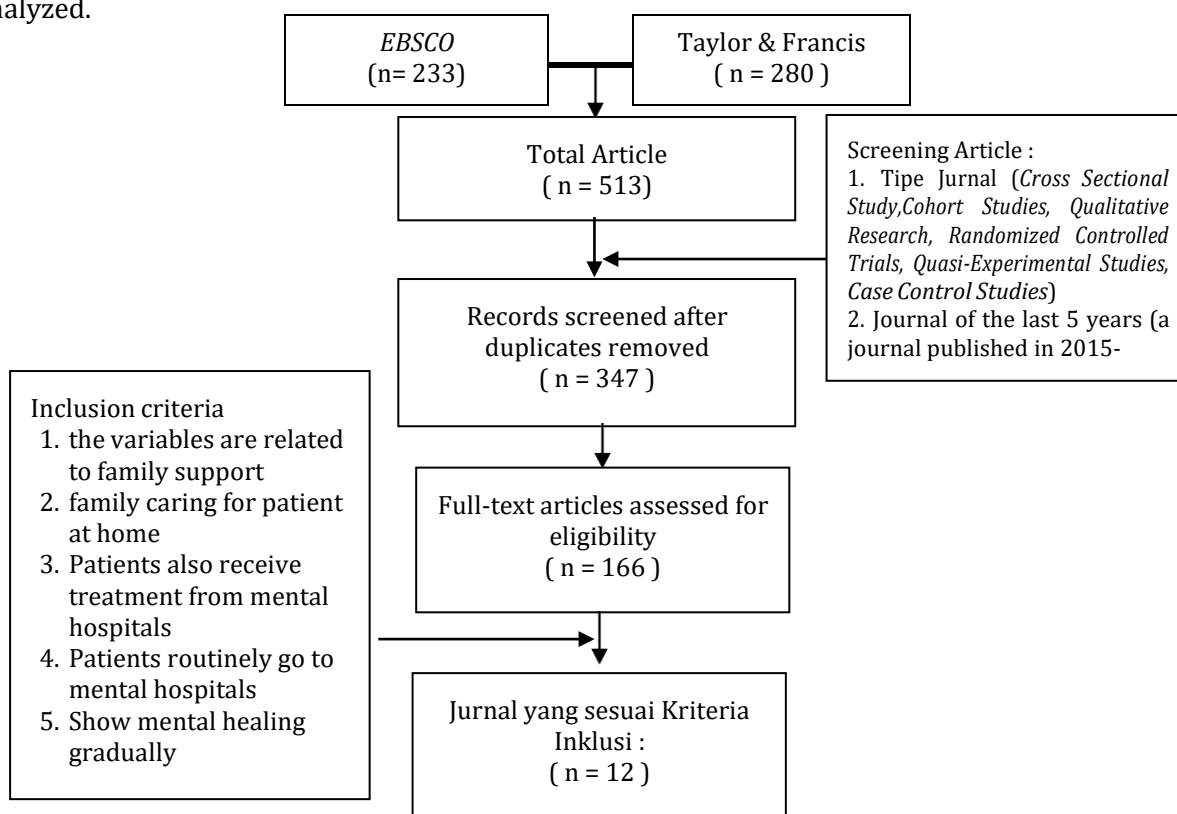


Figure 1 Article Search Flow

3. Results and Discussion

Data information has been analyzed in the form of a table containing the title of the journal and the name of the researcher, research objectives, population or sample, research instruments, research methods, data analysis methods, and research results.

Table 1 data analysis

No	Name and Journal Title	Purpose	Population/Sample	Instrument	Research Method	Discussion
1	Family Influence in Recovery from Severe Mental Illness. Heather Michelle Aldersey, Rob Whitley. (2015).	This study aims to determine the effect of family on recovery from severe mental illness.	The sample consisted of 54 people (26 women). Inclusion Criteria: (a) Must have had a diagnosis of schizophrenia, major depression, schizoaffective disorder or bipolar disorder for the past 5 years; (b) Must last at least 3 years; (c) currently have to use mental health or rehabilitation services; (d) Must be able to give informed consent; (e) Must speak English or French; (f) Must be 18 years of age or older; (g) Currently not hospitalized.	Semi-structured interview techniques to gain individual perspectives on recovery in general. The Socio-Demographic form is used to collect basic demographic data such as age, gender, marital status and parents.	The research method used is qualitative studies.	This study shows that there is high family support. Seen from (a). Moral Support, the presence of the family allows patients to understand that they are not alone in their recovery efforts, (b) Practical Support, families often provide practical support in the form of resources for patients during their recovery such as providing housing, food, providing pocket money, or giving present. This journal describes specifically, patients cite family as a motivator for recovery efforts. The journal shows that families can provide important moral and practical support and can serve as a driving force for recovery.
2	Family Support is the Key to Compliance with the Treatment of Relapsing Schizophrenia Patients	This study aims to determine the factors associated with medication	A sample of 36 Schizophrenic patients who were undergoing re-treatment at the Inpatient Installation of the RSJD Central Java Province, Indonesia.	Social Support Questionnaire (SSQ) to find out the social support of individuals and how satisfied they	Cross-sectional Study. Data analysis : 1. Descriptive Analysis 2. Chi-	This journal explains that respondents with secondary education are 20 respondents (54.1%), and one respondent (2.8%) does not go to school. Low family

	Betie Febriana, Wigyo Susanto, Dwi Heppy Rochmawati, and Wahyu Endang Setiawati. (2020).	adherence in Schizophrenic patients undergoing re-hospitalization at the inpatient unit of the RSJD in a city in Central Java, Indonesia.		are with the support they receive, especially in emotional support. Sociodemographic Questionnaire. Glasgow Antipsychotic Side-effect Scale (GASS). The Maryland Assessment of Recovery in Serious Mental Illness (MARS) assesses a process of recovery.	square test.	knowledge causes the frequency of relapse of schizophrenic patients to increase after being controlled by variables of attitude, support, family emotional expression. . Educational needs related to patient care are a major factor in family support as a source of long-term care for schizophrenic patients. There is a relationship between family support and relapse in people with schizophrenia. The family will be an effective therapy team if they have significant knowledge and skills.
3	The Relationship Between Knowledge And Family Support With Family Compliance In Controlling The Client's Medication With Schizophrenia. Dwi Christina Rahayunigrum, Helena Patricia. (2018).	This study aims to analyze the factors associated with family compliance in controlling the treatment of schizophrenic clients.	The sample in this journal consists of 38 families of schizophrenic patients in Solok Regency.	A questionnaire with interview techniques that included questions from the independent variables (including the level of knowledge and family support).	Cross-section Study. Data analysis : 1. Chi square Analisis analysis	This journal explains that the relationship between knowledge and adherence to treatment in patients with schizophrenia is statistical test results ($p = 0.002$). There is a significant relationship between knowledge and client compliance in taking medication in the working area of Solok Regency. Relationship between family support and medication adherence in schizophrenic patients. Statistical test results ($p = 0.011$). There is a significant

						relationship between family support and client compliance in treatment in the work area of Solok Regency. From the results of the study, it can be concluded that knowledge and family support play an important role in the healing process, especially in controlling treatment in schizophrenic patients.
4	Recovery from Schizophrenia: The Case of Mexican-origin Consumers and Family Caregivers. Maria M. Santos, Ph.D., Alex Kopelowicz, M.D., and Steven R. López, Ph.D. (2018).	This research aims to examines the future outlook for people with schizophrenia and their caregivers to understand what is at stake in making recovery.	The sample in this journal consists of 60 pairs of Mexican consumer caregivers. Consumer Inclusion Criteria: 1. Have a research-based diagnosis of schizophrenia or schizoaffective disorder 2. Communicate frequently with caregivers who are willing to participate in research. Caregiver Inclusion Criteria: 1. Originally from Mexico, 2. Ages 18-65 years, 3. Does not prove organic disorder or mental retardation, 4. Have the ability to give consent.	Semi-structured interview to identify what is at stake for consumers and their family caregivers.	Qualitative Study.	This journal explains that families who play a major role in recovery involve providing, consumers, and families being involved in a joint decision-making process that involves a variety of knowledge and information, such as cultural beliefs and mental health of patients to achieve healing based on aspects of treatment and close family support. Healing is seen from the family discussing differences and reaching a common view of recovery and being involved in it and focusing on treatment for the patient's recovery. The existence of healing in the family support provided has also been identified to date including social

						relationships, which also involve support from others and developing the role of the family to achieve healing.
5	The Correlation Between Family Support and Relapse In Schizophrenia At The Psychiatric Hospital. Rostime Hermayern i Simanullang. (2018).	This study was to determine the relationship between family support and relapse in schizophrenia.	There are 90 samples in this journal which were selected using purposive sampling. Inclusion criteria: 1. All family members who have family members with schizophrenia in both inpatient and outpatient settings. 2. Able to communicate well, aware and willing to be a respondent.	Family support questionnaire to measure family support and relapse of schizophrenia.	Cross-sectional Study. Analisa Data : 1. Chi-square test.	This journal explains that there is a statistically significant relationship between informational support ($p=0.00$), assessment support ($p=0.00$), instrumental support ($p=0.00$), and emotional support ($p=0.00$) with relapse in schizophrenia in psychiatry. Less support from family members tend to relapse more often than those who have good family support. There were 31% relapse patients with poor information support, 27% patients with poor assessment support, 12% patients with less instrumental support. There is a significant relationship between family support (informational support, appraisal, instrumental and emotional support) with relapse in schizophrenia.
6	Emotions, Ideas and Experiences of Caregivers of Patients With Schizophrenia About	This study aims to investigate the emotions, thoughts, and	The sample in this journal is 20 caregivers.	Four Open Ended Questions: 1. Can you tell us about the reasons why you chose to participate in the "Family to	Qualitative Research Methods	This journal describes the family support provided by the family being able to solve many problems by learning more about the mental disorder. Families are also

	"Family to Family Support Program"	experiences of caregivers of schizophrenic patients participating in the "Family to Family Support Program".		Family Support Program"? 2. What has changed in you and your life compared to before and after joining the program? 3. How has your decision to participate in this program affected your life? 4. What would you recommend to a schizophrenic nurse who has never participated in the "Family to Family Support Program"?		more aware of the causes and treatment of mental disorders, so they can overcome challenges, reduce negative feelings and anxiety about the patient's condition. Patient recovery has a positive effect from family support, because patients learn to cope with their own problems, initiate social interactions, feel better with family encouragement and think that schizophrenia is not the end of everything.
7	From my point of view, my wife has recovered: A qualitative investigation of caregivers perceptions of recovery and peer support services for people with bipolar disorder in a Chinese community. Winnie WY Yuen, Samson Tse, Greg	This study aims to explore how family caregivers in the Chinese context conceptualize recovery, how caregivers interact with peer support workers (PSW) and how they perceive peer support	The sample in this study recruited 14 caregivers a family of two: Integrated Community Centers for Mental Wellness (ICCMW) and a non-governmental organization (NGO). Inclusion Criteria: 1.The age of the participants ranged from 30 to 75. 2.The period spent caring for family members ranges from 1 to 45 years with an average of 13 years.	Semi-structured interviews with open-ended questions were used to interviews based on the literature on recovery.	A Qualitative Study.	This journal explains that families provide support based on their learning from lectures, seminars, reading books, information from mental health professionals, and adjusting their expectations through interaction and understanding of their family members. Healing occurs because of understanding the concept of healing from the perspective of family care, their experience of interaction with peers, and family support during the

	Murray and Larry Davidson. (2019).	services.				healing process. Some families also argue that they also doubt their family members will recover to the same person they were before they got sick. An important indicator of recovery is family support.
8	Family Caregivers' Perspective on Factors Affecting Recovery from Schizophrenia. S Gandhi, D Jones. (2020).	The aim of this study was to explore caregivers' perspectives on the factors influencing the recovery of their diagnosed family members with schizophrenia.	The sample used consisted of 18 patients with schizophrenia and their caregivers, symptom control and cognitive abilities were more important. Inclusion Criteria: 1. People diagnosed with schizophrenia according to ICD 10 criteria (F20). 2. Treated for 1 year. Exclusion Criteria: 1. Caregivers receiving treatment for chronic physical or mental illness.	Theoretical sampling to build various sociodemographic categories and disease backgrounds. Interviews were recorded, transcribed, and analyzed.	A Qualitative Study.	This journal explains that family support is provided in the form of appropriate treatment, positive thinking, carrying out family roles diametrically, paying attention to basic needs, praying, adapting to a supportive lifestyle, engaging in interesting activities, interacting with others, and having resources. adequate and good supporting factors. Families are important because they help physically, financially, and materially. Early identification of the disease and proper treatment is of utmost importance. Adherence to treatment, family support, a positive attitude towards the disease, and having adequate resources to meet the needs of patients and their families are interconnected.
9	A Cross-sectional study on spouse and parent differences in	The aim of this journal is to examine the relative	The sample from this journal consisted of 264 primary family caregivers. Inclusion Criteria:	Questionnaire to find out socio-demographic information. Global	A Cross-sectional Study.	This journal explains that family support with family members who experience schizophrenia brings positive

caregiving experience of people living with schizophrenia in rural China. Yu Yu1, Tong-xin Li, Yi-lu Li, Dan Qiu, Shi-jun Xi, Shui-yuan Xiao and Jacob Kraemer Tebes. (2020).	parenting experience and impact of partner and parental caregivers for persons living with schizophrenia (PLS) in China.	1) Caring for family members with schizophrenia who are enrolled in the 686 Program; 2) The treated family member met the criteria of the Chinese Classification of Mental Disorders-3 (CCMD-3) or International Classification of Diseases-10 (ICD-10) for schizophrenia; 3) The primary caregiver has lived with the PLS for at least the past two years and has primary responsibility for care; 4) The primary caregiver is over 16 years old, because according to Chinese civil law, people are 16 years old and over. 5) The primary caregiver speaks Mandarin, is literate, and is not seriously handicapped, thus enabling the person to understand and communicate in face-to-face interviews with caregivers. Exclusion criteria: 1) Caring for family members with diagnoses other than schizophrenia such as depression and epilepsy; 2) The primary caregiver who	Assessment of Functioning (GAF) to determine the function of People living with Schizophrenia (PLS). Patient Health Questionnaire (PHQ-9) to measure caregiver depression level. Caregiving Rewarding Feelings (CRF) to assess the feelings of (+) caregivers. Family Adaptation, Partnership, Growth, Affection and Resolve Index scale (APGAR) to assess perceived family functioning.	changes, such as increased self-confidence, self-affirmation, and personal growth. Healing has identified various positive aspects of family in the family, family connectedness, resilience of the healing process which has a family role in it. There is a significant relationship between family support and recovery in schizophrenic patients who actively work together to improve the healing of family members with schizophrenia.

