ANALYSIS OF SWEET DRINK HABITS ON DIABETES RISK PERCEPTIONS AMONG UNDERGRADUATE NURSING STUDENTS AT IKES PAYUNG STATE UNIVERSITY, PEKANBARU

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Abstract

Sugar Sweetened Beverages (SSB) are defined as drinks containing simple sugar or added caloric sweeteners that increase the amount of energy content. High sugar consumption from sweetened drinks can increase the risk of metabolic syndrome, including type 2 diabetes mellitus. Diabetes Mellitus (DM) is a disease caused by metabolic disorders that are characterized by increased blood sugar levels or hyperglycemia. This study aims to determine the relationship between the frequency and pattern of consumption of sweet drinks and the risk of developing diabetes mellitus. The research sample was 42 respondents of S1 Nursing students at IKES Payung Negeri Pekanbaru. The research instrument used a semi-quantitative food frequency questionnaire (SQ-FFQ) and a DM risk perception questionnaire that had been tested for validity and reliability. The analysis used was univariate analysis with respondent characteristics and bivariate analysis with the chi-square test. Based on the results of the study, it showed that the consumption of sweet drinks in the high category was 100 people (34.7%) and the consumption of sugar in sweet drinks in the higher category was 166 people (57.6%). The results of the chi square statistical test showed a p-value of 0.003 which is smaller than 0.05, so H0 is rejected. This indicates a significant relationship between the frequency of sweet drinks and the perception of DM risk in undergraduate nursing students at IKES Payung Negeri Pekanbaru.

Keywords: *Sweet Drinks, Diabetes Mellitus, Student*

INTRODUCTION

Diabetes Mellitus (DM) is a metabolic disorder characterized by elevated blood sugar levels, or hyperglycemia. Laboratory blood chemistry tests in DM patients show a fasting blood sugar level of >126 mg/dL in the morning and >200 mg/dL 2 hours after eating, or a temporary blood sugar level of >200 mg/dL (Fatimah, 2015) (Fatmona et al., 2023). DM can lead to various macrovascular and microvascular complications. DM can lead to cardiovascular disorders, which are quite serious if not promptly treated, increasing the risk of hypertension and myocardial infarction (Lestari et al., 2021).

According to the World Health Organization (WHO,) (2020) diabetes is a chronic metabolic disease characterized by elevated blood glucose (or blood sugar) levels, which can lead to serious diseases such as heart, blood vessel, eye, kidney and nerve damage. The most common type of diabetes is type 2 diabetes, generally suffered by adults, which occurs when the body becomes resistant to insulin, or does not produce enough insulin needed by the body. In the last 3 decades, the incidence of diabetes has increased drastically in many countries (WHO, 2020) (Delani, 2023).

This increase in cases is due to changes in diet and shifting consumption patterns. Junk food is a type of food that is high in fat, salt, and carbohydrates, typically found in snacks and fast food. High fat, salt, and carbohydrate content are known to contribute to the incidence of type 2 diabetes mellitus in Indonesians (Siregar A, Kaban R, 2023).

Based on data from the Riau Provincial Health Office, of the 12 regencies in Riau Province, the number of DM cases was 13,891 and Pekanbaru City had the first place in DM case visits with 12,325 visits (Riau Provincial Health Office, 2015) (Fadhli, 2022).

Sugar-sweetened beverages (SSBs) are defined as beverages containing simple sugars or added caloric sweeteners to increase their energy content. Types of sweetened beverages include carbonated drinks, coffee, fruit juice, milk, tea, sports drinks, energy drinks, yogurt, and supplement drinks. In Indonesia, these sweetened beverages contain around 16–34 grams of sugar per serving. This contributes to a relatively high sugar contribution to energy in sweetened beverages, accounting for 75.68% of total daily energy. Meanwhile, the Ministry of Health recommends limiting added sugar consumption to no more than 10% of total daily energy needs, equivalent to 4 tablespoons of sugar (50 grams) (Rizma, 2024).

