The Relationship of Sugar-Sweetened Beverages (SSB) Consumption with Nutritional Status in Adolescents at SMKN 32 Jakarta

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ABSTRACT

Nutritional problems such as obesity are a health problem that still occurs in all parts of the world. The incidence of malnutrition is influenced by many things, including excessive energy intake from food and drinks, such as Sugar-sweetened beverages (SSB). This study aims to identify the relationship between consumption of Sugar-sweetened beverages (SSB) and nutritional status among adolescents at SMKN 32 Jakarta. This research used a cross-sectional research design with 80 research subjects who were students aged 16-18 years who attended SMKN 32 Jakarta who were selected using consecutive sampling. Data on consumption of Sugar-sweetened beverages (SSB) was obtained from the BEVQ-15 (Beverage Questionnaire) questionnaire during the last month. Relationship test analysis using Spearman's Rank test. The results showed that overnutrition status in adolescents as many as 35 respondents consisting of 8 respondents (22.2%) male and 27 respondents (77.1%) female and the frequency of consumption of SSB in the soft drink type was 54.3%. there was a relationship between the frequency of SSB consumption and the nutritional status of respondents who consumed soft drinks (p=0.010). In conclusion there is a relationship between consumption of sugary sweet drinks and nutritional status in adolescents at SMKN 32 Jakarta.

Keywords: sugar sweetened beverages consumption, adolescents, nutrition status

ABSTRAK

Masalah gizi lebih seperti kegemukan menjadi salah satu masalah kesehatan yang masih terjadi seluruh belahan dunia. Kejadian status gizi lebih dipengaruhi oleh banyak hal, termasuk jumlah asupan energi yang berlebih dari makanan dan minuman, seperti minuman berpemanis. Penelitian ini bertujuan untuk mengidentifikasi hubungan konsumsi minuman berpemanis dengan status gizi lebih pada remaja di SMKN 32 Jakarta. Penelitian ini menggunakan desain penelitian *cross sectional* dengan subjek penelitian sebanyak 80 orang yang merupakan siswa dan siswi berusia 16-18 tahun yang bersekolah di SMKN 32 Jakarta yang dipilih secara consecutive sampling. Data konsumsi minuman berpemanis diperoleh dari kuesioner BEVQ-15 (*Beverage Questionnaire*) selama satu bulan terakhir. Analisis uji hubungan menggunakan uji Rank Spearman. Status gizi lebih pada remaja sebanyak 35 responden terdiri dari 8 responden (22.2%) laki-laki dan 27 responden (77.1%) perempuan dan frekuensi konsumsi SSB pada jenis minuman *softdrink* sebesar 54,3%. Hasil penelitian menunjukkan ada hubungan antara frekuensi konsumsi *sugar sweetened beverages* dengan status gizi responden yang mengonsumsi *softdrink* (p=0,010). Kesimpulan dalam penelitian ini adalah ada hubungan antara konsumsi *sugar sweetened beverages* dengan status gizi pada remaja di SMKN 32 Jakarta.

Kata kunci: konsumsi *sugar sweetened beverages*, remaja, status gizi

J. App. Sci. Pharm. Health, 2024, 1(1)

14

INTRODUCTION

Recently, the world has become increasingly aware of the role of added sugar, particularly in beverages, as a trend of food and beverages. Young people as the nation's successors will later be faced with the good or bad impacts of consumption habits that lead to health. Until now, nutritional problems among teenagers in several countries still occur and have become a national problem (Widianto et al., 2017). The prevalence of overnutrition, consisting of overweight and obesity, which occurs in children and adolescents aged 5-19 years, is increasing globally. Data for 2010 shows that the number of overweights was around 9-10%, increasing to around 12.5%. In addition, the prevalence of obesity in children and adolescents in 2010, which was 3.5-4.7%, increased to 5.5-7.7% (United Nation, 2021). On the other hand, the incidence of obesity also occurs in adulthood and has increased compared to the previous year (FAO, IFAD, UNICEF, 2022). Specifically in Indonesia, the incidence of overnutrition in Indonesia, based on data obtained from the 2018 Basic Health Research (RISKESDAS), of the population ≥ 18 years old who had a BMI ≥ 25 kg/m^2 was 26.5% for men, and 44, 4% in women. Based on data from the 2024 Indonesian Health Survey (SKI), it shows that overnutrition and obesity are still a problem, namely 11.7% of men and 12.6% of women aged 16-18 years (Kemenkes, 2018; Kemenkes RI, 2022).