			does not speak Chinese or has a serious physical or mental illness that prevents them from communicating effectively in face-to-face interviews			
10	Family Support Relationship with The Rate of Schizophrenia Patients in Puskesmas Rongkop District Gunungkidul Yogyakarta. Joko Subandono, Adi Heru Sutomo, Carla R Marchira. (2019).	This study aims to determine the relationship between family support with schizophrenic relapse, the level of family support for schizophrenia and the relapse rate of schizophrenia in the work area.	A total of 37 respondents based on the number of people with schizophrenia in Petir Village. Inclusion Criteria: 1. Family of clients who have family members who suffer from recurrent schizophrenia. 2. The client's family who lives at home with the client. 3. Between 25 and 60 years old. 4. Families who follow the client during illness. Exclusion criteria: 1. The family of the client who has a family member who suffering from non-relapsed schizophrenia. 2. The client's family who does not live with the client. 3. Be less than 25 years old or older than 60 years. 4. Families who do not follow clients while they are sick.	A questionnaire untuk mengumpulkan data tentang dukungan keluarga dan angka kekambuhan klien skizofrenia.	A Cross-Sectional Study.	Support found from This research is in the form of assistance provided by the family in support mental emotional patients with schizophrenia clients and taking medication as well as regularity in visits to the Puskesmas with family members with schizophrenia Results 8.10% very high category, 24.33% high category, 35.13% medium category, 32.43% category low, so it can be concluded that family support for people with schizophrenia in the Rongkop Gunungkidul Health Center is generally included in the medium category. For the recurrence rate of schizophrenia, 5.41% is in the high category, 32.44% in the medium category and 62.16% in the low category, so it can be concluded that the recurrence rate of schizophrenia in the working area of Rongkop Health Center Gunungkidul in general included in the low

						percentage There is a relationship that significant between support family with relapse schizophrenia in the region Rongkop Health Center work Gunungkidul. The higher the level of family support, the more low recurrence rate schizophrenia.
11	Family-focused recovery: Perspectives from individuals with a mental illness. Susan Waller, Andrea Reupert, Bernadette Ward, Francis McCormick and Susan Kidd. (2019).	This study aims to find out how those with mental illness define 'family' and the role of the family (if any) in their recovery journey.	The population used in this journal is 12 people who have been diagnosed with a severe mental illness. Inclusion Criteria: 1. Adults who are consumers of mental health services who live in the local area and think they are good enough to participate are included	Telephone interviews (as opposed to face-to-face interviews) were used to collect data. Twelve one-to-one semi-structured interviews to ensure alignment of interview questions with research questions.	A Qualitative Study.	Without family support, recovery will seem difficult because of the practical and purposeful support provided by their family members. Families can serve as conduit to the community for those with mental illness, participants described their families as helping them (re)engage with others. This study provides insight from the perspective of those with mental illness on the role of the family in the recovery journey
12	Support Needs for Family Caregivers of Clients with Mental Illness in Iran: A Qualitative Study Mohammad Akbari, Mousa Alavi,	This study explores the support needs of family caregivers of people living with mental illness in Iran.	The sample studied was about 20 family caregivers as well as the views of 29 professional support workers. Inclusion Criteria: 1. A family member who cares for a relative diagnosed with mental illness for at least 1 year at the family home.	Individual face-to-face interview s.	A Qualitative Study.	This journal explains that the important role played by the family in healing by providing social support, emotional support, safety and security. The role of the family is very important in supporting family members with mental illness and their physical and

Alireza Irajpour, Jahangir Maghsoudi, Violeta Lopez & Michelle Cleary. (2018).	emotional health. It is known that family caregivers are a significant support and resource in the care and treatment of Iranians with mental illness.

The writing sub-chapter will present a summary of 12 international journals on the relationship between family support and healing that has been analyzed previously. In this sub-chapter it will be divided into the following domains and sub-domains

3.1 Overview of Family Support

The description of family support that has 11 levels of emotional support is found in journals 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12. Moral or emotional support from the family is manifested in various ways in the recovery process for people with mental disorders. The support provided (whether physically present or in communication) is a positive influence on the recovery process. The presence of family allows sufferers to understand that they are not alone in their recovery efforts and that there are others who care about them. The presence of this family seemed to provide the steadfastness and stability that many respondents felt was necessary for recovery. Sufferers believe in the importance of being able to trust and trust their family members during the recovery process. The description of family support that has 8 levels of information support is found in journal numbers 2, 3, 4, 5, 6, 7, 8, and 11.

Information support, the family functions as a collector and disseminator (patient) for providing information about the illness suffered by family members. Families provide a multifaceted definition of recovery based on their learning from lectures, seminars, groups for family caregivers, reading books, information from mental health professionals (eg social workers, psychiatrists and clinical psychologists) and adjust their expectations through interaction and understanding of their family members so as to increase their knowledge of the causes and how to treat mental illness.

The description of family support that has a level of instrument support as much as 7 can be found in journals number 1, 4, 5, 8, 10, 11, and 12. Families support recovery through the provision of instrumental assistance in the form of funds, commodities, or logistical assistance to affected family members. mental illness. Families often provide practical support in the form of resources for participants during their recovery. Financial support comes through providing housing, paying separate rent for individuals, providing food, providing an allowance, or buying individual gifts. Financial assistance is often an important facilitator for recovery, given that many people with mental disorders are unable to find or keep jobs.

The description of family support that has an assessment support level of 6 is found in journals 4, 5, 6, 8, 9, and 12. Assessment support or awards are given in the form of positive responses such as praise and also good feedback to patients in terms of what they do. The family plays a role as motivation for recovery because the presence of family can often affect recovery. Families can also reduce anxiety, improve problem solving, increase positive coping, and increase family knowledge.

In the results of the analysis of journals conducted by researchers, the description of family support that has emotional support is 11 journals, information support is 8 journals, instrument support is 7 journals, and assessment support is 6 journals. From the results of the study, it was found that there were 4 family support, namely emotional support, information support, instrument support and assessment support, in several journals analyzed it was found that family support is very important to help patients socialize again, create supportive environmental conditions, respect patients personally and help solve problems (Pelealu, Bidjuni,

& Wowiling, Journal of Nursing, 2018). With the support from families and communities living with schizophrenia sufferers, the patient will feel more valued by his family, so that the spirit to recover, and can socialize with the community without having to be isolated (Pase & Kristina, 2020).

Instrumental support, family is a concrete source of help. Socio-economic status is often measured by a combination of education, employment, and income. A person can belong to a high economic level if he earns a high income, a high education and an adequate job. On the other hand, a person with low socioeconomic conditions because he gets a small salary, low education, and inadequate work, so that from the socioeconomic status of a family with Mental patients are required to provide instrumental support, especially for the cost of treatment and long treatment facilities (Penning & Wu, 2016). Appraisal support or appreciation is given in the form of positive responses such as praise and also good feedback to patients in terms of what the patient does. The family also helps in the daily activities of the patient, for example by sweeping, cooking, and other light household chores (Horizons et al., 2018).

Information support, the family functions as a collector and disseminator (patient) to provide information about the illness suffered by family members. From that, education from the family is also very important that must be considered, if the family is mostly high school education allows it to be easier to get new knowledge, while junior secondary education and elementary school to get new knowledge must use examples, role play methods or demonstrations. Thus, families with mental disorders need adequate knowledge about the care of mental patients at home from professionals regarding the varied symptoms of mental disorders and specific care so that families can provide support in treating mental patients appropriately (Susilowati et al., 2016).

Emotional Support, serves as a place of rest and recovery and helps regulate emotional and increase family morale. The ability to recognize other people's emotions is very dependent on their own emotional awareness, so basically family emotional support is the family's emotional intelligence itself where the skills in emotional intelligence are how to understand, recognize, feel, manage and lead one's own feelings and those of others and apply them (Friedman, 2013)

3.2 The process of healing mental disorders patients who are cared for by caregivers at home

The cures found in 12 journals are found in journals number 1, 2,3, 4, 5, 6, 7, 8, 9, 10, 11, and 12. Caring for family members with schizophrenia can bring positive changes in a person and can increase positive inner feelings, such as increased self-admiration, self-affirmation, self-confidence, self-satisfaction. As for the factors that influence recovery from schizophrenia such as: (1) undergoing the right treatment regimen and sticking to it, (2) developing some personal attributes, (3) carrying out family roles well, (4) paying attention to basic needs, (5) praying to the Almighty, (6) adapting to a supportive lifestyle, (7) doing useful activities or positive activities to fill spare time, (8) going out, being and sharing with others, and (9) have adequate resources with a good support system. In accordance with the results of the journal analysis on the relationship between family support and recovery in mental patients, significant results were obtained between two variables where the two variables were highly related. Therefore, one of the important efforts in healing and preventing recurrence is the existence of good family support. The family is the unit closest to the patient, and is the "primary nurse" for the patient, and plays a role in determining the method or treatment needed by the patient at home. So the role of the family is the key to the success of healing in treating patients with mental disorders (Rahmayani, 2018).

3.3 Relationship between Family Support and Healing in Mental Disorder Patients

After analyzing 12 international journals on family support and healing, the results showed that there was a significant relationship between family support and healing. This is from the 12 journals analyzed, there are 12 journals that say there is a significant relationship between family support and healing, besides that, between the two variables, there are weak results as many as 1 journal and 5 journal variables which are quite strong, and there are 6 variables that are quite strong. Family support is a form of encouragement by always providing assistance if the patient needs it (Sarawati, 2019). The family also functions as a support system for its members and family members perceive that people are supportive, always ready to provide help with assistance if needed. Family support itself can be provided in the form of information, appreciation support, instrumental support, and emotional support (Ali, 2017).

The results of the study explain that there is a relationship between family support and recovery in mental patients, based on the results of this study, it is expected that nurses and other medical personnel are able to provide education to the community about how important the role of family support in healing mental patients is. In this study the implications of nursing in accordance with the nurse's function as education by providing clear and complete information about the importance of family support for the recovery of mental patients, then the importance of information about the function and role of the family so that the family support provided will be maximized and the achievement of healing for family members. who have mental disorders, so that patients and their families are more active in controlling their illness to the health services that have been provided.

4. Conclusion

After going through a series of processes, based on the results of research in international journals regarding the literature review of the relationship between family support and healing in mental patients, it can be concluded that there are 5 sub-themes where each of these sub-themes discusses socio-demographic family support, then family support factors, the impact of lack of family support, the causes of healing and the impact of healing.

From the sub-chapters obtained, it can be concluded that family support is very important in providing a role for patients or families with mental disorders. And some of the causes of non-healing are problems of lack of understanding, lack of education, and the role of family support in healing in patients with mental disorders.

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Relationship Between Nurses Assertiveness and Level of Patients Satisfaction at the Polyclinic of University of Muhammadiyah Malang Hospital

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ABSTRACT

Introduction: Assertiveness is an ability to express what feelings are desired, felt, and thought to others while maintaining and respecting the rights and feelings of others—assertive attitude as an effort to improve service quality. Patient satisfaction is a response to the suitability of patients' level of interest or expectations before receiving services with after the services they receive. **Objectives:** This study aims to determine the relationship between the assertive attitude of nurses with the level of patient satisfaction in the Polyclinic of RSU University of Muhammadiyah Malang. **Methods:** This research method uses quantitative descriptive research with a cross-sectional approach. The number of samples in this study was 206 respondents. The sampling technique used is accidental sampling by determining the number of respondents' quotas using Slovin's formula. Data analysis used univariate and bivariate analysis with chi-square. **Results:** The result showed that the chi-square test results obtained a *p*-value of 0.001, *p*-value <0.05, so that *H*₀ was rejected, meaning that the nurse's assertiveness had a significant relationship with the level of patient satisfaction. **Conclusion:** Knowledge about assertiveness towards patients to increase patient satisfaction.

1. Introduction

Public demand for services generally refers to customer-focused quality, namely services that focus on customer satisfaction. This has an impact on people's demands on health services. Patients as users of nursing services demand their rights, namely quality, and complete nursing services. Quality nursing services will determine the excellent image of a hospital. Patients satisfied with their services will tell their relatives, neighbors, friends, and relatives (Nursalam, 2014).

Based on data from the Indonesian Ministry of Health, the prevalence of the number of health workers in Indonesia in 2017 was 836,466 people with the number of nurses being 345,276 people; specialist doctors were 54,316 people, general doctors were 45,387 people, midwives were 198,110 people, public health was 24,561 people, pharmacists are 45,839 people and environmental health is 6,595 (Kemenkes RI, 2018)

The quality of nursing services dramatically determines the quality of health care institutions. Especially in hospitals, nurses are the staff who have the most contact and interact with patients, so patients tend to judge and observe what they do. The aspect that patients often assess is the nurse's communication in caring for them. The expected communication is the communication of assertiveness carried out by nurses in providing services, manifested in the form of gestures and powerful speech (Laksono & Rosyiatul Husna, 2015).

Assertiveness is an ability to express what feelings are wanted, felt, and thought to others while maintaining and respecting the rights and feelings of others—assertive attitude as an effort to improve service quality. Therefore, good communication needs to be emphasized in all professional health care programs to ensure patient satisfaction and safety (Handayani & Nurman, 2019).

Patient satisfaction is a response to the suitability of patients' level of interest or expectations before receiving services with after the services they receive. Satisfied customers will share their tastes and experience with friends, family, and neighbors. The positive attitude of the officer towards the patient will significantly determine the positive interaction between the officer and the patient, thus providing added value for the patient, family, and community satisfaction (Morika, 2016)

The results of the study (Handayani, Ali, & Mahyudin, 2018) based on the results of the chi-square test, a significant value was obtained, namely 0.024 ($p < 0.05$), namely there was a relationship between assertive communication in the implementation of new patient orientation and patient satisfaction in the hospital inpatient room.

