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Consumption of Risky Foods as a Risk Factor for Diabetes Mellitus in Indonesia

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Abstract

Background: Diabetes Mellitus (DM) is a non-communicable disease whose prevalence continues to increase in Indonesia and the world. Based on the 2023 Indonesian Health Survey (SKI) report, consumption of risky foods such as sweet foods and drinks, fatty/fried foods, salty foods, processed foods, and soft drinks is still high in various community groups. Several studies have shown that consumption of foods high in sugar and fat is closely related to an increase in the incidence of DM. Therefore, an in-depth analysis is needed regarding the pattern of consumption of risky foods as the main factor in the development of DM in Indonesia. Objective: This study aims to analyze the relationship between consumption of risky foods and the incidence of DM in Indonesia based on data from SKI 2023. Method: The method used in this study is quantitative descriptive analysis based on secondary data from SKI 2023 and several related scientific articles. The analysis was conducted using a cross-sectional approach to see the consumption patterns of risky foods in various community groups, and analyzed univariately to determine the consumption of risky foods with the incidence of DM. Results: Consumption of risky foods in Indonesia is still high, especially among children, adolescents, and people with low levels of education. As many as 47.5% of the population consumes sweet drinks every day, while fatty and fried foods are consumed by 37.4% of the population every day. Consumption of risky foods is more common in young age groups, who are at high risk of obesity and prediabetes. In addition, people with low education tend to consume more processed foods and fatty foods than those with higher education. Various interventions are needed to reduce the risk of DM due to unhealthy food consumption patterns.

Keywords: diabetes mellitus, consumption of risky foods, healthy lifestyle, sweet drinks, unhealthy eating patterns

INTRODUCTION

Diabetes Mellitus (DM) is one of the non-communicable diseases (*Non-Communicable Diseases/NCDs*) whose prevalence continues to increase globally, including in Indonesia. Based on data from *the International Diabetes Federation (IDF)*, the number of DM sufferers in Indonesia has increased significantly from 9.1 million in 2014 to 14.1 million in 2035 In fact, it is predicted that this number could continue to increase to more than 21 million in 2030 (WHO, 2015). This disease not only impacts the quality of life of individuals, but also causes a large economic burden due to the high cost of treatment and the complications it causes (Rahati et al., 2014).

One of the main factors contributing to the increasing incidence of DM is unhealthy food consumption patterns. Excessive consumption of foods high in sugar, fat, and salt has been shown to increase the risk of insulin resistance and obesity, which are major predisposing factors in the development of DM (Veridiana & Nurjana, 2019). Based on data from *the 2023 Indonesian Health Survey (SKI)*, consumption of risky foods in Indonesia is still very high, especially among children, adolescents, and people with low levels of education. As many as 47.5 % of the population consumes sweet drinks every day, while 37.4% of the population consumes fatty and fried foods every day (SKI, 2023).

Studies show that consumption of foods high in sugar and fat not only increases the risk of obesity but also contributes to an increase in prediabetes rates among adolescents and young adults. Research in Jayapura City found that a sedentary lifestyle and consumption of sweet foods/drinks had

a significant relationship with the incidence of obesity and prediabetes in adolescents (Asriati, 2023). In addition, other studies have shown that elderly people who consume *sugar-sweetened beverages (SSBs)* have a much higher risk of DM than those who do not consume them (p = 0.000; OR = 9.375) (Ramadhani & Mahmudiono, 2018; Syauqy et al., 2023).

Apart from diet, demographic aspects such as education level, type of work, and economic status also influence risky food consumption patterns. People with low levels of education tend to consume more processed foods and fatty foods due to limited access to information on balanced nutrition (SKI, 2023). Meanwhile, informal workers and self-employed people tend to consume more fast food due to convenience and time efficiency (Almarshad et al., 2022).