There are several factors that influence the incidence of overnutrition in adolescents. Some direct factors include the health of the parents, where if the father and mother are overnourished, the child will be at greater risk. Apart from that, teenagers also have limited access to a healthier diet and limited physical activity. Currently, teenagers are exposed to a lot of access to unhealthy drinks and food which increases the risk of overnutrition (UNICEF, 2020). Recently, the consumption of SSB or drinks sweetened with sugar in Indonesia continues to increase from year to year and is in second place when viewed from sales figures of 12 billion liters in 2013 (Akhriani et al., 2016). Sugar sweetened beverage is a drink with added sugar which is included in the simple carbohydrate group. Carbohydrates themselves in the body play a role in providing glucose for the body's cells and then converting it into energy. A high intake of SSB can cause an imbalance in energy consumption. Excessive sugar content in (SSB) causes fat accumulation which has a 5.6x greater risk of obesity (Qoirinasari et al., 2018).

The group that is often exposed to (SSB) in this modern era is adolescents. The habit of consuming sugar that exceeds this limit can be a risk factor for obesity or overnutrition (Hodge et al., 2018). The risk factor for teenagers experiencing over nutritional status is due to changes in lifestyle such as consuming food and drinks from outside which results in changes in people's eating patterns which refer to foods and drinks high in calories, cholesterol, and fat, and not balanced with sufficient physical activity, thus causing overnutrition problems (Intantiyana et al., 2018; UNICEF, 2019). Currently, there is not much research that examines how the SSB habit in Jakarta is part of the current drinking trend and its relationship with nutritional status (BMI for Age). Therefore, the adolescents have a greater influence on the risk of obesity as age increase (Izhar, 2020). This study aims to analyze the relationship

between consumption of Sugar-sweetened beverages (SSB) and nutritional status among adolescents at SMKN 32 Jakarta.

METHODS

Research Design, Time, and Place

This research is observational research carried out through observations with an approach using a cross-sectional research design. This research was carried out in June 2023 with the research area located at SMKN 32 Jakarta among teenagers aged 16 - 18 years. This research has passed ethical approval Muhammadiyah University of Jakarta No.104/PE/KE/FKK-UMJ/VI/2023.

Population and Sample

The population in this research is the total number consisting of objects or subjects that have certain characteristics that have been determined by the researcher. The sampling technique used was non-probability sampling, namely consecutive sampling where the samples taken were all subjects who were observed and met the sample selection criteria. The inclusion criteria used were that the subject was willing to complete the measurements, the subject attended school at SMKN 32 Jakarta aged 16-17 years, the subject consumed Sugar-sweetened beverages (SSB) normally, and the subject was willing to become a research respondent by filling out the Informed consent form. Meanwhile, the exclusion criteria used were subjects unable to complete the measurement or refusing to continue, subjects not attending the study, subjects not willing to be respondents and subjects limiting their consumption of (SSB), being sick, not being on a diet and not fasting. Based on the calculation of the sample size plus the possibility of dropping out of 10%, the sample size was 74. The results obtained were to enrich the number of subjects. In this study, research subjects were taken which were added to the sample size according to the Slovin formula calculation, so the sample size was 80 samples.

Data Collection and Processing

The data collected in this research is primary data taken directly by the enumerator consisting of the characteristics of the respondents, their drinking habits of (SSB) and nutritional status. Data collection was carried out by distributing questionnaires to collect data on respondents' characteristics including gender, age and pocket money. Data on consumption of SSB was obtained from the BEVQ-15 (Beverage Questionnaire) questionnaire during the last month. Nutritional status (BMI for Age) was measured by measuring body height using a stature meter with an accuracy of 0.1 cm, measuring body weight using a weight scale with an accuracy of 0.01 kg.