Based on the results of a preliminary study conducted at the Muhammadiyah University Hospital in Malang from the results of initial observations on 23-25 October 2019 of 10 outpatients at the Muhammadiyah University Hospital Malang, two people were delighted, six people were quite satisfied, and two people were not satisfied. People ask questions about the convenience of the patient's relationship with health workers and the cost of health services. Then from the data, there is still a lot of information that the main complaint against the service of nurses who do not want to communicate with patients, lack attention to patients, and are not friendly to patients. This mismatch of expectations and expectations and the reality obtained show that the hospital, as a friend of the community, has not maximally presented good service quality to its patients. According to the results of interviews that researchers conducted (25 October 2019) with outpatients at Muhammadiyah General Hospital related to patient satisfaction, Some things are the main phenomena that are interesting to study, where some patients who undergo outpatient services feel that the services received from the hospital are not by the patient's expectations because according to patients, especially for patients with government insurance (BPJS), the service will be different from patients who receive health insurance. Pay independently. However, on the other hand, as the spearhead of service, nurses try to provide the best for patients with their communication. But sometimes some cannot accept it well, so that a different attitude will arise. Even though nurses have a code of work ethics, providing services is the main task and doing it with an assertive attitude because of the job's demands. This study aimed to determine the relationship between the nurse's assertiveness and the level of patient satisfaction.

2. Methods

2.1 Research design

This research is an observational study that uses an analytical survey method with a cross-sectional approach

2.2 Population and sample

Respondents in this study were all patients who visited in October 2020 at the Polyclinic of the University of Muhammadiyah Malang Hospital, totaling 206 patients. Respondents were selected by the accidental sampling technique that coincidentally met and followed the sample criteria: patients willing to be respondents, can communicate well, read, and write. Researchers set a sample quota based on Slovin's formula.

2.3 Data collection techniques and instrument development

Collected data by giving questionnaires to respondents measuring the level of patient satisfaction and the assertive attitude of nurses who have been tested for validity and reliability. The results of Cronbach's Alpha on the Patient Satisfaction Questionnaire were 0.904, and the assertiveness was 0.756, so that the questionnaire was declared valid and reliable.

2.4 Data Analysis Techniques

The respondents' demographic data were presented with the distribution of frequency and central tendency. At the same time, the data analysis technique of the relationship between nursing assertiveness and patient satisfaction was analyzed using chi-square with a 95% confidence level.

3. Results and Discussion

Table 1. Respondent's Characteristic

Characteristic	n	%
Age		
<45 years	110	53,4
≥45 Years	96	46,6
Gender		
Males	86	41,7
Females	119	57,8
Educational Background		
Elementary School	4	1,9
Junior High School	19	9,2
Senior High School	159	77,2
Diploma	7	3,4
Bachelor	17	8,3
Total	206	100

Table 2. Distribution of the Nurses Assertive at the Polyclinic of RSU University of Muhammadiyah Malang

Variable	n	%
Nurses Assertive		
Good (≥30)	160	77,7
No good (<30)	46	22,3
Total	206	100

Table 3. Distribution of Patient Satisfaction Levels at the Polyclinic of RSU University of Muhammadiyah Malang

Variable	N	%
Patient Satisfaction Levels		
Satisfied (<40)	110	53,4
Dissatisfied (≤40)	96	46,6
Total	206	100

Table 4. crosstab Relationship of Nurse Assertive to Patient Satisfaction Level at Polyclinic of RSU Muhammadiyah University Malang

Nurses assertive	Patient Satisfaction Level				N
	Satisfied		Dissatisfied		
	n	%	n	%	
Good	95	59,4	65	40,6	160
No good	15	32,6	31	67,4	46
N	110	53,4	96	46,6	206

Table 5. Chi-Square Test the Relationship of Nurses Assertive Attitudes Towards Patient Satisfaction Levels at the Polyclinic of RSU University of Muhammadiyah Malang in 2020

	<i>Value</i>	<i>df</i>	<i>Asymp. Sig. (2 - sided)</i>	<i>Exact Sig. (2 - sided)</i>	<i>Exact Sig. (1 - sided)</i>
<i>Pearson Chi-Square</i>	10.286 ^a	1	0.001		
<i>Continuity Correction^b</i>	9.239	1	0.002		
<i>Likelihood Ratio</i>	10.389	1	0.001		
<i>Fisher's Exact Test</i>				0.001	0.001
<i>Linear by Linear Association</i>	10.236	1	0.001		
Total	206				

3.1 Respondent's Characteristic

Characteristics of respondents from 206 respondents found that the majority were <45 years old, namely 110 respondents (53.4%), female sex, namely 119 respondents (57.8%), and the highest education was Senior High School with 159 respondents (77.2%).

3.2 Nurses Assertiveness

The research data collected at the Polyclinic of the University of Muhammadiyah Malang General Hospital stated that from 206 respondents, 160 respondents (77.7%) had good assertiveness, and 46 respondents (22.3%) had no good assertiveness.

Based on the results of the research, some assertiveness is good, and some are not good; this can be caused because the nurse's assertive attitude is a behavior that has a sense of courage in conveying honesty as well as openness in conveying about their needs, feelings, and thoughts by not hurting the feelings of others, well conveyed. Assertiveness in dealing with a problem can be overcome by still thinking objectively and thinking openly by prioritizing what must be done and resolved correctly. Someone who has an assertive attitude can reduce the risk that can be detrimental is also needed in making positive interactions with patients. Furthermore, the University of Muhammadiyah Malang Hospital is one of the new private hospitals where this is also related to the National Hospital Accreditation Standard (SNARS). A good assertive attitude in nursing care increases patient satisfaction (Hernanto & Izza, 2019). Assertiveness is a behavior in communicating what is desired, felt, and thought to others while maintaining and respecting the rights and feelings of others. The application of an assertive attitude can improve the performance of nurses and can improve the quality of services in hospitals. Nurses in providing services are required to behave assertively (Simamora, 2012).

3.3 Patient Satisfaction Levels at the Polyclinic of RSU University of Muhammadiyah Malang

Research data collected at the Polyclinic of the University of Muhammadiyah Malang Hospital in 2020 stated that of 206 respondents, 110 respondents (53.4%) were satisfied and 96 respondents (46.6%).

This can be caused because RSU UMM is a hospital that is still developing; some nurses are also new. Although the supporting facilities are also new, patient satisfaction in receiving services is not following the expectations and wishes of the patient. A patient, when receiving service at the hospital, does not match his expectations so that it can cause a feeling of disappointment for the patient so that it can affect the patient's sense of satisfaction with the hospital and also if the patient gets good service regarding hospital services so that the level of patient satisfaction is good and can also recommend the results of the hospital—received service. One indicator of the success of individual health services is patient satisfaction (Muninjaya, 2012). Patient satisfaction is the service recipient's response to the discrepancy between importance and perceived performance. Satisfied customers will share their tastes and experience with friends, family, and neighbors. The officer's positive attitude towards the

patient will significantly determine the officer's positive interaction, thus providing added value for patient, family, and community satisfaction. Hospitals as business institutions will develop rapidly if customer satisfaction and loyalty, patient satisfaction, and hospital service users are the primary or essential elements of patient satisfaction. Service quality must be centered on efforts to meet the needs and desires of patients and the accuracy of their delivery to balance patient expectations. If the service received or perceived is under what is expected, then the perceived service quality is excellent and satisfactory. If the service received exceeds the patient's expectations, the service quality is perceived as ideal quality. Conversely, if the service received is lower than expected, the perceived service quality is poor. So it takes an assertive attitude of nurses so that patients feel at least satisfied (Laksono & Rosyiatul Husna, 2015).

3.4 The Relationship of Nurses Assertive Attitudes Towards Patient Satisfaction Levels at the Polyclinic of RSU University of Muhammadiyah Malang

Based on the chi-square test results, the p-value was 0.001, p-value <0.05, so H_0 was rejected, which means that the nurse's assertiveness was significantly related to the level of patient satisfaction.

Based on research conducted at the Polyclinic of RSU University of Muhammadiyah Malang, assertiveness can affect patient satisfaction. This is because it is influenced by nurses' assertive attitude, which includes nurse communication, friendliness of health workers, information obtained, health facilities or facilities obtained as essential things in improving patient services in increasing patient satisfaction.

A good attitude will improve the professional relationship between nurses and the health team. In addition, a good attitude will also be beneficial for the development of a professional nursing model. Assertive attitude to improve patient safety, improve job description clarity and play an essential role in increasing patient satisfaction in hospitals; it is necessary to increase the ability of assertive attitudes by nurses and all arrangements in hospitals by participating in training on assertiveness to improve the quality of services in the hospital (Nasir, 2011).

A nurse must be assertive in asking the right questions and making their voices heard. Patient satisfaction is the patient's feeling after receiving service at the hospital from the facilities, facilities, infrastructure, and wishes and expectations in obtaining health services. The low level of hospital services will affect patient dissatisfaction with service quality which is influenced by the quality of services provided by the hospital (Handayani et al., 2018)

4. Conclusion

This study concludes that the assertive attitude of nurses at the University of Muhammadiyah Malang is on average good so that service recipients can feel satisfied when they check their health. Patient satisfaction must continue to be improved by increasing the ability of nurses to be assertive in providing services and continuing to improve supporting facilities, both health facilities and infrastructure.

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The Effect of Pursed Lip Breathing on Dyspnea and Increased Oxygen Saturation in COPD Patients: A Literature Study

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ABSTRACT

Introduction: Chronic obstructive pulmonary disease (COPD) is defined as a clinical syndrome which is a group of chronic, progressive, debilitating of respiratory function characterized by airflow limitation and is reversible. **Objectives:** The purpose of this study was to determine the effect of pursed lip breathing on dyspnea and oxygen saturation in COPD patients based on a literature study. **Methods:** The research design used in this study was a literature review, with a sample of 14 journals, Pubmed (n = 2), Willey (n = 2), Scient Direct (n = 3), Proquest (n = 1). The Joanna Briggs Institute was used to assess studies and previous studies using randomized controlled trials, and quasi experimental. **Results:** The results of this study indicate that there is an effect on the administration of pursed lip breathing on dyspnea and an increase in oxygen saturation in COPD patients. **Conclusions:** This study can be used as a reference for further research on the effect of pursed lip breathing on dyspnea and increased oxygen saturation in COPD patients.

1. Introduction

Chronic Obstructive Pulmonary Disease (COPD) is a group of lung diseases that impede airflow and cause difficulty breathing characterized by persistent airflow limitation, generally progressive in nature, associated with excessive chronic inflammatory response in the airways. Characteristics of airflow limitation in COPD is caused by a combination of small airway obstruction and parenchymal damage (emphysema which varies from individual to individual, causing loss of alveoli and small airways connections and decreased elasticity of lung recoil (Syarifah & Amin, 2020). According to the Global Initiative for Chronic Obstructive Lung Disease (GOLD), COPD is a common preventable and treatable disease characterized by respiratory symptoms and airflow limitation caused by airway and/or alveolar abnormalities usually caused by significant exposure to noxious particles or gases and influenced by host factors including abnormal lung development.

World health organization (WHO) estimates that by 2020 the prevalence of COPD will continue to increase from sixth to third in the world as the most common cause of death after cardiovascular disease and cancer. WHO itself states that COPD is the fourth leading cause of death in the world which will cause death in 2.75 million people or the equivalent of 4.8%. According to the PDPI (Indonesian Lung Doctors Association) it is estimated that the prevalence of COPD in the world is life-threatening affecting more than 251 million people, while 6.3% in Southeast Asia with the highest prevalence in Vietnam (6.7%) and China (6.3%). 5% (PDPI, 2018). COPD itself develops slowly and rarely occurs under the age of 30. In Indonesia, the highest prevalence of COPD is in East Nusa Tenggara (10.0%), Central Sulawesi (8.0%), then West Sulawesi, and finally South Sulawesi with 6.7 percent each. (Kemenkes, 2014). COPD suffers more by men than women (Kemenkes, 2013). Research conducted by Kusumawardani et al., (2017) showed that the history of COPD in the population aged 30 years and over was found to be 3.7%. The prevalence tends to be higher for men (4.2% compared to 3.3%). Meanwhile, at age, the prevalence of COPD increased in the elderly group by 7.9% (Takatelide et al., 2017).

The decrease in respiratory function that occurs in COPD patients can be related to the lifestyle that COPD patients have previously lived. Decreased respiratory function causes an increase in effort in the breathing process which is characterized by shortness of breath felt by COPD patients (Rosyadi et al., 2019). If dyspnea is allowed to continue, it can cause a decrease in oxygen saturation in COPD patients (Amira Permata ST, 2018). Oxygen saturation is the amount of oxygen carried by hemoglobin, written as the percentage of total oxygen bound to hemoglobin. The normal value of oxygen saturation as measured using pulse oximetry ranges from 95-100% (Septia et al., 2016). The oxygen saturation of COPD patients can decrease to a value of 85% which causes the patient to experience hypoxemia, cyanosis, decreased concentration and mood changes. (Somantri, 2012).

Pursed-lip breathing is the simplest breathing exercise to control shortness of breath that the patient can learn spontaneously. Pursed lip breathing (PLB) is a breathing technique in which air is inhaled slowly through the nose (like kissing a rose), keeping the mouth closed and exhaling slowly through the mouth by closing the lips with a frown (like blowing out a candle). Pursing the lips delays exhalation and slows the rate of breathing. Continuous pursed-lip breathing exercises reduce shortness of breath and increase oxygen saturation. This helps the patient to control the rate and depth of breathing. Then encourage relaxation, facilitate the patient to control dyspnea and reduce feelings of panic (Babu et al., 2016). Pursed-lip breathing may be useful for increasing resistance to weak breathing exercises and reducing oxygen desaturation during exercise in patients with moderate to severe COPD. (Bharadwaj et al., 2016). The advantage of conducting pursed lip breathing rehabilitation interventions is that pursed lips breathing can improve gas exchange which can be seen by improving arterial oxygen saturation. Pursed lips breathing also improves breathing patterns and increases tidal volume. In addition, pursed lips breathing aims to provide subjective benefits to patients, namely reducing shortness of breath, anxiety and tension due to tightness. Shortness of breath or dyspnea here is shortness of breath caused by mechanical factors of the respiratory muscles, increased chest wall resistance, lack of oxygen intake into the body, impaired gas exchange, airway obstruction, and weakness of the respiratory muscles. (Rosyadi et al., 2019).

Based on the background description above, the authors are interested in identifying the effect of pursed lips breathing in COPD patients through a literature study with the aim of knowing the effect of pursed lips breathing on dyspnea and increasing oxygen saturation in patients with COPD with a literature study.

2. Methods

2.1 Design and Study Criteria

This paper uses a literature review method by conducting a systematic search in accordance with the 2009 PRISMA guidelines. The search is based on four databases of PubMed, Science Direct, Willey and Proquest. Searches including keywords and variants that identify this strategy are used in combination with MeSH terms or free provisions. The studies reviewed were quantitative English and full-text studies, as well as intervention studies within the last 5 years of publication in adult patients with chronic obstructive pulmonary disease.