According to the 2023 Indonesian Health Survey (SKI) report, the highest proportion of sugary drink consumption habits, with a frequency of 1-6 times per week, is in the 19-29 year old age group, or young adults, at over 40%. This is also influenced by the activities and routines carried out by young adults. The majority of this age group are students or workers who have the perception that sugary drinks are social drinks and are often served at meetings, and are consumed continuously despite being aware of the impact of excessive SSBs consumption on health, which then influences their consumption and drinking habits. This is supported by Masri's research, which reported that the level of consumption of high-calorie drinks tends to be higher among students with poor knowledge (73%) compared to students with good knowledge (39.1%). SSBs are drinks with sweeteners or added sugars, including corn sugar, fructose, glucose, High-Fructose Corn Syrup (HFCS), lactose, maltose, sucrose, and others (Centers for Disease Control and Prevention, 2017; Prahastuti, 2011). High sugar consumption from sweetened beverages can increase the risk of metabolic syndrome, including type 2 diabetes mellitus (Jayanti et al., 2021).

Research conducted by Islamiyati (2014) on knowledge, attitudes, and consumption practices of instant drinks indicated that 91.7% of students frequently consumed instant foods and drinks had a very high level of understanding. Limited time during meals makes students prefer instant foods and drinks. These results reflect students' lack of understanding of the negative impacts of repeated consumption of instant foods and drinks, which is reflected in their high consumption of these types of foods. Consumption of sweetened beverages has been a major contributor to increased added sugar intake and is associated with increasing cases of obesity and type 2 diabetes mellitus. Furthermore, sweetened beverages have high sugar content, but do not provide a feeling of fullness and have low nutritional value. In addition to physical impacts, blood sugar fluctuations associated with high sugar consumption can also affect adolescents' emotional stability, causing sudden mood swings and feelings of instability (Nurjayanti et al., 2020) (Ningsih et al., 2024).

Based on a preliminary study conducted by the author by interviewing 10 undergraduate nursing students, it was found that 70% (7 out of 10) of the students consumed sweetened drinks. Students could consume them 2-3 times a day with different types of drinks such as coffee, tea, fruit juice, milk, yogurt, and packaged drinks. Meanwhile, 30% (3 out of 10) of the students said they only consumed them once a day.

From the above phenomenon, the author is interested in conducting research on the analysis of sweet drink habits towards the perception of diabetes risk in undergraduate nursing students at the Pekanbaru State Health Institute.

RESEARCH METHODS

This research is quantitative, using a cross-sectional approach. The sample size was 288 undergraduate nursing students. The sampling technique used was probability sampling. This study used a semi-quantitative food frequency questionnaire (SQ-FFQ) and a DM risk perception questionnaire, both of which had been tested for validity and reliability. The collected data were analyzed using univariate and bivariate analyses (chi-square test). The aim of this study was to determine the relationship between the frequency and pattern of sugary beverage consumption and the risk of developing diabetes mellitus.

RESEARCH RESULTS

Table 1. Frequency Distribution of Student Characteristics at the State Islamic Health Institute (IKES) in Pekanbaru (N=288)

No	Kharakteristik	Frekuensi (n)	Persentase(%)
1	**Umur**		
	17 Tahun	1	0,3
	18 Tahun	37	12,8
	19 Tahun	68	23,6
	20Tahun	80	27,8
	21 Tahun	72	25,0
	22 Tahun	26	9
	23 Tahun	4	1,4
	Total	**288**	**100%**
2	**Jenis Kelamin**		
	Laki Laki	41	14,2
	Perempuan	247	85,8
	Total	**81**	**100%**
3	**Indeks Masa Tubuh**		
	Kurus	21	7,3
	Normal	101	35,1
	Berlebihan	158	54,9
	Obesitas 1	6	2,1
	Obesitas 2	2	0,7
	Total	**81**	**100%**

Source: Primary Data

Table 1 shows that nearly half of the respondents (27.8%) were under 20 years of age, and almost all (85.8%) were female. For body mass index, more than half (54.9%) had a BMI in the overweight category.

Table 2. Frequency Distribution of Respondents Based on Type of Sweet Drinks Consumed (N=288)

No	Kategori	Mean (min-maks)
1	*Soft Drink*	0,99(0-5)
2	*Fruit Drink*	2,24(0-11)
3	*Sport Drink*	1(0-6)
4	*Energy drink*	0,18(0-4)
5	*Flavored Milk*	1,80(0-6)
6	*Coffe & Tea*	2,32(0-11)

Source: Primary Data

From table 2, it can be seen that the types of drinks most frequently consumed by respondents in this study were coffee & tea, with an average consumption of 2.32 in the range of 0 to 11 types of drinks consumed.