The increasing incidence of DM in Indonesia due to unhealthy food consumption patterns requires an in-depth study to understand the factors that contribute to this risky diet. A comprehensive analysis is needed to identify vulnerable groups, risky food consumption patterns based on socio-demographic factors, and the relationship between risky food consumption and DM incidence in Indonesia. The results of this study are expected to be the basis for the government and policy makers in designing more effective interventions, such as strengthening nutritional education, regulation of sugar and fat consumption, and promotion of a healthy lifestyle through national programs such as the Healthy Community Movement (GERMAS) (Afriyanti, 2023).

Considering the high rate of risky food consumption and the increasing prevalence of DM, this study is very important to provide a deeper understanding of how risky food consumption habits contribute to the increase in DM cases in Indonesia. This study aims to analyze the relationship between risky food consumption and DM incidence in Indonesia based on data from SKI 202.

METHOD

This study uses a descriptive analytical study design with a quantitative approach. cross-sectional, which aims to analyze the consumption of risky foods as a risk factor for the incidence of Diabetes Mellitus (DM) in Indonesia. This design was chosen to obtain an overview of the pattern of consumption of risky foods and their relationship to the incidence of DM based on secondary data from *the 2023 Indonesian Health Survey (SKI)*. The study aims to provide a comprehensive understanding of how consumption of risky foods contributes to the incidence of DM in Indonesia.

RESULT & DISCUSSION

Table 1. Proportion of Risky Food Consumption Habits in Indonesia

Types of Risky Foods	≥1 time per day (%)	1 – 6 times per week (%)	≤3 times per month (%)
Sweet Food	33.7	56.2	10.1
Sweet Drinks	47.5	43.3	9.2
Salty Food	30.4	52.2	17.4
Fatty/Cholesterol/Fried Foods	37.4	51.7	11.0
Grilled Food	4.5	41.3	54.1
Processed Foods with Preservatives	7.8	45.4	46.7
Soft Drink / Carbonated Drink	2.5	11.9	85.6

Source: Indonesian Health Survey, 2023

Based on Table 1, it is known that the majority of risky foods consumed by the public ≥1 time per day are sweet drinks (47.5%), risky foods consumed by the public 1-6 times per week are sweet foods (56.2%), and risky foods consumed by the public ≤ 3 times per month are soft drinks/carbonated drinks (85.6%).

Table 2. Proportion of Consumption of Risky Foods Based on Age Group and Education

Characteristics	Sweet Food (%)	Sweet Drinks (%)	Salty Food (%)	Fatty Foods (%)	Grilled Food (%)	Soft Drinks (%)
Age						
3 – 4 years	50.1	51.4	30.2	30.0	4.2	1.9
5 – 9 years	49.3	53.0	33.7	36.9	5.6	2.8
10-14 years	42.9	50.7	33.3	39.8	5.4	3.2
15-19 years	35.3	45.8	32.2	39.0	4.9	3.2
20-24 years	33.0	44.3	32.5	37.6	5.1	3.4
25-29 years old	31.8	45.0	30.8	38.1	4.7	2.9

Characteristics	Sweet Food (%)	Sweet Drinks (%)	Salty Food (%)	Fatty Foods (%)	Grilled Food (%)	Soft Drinks (%)
30-34 years	31.5	46.1	30.9	38.6	4.4	2.5
35-39 years	31.5	48.3	30.7	39.3	4.8	2.4
40-44 years	30.0	48.3	30.3	38.2	4.2	2.1
45-49 years	29.3	47.9	29.2	38.5	4.1	1.9
50-54 years	28.3	47.1	28.9	37.6	4.2	1.9
55-59 years	27.6	47.1	27.9	36.5	3.9	1.8
60-64 years	26.2	46.3	26.7	35.6	3.8	1.6
65+ years	25.0	45.2	24.8	32.1	3.1	1.6
Education						
No school	39.3	49.2	31.8	35.3	6.8	2.8
Did not finish elementary school	40.1	50.2	31.5	37.1	5.3	2.7
Graduated from elementary school	31.1	48.8	32.2	39.6	4.1	2.3
Graduated from junior high school	32.2	48.0	31.4	39.5	4.2	2.6
Graduated from high school	30.5	45.4	28.5	36.8	4.2	2.4
Graduated D1/D2/D3/PT	30.2	41.2	26.5	34.4	4.2	2.1

Source: Indonesian Health Survey, 2023

Based on Table 2, it is known that consumption of sweet foods/drinks highest in children (3-9 years), consumption of high-fat foods in the productive age group (20-39 years), while Respondents with low education consume more risky foods, especially sweet and salty foods (50.2% and 31.8%).