Data analysis

Data analysis was carried out using computer applications, namely Microsoft Excel 2019 and IBM SPSS Statistics version 25. Data analysis was carried out using observational statistical methods to

determine the proportion and average of subjects in characteristic categories. Age data is categorized into 2 categories, namely 16 years and 17 years. Respondents' pocket money was categorized into two categories, namely Rp. 10,000 – 50,000, and Rp. 50,000 – 100,000. Nutritional status is categorized based on BMI for Age which consists of Malnutrition, Good Nutrition, Overnutrition, Obesity (Kementerian Kesehatan RI, 2020). The sweetened beverage category according to the BEVQ-15 questionnaire consists of Fruit Juice, Sweet Juice, Milk, Low Fat Milk, Fat Free Milk, Soft drink, Diet Drinks, Sweet Tea, Sweetened Milk Coffee Tea, Beer, Liquor, Wine, and Energy Drinks. The history of sweetened drink consumption was analyzed, including the costs used to purchase (SSB). Next, the data was tested for normality to determine whether the data was normally distributed or not. If the data is normal, the paired t test (parametric) be used for the difference test, and the person test for the relationship test. If the data is not normal, it can be tested with Mann Whitney to determine differences in nutritional status by gender. Apart from that, the data was also tested using the Spearman rank test which aims to test the relationship between two variables.

RESULTS

Respondent Characteristics

The characteristics analysed in this study include age, gender, and amount of pocket money. Based on the research results, most respondents aged 16-17 years, 74 respondents aged 16 years and 6 respondents aged 17 years. In Table 1, the most data obtained with the amount of pocket money ranging from IDR 10,000 – 50,000 is 69 teenagers from 10 men (14.5%) and 59 women (85.5%) teenagers. Meanwhile, there were 11 teenagers with pocket money of more than Rp. 50,000- 100,000, 5 boys (18.8%) and 6 girls (81.3%). Most of the respondents consisted of female respondents (81.25%).

Table 1. Characteristics of respondents based on gender.

Characteristics	Gender						p-value
	Male		Female		Total		
	n	%	n	%	n	%	
Age							
16 Years	13	17.6	61	82.4	74	100.0	0.344
17 Years	2	33.3	4	66.7	6	100.0	
Total	15	18.8	65	81.3	80	100.0	
Pocket Money							
Rp.10.000 – 50.000	10	14.5	59	85.5	69	100.0	0.015*
Rp.50.000 – 100.000	5	45.4	6	54.4	11	100.0	
Total	15	18.8	65	81.3	80	100.0	

*Significant differences (p<0.05) (Mann-Whitney Test). Source: Primary Data

Nutritional Status (BMI-for-Age)

Based on Table 2, it explains the nutritional status of respondents obtained during the research using the body mass index according to age (BMI-for-Age). The nutritional status of respondents shows that

J. App. Sci. Pharm. Health, 2024, 1(1)

17

out of 80 respondents, there were 6 respondents consisting of 3 respondents (50%) male and 3 female respondents (50%) who had underweight nutritional status, 34 respondents consisting of 3 respondents (8.8%) men and 31 respondents (91.2%) women had normal nutritional status, 35 respondents consisting of 8 respondents (22.2%) men and 27 respondents (77.1%) women with overweight nutritional status and 5 respondents consisting of 1 respondent (20%) male and 4 respondents (80%) female had the nutritional status of obesity.

Table 2. Nutritional status (BMI-for-Age) based on gender

Category	Gender						*p-value*
	Male		Female		Total		
	n	%	n	%	n	%	
BMI-for-Age							
Underweight	3	50	3	50	6	100.0	
Normal	3	8.8	31	91.2	34	100.0	0.835
Overweight	8	22.9	27	77.1	35	100.0	
Obesity	1	20	4	80	5	100.0	
Total	15	18.8	65	81.3	80	100.0	

*Significant differences (p<0.05) (Mann-Whitney Test). Source: Primary Data

Consumption of Sugar-sweetened beverages (SSB)

Table 3 shows that there were 74 respondents who had a history of SSB consumption, namely 13 men (17.6%) and 61 women (82.4%). Meanwhile, of the 6 respondents who did not have a history of SSB consumption during the last month, there were 2 men (33.2%) and 4 women (66.7%). SSB consumption of more than 1x per day is most often consumed by adolescent girls (85.7%) while adolescent boys (23.7%) consume less than 1x per day. Adolescent girls (82.2%) and adolescent boys (17.8%) are accustomed to consuming SSB alone rather than with friends or family. The cost of purchasing SSB is mostly done by teenage girls (84.9%) and teenage boys (15.1%) at a price of IDR 5,000 – 10,000 per SSB unit.