Table 3. Frequency Distribution of Respondents Based on the Frequency of Sweet Drinks Consumed in 1 Week (N=288)

No	Konsumsi Minuman Berpemanis	Frekuensi (n)	Persentase (%)
1	Kurang	97	333,7
2	Cukup	91	31,6
3	Tinggi	100	34,7%
	Total	288	100%

Source: Primary Data

Dari tabel 3 didapatkan hampir separuhnya responden (34,7%) mengkonsumsi minuman manis dengan kategori tinggi 5-6x/minggu sebanyak 100 orang.

Tabel 4. Frequency Distribution of Respondents Based on Sugar Consumption in Sweet Drinks (N=288)

No	Konsumsi Gula/Gram	Frekuensi(n)	Persentase(%)
1	Cukup: <50g/hari	122	42,4
2	Lebih: >50g/hari	166	57,6
	Total	**288**	**100%**

Dari tabel 4 didapatkan lebih dari separuhnya responden (57,6%) mengkonsumsi gula dalam minuman manis dengan kategori lebih dari 50g/hari sebanyak 166 orang.

DISCUSSION

Frequency Distribution of Student Characteristics at the State Islamic Health Institute (IKES) in Pekanbaru (N=288)

1. Age

Based on the research results, almost half of the respondents (27.8%) were 80 people aged 20 years. According to Damayanti et al. (2022), the 21-year-old age group showed a high tendency to consume sweet drinks, with 225 respondents (47.2%). This is due to a strong urge to keep up with the times and try new things, as well as environmental influences that make them tend to imitate the lifestyles of their peers.

Age is a common risk factor for diabetes mellitus patients. As we age, our bodies process carbohydrates and release insulin differently. Insulin plays a role in regulating blood glucose levels and controlling the amount of glucose that can enter cells (Susanti, Maulida, et al., 2024). According to researchers' assumptions, it can be concluded that high consumption of sugary drinks among 20-21 year olds is influenced by current trends and peer influence. As we age, the body has difficulty regulating carbohydrates and insulin, which increases the risk of diabetes.

2. Gender

Based on the research results, almost all (85.8%) were female, totaling 247 people. Research conducted (V. Rahayu et al., 2024) found that most respondents in this study were female, with a total of 229 people (89.1%). Women tend to consume sweet foods as a way to cope with stress. Stress can trigger the release of corticotropin releasing factor (CRF) from the paraventricular nucleus (PVN) of the hypothalamus, which then stimulates the synthesis of adrenocorticotropic hormone (ACTH) in the anterior pituitary. ACTH then stimulates the adrenal cortex to produce glucocorticoids (GC) such as cortisol or corticosterone. Cortisol released by the adrenal glands can increase the desire to consume sweet foods.

According to the researcher's assumptions, it can be concluded that women tend to consume sweet foods or drinks.

3. Body Mass Index

Based on the research results, more than half (54.9%) had a BMI in the overweight category, amounting to 158 people. BMI is a simple comparison between body weight and height used to determine the categories of overweight and obesity in individuals (Kinansi et al., 2023).

Obesity can be measured using body mass index (BMI), with the WHO Asia-Pacific threshold of 25 kg/m². In young adults, a high BMI is associated with an increased risk of diabetes mellitus, with the odds of developing the disease being approximately 1.28 to 1.83 times greater. Unhealthy dietary patterns can also increase the risk of diabetes mellitus in this age group. Individuals aged 15 years and older who frequently consume sweet foods or drinks, as well as high-fat foods, are at greater risk of developing diabetes (Kinansi et al., 2023).

According to the researchers' assumptions, it can be concluded that the large number of people with overweight BMIs indicates that obesity remains a problem that requires attention. A high BMI can increase the risk of diabetes, especially when combined with an unhealthy diet.

Frequency Distribution of Respondents Based on Type of Sweet Drinks Consumed (N=288)

1. Types of Sweet Drinks

Based on the research results, it was found that the types of beverages most frequently consumed by respondents in this study were coffee and tea, with an average consumption of 2.32, ranging from 0 to 11 types of beverages consumed. The current trend of consuming sweetened beverages contributes to increased calorie and sugar intake, which can trigger obesity and various degenerative diseases such as diabetes mellitus, heart disease, and gout (Hanifah et al., 2023).

