

CHAPTER I INTRODUCTION

A. Background

The World Health Organization (WHO) defines Diabetes Mellitus (DM) as a chronic metabolic disease, which is characterized by high blood glucose levels (hyperglycemia). This condition occurs because the pancreas does not produce enough insulin, or the body cannot use insulin effectively, or both. Uncontrolled hyperglycemia over time can cause serious damage to various organs such as the heart, blood vessels, eyes, kidneys, and nerves. WHO data states that Indonesia is the fourth country ranked as the number of diabetics after the United States, China, and India. WHO estimates that in 2030 the number of people with diabetes will increase, now the world is inhabited by 171 million people with Diabetes Mellitus and will double in 2030 (WHO, 2023).

Data from *the International Diabetes Federation* (2025) (IDF) states that Indonesia has a prevalence of Diabetes of 12.4% in 2024, and is expected to increase to 14.7% in 2050, while data in Indonesia in 2024 DM sufferers have reached 20 million people, around 73.7% of Indonesians who suffer from diabetes are not aware that they suffer from diabetes and the death rate in Indonesia has reached 1.2 million people and this caused by DM disease. The Indonesian Health Survey (2023) (SKI) stated that diabetes prevalence data in Indonesia based on blood sugar checks of 2.2% of the population aged ≥ 15 years diagnosed with DM indicates that diabetes is still a health problem that needs serious attention.

Nuzula's research also explains that pre-diabetes is closely related to the risk of diabetes that arises in adulthood, prediabetes increases

globally in all age groups, including children and adolescents, and increases significantly with age. There are several factors that contribute to the increased risk of diabetes in adolescents, namely consumption of artificially sweetened beverages and fast food, and unhealthy lifestyles (Nuzula et al., 2025)

Adolescents are a group that is very vulnerable to unhealthy consumption patterns. Changes in modern lifestyles, easy access to fast food, and the rise of packaged sweet beverages make teenagers tend to consume *junk food* and sugar-sweetened beverages excessively. The increased consumption of sweetened beverages and fast food is related to obesity and an increase in diabetes cases at a young age. This habit is more risky if it occurs in adolescents who often consume sugary drinks and fast food, because genetic factors plus an unhealthy lifestyle can accelerate the occurrence of hyperglycemia as an early stage towards diabetes (Dini Labelo et al., 2025)

Artificially sweetened beverages are often perceived as a low-calorie alternative, but some studies have shown a link with increased insulin resistance and impaired glucose metabolism. Meanwhile, *junk foods* that are generally high in saturated fats, salt, and simple carbohydrates can trigger obesity and metabolic syndrome which are the main risk factors for hyperglycemia and DM (Dini Labelo et al., 2025)

One of the biggest contributors to this problem is changes in consumption patterns, especially the drastic increase in the consumption of artificially sweetened beverages or *Sugar-Sweetened Beverages (SSBs)*. These drinks, such as soda, packaged tea, energy drinks, and contemporary milk coffee, and drinks that have a very high added sugar content, high glycemic index, and low nutritional value (Ministry of Health of the Republic of Indonesia, 2022).

Physiologically, the consumption of simple sugar in liquid form is quickly absorbed by the body, causing a spike in blood glucose (*glucose spike*)

sharp. To cope with this, the pancreas releases large amounts of insulin. Repeated and excessive consumption will overload the pancreas and over time can lead to insulin resistance, in which the body's cells become less responsive to insulin. Insulin resistance is a key mechanism underlying the occurrence of hyperglycemia and DM (Lestari, 2021).

Regular consumption of *junk food* contributes to excess calorie intake (*caloric surplus*). This excess energy is stored as fatty tissue (adipose), especially visceral fat around the abdominal organs. This excess adipose tissue is pro-inflammatory, releasing cytokines that can interfere with insulin signaling and contribute directly to insulin resistance and hyperglycemia, even regardless of sugar consumption (Pratiwi & Wahyuningsih, 2023).