Relationship between Sweetened Drink Consumption and Nutritional Status

Based on the results obtained in Table 4, it was found that there was no relationship between the frequency of consumption of SSB and nutritional status, types of drinks such as fruit juice, sweet juice, milk, low fat milk, fat free milk, diet drinks, sweet tea, tea. The highest frequency of drinks (1-3x/day) is sweet tea, coffee, soft drinks, and milk. Sweet milk tea and coffee, beer, liquor, wine, and energy drinks have no relationship with nutritional status, namely p-value (>0.05). The relationship between consumption of SSB and nutritional status was found in soft drink types (p=0.010).

Table 3. Consumption of sugar sweetened beverages

| Category | Gender | | | | | | p- value |
| | Male | | Female | | Total | | |
	n	%	n	%	n	%	
History of Sweetened Drink Consumption							0.344
Yes	13	17.6	61	82.4	74	100.0	
No	2	33.2	4	66.7	6	100.0	
Total	15	18.8	65	81.3	80	100.0	
Sweetened Drink Consumption/Day							
<1x/day	9	23.7	29	76.3	38	100.0	0.285
>1x/day	6	14.3	36	85.7	42	100.0	
Total	15	18.8	65	81.3	80	100.0	
Sweetened Drink Consumption Together							
Yes	2	28.6	5	71.4	7	100.0	0.489
No	13	17.8	60	82.2	73	100.0	
Total	15	18.8	65	81.3	80	100.0	
Cost of Purchasing Sugar-sweetened beverages (SSB)							
Rp. 5.000 – 10.000	8	15.1	45	84.9	53	100.0	0.156
Rp. 10.000 – 30.000	5	20.8	19	79.2	24	100.0	
Rp. 30.000 – 50.000	0	0.0	1	100.0	1	100.0	
>Rp. 50.000	2	100.0	0	0.0	2	100.0	
Total	15	18.8	65	81.3	80	100.0	

*Significant differences ($p < 0.05$) (Mann-Whitney Test). Source: Primary Data

The table above shows that there is a relationship between the frequency of consumption of sugar sweetened beverages and nutritional status, respondents who consume soft drinks 1-3x/week tend to have normal nutritional status, namely 61.8%. As many as 54.3% of subjects who consumed soft drinks 1-3x/day tended to have higher nutritional status. Based on the results of Table 4, it shows the p value = 0.010 so there is a significant relationship between the frequency of soft drink consumption and nutritional status.

Table 4. The relationship between frequency of consumption of Sugar-sweetened beverages (SSB) and nutritional status