This finding is in line with research (V. Rahayu et al., 2024) which found that the most frequently consumed type of sweetened beverage is tea, with a percentage of 46.7%. The popularity of tea as a sweetened beverage is supported by its ease of preparation, its availability in various outlets around campus at pocket-friendly prices, and a variety of flavor choices. In

addition, as one of the largest tea producers in the world, Indonesia has wide access to this beverage, making it increasingly accessible to respondents (Manumono & Listiyani, 2023).

According to the researchers' assumptions, it can be concluded that coffee and tea are the sweet drinks most frequently consumed by respondents. High consumption of these beverages increases the risk of obesity and degenerative diseases.

2. Frequency of Consuming Sweet Drinks

Based on the research results, almost half of the respondents (34.7%) consumed sweetened beverages in the high category 5-6 times/week, amounting to 100 people. This finding is in line with research (Adelia et al., 2024) which showed that of the 86 respondents, almost all (98.84%) consumed sweetened beverages ≥3 times/week, which is included in the high category.

Research (Sim et al., 2019) shows that adolescents in Korea tend to consume higher amounts of sweetened beverages, averaging seven or more times per week. This consumption rate is influenced by various factors, such as parental habits, attitudes toward limiting sweetened beverages, availability at home, gender, and environmental factors such as peer influence, TV viewing time, stress levels, sleep quality, and frequency of fast food consumption (Imoisili et al., 2020).

According to researchers' assumptions, it can be concluded that high consumption of sugary drinks is influenced by lifestyle, family habits, and social factors. If left unchecked, these habits can increase the risk of health problems later in life.

3. Sugar Consumption in Sweet Drinks

The study found that more than half of the respondents (57.6%) consumed sugar in sweetened beverages, exceeding 50g/day (166 people). This finding aligns with research by Adelia et al., 2024, which found that more than half of the respondents (58.1%) consumed sweetened beverages exceeding 50g/day. Research by Russo et al., 2020 found a much higher figure, with the average consumption of sweetened beverages among adolescents reaching 600.73g/day.

Sugar-sweetened beverages (SSBs) are high in calories without providing a feeling of fullness and have low nutritional value. Examples include soda, fruit juice, coffee, sweet tea, and energy drinks. Excessive consumption of SSBs is associated with an increased risk of overweight, obesity, and diabetes mellitus. The frequency and amount of sugar in beverages consumed can accelerate weight gain. Therefore, preventative measures are needed to reduce the habit of consuming sugar-sweetened beverages to reduce the incidence of obesity and other metabolic diseases (Hanifah et al.,2023).

According to the researcher's assumptions, it can be concluded that high sugar consumption in sweet drinks of more than 50g/day is related to the risk of obesity and diabetes. The discussion section presents the findings logically, linking them to relevant sources. The discussion is argumentative, addressing the relevance of the findings, theory, previous research, and empirical evidence, and demonstrating the novelty of the findings. The discussion should consist of 80% primary references. The discussion should be written in Tahoma 10 font, 1.5 spacing.

CONCLUSION

Based on the research objectives and research results on the Analysis of Sweet Drink Habits on Diabetes Risk Perceptions in Undergraduate Nursing Study Program Students at Ikes Payung Negeri Pekanbaru, it can be concluded:

1. Based on the research results, the most frequently consumed beverages by respondents in this study were coffee and tea, with an average consumption of 2.32, ranging from 0 to 11 beverages consumed.
2. Based on the research results, almost half of the respondents (34.7%) consumed sugary drinks in the high category 5-6 times/week, a total of 100 people.
3. Based on the research results, more than half of the respondents (57.6%) consumed sugar in sweetened drinks in the category of more than 50g/day, a total of 166 people.
4. Based on the research results, the chi-square statistical test showed a p-value of 0.003, which is less than 0.05, so H0 is rejected. This indicates a significant relationship between the frequency of sugary drinks and the perceived risk of diabetes among undergraduate nursing students at the Pekanbaru State Health Institute (IKES Payung Negeri). The conclusion is written in Tahoma 10 font. The conclusion contains a brief summary of the research results and discussion, written in one or two paragraphs. Conclusions are research findings in the form of answers to research questions or research objectives, written in essay form, not in statistical sentences.

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