The problem becomes increasingly complex because the consumption of sweetened drinks and *junk food* often occur at the same time (Pramono & Hidayati, 2021). Teens who buy fast food packages almost always pair it with fizzy drinks or other sugary drinks. This combination of the "calorie bomb" of saturated fats and simple sugars creates a double metabolic load on the body, accelerating the rate towards metabolic dysfunction and hyperglycemia.

A survey conducted at SMA Negeri 1 Bengkulu City on January 20, 2026 among grade XI students with a population of 390 showed that the consumption of artificially sweetened beverages and *junk food* was quite high among adolescents. The results of interviews from UKS show that most students often consume artificially sweetened drinks such as packaged drinks, fizzy drinks, and boba drinks, as well as fast food.

Based on the initial screening of 13 students, it was found that several students with high blood sugar levels were included in the category of consumption of high-sweetened drinks and the category of frequent junk food consumption. The results of this screening are one of the bases that show the need to conduct research on consumption habits and the risk of hyperglycemia in adolescents.

SMA Negeri 1 Bengkulu City was chosen as the location for the research because it is located in the Lempuing Village area which is a assisted village of the Bengkulu Ministry of Health Polytechnic. As part of the target area, this school is the target of various educational, research, and community service activities.

In addition, until now there have not been many studies that have examined the relationship between the consumption of artificially sweetened beverages and *junk food* with the risk of hyperglycemia in students of SMA Negeri 1 Bengkulu City. Therefore, this study is expected to provide an overview of the condition of adolescents in the school as well as be the basis for efforts to promote health and prevent non-communicable diseases from school age.

Excessive consumption of artificially sweetened beverages can increase daily sugar intake so that it has the potential to increase blood glucose levels and trigger hyperglycemia. Sugar-sweetened beverages are one of the main sources of added sugars that can increase the risk of metabolic diseases such as diabetes if consumed in excess.

Based on this phenomenon, the researcher is interested in conducting a study on the relationship between the consumption habits of artificially sweetened drinks and *junk food* to the risk of hyperglycemia in adolescents at SMA Negeri 1 Bengkulu City, to find out whether there is a relationship between these consumption patterns and an increased risk of blood sugar levels in adolescents.

B. Problem Formulation

Based on the above background, the problems that can be formulated are: Is there a relationship between the consumption habits of artificially sweetened drinks and *junkfood* to the risk of hyperglycemia in adolescents.

C. Research Objectives

The objectives of this study are:

1. General purpose

It is known that the relationship between the consumption of artificially sweetened beverages and *junk food* to the risk of hyperglycemia in adolescents.

2. Special Purpose

- a. It is known that the characteristics of the respondents include age, gender, BMI and smoking habits in adolescents at SMA Negeri 1 Bengkulu City.
- b. It is known that the frequency of artificially sweetened beverage consumption habits in adolescents at SMA Negeri 1 Bengkulu City.
- c. It is known that the frequency of *junkfood consumption* habits in adolescents at SMA Negeri 1 Bengkulu City.
- d. It is known that the relationship between the consumption of artificially sweetened beverages and the risk of hyperglycemia in adolescents at SMA Negeri 1 Bengkulu City.
- e. It is known that the relationship between *junkfood consumption habits* and the risk of hyperglycemia in adolescents at SMA Negeri 1 Bengkulu City.

D. Research Benefits

1. For Health Workers

Become a reference material in providing education and health promotion regarding the prevention of hyperglycemia and diabetes since adolescence.

2. For Teens

Providing insight into the adverse impact of artificially sweetened beverage consumption habits and *junk food* on metabolic health so that it can encourage behavior changes towards a healthier diet.

3. For Educational Institutions

It can add references to literature reading in improving the quality of education and learning materials regarding the relationship between the habit of drinking artificially sweetened drinks and *junk food* to the risk of hyperglycemia in adolescents.

4. For Other Researchers

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