Nutritional Status	Never		1-3x/week		1-3x/day		Total		*p-value*
	n	%	n	%	n	%	n	%	
Fruit juice									
Severe-Undernutrition	0	0.0	0	0.0	0	0.0	0	0.0	
Underweight	1	16.7	5	83.3	0	0	6	100.0	
Normal	12	35.3	20	58.8	2	5.9	34	100.0	0.986
Overweight	13	16.3	18	51.4	4	11.4	35	100.0	
Obesitas	1	20	4	80.0	0	0.0	5	100.0	
Total	27	33.8	47	58.8	6	7.5	80	100.0	
Sweet Juice									
Severe-Undernutrition	0	0.0	0	0.0	0	0.0	0	0.0	
Underweight	4	66.7	2	33.3	0	0.0	6	100.0	
Normal	25	73.5	8	23.5	1	2.9	34	100.0	0.115
Overweight	19	54.3	13	37.1	3	8.6	35	100.0	
Obesitas	3	60	1	20	1	20	5	100.0	
Total	51	63.7	24	30	5	6.3	80	100.0	
Milk									
Severe-Undernutrition	0	0.0	0	0.0	0	0.0	0	0.0	
Underweight	1	16.7	0	0.0	5	83.3	6	100.0	
Normal	4	11.8	18	52.9	12	35.3	34	100.0	0.156
Overweight	1	2.9	10	28.6	24	68.6	35	100.0	
Obesitas	0	0.0	3	60	2	40.0	5	100.0	
Total	6	7.5	31	38.8	43	53.8	80	100.0	
Low Fat Milk									
Severe-Undernutrition	0	0.0	0	0.0	0	0.0	0	0.0	
Underweight	6	100.0	0	0.0	0	0.0	6	100.0	
Normal	33	97.1	1	2.9	0	0.0	34	100.0	0.296
Overweight	34	97.1	1	2.9	0	0.0	35	100.0	
Obesitas	4	80.0	1	20	0	0.0	5	100.0	
Total	77	96.3	3	3.8	0	0.0	80	100.0	
Fat-Free Milk									
Severe-Undernutrition	0	0.0	0	0.0	0	0.0	0	0.0	
Underweight	6	100.0	0	0.0	0	0.0	6	100.0	
Normal	32	94.1	2	5.9	0	0.0	34	100.0	0.068
Overweight	29	82.9	4	11.4	2	5.7	35	100.0	
Obesitas	4	80.0	1	20.0	0	0.0	5	100.0	
Total	71	88.8	7	8.8	2	2.5	80	100.0	
Softdrink									
Severe-Undernutrition	0	0.0	0	0.0	0	0.0	0	0.0	
Underweight	1	16.7	4	66.7	1	16.7	6	100.0	
Normal	9	26.5	21	61.8	4	11.8	34	100.0	0.010*
Overweight	5	14.3	11	31.4	19	54.3	35	100.0	
Obesitas	1	20.0	3	60	1	20	5	100.0	
Total	16	20.0	39	48.8	25	31.3	80	100.0	
Beer, Wine									
Severe-Undernutrition	0	0.0	0	0.0	0	0.0	0	0	
Underweight	6	100.0	0	0.0	0	0.0	6	100.0	
Normal	35	100.0	0	0.0	0	0.0	34	100.0	
Overweight	35	100.0	0	0.0	0	0.0	35	100.0	-
Obesitas	5	100.0	0	0.0	0	0.0	5	100.0	
Total	80	100.0	0	0.0	0	0.0	80	100.0	
Sweet tea									
Severe-Undernutrition	0	0.0	0	0.0	0	0.0	0	0.0	
Underweight	1	16.7	1	16.7	4	66.7	6	100.0	
Normal	5	14.7	12	35.3	17	50.0	34	100.0	0.183

Nutritional Status	Frequency of Consumption of Sugar-sweetened beverages (SSB)								*p-value*
	Never		1-3x/week		1-3x/day		Total		
	n	%	n	%	n	%	n	%	
Overweight	3	8.6	6	17.1	26	74.3	35	100.0	
Obesitas	1	20	1	20	3	60.0	5	100.0	
Total	10	12.5	20	25	50	62.5	80	100.0	
Sweet milk tea and coffee									
Severe-Undernutrition	0	0.0	0	0.0	0	0.0	0	0.0	
Underweight	1	16.7	0	0.0	5	83.3	6	100.0	
Normal	18	52.9	8	23.5	8	23.5	34	100.0	0.235
Overweight	11	31.4	7	20.0	17	48.6	35	100.0	
Obesitas	0	0.0	3	60.0	2	40	5	100.0	
Total	30	37.5	18	22.5	32	40	80	100.0	
Energy Drink									
Severe-Undernutrition	0	0.0	0	0.0	0	0.0	0	0.0	
Underweight	4	66.7	1	16.7	1	16.7	6	100.0	
Normal	32	94.1	2	5.9	0	0.0	34	100.0	0.323
Overweight	32	91.4	1	2.9	2	5.7	35	100.0	
Obesitas	5	6.3	0	0.0	0	0.0	5	100.0	
Total	73	91.3	4	5.0	3	3.8	80	100.0	

