ORIGINAL ARTICLE

Sweetened Drink Consumption Pattern and Risk of Obesity Awareness

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ARTICLE INFORMATION	**ABSTRACT**
	Introduction: *Trends in sweetened drink consumption increased in the past two years. The ease of technology to order food and beverage through online applications, and also the increasing number of cafes that provide a comfortable place, causing a change in lifestyle and eating patterns whose nutritional value does not meet health standards. Excessive calorie intake will have an impact on health, causing obesity.* ***Objectives:*** *To explore the pattern of sweetened drink consumption and awareness of the risk of obesity among nursing students.* ***Methods:*** *A cross-sectional study was conducted for three months (June-September 2021). We recruited 88 nursing students. Using the Indonesian version of the Beverage Frequency Questionnaire (BFQ), we collected the data and the obesity knowledge questionnaire by purposive sampling. Total intake of drink in milliliter and calories in kcals were calculated. The data were analyzed through SPSS version 23.* ***Result:*** *Most nursing students' consumption of sweetened drinks was in the high category, with 75 respondents (85%) and 13 respondents (15%) in the normal category. The drinks most often consumed were tea, instant coffee, and flavored milk. Body mass index (BMI) was mainly in the normal category with 47 respondents (53%), 27 respondents (31%) in the fat category, and 14 respondents (16%) in the thin category. Awareness of the risk of obesity, most respondents 72 respondents (81%) have good knowledge of 72 respondents (81%). The average daily consumption of sweetened drinks on the respondents was 113 grams per day.* ***Conclusion***: *The majority of respondents have a high consumption pattern of sweetened drinks even though they have normal nutritional status and are aware of the risk of obesity*

1. Introduction

The rapid development of technology and the flow of globalization influence the ease of technology to order food and beverage products through online applications and the increasing number of cafes that provide a comfortable place, causing a change in style, life, and diet (Aditya & Suprayitno, 2021; Marta, Safitri, & Aini, 2021; Pebriani & Marleni, 2020). A sugar-sweetened beverage is a drink that is added with simple sugar during the production process, which can increase energy content, but has little content of other nutrients. The usually used sugars are brown sugar, white sugar, corn sugar, syrup, honey, and molasses. In 300-500 ml servings of sweetened drinks circulating in Indonesia, there are 37-54 grams of wrestling (Akhriani et al., 2016). Intake of consumption of sweetened beverages such as ready-to-eat beverage products, such as dairy products, tea, boba milk tea, and coffee drink products with various toppings such as pudding, jelly, and additional cheese can lead to overweight and even obesity (Min, Green, & Kim, 2016; Putri, Dewi, & Maemunah, 2020).

The rate of obesity has increased over the past decade worldwide. The prevalence of obesity in adults aged >15 years has increased compared to 2013 from 26.6% to 31.0%

(Riskesdas, 2018). Obesity can cause several impacts, including increasing the risk of cardiovascular disease, cancer, hypertension, type 2 diabetes, stroke, glucose intolerance, dyslipidemia, respiratory disorders, and psychological effects (Lestantina et al., 2018).

The imbalance between consumption and the level of nutritional adequacy starts from the wrong understanding and behavior of nutrition, so it can cause nutritional status problems. The consumption pattern of sweetened drinks with uncontrolled calorie content can impact excess nutritional status (Kumala et al., 2019). Factors influencing the behavior of consumption of sweetened drinks in adolescents are information sources, peer influence factors, comfortable places to gather, places that provide various facilities, and attractive layouts that cause the frequency of visits to be high, plus delicious food taste factor (Pamelia, 2018).

Based on these conditions, it is necessary to study the pattern of consumption of sweetened drinks in adolescents in this case, namely nursing students of FIKES UMM, and awareness of the risk of obesity.

2. Methods

1. Research Design

In a cross-sectional design, the independent variable in this study is the pattern of sweetened drinks. The dependent variable is the nutritional status of adolescents and awareness of obesity risk.

2. Population and sample

The population used in this study were students and students of the Nursing Science study program at the University of Muhammadiyah Malang class of 2019, with 187 respondents. Subjects must obtain full informed consent about the aims and objectives of the study. The primary objective was to assess the consumption pattern of several beverages and calorie intake among nursing students of FIKES UMM. Assessment of consumption of sweetened drinks consists of carbonated drinks, instant tea/coffee, juice, isotonic drinks, energy drinks, and flavoured milk. Secondary objectives were to determine the relationship between nutritional status and awareness/knowledge of obesity risk and report beverage consumption predictors.

3. Data collection techniques and instrument development

This research started in June-September 2021. This research was carried out at the University of Muhammadiyah Malang, namely on campus 2 of the University of Muhammadiyah Malang. In this research, the researcher used the purposive sampling technique. The sample in this study was 88 students of the Nursing Science study program at the University of Muhammadiyah Malang class of 2019 based on calculations using G-Power.

The instrument in this study used a questionnaire on the frequency of consumption of sweetened drinks. Measurement of nutritional status of researchers using the measurement of Body Mass Index based on weight and height. Obesity risk awareness using a knowledge questionnaire. Through the validation process with the Pearson Correlation, the questionnaire obtained the value of r count for each item that meets the requirements, namely > 0.442, so that the item is valid and can be continued. The reliability test results with Cronbach Alpha obtained that the Cronbach alpha value met the requirements, namely > 0.600, so that the variables used were reliable.