2.2 Study Selection

The total database is 1377, identified the combination of keywords with the application of the PICO approach and inclusion for the last five years and devoted to the Randomized Control Trial (RCT) and quasi-experimental research design, the keywords "Pursed Lips Breathing" AND "chronic obstructive pulmonary disease" AND "oxygen saturation" were identified. AND "Dyspnea" The search results with these keywords obtained 6 research articles in Pubmed, 40 articles in Science Direct, 10 research articles in Willey and 14 Proquest research articles. The PRISMA flow chart in Figure 1 illustrates the process of inclusion and exclusion of research articles. Of the articles that match the research objectives are 8 articles.

2.3 Review of the Selected Studies

This paper uses a literature review method by conducting a systematic search in accordance with the 2009 PRISMA flow diagram (Moher, Liberati, Terzlaff, & Altman, 2014) and critiquing journals using JBI.

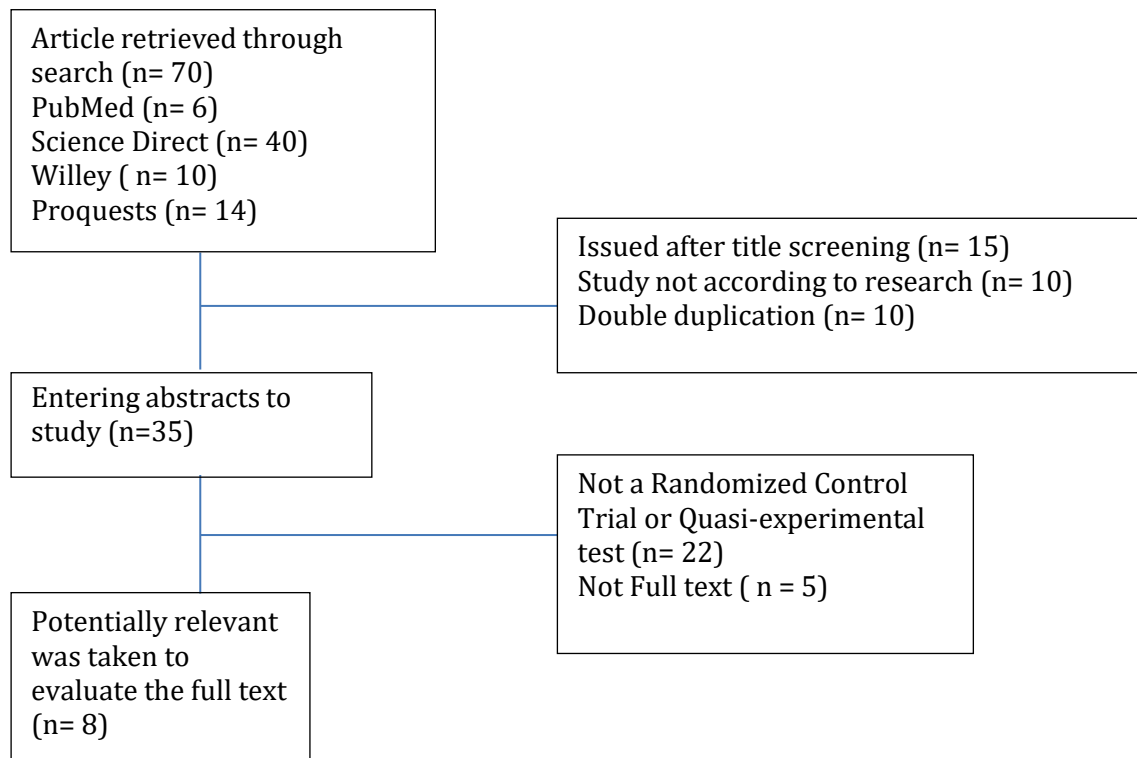


Figure 1. Flow chart of eligibility and inclusion assessment

3. Results and Discussion

3.1 Study Characteristics

The type of research from all articles analyzed is a quantitative approach to Randomized Control Trial and Quasi Experiments, these articles were published between 2015 and 2021. This research was conducted in Egypt, Canada, Brazil, Iran, Indonesia. The participants involved in these 8 studies were between 35-98 participants.

3.2 Intervention

Pursed lips breathing has also been shown to be effective in reducing dyspnea as in a study conducted by Mohammed 2019 in 60 COPD patients who were educated about COPD management and taught PLB techniques stated that there was a statistically significant improvement after intervention in dyspnea symptoms and anxiety status on the test ($p < .05$). There was a statistically significant increase in temperature (T), heart rate (HR), blood pressure (BP) and respiratory rate (RR) during the study ($p < 0.05$) after the intervention. There is also a positive relationship between anxiety and dyspnea after the intervention

The six articles selected using Pursed Lips Breathing on increasing oxygen saturation, Budiono noted that there was a statistically significant difference in oxygen saturation before and after PLB, while the results of research conducted by Sari 2016 showed that there was an increase in oxygen saturation between the control and intervention groups with $P < 0.001$. Wahidiati's results showed that there was a difference in effectiveness between the tripod position and PLB with a P value of < 0.00 , this indicates that PLB increases oxygen saturation in

COPD patients compared to the tripod position. In the evaluation of the intervention group COPD patients on the Saturation of Peripheral Oxygen (SPO₂) index with a mean difference of 2.05%, Respiratory Rate (RR) -0.65 minutes and Pulse Rate (PR) -1.6 bpm significant ($p < 0.05$), and the systolic blood pressure index in healthy subjects increased (3.35 mmHg). The results of this study indicate that the effective use of PLB as an easy, inexpensive, non-invasive and non-pharmacological method is considered an important factor in improving oxygenation status and physiological indicators in COPD patients and should be considered as an important part of the rehabilitation program for these patients. Apart from that, in COPD patients with low PEF, PLB interventions are given which can reduce dynamic hyperinflation and increase exercise tolerance, breathing patterns and arterial oxygenation at submaximal intensity exercise with a significance value of <0.05 (Cabral et al., 2015).

3.3 Review of the Selected Studies

In this study to assess the feasibility of the articles included, we used The Joanna Brings Institute (JBI) Critical Appraisal for several types of Quasi experimental studies and Randomized Control Trial ($n=8$). The assessment checklist based on The JBI Critical Appraisal contains several questions to assess the quality of the study. The assessment criteria were assigned a score of 'yes', 'no', 'unclear' or 'not applicable', and each criterion with a 'yes' score was assigned one point and another score was zero, each study score was then calculated and summed. Critical appraisal is to assess studies that have met the requirements and were carried out by researchers. If the research score 50% meets the critical appraisal criteria with a cut-off point value that has been agreed upon by the researcher, then the study is included in the inclusion criteria. We excluded studies of low quality in order to avoid bias in the validity of the results and review recommendations. In the last screening,

3.4 Effect of Pursed Lip Breathing on Dyspnea

The pursed lips breathing technique has many benefits as one of the non-pharmacological actions of respiratory management in independent nursing practice. This technique is able to reduce the respiratory rate and increase the oxygenation (SpO₂) of COPD patients (Qamila et al., 2019).

The results of 4 studies that discussed the effect of pursed lip breathing on dyspnea stated that there was an effect of pursed lip breathing on decreasing dyspnea in COPD patients. This is in line with research conducted by (Mohamed, 2019) in 60 COPD patients who were educated about COPD management and taught PLB techniques stated that there was a statistically significant improvement after intervention in dyspnea symptoms and anxiety status on the test ($p < .05$). There was a statistically significant increase in temperature (T), heart rate (HR), blood pressure (BP) and respiratory rate (RR) during the study ($p < 0.05$) after the intervention. There is also a positive relationship between anxiety and dyspnea after the intervention.

Pursed Lip Breathing Exercise is a breathing exercise that consists of two mechanisms, namely deep inspiration and deep and long active expiration. Expiration is normally the process of exhaling without using excess energy. Breathing Pursed Lip Breathing Exercise involves a long exhalation process. Long expiration will certainly increase the strength of intra-abdominal muscle contractions so that intra-abdominal pressure increases more than during passive expiration. Intra-abdominal pressure that increases even stronger will certainly increase the movement of the diaphragm upwards making the thoracic cavity smaller. This shrinking thoracic cavity causes the intra-alveolar pressure to increase so that it exceeds atmospheric air pressure. This condition will cause air to flow out of the lungs into the atmosphere. Long expiration when breathing Pursed Lip Breathing Exercise will also cause airway obstruction to be removed so that respiratory resistance decreases. Decreased respiratory resistance will facilitate the inhaled and exhaled air so that it will reduce shortness of breath (Berry, Michael J, 2018).

Different from the 3 results of research on the effect of pursed lips breathing on dyspnea in COPD patients above, according to the study (Salle et al., 2019) conducted on 35 COPD patients stated that after performing pulmonary function tests, the patients then breathed with the PLB technique, resulting in lower respiratory rates. Twenty-nine patients described PLB as breathing that was less comfortable than usual, but PLB resulted in a higher mean oxygen uptake.

3.5 Effect of Pursed Lip Breathing on Increasing Oxygen Saturation

The pursed lips breathing technique has many benefits as one of the non-pharmacological actions of respiratory management in independent nursing practice. This technique is able to reduce the respiratory rate and increase the oxygenation (SpO₂) of COPD patients (Qamila et al., 2019).

The purpose of this study was to determine the effect of pursed lip breathing on increasing oxygen saturation based on a systematic review. Based on the 10 studies discussed, it was stated that there was an increase in oxygen saturation after being given PLB in COPD patients. according to (Budiono et al., 2017) In a study conducted on 24 COPD patients, more than half of the respondents (58%) had oxygen saturation values below normal (<95%). Meanwhile, after PLB exercise, the oxygen saturation value was in the normal range (≥95%) for all respondents. This research is in line with research conducted by (Amira Permata ST, 2018) which said that there was a difference in the average oxygen saturation of patients with COPD degree II before and after pursed lip breathing breathing exercises. Prior to pursed lip breathing, the average oxygen saturation of respondents was 96.72%, after pursed lip breathing the oxygen saturation increased by 1.39 to 98.11%. This shows that there is an effect of pursed lip breathing exercises on increasing oxygen saturation of COPD patients with p value = 0.001. ($\alpha=0.05$).

Pursed Lip Breathing or pursed lip breathing is a breathing exercise to improve lung mechanics and spontaneous breathing. The practice of closing the lips by prolonging the breath will increase the amount of carbon dioxide captured and increase oxygen transport, so that the medulla oblongata is not stimulated to increase respiratory effort because there has been a balance of gas homeostasis in the body, and this will stabilize the breathing pattern to be effective. (Laily Widya Astuti, 2014).

Research result (Wahidati et al., 2019) in 34 COPD patients showed that the average value of oxygen saturation in COPD patients before pursed lips breathing with full fowler was 94.00 with a standard deviation of 1.00 and after pursed lips breathing intervention for 3 consecutive days, 15 minutes, the average value of oxygen saturation is 95.23 with a standard deviation of 1.03. This shows the average difference in peripheral oxygen saturation in the pre-test and post-test group 2 with pursed lips breathing treatment is 1.23. The results of the paired sample T test showed a p-value in the control group of 0.000 ($p < 0.05$) which showed a significant difference in the results of the pre-test and post-test of oxygen saturation in group 2 with pursed lips breathing treatment.

Research conducted by (Sakhaei et al., 2018) in 40 COPD patients also stated that in the evaluation of COPD patients in the intervention group with repeated measure tests in oxygen saturation with a mean difference of 2.05 RR -0.65 and PR 1.6, there was a statistically significant difference. Pursed lip breathing or PLB compared to normal breathing has an increased effect on oxygenation levels. This could lead to significant positive changes in respiratory and cardiac parameters in COPD patients. This is in line with research by (Sumedi et al., 2021) in 48 COPD patients who stated that pursed-lip breathing exercises or PLB were recommended for patients with chronic obstructive pulmonary disease to increase oxygen saturation levels.

Pursed Lips Breathing is a breathing exercise by pursing the lips. Pursing the lips of the breath helps people with COPD to empty their lungs and slow down the rate of breathing. PLB helps to restore the position of the diaphragm which is the respiratory muscle located under the lungs. PLB also causes the abdominal muscles to contract during expiration, this will force the

diaphragm up, and help to empty the lungs, as a result COPD sufferers will breathe slower and more efficiently.(Smeltzer & Bare, 2013).

According to research conducted by (Sari & Suhartono, 2016) showed a significant difference between the treatment before intervention and after intervention in the control group ($p = 0.005$). Oxygen saturation variable data using paired t test showed a significant difference between oxygen saturation before intervention and after intervention in the control group ($p < 0.001$).

Based on research (Bharadwaj et al., 2016) in 68 patients showed that there were significant results after being given PLB exercise and patients could exercise more. This is also in line with research conducted by (Cabral et al., 2015) in 40 COPD patients showing that PLB can increase oxygen saturation in patients with COPD.

COPD patients are highly recommended to perform breathing exercise techniques including diaphragmatic breathing and pursed lips breathing with the aim of improving ventilation and synchronizing the work of the abdominal and thoracic muscles. Breathing exercises are generally done 20-30 minutes per day (all at once or 2x a day). Pursed lips breathing is done by the patient sitting and breathing by exhaling through the mouth that is almost closed (like whistling) for 4-6 seconds. This method is expected to cause pressure during expiration so that air flow slows down and increases the pressure in the abdominal cavity which is transmitted to the bronchioles so that airway collapse during expiration can be prevented.(Amira Permata ST, 2018).

3.6 Effect of Pursed Lips Breathing on Dyspnea and Oxygen Saturation in COPD Patients

COPD is a group of lung diseases characterized by increased airway resistance due to narrowing of the lower respiratory tract lumen. In COPD patients, hypoxaemia and hypercapnia can also occur due to respiratory muscle weakness and obstruction, resulting in increased airflow resistance, pulmonary hyperinflation and ventilation and perfusion imbalances. The clinical manifestations shown are the sensation of chest tightness and dyspnea so that it can cause a decrease in oxygen saturation levels, of course this really requires serious medical treatment.(LeMone, 2016).

Pursed lips breathing exercise is a breathing exercise technique by inhaling air through the nose and exhaling by pursed lips with an extended expiration time. Breathing with pursed lips, can improve oxygen transport, helps to control slow and deep breathing patterns, and helps patients to control breathing, even in conditions of physical stress.(Junaidin et al., 2019).

Pursed lip breathing is useful for improving ventilation and increasing the work of the abdominal and thoracic muscles, besides that pursed lip breathing can increase pressure in the abdomen so that it can cause a drastic increase in lung ventilation that has been reduced and increase the motility of the chest wall area which leads to increased respiratory muscle activity. This happens because special exercises for the respiratory muscles in pursed lip breathing will result in an increase in maximum ventilation ability, reducing shortness of breath, thereby improving quality of life.(Maryoto, 2015).