* Significant differences (p<0.05) (*Rank Spearman*)

DISCUSSION

SSB consumption habits in adolescents

Currently, the incidence of obesity is increasing, including in children and adolescents. Limited access to healthy food is one of the things that becomes an obstacle for children and teenagers having a healthy lifestyle. Apart from that, high access to unhealthy food and drinks also triggers an increase in the problem of obesity. One thing that plays a role in unhealthy eating and drinking habits is the consumption of SSB (UNICEF, 2022). The habit of consuming SSB in various types is a habit that is currently trending among adolescents (Setyawati et al., 2023) . Some examples of SSB that are often consumed include soft drinks, coffee, sweet tea, energy drinks, milk, and juice (Hardy et al., 2018; Wicaksari, 2023). Research conducted by Hardy et al (2018) shows that teenagers most like to consume SSB in the energy drink category. Other research conducted in Surabaya showed that the type of SSB most frequently consumed by teenagers was sweet tea compared to other types of SSB (Elkarima et al., 2023).

Based on the results obtained in this study, it can also be seen that the frequency of SSB consumption among teenagers is a popular thing. There are many types of SSB that are often consumed with the highest frequency, namely sweet tea (62,5%), sweet coffee, and soft drinks (31,3%). This shows that this research is in line with previous research that has been conducted and shows the same trend regarding SSB consumption habits in adolescents and the types consumed are also similar, namely types of SSB that have high sugar content such as sweet tea and soft drinks (Elkarima et al., 2023; Hardy et al., 2018; Setyawati et al., 2023; UNICEF, 2022). The habit of consuming SSB in teenagers needs to be of concern because high consumption of SSB can have a negative impact on the body. Some of the

impacts that can result from excessive consumption of SSB include increased incidence of obesity, decreased oral health, and increased risk of non-communicable diseases in adolescents such as diabetes mellitus, cardiovascular and other diseases (Calcaterra et al., 2023; Hodge et al., 2018; Park et al., 2023). The Indonesian Ministry of Health has recommended a maximum daily sugar intake of 50 grams (4 tablespoons). This recommendation is important to carry out to achieve a healthy body, one of the efforts is to regulate SSB consumption in adolescents (Kemenkes, 2014).

Relationship between SSB consumption and nutritional status

SSB consumption in teenagers is one of the biggest sources of sugar in their daily lives. Many studies have strong evidence showing a link between SSB consumption and the incidence of weight gain and obesity. Apart from that, SSB consumption which is becoming a trend among teenagers also has an impact on increasing unhealthy calorie intake which triggers unhealthy eating habits in children and teenagers (Malik & Hu, 2022; Park et al., 2023; UNICEF, 2022). Excessive consumption of SSB has been proven to have an impact on weight gain and cause excess nutrition. Obesity that occurs is not only obesity as measured by BMI-for-age but also central obesity in adolescents. This will increasingly become a problem if it is not prevented so that SSB consumption in teenagers does not become increasingly excessive and repeated (Elkarima et al., 2023; Gui et al., 2017; UNICEF, 2020).

Based on the results obtained in this study, it is known that each type of SSB consumed by adolescents has a different impact on weight gain. This research shows that soft drink SSB has a relationship with nutritional status in adolescents. The research is in accordance with previous research which shows the same results, namely that each type of SSB has a different impact on weight gain, with the type of SSB in the soft drink category having a significant impact on weight gain in adolescents (Hardy et al., 2018). This is thought to be because soft drinks are one of the best-selling drinks and are often found by students during school breaks, mealtimes and (SSB) cause an addictive effect to drink again after the first drink. SSBs are a source of additional calories with no nutritional value and may replace dietary energy sources (Calcaterra et al., 2023).