The 2023 Indonesian Health Survey (SKI) report, as many as 47.5 % of the Indonesian population consumes sweet drinks every day, while 33.7% of the population consumes sweet foods every day (SKI, 2023). This habit increases the risk of hyperglycemia, especially for individuals with a diet high in simple carbohydrates and low in fiber.

Diabetes Mellitus (DM) is a metabolic disease characterized by increased blood glucose levels due to impaired insulin production or function. One of the main factors contributing to the increased incidence of DM is the consumption of foods and drinks high in sugar, including sweet foods, sweet drinks, and soft drinks (Veridiana & Nurjana, 2019).

Sweetened beverages, including sweet tea, syrup, packaged juice, and energy drinks, are one of the main contributors to sugar intake in people's diets. Research conducted by Ramadhani & Mahmudiono (2018) found that consumption of sugar-sweetened beverages (SSBs) was significantly associated with an increased risk of DM in the elderly (p = 0.000; OR = 9.375). Elderly people who regularly consume sweetened drinks have a greater chance of experiencing glucose metabolism disorders due to decreased insulin sensitivity with age. In addition, another study showed that individuals who consume more than two servings of sweetened drinks per day have a 2.5 times higher risk of DM than those who rarely consume them (Asriati, 2023; Alamnia et al., 2023; Witter et al., 2015).

Soft drinks or carbonated drinks also contribute greatly to the increased risk of DM. These drinks generally contain very high sugar levels and have a glycemic index that quickly increases blood glucose levels in a short time . A study conducted by Diabetes Atlas (2021) shows that excessive consumption of soft drinks is associated with weight gain, obesity, and insulin resistance, all of which are major factors in the development of type 2 DM. In addition, research by the Indonesian Ministry of Health (2018) shows that people who regularly consume soft drinks are 1.8 times more likely to develop DM than those who do not consume them. This is due to the combination of high levels of sugar, phosphoric acid, and other additives in soft drinks that can affect the body's metabolism and cause chronic inflammation that worsens pancreatic function (Masupe et al., 2018; Locke et al., 2018).

Sweet foods, such as cakes, candies, biscuits, and chocolate, also plays a role in increasing the risk of DM, especially if consumed in excessive amounts without sufficient physical activity. A study conducted by Veridiana & Nurjana (2019) found that individuals who have a habit of consuming sweet biscuits regularly have a 1.198 times higher chance of developing DM than those who do not consume them. This consumption pattern is further exacerbated by low fiber and protein intake, which causes

blood sugar spikes to occur more quickly after eating (Yuningrum et al., 2020; Xu et al., 2019).

Based on data from *the 2023 Indonesian Health Survey (SKI),* consumption of risky foods in Indonesia is still high, especially among children, adolescents, and people with low levels of education. As many as 47.5 % of the population consumes sweet drinks every day, while 37.4% of the population consumes fatty and fried foods every day (SKI, 2023). Consumption of foods high in sugar, especially in children and adolescents, can cause repeated spikes in blood glucose levels and potentially trigger insulin resistance from an early age (Asriati, 2023). In addition, high consumption of fatty and fried foods can cause obesity, which is one of the main risk factors in the development of type 2 diabetes (Azriful Azriful, Yudi Adnan, Emmi Bujawati & Nildawati, 2024).