According to the assumptions of the research conducted (Siregar, 2019) that pulsed lip breathing exercise is an effective form of therapy to improve the reduction of shortness of breath, besides being easy, this deep breathing technique therapy also does not require a large place and inexpensive tools so that it is suitable for everyone, especially COPD patients who tend to experience shortness of breath.

Pursed lips breathing is a strategy used in pulmonary rehabilitation to reduce shortness of breath by means of relaxation. COPD patients will benefit from using this technique, because this strategy is designed to help patients control breathing patterns, increase ventilation to increase the effectiveness of breathing patterns, improve effective coughing mechanisms, prevent atelectasis, increase respiratory muscle strength, increase relaxation and prevent recurrence and out of breath (Sumedi et al., 2021).

4. Conclusion

Based on the journals that have been analyzed by the researchers, the results showed that COPD patients who were given the pursed lips breathing intervention had an effect, namely a decrease in dyspnea and an increase in oxygen saturation. Pursed lips breathing can improve gas exchange which can be seen by improving oxygen saturation in the arteries. Pursed lips breathing can also improve breathing patterns and increase the patient's tidal volume. In addition, pursed lips breathing also aims to provide subjective benefits, namely reducing shortness of breath in patients suffering from COPD

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Management of the Covid 19 Prevention Protocol for the Elderly in Malang Regency

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ABSTRACT

Introduction: Prevention of Covid-19 is a recommendation that needs to be done in everyday life, especially in the elderly, because the elderly experience a decrease in the body's immune system. **Objective:** This study aims to determine the management of the Covid 19 prevention protocol in the elderly in Malang Regency. **Methods:** The research design used in this approach is a qualitative approach with a case study approach strategy or Case Study Research, which examines a problem through a single case study. Data retrieval using semi-structured interview techniques and using triangulation. Analysis of the data in this study using domain analysis. **Result:** The results of this case study research obtained 4 themes of protocol management for the prevention of Covid-19 in the elderly, namely; Elderly people experience cognitive decline which causes forgetfulness, a decrease in the physical condition of the elderly. **Conclusions:** there is a perception of tightness, lack of family support, and the environment does not apply the Covid-19 health protocol.

1. Introduction

Coronavirus (COVID 19) is one of a large family of viruses that causes illness ranging from mild to severe symptoms. There are at least two types of coronavirus that cause diseases that can cause severe symptoms, such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). Coronavirus Disease (COVID-19) is a new type of virus that has never been previously identified in humans that causes a pandemic (Seri, Jasmen, & Lia, 2020). The pneumonia case became a mysterious disease case that started from the city of Wuhan, Hubei Province which in the end this case shocked the world at the beginning of 2020. At first, this case was named 2019 novel coronavirus (2019-nCov) because this disease was discovered on December 31, 2019. On February 11, 2020, WHO stated that this case had a new name, namely Coronavirus Disease (COVID-19) caused by the Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) virus. This virus has spread to various countries, including China and more than 190 countries. WHO declared on March 12, 2020 that COVID-19 was an epidemic or pandemic (Silalahi, 2020).

Based on data from the Indonesian COVID-19 handling task force on November 15, 2020, explained that the percentage of patients who died reached 13.84% including the vulnerable group aged >60 years (elderly) who had the highest percentage of deaths, reaching 6,447 people, while for the age group 46-59 years who occupy the second position as much as 5.44% with the number of patients who died as many as 5,678 people, and at the age of 31-45 years and 0-5 years, which had a percentage of 0.46% and 0.95%, respectively (Vania, 2020). Most patients infected with SARS-CoV-2 show symptoms of the respiratory system such as fever, coughing, sneezing, and shortness of breath. Based on data from 55,924 cases, the most common symptoms were fever, dry cough, and fatigue. Other symptoms that can be found are productive cough, shortness of breath, sore throat, headache, myalgia/arthritis, chills, nausea/vomiting, nasal congestion, diarrhea, abdominal pain, hemoptysis, and conjunctival congestion (Adityo, et al., 2020).

The aging process will continue to occur and cause various kinds of morphological changes that affect the function of the respiratory system. A decrease in structure and function that causes an increase in the burden of breathing compared to a young age, this is associated with decreased acute diseases such as heart disorders, bacterial or viral infections, and airway obstruction (Tavares et al., 2017). According to Geriatric Expert Probosuseno (2020) stated that bacterial, viral, and COVID-19 infections are very vulnerable to the elderly, which is caused by aging which is marked by a lack of strength in the function of the body's organs. As a person ages, the body's capacity will decrease such as decreased hormone production, endurance, ability to process food. So that it will have an impact on differences in immunity and health in the elderly and young people, resulting in many elderly people already experiencing various kinds of diseases such as hypertension and decreased heart function which will increase their vulnerability to COVID-19 (Ika, 2020). Aging in the elderly is a process of slowly disappearing from the ability of the tissue that functions to repair itself (replace) and maintain its normal function so that it does not survive infection and cannot repair the damage suffered (Sundari et al., 2016). The elderly group is one of the groups that have a higher risk of being infected with the Corona Virus caused by the weakening of the immune system with age (Siagian, 2020)

Despite being the most vulnerable group of people, the elderly still carry out activities outside the home. One example of elderly activities that are still being carried out during this pandemic is participating in the RT social gathering, taking pensioners' salaries, shopping at markets and shops/stalls, attending recitations that gather large crowds, receiving guests or the arrival of relatives from out of town, and much more. . Sometimes there are still many elderly people who ignore the COVID-19 health protocols, one of which is not wearing masks, not washing their hands before and after doing activities, even not preparing/providing a container for washing hands in front of their homes (Seri, Jasmen, & Lia, 2020). Based on research on the elderly, it shows that the age group is among the most vulnerable to COVID 19. However, it is quite worrying that the elderly often do not carry out isolation. A survey conducted in 27 countries published in the journal PLOS ONE, shows that the elderly tend not to want to self-isolate and do not comply with health protocols to prevent the spread of Covid 19 (Simanjuntak, 2020).

Based on observations from researchers, there is an elderly person who is 70 years old in Malang Regency who is one of the elderly who does not comply with the Covid-19 health protocol. In the daily activities of the elderly, apart from working as farmers, they have other activities including, participating in tahlilan activities, social gathering, taking salaries at the bank, attending community activities such as celebrations, and many other activities are carried out without wearing a mask. The elderly thought that no Covid 19 cases were found in the village, which made them feel that the use of masks was not too important and had little effect on their health (Asnawati et al., 2020). The study aims to determine the management of the Covid 19 prevention protocol in the elderly in Malang Regency.

2. Methods

Research design or research basis is an activity that is used as a guide in conducting the research process. The research design aims to provide a clear and structured description of the researcher in conducting his research. Qualitative research is research that aims to understand a phenomenon that is holistic and uses descriptive methods in a special context optimally as a scientific method commonly used, and experienced by research subjects, for example on perceptions, motivations, behaviors, perceptions, actions and so on (Sidiq & Choiri, 2019). This research design is a research design with a Case Study Research research strategy, namely examining a problem through a single case study. The single unit in question is one person, or a group of residents affected by the problem. Units involved in this problem will conduct an in-depth analysis in terms of factors related to the case, treatment of events that arise in connection with actions and reactions to cases (Han Goleman, Boyatzis, & Mckee, 2019).

3. Results and Discussion

Researchers describe various data which are the results of interviews and observations that have been carried out in Malang Regency on 24, 25 and 27 December 2020 with management problems dealing with Covid 19 in the elderly. This general information was obtained from the participants through an initial visit before conducting interviews and observations. The first participant was an elderly man, Mr. S who is 70 years old with a history of elementary school education. Mr. S has two married children, namely the first child who lives with her husband and child, and the second child who is married and lives at home with her husband and children and Mr. S and his wife. P1 became the object of an elderly qualitative research on the covid 19 protocol. Mr S rarely obeys the covid 19 protocol because he is already 70 years old and easily forgets. Daily life as a farmer, and not thinking too much about the pandemic conditions.

The second participant, Mrs. R who is the second child of Mr. S with the age of 40 years. Mrs. R (P2) who lives at home with Mr. S and his husband, children and mother. In her daily life, Mrs. R understands more about Tn.S's daily life in preventing covid. This interview was conducted in the living room in the morning. The third participant is Mrs. T which is the first child of Mr. S is 46 years old who has one child. Mrs. T with a high school education who lives at home with her husband and children, the house between Tn.S and Mrs. S is just next to each other. Interviews were conducted in the living room.

The results of interviews and case study observations were carried out on 24,25,27 December 2020 on Jl. Arjuna RT 02/RW 03 Ds. Sukorejo Kab. Malang, East Java. The interview was conducted with the three participants consisting of P1 with the initials Tn.S, the second with P2, namely with the second child, Tn.S with the initials Ny. R, and the third with P3 with the first child, Mr. S with the initials Mrs. Q. Interviews with P1 were conducted on December 24 at 13.00 WIB in the family room, then with P2 conducted on December 25, 2020 at 08.00 WIB in the living room, and finally with P3 on December 27, 2020 at 13.00 WIB in the living room. the living room of the P3 house.

Table 1. Analysis of Research Data on Management of Covid 19 Prevention Protocols in the Elderly

Number	Theme
1	Elderly people experience cognitive decline causing easy to forget
2	The decline in the physical condition of the elderly appears the perception of shortness of breath
3	Lack of family support
4	The environment does not apply the Covid-19 health protocol

Researchers found 4 themes related to the management of the Covid 19 prevention protocol in the elderly. From the results of interviews with 3 participants, namely P1, P2, and P3, it can be seen that the cause of the failure of the management of the Covid 19 prevention protocol in the elderly in Malang district is as shown in table 1.

3.1 The cause of the failure of the management of the Covid 19 prevention protocol in the elderly is due to cognitive decline which causes forgetfulness

Continuing business will often experience consistent forgetfulness, disorientation, especially in terms of time, experience problems in the ability to express opinions and problem solving, experience disturbances in carrying out activities at home, and disturbances in self-care (Setiawan et al., 2014). The majority of elderly people experience memory loss or forget easily. The new habit/recommendation to comply with the Covid health protocol from the government makes the elderly rarely comply and even don't comply due to memory decline factors and the slowdown in receiving new information which makes the elderly have to be frequently reminded by their closest people. The presence of impaired cognitive function in the elderly causes problems that are often faced such as disruption of time, space, place orientation and not easy to accept new things/ideas (Anggraeni et al., 2020).

3.2 The cause of the failure of the management of the Covid 19 prevention protocol in the elderly is due to a decrease in physical condition so that the perception of shortness arises.

Elderly people find it difficult to complain of shortness of breath and difficulty breathing when wearing a mask, so they often open the mask when they feel tight or uncomfortable when breathing. One of the management of Covid-19 prevention is the obligation to wear a mask which causes the elderly to feel uncomfortable and feel congested when inhaling air or breathing, due to a physical decline, namely the respiratory system. The cause of decreased respiratory effort, both inspiration and expiration, is the weakening of the abdominal muscles. In the elderly there has been a change in the respiratory system and respiratory organs which causes them to be more susceptible to respiratory disorders. Structural changes in the respiratory system affect the amount of air flowing from and into the lungs and gas exchange at the alveolar level (Sofia, 2012). Changes in the respiratory system in the elderly cause them to often open masks when they feel uncomfortable when breathing (Kuntardjo et al., 2020).

3.3 The cause of the failure of the management of the Covid 19 prevention protocol in the elderly is due to the lack of family support

The Corona Virus Diseases (Covid-19) pandemic is a new case in the world of health that has several psychological, social and spiritual impacts. This disease infects quickly in humans, it is so very surprising for the life sector. Conditions like this must really be watched out for, especially at ages who have a high susceptibility and risk of infection, one of which is the elderly. This incident really needs attention from various parties, especially the family as a companion for the elderly. Families must have the ability to be able to recognize health problems, make decisions, provide family health services, maintain home environmental conditions that support health, and maintain relationships that can benefit the family and local health facilities (Mulati, 2020).

With the Covid-19 pandemic, it is very necessary to have support from families whose function is very important in the sustainability of health quality, especially for families with elderly members. Elderly people who have a higher risk of contracting Covid-19 must receive special attention from their families, because at this age they have many decreased functions, one of which is immunity productivity. Families must be more optimal in maintaining and maintaining the health of all their family members during the Covid-19 pandemic by continuing to implement recommendations to comply with health protocols, providing mutual support/motivation to elderly family members. A healthy family is a family that can carry out its roles and functions well in maintaining family health, including being able to take care of each other and create a balance of family health status. Families must be able to pay attention to efforts to prevent the transmission of Covid-19 in the elderly. Families as companions for the elderly are the key to success in efforts to manage the Covid-19 prevention protocol in the elderly (Abidin & Julianto, 2020).

3.4 The cause of the failure of the management of the Covid 19 prevention protocol in the elderly is due to an environment that does not implement health protocols

The environment is one of the factors that influence the formation and development of individual behavior, both the physical environment and the socio-psychological environment. Behavior is part of a person's actions that can be learned and observed. People who do not apply the Covid-19 health protocol are based on a low level of knowledge so that people ignore the importance of implementing Covid-19 prevention (Sabriana & Indrawan, 2020). A good environment is an environment that implements behavior in an effort to prevent Covid-19. Participants' environment/neighbors who behaved badly in the Covid-19 pandemic era, evidenced by behavior that did not implement Covid-19 prevention, such as not washing hands with soap or hand sanitizer, not maintaining distance, and many other recommendations that were violated by the environment/ neighbors around the participants.

The presence of bad behavior from the participant's neighbors makes participants feel that their environment is safe from Covid-19 disease which makes participants follow behavior that does not comply with Covid 19 prevention (Purnamasari & Raharyani, 2020).

4. Conclusion

Based on the research that has been done, it can be concluded that the causes of the failure of the management of the Covid-19 prevention protocol in the elderly obtained 4 themes; (1) Elderly experience cognitive decline causing easy to forget, (2). The decline in the physical condition of the elderly appears the perception of shortness of breath (3). Lack of family support, and (4). The environment does not apply the Covid-19 health protocol.

Participants further improve compliance in carrying out the Covid-19 health protocol in accordance with the recommendations of the government and the health team because the elderly have a high vulnerability to being exposed to a disease. Families are expected to always provide support, motivation and attention in preventing Covid-19 in daily life, especially for elderly family members. The public can improve discipline and apply optimally in carrying out the Covid-19 health protocol.