Soft drink consumption can be used as an indicator of poor consumption patterns related to increased calorie intake and can replace nutritious foods (Nurwanti et al., 2019). Other research shows that around 30% of teenagers in the study who drank ≥1 cup of SSB every day were overweight or obese, but the prevalence was higher among teenagers who drank SSB in the

new generation of teenagers. This research did not find a consistent relationship between those with a lower intake of sugar sweetened beverages and the likelihood of having more nutritional status (Hardy et al., 2018). This research obtained results showing that soft drink consumption has a relationship (p<0.05). There are many factors that influence the nutritional status of adolescents, including family income, dietary patterns, problems with malnutrition, excessive nutritional patterns, physical growth, freedom in choosing food, time and financial aspects (Nurmala, 2018). Excessive sugar content in sweetened drinks causes fat accumulation to have a 5.6x greater risk of obesity (Qoirinasari et al., 2018). In another study with 224 teenage respondents, it was found that teenagers who received non-calorie drinks experienced weight loss and had a lower BMI-for-Age compared to teenagers who continued to consume SSB intake (Calcaterra et al., 2023). Currently, several efforts have been made to help limit SSB consumption in adolescents. Strict regulations regarding SSB are needed to ensure that there is no excess consumption of SSB, and consumers can also have good knowledge in choosing foods or drinks with certain sugar content. Apart from that, a tax program on SSB drinks is also needed (Sartika et al., 2022; UNICEF, 2022)

CONCLUSION

Based on the results of this research, it can be concluded that there is a relationship between the consumption of sugar sweetened beverages and the nutritional status of adolescents at SMKN 32 Jakarta who consume soft drinks. Overnutrition among women was 77.1% compared to male respondents who experienced overnutrition at 22.9%. Softdrink consumption has a relationship with the nutritional status of the subject.Further research is needed regarding the consumption of sugar sweetened beverages and its relationship with nutritional status in adolescents.

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REFERENCES

1. Akhriani, M., Fadhilah, E., & Kurniasari, F. N. 2016. Hubungan konsumsi minuman berpemanis dengan kejadian kegemukan pada remaja di SMP Negeri 1 Bandung. Indonesian Journal of Human Nutrition. 3(1): 29–40.
2. Calcaterra, V., Cena, H., Magenes, V. C., Vincenti, A., Comola, G., Beretta, A., Napoli, I. Di, & Zuccotti, G. 2023. Sugar-Sweetened beverages and metabolic risk in children and adolescents with obesity : A narrative review. Nutrients. 15(702):1–19, https://doi.org/10.3390/nu15030702.

3. Elkarima, E., Abihail, C. T., Priambudi, D. A., Mahmudiono, T., & Megatsari, H. 2023. College Students' behavior consuming sugar-sweetened beverages (SSB) during the covid-19 pandemic. Amerta Nutrition, 7(2):185–191, https://doi.org/10.20473/amnt.v7i2.2023.185-191.

4. FAO, IFAD, UNICEF, W. & W. 2022. The state of food security and nutrition in the world 2022. Repurposing food and agricultural policies to make healthy diets more affordable. In Rome, FAO. https://doi.org/10.4060/cc0639en The. https://doi.org/10.4060/cc6550en.

5. Gui, Z., Zhu, Y., Cai, L., Sun, F., & Chen, Y. 2017. Sugar-Sweetened beverage consumption and risks of obesity and hypertension in chinese children and adolescents : A National cross-sectional analysis. Nutrients. 9(1302): 1–14, https://doi.org/10.3390/nu9121302.

6. Hardy, L. L., Bell, J., Bauman, A., & Mihrshahi, S. 2018. Association between adolescentsâ€™ consumption of total and different types of sugar-sweetened beverages with oral health impacts and weight status. Australian and New Zealand Journal of Public Health, 42(1): 22–26, https://doi.org/10.1111/1753-6405.12749

7. Hodge, A. M., Bassett, J. K., Milne, R. L., English, D. R., & Giles, G. G. 2018. Consumption of sugar-sweetened and arti fi cially sweetened soft drinks and risk of obesity-related cancers. Public Health Nutrition. 21(9): 1618–1626,https://doi.org/10.1017/S1368980017002555.

8. Intantiyana, M., Widajanti, L., & Rahfiludin, M. Z. 2018. Hubungan citra tubuh, aktivitas fisik dan pengetahuan gizi seimbang dengan kejadian obesitas pada remaja putri gizi lebih di SMA Negeri 9 Kota Semarang. Jurnal Kesehatan Masyarakat. 6(5): 404–412.