4. Data analysis

The analysis of this study used the Spearman correlation test with both ordinal data scales using SPSS version 23.

3. Results and Discussion

This study used 88 nursing student respondents at the Faculty of Health Sciences, University of Muhammadiyah Malang.

3.1 Demographic data of respondents

The majority of respondents were aged 20 years, as many as 48 respondents (55%), and the majority were female 76 respondents (86%) the data shown in Table 1.

Table 1 Characteristics of Demographic Data of Respondents of Nursing Students, University of Muhammadiyah Malang (n=88)

Category	Frequency (f)	Percentage (%)
Age :		
19 years old	30	34%
20 years	48	55%
21 years	9	10%
22 years	1	1%
Gender:		
Man	12	14%
Woman	76	86%

3.2 Data on consumption of sweetened drinks

The results showed that the consumption of sweetened beverages by nursing students was mostly in the high category as many as 75 respondents (85%) and as many as 13 respondents (15%) in the normal category.

Table 2 Distribution of Frequency and Percentage of Consumption Patterns of Sweetened Drinks by Nursing Students, University of Muhammadiyah Malang

Consumption	Frequency (f)	Percentage (%)
Tall	75	85%
Normal	13	15%

3.3 Based on the nutritional status of nursing students

Mainly in the normal category, as many as 47 respondents (53%), as many as 27 respondents (31%) in the fat category, and as many as 14 respondents (16%) in the thin category.

Table 3 Distribution of Frequency and Percentage of Nutritional Status of Nursing Students, University of Muhammadiyah Malang

Nutritional status	Frequency (f)	Percentage (%)
Thin	14	16%
Normal	47	53%
Fat	27	31%

3.4 Awareness/knowledge data

Based on the awareness of obesity risk, nursing students were mainly in the excellent category, with as many as 72 respondents (81%) and 16 respondents (19%) in the excellent category.

Table 4 Distribution of Frequency and Percentage of Awareness/Knowledge of Nursing Students, University of Muhammadiyah Malang

Awareness/Knowledge	Frequency (f)	Percentage (%)
Well	72	81%
Enough	16	19%

3.5 Relationship of consumption pattern of sweetened drink with awareness/knowledge

Table 5 Cross-tabulation and spearman test results

Nutritional status	Consumption Pattern		Total	r(p)	P
	Tall	Normal			
Thin	12	2	14	-	0.159
Normal	37	10	47	0.152	
Fat	26	1	27		
Total	75	13	88		

Based on the results of the Spearman test, the value of sig. (p) 0.159>0.05, it can be concluded that there is no significant correlation. The level of strength of the relationship can be seen from the value of the correlation coefficient (r) -0.152 meaning, the level of correlation between consumption patterns of sweetened drinks with nutritional status is fragile. The correlation coefficient in the results above is negative, namely -0.152, so the consumption pattern of sweetened drinks and nutritional status is not in the same direction. It can be interpreted that the pattern of high consumption of beverages does not improve the nutritional status of adolescents.

Nutritional status can be influenced by other factors such as total energy expenditure. Total energy expenditure (TEE) is defined as the individual's total energy expenditure derived from three components, namely basal metabolism, consumption effects, and physical activity (Qamariyah & Nindya, 2018). The respondent's productive age allows for moderate to high activity so that consumption of sweetened drinks does not affect nutritional status where calories from sugary drinks are released as energy.

The physiological effects of drinking on appetite satisfaction and satiety appear to differ between solids and liquids. According to (Preedy et al., 2011) in his book entitled "Handbook of Behavior, Food and Nutrition," consuming sweetened drinks has a faster transit time in the oral cavity which causes less time for sensory receptors in the oral cavity to be exposed to taste, smell, and texture to signal fullness. This reason may lead to high consumption of sweetened drinks.

3.6 Relationship of consumption pattern of sweetened drinks with awareness/knowledge

Table 6 Cross-tabulation and spearman test results

Awareness/Knowledge	Consumption Pattern		Total	r(p)	P
	Tall	Normal			
Well	69	3	72	0.196	0.067
Enough	6	10	16		
Not enough	0	0	0		
Total	75	13	88		

Based on the results of the Spearman test, the value of sig. (p) 0.196> 0.05, the correlation coefficient in the above results is positive. It can be interpreted that the pattern of high consumption of beverages is followed by awareness/knowledge of the risk of obesity is also high. Obesity occurs due to excessive energy consumption, and excess energy is stored in the body as fat, resulting in excess weight. Obesity can cause several impacts, including increasing the risk of cardiovascular disease, cancer, hypertension, type 2 diabetes, stroke, glucose intolerance, dyslipidemia, respiratory disorders, and psychological effects (Lestantina et al, 2018).

4. Conclusion

Consumption of sweetened beverages is associated with awareness of the risk of obesity. However, there is no significant relationship between consumption patterns of sweetened drinks with nutritional status of nursing students. Most of the sweetened drinks consumed are tea or instant coffee and flavoured milk-consumption of sweetened drinks 12 times more than the recommended addition of sugar. There needs to be further research on the habit of consuming sweetened drinks with sedentary behavior in adolescents.

Ethics approval and consent to participate

Subjects get complete information about the goals and objectives of the research to be carried out; respondents have the right to participate or refuse to become respondents freely. In the informed consent, it is also necessary to state that the data obtained will only be used for scientific development.

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