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Effect of *Camellia Sinensis* to Decreased Dental Plaque Accumulation Elementary School-Aged Children: A Scooping Review

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ABSTRACT

Introduction: The child phase is a *suatu* phase that is as important where in this phase there is a growth and development of all organs of the body. The most commonly seen growth is the teeth. Teeth are an important organ to help cut incoming food. However, some problems are often found in school-age children, namely the appearance of dental plaque. Dental plaque is a problem that arises where soft deposits derived from a collection of bacteria that multiply above the surface of the tooth that arise and attach to the surface of the tooth and form biofilms around the surface of the teeth and oral cavity. One herbal remedy that can be used to reduce the accumulation of dental plaque is *camellia sinensis* (*camellia sinensis*). **Objective:** The goal of this study was to find out the effect of *camellia sinensis* on the decreased accumulation of primary school-age dental plaque. **Method:** The research design used in this study is a literature study with a sample of 15 journals, NCBI ($n = 2$), Google Scholar ($n = 11$), Pubmed ($n = 1$) and Pro Quest ($n = 1$) then conducted quality assessment with JBI tools get 8 journals that are done data extraction and data analysis. **Results:** The result of this study is the effect of *camellia sinensis* on the decrease in the accumulation of dental plaque of elementary school-age children. **Conclusion:** The effect of *camellia sinensis* found in 8 articles including from 5 journals (62.5%) with comparator results showed *camellia sinensis* was effective in decreasing plaque accumulation, and 1 journal (12.5%) without comparison showed *camellia sinensis* results were effective in reducing plaque accumulation, and 2 journals (25%) showed ineffective results.

1. Introduction

Data from the *World Health Organization* (WHO, 2020) related to the number of dental plaque in children is estimated at 530 million children per year (WHO, 2020). Data from basic health research (RISKESDAS) 2018 has recorded the proportion of dental plaque-related problems in Indonesia to be the largest prevalence in dental problems in Indonesia, which is 45.3% (Indonesian ministry of health, 2020). The prevalence of dental plaque in elementary school-aged children in Indonesia is 76.2% (Norfa'i & Rahman, 2017).

The age group that is very susceptible to the onset of plaque is the age of 7-12 years where the age is in elementary school children. This age is the time when milk teeth are susceptible to bacterial buildup undergoing a transition to permanent teeth (Pujirahayu, 2019). At this age, intensive dental care is needed because of the change of teeth and the growth of new teeth. At the age of elementary school lack of knowledge about dental care will affect the onset of plaque, so there needs to be preventive efforts in children to reduce dental plaque problems that occur in elementary school-aged children (Rosidi, Haryani, & Adimayanti, 2014).

There is an effort that can be done to preventive in addition to toothbrush, namely the use of mouthwash. It is a practical way to remove bacteria and plaque that sticks between the teeth that cannot be reached by the toothbrush. Effectiveness in controlling plaque by gargling has increased because the surfaces in the oral cavity are easily accessible (Pujirahayu, 2019). Plants used for antibacterial have antioxidant power in lowering the accumulation of bacteria that stick to the teeth, while plants that have antioxidants there are various types but not all levels of antioxidants in plants are high. One example of a plant that has high antibacterial and antioxidants is *camellia sinensis* or commonly called black tea (Anggayanti et al., 2013).

The extracts contained in *camellia sinensis* are floanoids and kaketin. Floanoids and kaketin are chemical components present in the tea plant /*camellia sinensis* that have uses as an inhibitor of the formation of bacteria present on the surface of the teeth and prevent the attachment of bacteria attached to the surface of the teeth (Setianingtyas et al., 2018). The extract has effectiveness against decreasing the accumulation of dental plaque in accordance with research by Setianingtyas et al., (2018) with the result that gargling using *camellia sinensis* had an effect in decreasing the accumulation of dental plaque in children. Based on the results of the above research researchers are interested in analyzing and getting an overview of the literature study so that it can be drawn the title of The Literature Study the Influence of *Camellia sinensis* The Decrease in Tooth Plaque Accumulation in Elementary School Age Children.

2. Methods

2.1 Search Strategy

This literature is reviewed using 3 databases namely google scholar, pubmed, and proquest. The search keyword consists "Effect of *Camellia sinensis* Decreased Tooth Plaque Accumulation in Elementary School Age Children." Search for articles related to the variety of *camellia sinensis*.

2.2 Inclusion Criteria

Journal inclusion criteria consist of 1) Journal published in 2015-2020. 2) International and national 3) journals with RCT research designs design, Quasi Experiment. 4) Journals that discuss the variety of *Camellia sinensis* against plaque in elementary school age children. 5) Journal that can be accessed in full (Full text).

2.3 Study Selection and Data Extraction

Screening in this study was carried out through the title and abstract that resulted from the search strategy. Journal articles that are not relevant are issued while other fully accessible journals are screened with predetermined inclusion criteria. The journals obtained are then extracted into tabular form to make it easier to describe the contents of the research journal. The data analysis table contains the author (author), the year the journal was published, the country of the journal publisher, the journal research design, the quality score, the research population/research sample, and the outcome (the results of the journal research).

2.4 Quality Assessment

Quality assessment of the article using the Joanna Briggs Institute (JBI) instrument. The JBI instrument was chosen because it can assess the quality of the journal with *randomized control trial, clinical trial, a cluster randomized trial, experimental study, original article, dan research article*. Several research stages were done so the literature study results credibility is legit and credible. The applied stages were:

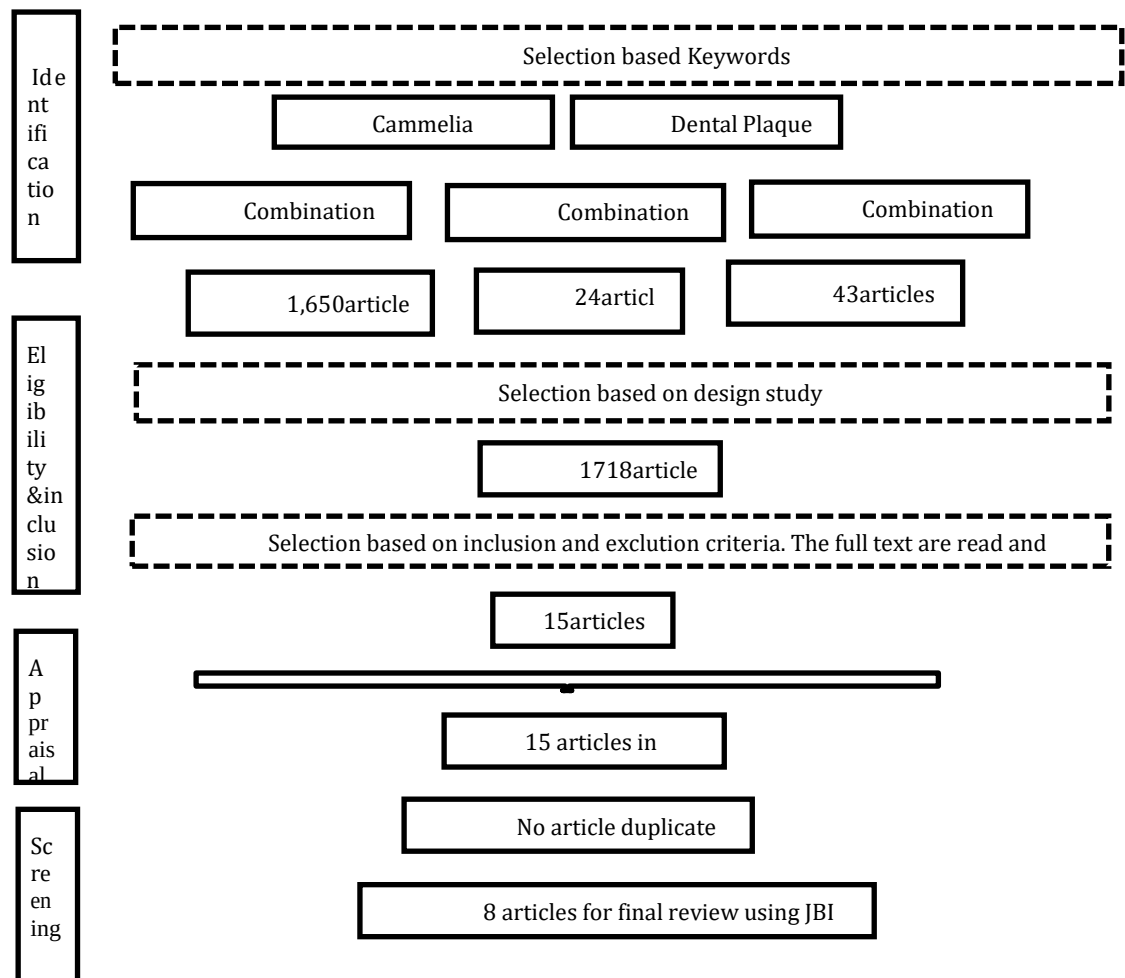


Figure 1 The applied stages were the literature study results

3. Results and Discussion

Table 1 Data Analysis

Title, Author, publication year	Study design	Sample	Intervention	Comparati on	Outcome
Effect of Gargling Black Tea Solution (Bless Tea) In Reducing Plaque Accumulation In The Teeth of Elementary School Age Children, Rahminingrum, Pujirahayu, 2019	quasi-experiment al	40 students aged 7-8 years. 16 men and 24 women.	Respondents were asked to gargle using black tea by brewing into aquades 320 ml as much as 4 bags (8 g) of black teabag brewed at optimum temperature 70-80 c. The gargling process is carried out for 30 seconds and carried out for one month with a frequency twice a week.	The control group was given a 0.2% <i>chlorhexidine</i> mouthwas h, a liquid used to lower plaque.	The results showed that the effect of rinsing black tea solution in reducing tooth plaque buildup in school children aged 7-8 years was shown the intervention group value $p = 0.03$ ($p < 0.05$) in the control group

					p = 0.04 (p<0.05)
Effect of Black tea as mouth rinse among selected school children with dental plaque, Radhika, B Vanaja Kumari, 2016	Randomized controlled trial	30 sample with 26 men and 34 women.	Intervensi is done by giving 2 grams of black tea powder added 200 ml of hot water, and with warm temperature children are asked to gargle black tea for 30 seconds, 5 times in 3 minutes interval for 2 weeks continuously, which will reduce dental plaque.	The control group was treated using a solution of <i>chlorohexane</i> .	The results of this study showed a significant difference between the intervention group and the control group, the intervention group was more effective than the control group with a value of p = 0.09 (p>0.05) in the intervention group and in the control group obtained a result of p = 0.05 (p>0.05).
Effectiveness of Black Tea Gargling Against Decreased Plaque Accumulation In Children Aged 7-8 Years, Prastiwi Setianingtyas, Lisa Prihastari, Nurul Wardhani, 2018	Randomized Controlled Trial	31, 16 children 16 boys and 15 girls.	Intervention was carried out by examination of plaque index using the Loe and Silness method visually then gargling was done as much as 10 ml for 1 minute and the study subjects were not allowed to eat or drink except water for 1 hour after gargling.	Control group gargles with fluoride solution	The results of the study concluded that there was no significant difference between the intervention group and the control group, having the same result as the value (p<0.05) while in the control group (p<0.05).
Comparing the antiplaque efficacy of 0.5% <i>Camellia sinensis</i> extract, 0.05% sodium fluoride, and 0.2% chlorhexidine gluconate mouthwash in children, Chaitali U.	A randomized blinded controlled trial	60 healthy children from the age group of 9-14 years.	Tea is extracted by combining 31/2 oz of mineral water (fizzy). This tea is soaked at room temperature for 1 hour and then poured into a container, the tea is filtered with a sieve when poured, followed by cooling. Loose tea is thrown away. 500 ml	Grub A is given a gargling treatment with a solution of 0.2% chlorhexidine gluconate and grub B is treated by gargling 0.05%	The results showed that the decrease in plaque scores decreased in the fluoride group.

Hambire, Rashmi Jawade, Amol Patil, Vaibhav R. Wani3, Ankur A. Kulkarni, Parag B. Nehete, 2017			concentrated tea is mixed with 1000 ml of distilled water to get a solution of 0.5% tea mouthwash.	fluorine solution.
Difference in plaque index after gargling with a steeping of Green tea and black tea elementary school students, Mustapa Bidjuni, I Ketut Harapan, Nova Sasombo, 2015	Experimental study	Class V students as many as 30 students.	Measurement of plaque index using Loe and Sillness plaque index. Then gargling intervention with black tea and green tea.	Green tea The results showed that there was no difference in the significance of gargling with a steeping of green tea and black tea more significantly the plaque score dropped with the flushing of black tea steeping by $p = 0.054 > \alpha = 0.05$.
Effectiveness of black tea steeping (<i>camellia sinensis</i>) the decrease in dental plaque index, Feryra Putri Ayu Suma, Nurdiana Dewi, Rosihan Adhani, 2016	quasi experiment with design pre- and post-test	A sample of 60 respondents	The manufacture of black tea is 20 grams of black tea powder that has been filtered mixed and brewed with water on a scale of 1: 4 and left for 5 minutes so that the catechins in the tea come out of the tea leaves. The water used in brewing tea with hot water with the best temperature is 60-70 degrees Celsius so that antibacterial tea will be more effective with 50 ml of strained tea mixed with 200 ml of water.	- The results showed that black tea steeping(<i>Came llia sinensis</i>)was effective or had an effect on decreasing the dental plaque index with a statistical value of $p=0.00$ with a significant value ($p<0.05$).

Test the effectiveness of gargling using black tea steeping water (<i>camellia sinensis</i>) in lowering plaque accumulation Putu Ary Satryadi, Shirley E.S Kawengian, P.S. Anindita, 2016	Quasi experiment al study design pretest and posttest design	Sample examined as many as 60	Intervention is done by looking at the initial plaque score by using <i>disclosing solution</i> and cotton <i>cotton pellets</i> after gargling water steeped in black tea (20 ml) for 30 seconds as recommended use of mouthwash. It is then reassessed as the plaque scores at the time before gargling.	In the control group was given gargling treatment with aquades (20 ml).	In the results of the study found there was a difference in effectiveness in the reduction of plaque between gargling water steeped in black tea and gargling aquades which was shown from a significant value of 0.05 ($p < 0.05$).
Effects of rinsing with Sirih Hijau (Piper betle L.) and Black Tea (<i>Camellia sinensis</i> (L.) Kuntze) on plaque index with O'leary method, Rosnaeni, Vinna K. Sugiaman, 2013	Experiment al study	It used 45 male subjects.	Intervention was carried out in 2 groups with gargling recursion was done 4 times, namely before breakfast, before lunch, before dinner, and before going to bed. Each time gargling uses 30 ml of steeping of test ingredients with a duration of 3 minutes. Respondents should only eat the food menu that has been provided three times a day by drinking water and is not allowed to clean teeth, either mechanically or chemically.	Control group gargles with green betel leaves	The results showed black tea was more effective in lowering the dental plaque index than green betel with significant values ($p < 0.05$) and at green betel 0.05 with significant values ($p < 0.05$).