Diabetes Mellitus (DM) is a non-communicable disease whose prevalence continues to increase globally, including in Indonesia. Based on *the International Diabetes Federation (IDF),* the number of DM sufferers in Indonesia has increased from 9.1 million in 2014 to more than 21 million predicted in 2030. One of the main factors contributing to the increase in DM incidence is unhealthy food consumption patterns, especially those high in sugar, fat, and salt. Consumption of these risky foods has been shown to increase insulin resistance and obesity, which are major predisposing factors in the development of DM (Veridiana & Nurjana, 2019). Therefore, it is important to understand how risky food consumption patterns relate to DM incidence in Indonesia (Arifin et al., 2022; Busnatu et al., 2022).

Other studies have shown that consumption of risky foods not only affects young age groups but also the elderly. A study conducted by Ramadhani & Mahmudiono (2018) found that elderly people who consume *sugar-sweetened beverages (SSBs)* have a much higher risk of DM than those who do not consume them (p = 0.000; OR = 9.375). This shows that excessive sugar consumption still has a significant impact on the incidence of DM, even in the elderly. In addition, the body's sensitivity to insulin decreases with age, thus exacerbating the negative effects of a diet high in sugar and fat (Ramadhani & Mahmudiono, 2018; Grigolon et al., 2019).

In addition to dietary factors, socio-demographic aspects also play an important role in the consumption of risky foods and the incidence of DM. People with low levels of education tend to consume more processed foods and fatty foods due to limited access to information on balanced nutrition (SKI, 2023). In addition, informal workers and self-employed people are more likely to consume fast food because of the convenience and time efficiency (Delima Siregar, 2018). The social environment also contributes, where the habit of eating outside the home and the influence of the media in promoting unhealthy foods further increase the consumption of risky foods (Díaz-Redondo et al., 2015).

Lifestyle that includes unhealthy eating patterns is increasingly recognized as a major risk factor for the emergence of type 2 diabetes mellitus (T2DM). Consumption of high-risk foods, such as fast food, fried foods, sugary sodas, and excessive carbohydrate intake, has a strong relationship with the incidence of T2DM. Individuals who routinely consume unhealthy foods such as fried foods and fast foods, especially those consumed outside the home, are at higher risk of developing T2DM compared to those who rarely consume these foods. This happens because foods that are repeatedly fried have decreased nutritional quality and high calorie and sodium content, which significantly increase blood sugar levels (Sami et al., 2017).

In addition to diet, lack of physical activity is also a lifestyle that significantly contributes to the occurrence of T2DM. Low physical activity can cause insulin resistance, which is the main cause of type 2 diabetes mellitus. A study by Resti and Cahyati (2022) stated that lack of physical activity is significantly correlated with an increased risk of T2DM among productive age groups. This study shows that a sedentary lifestyle, which is common in urban areas such as East Jakarta, is a condition that supports the emergence of chronic diseases such as diabetes. Thus, interventions in the form of healthy eating education and increased physical activity are very important to prevent the development of type 2 diabetes mellitus in the community (Resti & Cahyati, 2022; Zainafree et al., 2025; Tanton et al., 2015).

Considering the high consumption of risky foods and the increasing prevalence of DM, more effective public health interventions are needed. Early nutrition education programs need to be strengthened through schools to reduce the habit of consuming high-sugar foods and drinks (Veridiana & Nurjana, 2019). In addition, the government must be more active in limiting unhealthy food advertisements and implementing high tax policies on products with excessive sugar content (Asriati, 2023). Healthy lifestyle campaigns, such as *the Healthy Community Movement (GERMAS),* need to be expanded to encourage changes in eating patterns and increased physical activity in the

community. With these strategic steps, it is hoped that the incidence of DM can be reduced and the quality of life of the Indonesian people can be improved.

CONCLUSION

Data from *the 2023 Indonesian Health Survey (SKI)* shows that 47.5 % of the Indonesian population consumes sweet drinks every day, 33.7% consume sweet foods every day, and 37.4% consume fatty and fried foods every day. Comprehensive efforts are needed to change people's consumption patterns and increase awareness of the importance of a healthy diet to reduce the incidence of DM in Indonesia. Further research can use longitudinal or cohort studies to track changes in food consumption patterns and their impact on the incidence of DM in the long term.

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