9. Izhar, M. D. 2020. Determinan kejadian overweight pada wanita usia subur di kota jambi. Jurnal Ilmiah Universitas Batanghari Jambi. 20(2): 410–417, https://doi.org/10.33087/jiubj.v20i2.951

10. Kemenkes. 2014. Pedoman Gizi Seimbang.

11. Kemenkes. 2018. Laporan Riskesdas 2018 Nasional.pdf. In Lembaga Penerbit Balitbangkes (p. hal 156).

12. Kemenkes RI. 2022. Hasil Survei Status Gizi Indonesia (SSGI) 2022. Kemenkes, 1–150.

13. Kementerian Kesehatan RI. 2020. Peraturan Menteri Kesehatan Republik Indonesia Nomor 2 Tahun 2020 Tentang Standar Antropometri Anak. 21(1), 1–9.

14. Malik, V. S., & Hu, F. B. 2022. The role of sugar-sweetened beverages in the global epidemics of obesity and chronic diseases. Nature. 18, 205–218. https://doi.org/10.1038/s41574-021-00627-6.

15. Nurmala, D. 2018. Hubungan pengetahuan dan konsumsi sugar sweetened beverages dengan status gizi remaja Di SMPN 3 Surakarta. In *SKRIPSI*. Universitas Muhammadiyah Surakarta.

16. Nurwanti, E., Hadi, H., Chang, J.-S., Chao, J. C.-J., Paramashanti, B. A., Gittelsohn, J., & Bai, C.-H. (2019). Rural–urban differences in dietary behavior and obesity: results of the riskesdas study in 10–18-year-old indonesian children and adolescents. Nutrients. 11(2813), 1–14.

17. Park, S., Lee, S. H., Merlo, C., & Blanck, H. M. 2023. associations between knowledge of health risks and sugar-sweetened beverage intake among US adolescents. Nutrients. 15(2408): 1–10.

18. Qoirinasari, Simanjuntak, B. Y., & Kusdalinah. 2018. Berkontribusikah konsumsi minuman manis

terhadap berat badan berlebih pada remaja ?. Jurnal AcTion. 3(3): 88–94. https://doi.org/10.30867/action.v3i2.86.

19. Sartika, R. A. D., Atmarita, Duki, M. I. Z., Bardosono, S., Wibowo, L., & Lukito, W. 2022. Consumption of sugar-sweetened beverages and its potential health implications in Indonesia. Kesmas: Jurnal Kesehatan Masyarakat Nasional. 17(1): 1–9, https://doi.org/10.21109/kesmas.v17i1.5532.

20. Setyawati, N., Ulvie, Y. N. S., Sulistiani, R. P., & Firdananda, F. J. 2023. Relationships of screen time and sugar-sweetened beverages consumption with body fat percentage in female students in Semarang. J. Gizi Pangan. 18(Supp.1), 122–124, http://journal.ipb.ac.id/index.php/jgizipangan.

21. UNICEF. 2019. Landscape analysis of overweight and obesity in indonesia.

22. UNICEF. 2020. UNICEF advocacy strategy guidance for the prevention of overweight and obesity in children and adolescents. (Vol. 23, Issue 1). UNICEF. https://doi.org/10.17116/profmed202023011142.

23. UNICEF. 2022. Policy Brief Sugar-Sweetened Beverage Taxation.

24. United Nation. 2021. Global Nutrition Report 2021. In global nutrition report (Issue June). https://globalnutritionreport.org/documents/851/2021_Global_Nutrition_Report_aUfTRv0.pdf

25. Wicaksari, S. A. 2023. Source of sugar-sweetened beverages consumption among Indonesian: A mini review. Journal of Global Nutrition (JGN). 2(2): 151–159.

26. Widianto, F., Mulyono, S., & Fitriyani, P. 2017. Remaja bisa mencegah gizi lebih dengan meningkatkan self-efficacy dan konsumsi sayur-buah. Indonesian Journal of Nursing Practices, 1(2), 16–22. https://doi.org/10.18196/ijnp.1257.

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25