3.1 Effectiveness of Camelia Sinensis against the decline of Dental Plaque

The results after conducting an analysis of 8 journals obtained some effects of *camellia sinensis* mouthwash use on decreased plaque accumulation with O'Leary's method, yaitu examination was carried out on all teeth of study subjects. the highest plaque score of 10 is at a bad plaque level and if less than 10 plaque levels improve. Application in school-age children aged 6 to 12 years has a phase of transition of milk teeth to permanent teeth, teeth at primary school age there is a pattern of tooth eruption that is susceptible to bacterial, especially streptococcus mutans bacteria contained in dental plaque (Rezki &, 2014) . Accumulation of dental plaque can occur in anyone who neglects dental and oral hygiene, dental plaque occurs as a result of his own individual factors in maintaining the cleanliness of his teeth and mouth (Mukhbitin, 2015).

3.2 Effect of *Camellia Sinensis* intervention compare with other substance

Camellia sinensis has a useful content to reduce the accumulation of plaque, namely polyphenols which are the main components that can inhibit glucans from the akating power component in plaque called sucrose, sucrose can also kill bacteria that cause dental plaque, and *camellia sinensis* is good for overcoming dental plaque in elementary school age (Suma et al., 2016). This indicator is discussed in 8 journals obtained. Some comparisons of the effectiveness of *camellia sinensis* compared to other substances obtained different results.

Based on indicators of comparison of *camellia sinensis* (*camellia sinensis*) with *chlorhexidine*. *Camellia sinensis* solution and *chlorhexidine* solution have the same equation that both have anti-bacterial bland power to prevent bacterial growth on dental plaque. This indicator is discussed in 2 journals from 8 journals studied.

Comparison *camellia sinensis* with *fluoride* some journals describe that *camellia sinensis* has the same effect as gargling with *fluoride* solution in increasing salivary PH which is useful in inhibiting plaque growth (Prihastari et al., 2019). In line with research conducted by C. Hambire et al (2015) states that if given the same dose between *camellia sinensis* and fluoride then the results show the same value. This indicator is discussed in 1 journal from 8 journals studied. The comparison of *camellia sinensis* with *compare chlorhexide* and *fluoride* based on journals that have been studied found no significant difference between *camellia sinensis* with *chlorhexide* and *fluoride* which means that the intervention group and control group both have the same effectiveness in overcoming plaque accumulation. (C. U. Hambire et al., 2015). The indicator can be found in 1 journal in 8 journals studied.

Comparison of *camellia sinensis* with aquades which is a liquid made of distilled water or distillation water which is pure water or H₂O with no mineral water element, aquades resulting from the results of evaporating water at boiling temperature then left to cool and condense shows a more significant number in decreasing plaque accumulation than aquades with an average value of *camellia sinensis*. 0.84 while aquades 0.61. This happens because in aquades solution there is no anti-plaque or anti-bacterial that can inhibit plaque. This indicator can be found in 1 journal out of 8 journals studied.

Comparison of *camellia sinensis* with green teh which is one of the components that have the same benefits as *camellia sinensis* is able to fight bacteria in the mouth and can prevent the formation of plaque, but there is a difference between *camellia sinensis* and green tea that is based on the processing process, green tea without going through the fermentation process while *camellia sinensis* through the fermentation process first (Sartika et al., 2015).

Comparison of *camellia sinensis* which is an herbal antiseptic that has been known since ancient times, betel leaves have antibacterial properties against aerobic and anaerobic bacteria that are basically antiseptic because the content of essential oils showed more effective results in *camellia sinensis* significantly in lowering plaque accumulation, both of which have antibacterial properties in lowering plaque accumulation but more in the body. *camellia sinensis*. This indicator can be found in 1 journal in 8 journals studied.

4. Conclusion

As a result of conducting an analysis with a total of 8 journals, researchers obtained the results that from 5 journals (1 journal no *compare* journals with *compare*) with a percentage (62.5%) showed *camellia sinensis* solution had a good influence in lowering plaque accumulation especially at elementary school age which is the same age. Very susceptible to dental plaque. But there were also results that showed no significant difference *chlorhexidine* solution and green tea both groups had equally effective results in 3 journals with percentage (37.5%). So, it can be concluded that *camellia sinensis* has a more effective influence to reduce the accumulation of dental plaque especially if used in elementary school age children.

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Relation between Knowledge and Pain Intensity with Early Mobilization in Post Sectio Caesarea Mothers

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ABSTRACT

Introduction: Sectio caesarea is a form of artificial childbirth through an incision in the mother's abdomen. The incision wound affects the mother, the most tangible way of being acute pain. Pain is a personal experience which is expressed differently in each individual. One form of non-pharmacological therapy to decrease pain is early mobilization. Factors affecting early mobilization includes lifestyle, which is influenced by education and knowledge. If a subject's knowledge about the usage and purpose of mobilization is low, it will greatly affect the level of implementation of said early mobilization. **Objective:** To find the correlation between Knowledge and Pain Intensity with Early Mobilization in Post Sectio Caesarea mothers. **Method:** This research uses the cross-sectional design approach on post section caesarean mothers with a total of 34 respondents. Data collection methods involve using Knowledge questionnaire, Numeric Rating Scale (NRS) score, and Early Mobilization. Data analysis involves using the Chi-Square Test. **Result:** Research based on 34 respondent's questionnaires, analyzed using Chi-Square test, produced a score of correlation between knowledge and early mobilization ($p=0.017$) and between pain intensity and early mobilization ($p=0.000$). These scores show that there is a correlation between Knowledge and Pain Intensity with Early Mobilization on Post Sectio Caesarea Mothers. **Discussion:** Knowledge is a factor that influences early mobilization because if a person's level of knowledge is low then the level of implementation. Post sectio Caesarea mothers often complain of pain in the incision area so that mothers are reluctant to do early mobilization. This is where the nurse's role as educator and motivator to the client so that the client does not experience an unwanted complication. Early mobilization will help speed up the recovery process of the puerperium in post section caesarea.

1. Introduction

Sectio Caesareais a surgical method of delivering a baby through an incision in the abdominal wall and uterus. The post-sectio caesarea recovery period is generally carried out with bed rest which if done excessively can cause several complications such as impaired blood circulation and accumulation of excess fluid in the parietal cavity which can cause pneumonia. (Nolan, 2010). These complications can be prevented by early mobilization (Danefi & Agustini, 2016). Common things that cause post SC mothers are reluctant to do early mobilization are worries about post SC suture wounds, pain and lack of knowledge about early post SC mobilization.

Based on research conducted by Hillan Regarding post-SC pain, it is known that on day 1-2 patients still experience pain in SC wounds, and 32% of respondents admit that they still feel pain in SC wounds until they go home from the hospital. Based on the preliminary study conducted by (Buhari et al., 2015) it was found that 4 out of 5 post-SC mothers did not do early mobilization after 2-6 hours of delivery. Based on the results of a survey conducted by Mariati (2015), there were 32 post-SC mothers went home later, namely on the 7th and 8th days post-SC due to complications due to not doing early mobilization with.

Factors that influence early mobilization include the level of knowledge. If a person's level of knowledge about early mobilization tends to be low, then it will affect the implementation of early mobilization. This is where the role of the nurse as an educator to the

client and family is needed so that the client does not experience an unwanted complication. Lack of knowledge about early mobilization in post section caesarean mothers can affect the implementation of early mobilization (Apriani, 2014).

Early mobilization in post-SC mothers is a person's ability to move freely to help accelerate the post-SC recovery period (Vivian, 2011). Mobilization is carried out gradually so that all circulatory systems in the body can adjust and function normally again. In post-section caesarea mothers are allowed to get out of bed no later than 24-48 hours after giving birth starting with the left or right side, sitting and then walking (Astutik, 2015). Early mobilization is also needed as an important aspect of physiological function to maintain the independence of post-SC ibu mothers (Wirnata, 2010).

As for the impact if the post-sectio caesarean patient does not mobilize early, among others, it can cause an increase in body temperature which can lead to the risk of infection in post-caesarean patients, abnormal bleeding and poor uterine involution, difficulty urinating, gastric distension, respiratory and cardiovascular disorders. (Fauz, 2007) (Mochtar, 2011). Based on the description of the problems that occur, the study aim to conduct further research on Relationship between Knowledge and Pain Intensity with Early Mobilization of Post-C-section Mothers.

2. Methods

This research is a non-experimental study with analytical observational methods and cross-sectional studies approach. Analytical observation with a cross-sectional approach is a type of research that emphasizes the measurement time or data observation one time at a time which is carried out on the dependent variable and the independent variable. This approach is used to see the relationship between one variable and another. Cross-sectional research is a type of research where the independent and dependent variables are measured and carried out only once (simultaneously) and there is no follow-up (Nursalam, 2014, Donsu, 2014). Not all research subjects must be observed at the same time, but both the independent and dependent variables will only be assessed once.

This research was conducted in several villages in Sumber Pucung Subdistrict, Malang Regency in March-May 2020. The study was conducted on 49 mothers who gave birth using the Caesarean section method without differentiating indications due to sample limitations. The inclusion criteria in this study were patients who delivered Sectio Caesarea without history and complications, patients who had mobilized early the first day, patients actively participated during the implementation of the study, were willing to be respondents. The measuring instrument used is a questionnaire used to measure knowledge, pain intensity and early mobilization. Bivariate analysis was carried out using the Chi Square test with the help of SPSS.

3. Results and Discussion

Table 1 Characteristic of respondents

Characteristics of Respondents	Frequency	Percentage (%)
Education		
- SD	3	6.1%
- junior high school	16	32.7%
- senior High School	28	57.1%*
- College	2	4.1%
Work		
- Farmer	1	2.0%
- Housewife	44	89.8%*
- Private	3	6.1%
- Teacher	1	2.0%
Information		
- Counseling	48	98.0%*
- Internet	1	2.0%

Sc. History		
- 1x	30	88.2%*
- 2x	4	11.8%
Parity Classification		
- Primipara	14	41.2%
- Multipara	20	58.8%*
Anesthesia		
- SAB (Spinal Anesthesia Block)	34	100%*

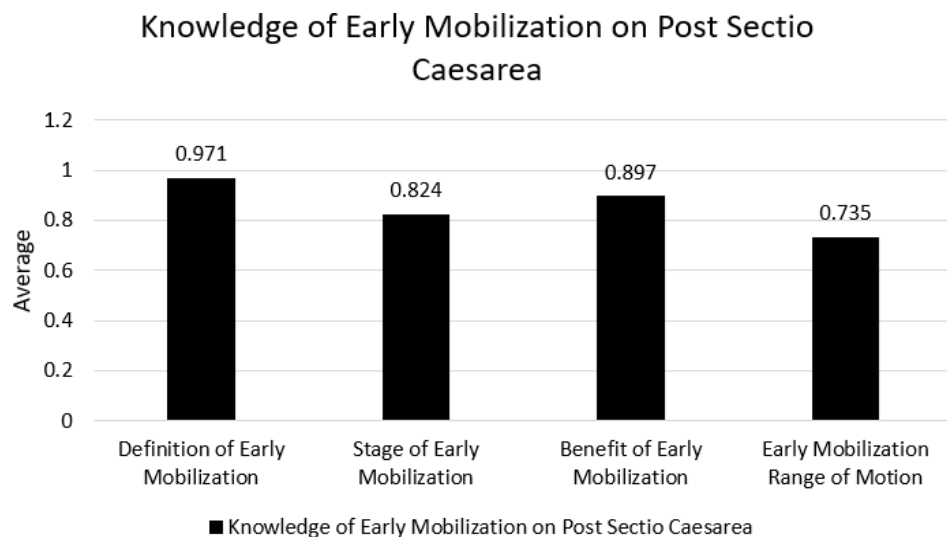


Figure 1. Bar Diagram of Knowledge Indicators on Early Mobilization in several Villages in Sumber Pucung District, Malang Regency in March-May 2020

Based on the diagram above, it is known that there are differences in the level of knowledge of early mobilization in post sectio caesarea mothers starting from the understanding, the stages of early mobilization, the benefits of mobilization, the range of motion of early mobilization. The highest average value is obtained in the definition component with a score of 0.971 and the lowest value is in the range of motion component of early mobilization with a score of 0.735. This shows that most of the patients undergoing post Sectio Caesarea surgery in several villages, Sumber Pucung District, Malang Regency involved in this study had good knowledge of early mobilization.

Table 2. Frequency Distribution of Pain Intensity Early Mobilization in several Villages of Sumber Pucung District, Malang Regency in March-May 2020

Pain Intensity Criteria	Frequency	Percent
Mild Pain	4	11.8
Moderate Pain	21	61.8
Severe Pain	9	26.5
Total	34	100.0

Based on table 2 it is known that of the 34 respondents involved in this study, 61.8% of patients experienced moderate pain injuries on the first day. This shows that most of the patients who underwent post-section caesarea surgery in several villages in Sumber Pucung District, Malang Regency involved in this study experienced moderate pain due to post-section caesarea wounds on the first day.

sTable 3 Distribution of Early Mobilization Frequency in several Villages in Sumber Pucung District, Malang Regency in March-May 2020

Early Mobilization Criteria	frequency	Percentage (%)
6-24 Hours	13	38.2
>24 Hours	21	61.8
Total	34	100.0

Based on table 3, it is known that from 34 patients who underwent post Sectio Caesarea surgery in several villages, Sumber Pucung District, Malang Regency involved in this study, 61.8% of patients did early mobilization. This shows that most of the patients who underwent post Sectio Caesarea surgery in several villages in Sumber Pucung District, Malang Regency involved in this study did early mobilization.

3.1 The relationship between knowledge and early mobilization of post sectio caesarea ibu

Table 4. Results of Data Analysis Using the Chi-Square Test Relationship between Knowledge and Early Mobilization of Post Sectio Caesarea mothers in several villages, Sumber Pucung District, Malang Regency in March-May 2020

in March-May 2020							P-Value
Knowledge	Early Mobilization				Amount		
	Yes		No				
	n	%	n	%	N	%	
Well	3	6.9%	15	11.1%	18	18.0%	0.017
Enough	10	6.1%	6	9.9%	16	16.0%	
Not enough	0	0%	0	0%	0	0%	
Total	13	13.0%	21	21.0%	34	34.0%	

Based on the test results listed in table 5.6 above, it can be seen that that of 34 patients undergoing post Sectio Caesarea surgery in several villages, Sumber Pucung District, Malang Regency involved in this research, as many as 18.0% patients who have good knowledge about early mobilization, perform early mobilization after surgery, and as much 16.0% patients who have sufficient knowledge about early mobilization, do not mobilize early after surgery.

Testing the relationship between knowledge and early mobilization of post sectio caesarea mothers in several villages, Sumber Pucung District, Malang Regency was carried out using the Chi Square Test. Based on the table, it is known that the probability value is 0.017. These results show the probability < level of significance ($\alpha=5\%$). Thus, it can be stated that there is a significant relationship between knowledge and early mobilization of post sectio caesarea mothers in several villages in the District of Malang Regency

3.2 Relationship of pain intensity with early mobilization

Table 5. Results of Data Analysis Using the Chi-Square Test Relationship between Pain Intensity and Early Mobilization of Post Sectio Caesarea in several villages, Sumber Pucung District, Malang Regency in March-May 2020

March-May 2020							
Pain Intensity	Early Mobilization				Amount		P-Value
	Yes		No				
	n	%	n	%	n	%	
Light	11	5.4%	3	8.6%	14	14.0%	0.000
Heavy	2	7.6%	18	12.4%	20	20.0%	
Total	13	13.0%	21	21.0%	34	34.0%	

Based on the results of the chi square test obtained from 34 patients undergoing post Sectio Caesarea surgery in several villages, Sumber Pucung District, Malang Regency involved in this research, as many as 20.0% patient who experiencing severe pain because of the caesarean post section wound on the first day, perform early mobilization after surgery.

Testing the relationship between pain intensity and early mobilization of post sectio caesarea mothers in several villages, Sumber Pucung District, Malang Regency was carried out using Chi-Square. Based on the table, it is known that the probability value is 0.000. These results show the probability < level of significance ($\alpha=5\%$). Thus, it can be stated that there is a significant relationship between pain intensity and early mobilization of post sectio caesarea mothers in several villages in Sumber Pucung District, Malang Regency.

4. Conclusion

The conclusions obtained from this study are: 1) On average, respondents have good knowledge of early mobilization of post-section caesarea. 2) On average, patients who experienced caesarean section post-section pain after their mobilization experienced moderate pain due to their caesarean post-section wound on the first day. 3) Most of the respondents in the study did early mobilization. 4) The results of the Chi-Square test on the Knowledge variable with Post Sectio Caesarea Early Mobilization stated that there was a significant relationship between knowledge and early mobilization of post sectio caesarea mothers in several villages in Sumber Pucung District, Malang Regency.

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Analysis of Factors Affecting The Quality of Sleep among Breast Cancer Patients: A Literature Study

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ABSTRACT

Introduction: : Breast cancer is a malignant tumor that originates from within the breast cells. This disease occurs almost entirely in women, but men can also get it. In general, it is estimated that breast cancer is the leading cause of death from cancer after lung cancer. **Objectives:** The purpose of this study was to identify factors that influence sleep quality in breast cancer patients. **Methods:** The research design used in this study was a literature review. We collected from three databases, including Google Scholar, Pubmed, and Proquest. We performed screening and checking for the eligibility, 10 journals were included in this study. **Results:** The result of this study was a significant relationship with sleep quality in patients with breast cancer. This was due to the extent of the disease, as well as the presence of pain and side effects of treatment. Additionally, pain, anxiety and fatigue were the factors affecting poor sleep quality among breast cancer patients. **Conclusions:** There was a relationship with factors that affect sleep quality in breast cancer patients. These factors were pain, anxiety, fatigue, nausea and depression. The review recommended future research should focus on the intervention to improve breast cancer patients sleep quality.

1. Introduction

Sleep is one of the basic needs of humans, sleep is one of the most important physiological processes in humans which aims to maintain health and continue bio-psycho-social and cultural functions. Sleep needs that must be met adequately, namely 7-9 hours per day, sleep can affect health and quality of life. Low sleep quality will be an indicator of many medical ailments and there is a strong relationship between physical, psychological and sleep health (Nur & Padoli, 2018). Sleep deprivation is known to be associated with anxiety, irritability and failure to make decisions.

This condition can also be experienced by breast cancer patients, insomnia is a common sleep disorder. Sleep patterns of breast cancer patients can be disturbed due to physical pain due to cancer, pain, side effects of drugs or other cancer therapies (eg nausea, vomiting, diarrhea), environment (room temperature and noise), lifestyle (diet, exercise, etc.). sleep routine, emotional state), and the psychological impact of cancer (Hananta et al., 2014a)

According to the latest data from the American Cancer Society (ACS) in 2013 that there were about 39,620 women died of breast cancer. According to estimates by the Globocan International Agency for Research on Cancer (IARC) in 2018, breast cancer is a cancer with the highest percentage of cases, namely 11.6%, while the incidence of breast cancer is 40 per 100,000 women. In Indonesia, the prevalence of breast cancer is high and breast cancer is the fifth leading cause of death in Indonesia. According to the Ministry of Health, it is recorded that of the many cancers that attack the Indonesian population, breast cancer is one of the highest cases in all hospitals and they mentioned about 34.3% or 2,089 million people in Indonesia suffer from breast cancer.

Sleep disturbances experienced by breast cancer patients can affect the quality of life, the immune system, cognitive abilities, and the ability to perform daily activities (Alfiyanti et al., 2017) so that it can aggravate the disease process and lower the immune system. The

background of the problem described above, this study aims to find out more about factors related to sleep quality in breast cancer patients using the literature study method.

2. Methods

The research design used in this study is a literature study. Literature study is a comprehensive study that discusses specific related research, composed of various sources that discuss a summary of the theory and the latest findings related to the research topic (Rosyadi et al., 2019). This study databases were Google Scholar, Pubmed, and Proquest.

Researchers identified problems through several journals from international research results as research material. The problem raised in this study is "Factors affecting sleep quality in breast cancer patients". The keywords that be used according to this theme in English and which be typed in the search field are "Factors affecting sleep quality in breast cancer patients" and factors OR sleep quality AND breast cancer. The inclusion criteria were: 1) Journals related to factors related to sleep quality of breast cancer patients, 2) included journals in the period from 2016-2020, 3) full text articles, 4) Screening journals based on study design: cross-sectional study, randomized controlled trial, case study, and cohort study.

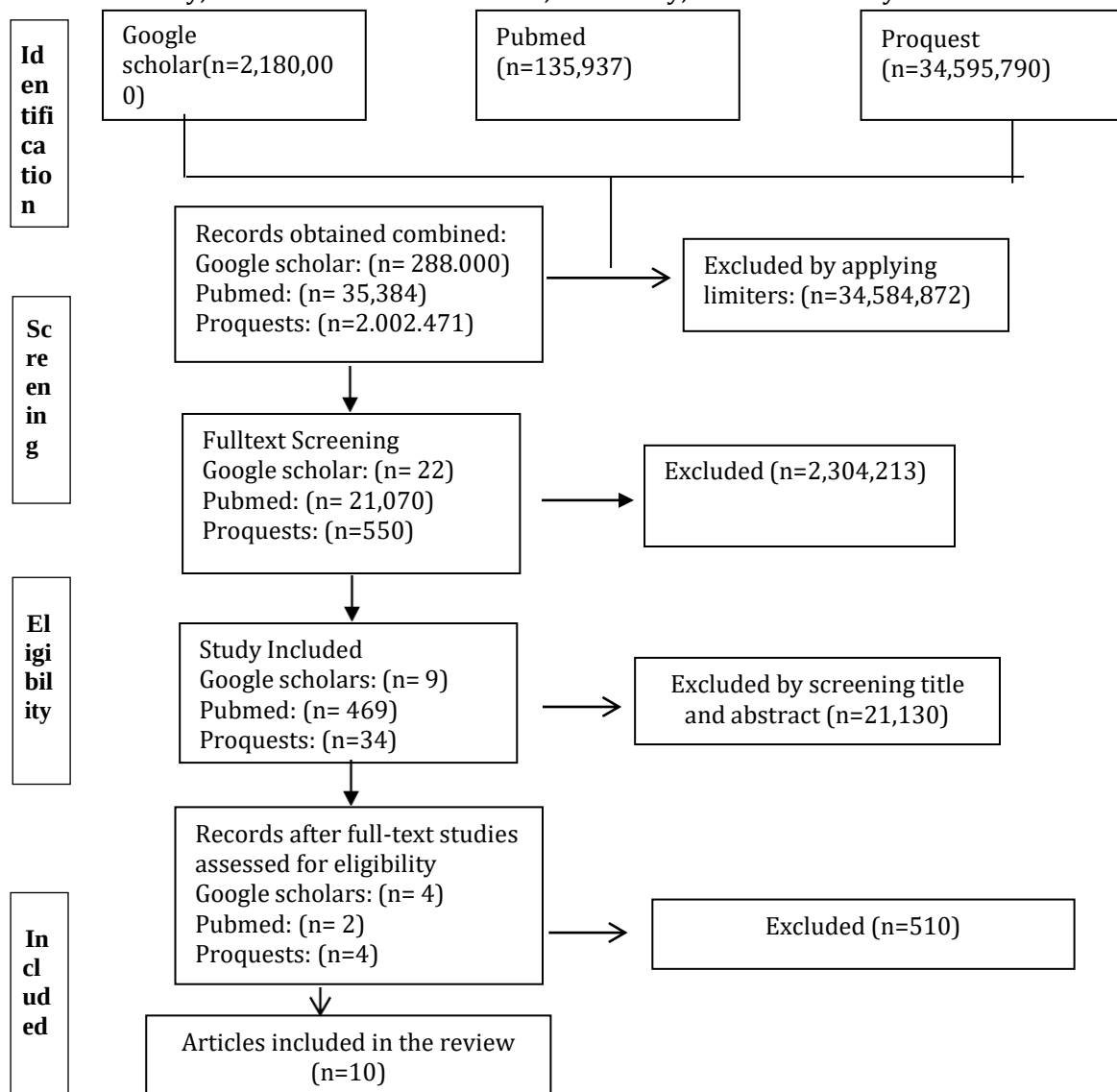


Figure 1. literature selection and exclusion process

3. Results and Discussion

The following was a table of data extraction from journals included in this study.

No	Authors, publication year	Study design	Sample	Outcome
1.	(Afifah & Padoli, 2019)	Cross sectional	20 Breast Cancer Patients	There was a relationship between anxiety and sleep quality in breast cancer clients ($p = 0.001$) where the more severe the anxiety, the worse the sleep quality.
2.	(Berger et al., 2019)	Cross sectional	1260 patients diagnosed with breast cancer	Most of the women were white (93.7%) and married (71.5%); the mean age was 21-90 years. Factors affecting sleep quality: younger age, lower physical activity and higher fatigue, mental health, body aches
3.	(Overcash et al., 2018)	Cross sectional	52 breast cancer patients aged 69 years receiving treatment at Oncology	Factors affecting sleep quality were fatigue, pain, depression, fatigue.
4.	(Yang et al., 2019)	Case study	401 patients	The results showed that there was a relationship between sleep duration, sleep quality, use of sleeping pills, frequency of insomnia, naps, and breast cancer risk.
5...	(Peoples et al., 2017)	Randomized controlled trial	548 cancer patients diagnosed with breast cancer.	The results showed that fatigue in breast cancer patients before treatment, such as more severe nausea, sleep disturbances, and younger age were significant risk factors.
6.	(Rogers et al., 2017)	Randomized controlled trial	222 breast cancer patients	The results showed a statistically significant difference between the intervention group and the control group.
7.	(Imanian et al., 2019)	Cross sectional	115 breast cancer patients.	The results of this study indicated that fatigue has a significant relationship with sleep quality.

8.	(Fontes et al., 2017)	Cohort Study	502 breast cancer patients	The results of the analysis demonstrated an association between different patient characteristics and the occurrence of good sleep quality (PSQI 5) at 1 year, among those with poor sleep quality at baseline.
9.	(Otte et al., 2016)	Cross-sectional	38 breast cancer patients	The majority of Breast Cancer survivors (BCS) had high sleep quality scores, low anxiety scores, low depression scores, and high hot flash interference scores.
10.	(Weng et al., 2021)	Cross-sectional	448 women with breast cancer	Multiple logistic regression analysis revealed that significantly more patients with sleep disorders exhibited psychological distress, severe illness, depression, and impact of stressful events than patients without sleep disorders.

Based on the analysis data from 10 journals obtained that affect sleep quality in breast cancer patients, including pain, anxiety, fatigue, nausea and depression. Study by Fortner et al., (2002) found that sleep disturbances experienced by respondents were associated with decreased sleep due to pain and nocturia. The two main causes of pain were disease progression and medication side effects. Progression of the disease can cause pain in the bones and nerves, whereas medication-related side effects, such as mucositis and peripheral neuropathy, can also cause pain.

Results from 2 research journals that discuss the effect of anxiety on sleep quality in breast cancer patients. Research conducted by Afifah & Padoli (2019; Fontes et al., (2017) stated that there is a relationship between anxiety and sleep quality in breast cancer clients. Anxiety can arise due to thinking about the prognosis and the length of time the client has suffered from the disease.

According to research Overcash et al., (2018) and Imanian et al., (2019) stated that the results of the Brief Fatigue (BFI) measurement consisting of nine items, tested positive for fatigue and lack of sleep in breast cancer patients. Additionally, Peoples et al.,(2017), the severity of post-chemotherapy nausea has a direct or indirect effect on sleep disturbances. Symptoms of depression are common in the first 6 months after being diagnosed with cancer, then will decrease as the patient can adjust to the diagnosis of the disease and the acute effects of cancer treatment (Overcash et al., 2018 ; Fontes et al., 2017; Otte et al., 2016; Weng et al., 2021).

4. Conclusion

This study provides results that the factors that affect the quality of sleep in breast cancer patients include pain, anxiety, fatigue, nausea and depression. These factors are the main predictors in influencing the patient's disturbed sleep quality. The majority of sleep quality obtained is poor sleep quality, this is evidenced by the sleep quality assessment score, if this continues it will result in cancer starting to spread or increasing the degree of treatment. In

addition, factors that affect sleep quality in breast cancer patients provide subjective benefits, namely as a prevention so that sleep quality does not occur in breast cancer.

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