CHAPTER V
RESEARCH RESULTS

A. The Course of Research

This research was carried out at SMA Negeri 1 Bengkulu City. Data collection will be carried out in May 2026 using a *cross sectional research design*, namely the measurement of independent variables and dependent variables is carried out at the same time, this researcher has already taken care of a research cover letter from an educational institution. Furthermore, the researcher submitted an application for a research permit to the Bengkulu City Investment and One-Stop Integrated Services Office (DPMPTSP). Furthermore, the licensing process is to the Bengkulu Provincial Education Office Branch as the agency in charge of SMA Negeri 1 Bengkulu City. The researcher then submitted a permit to carry out the research to the Principal of SMA Negeri 1 Bengkulu City as the location of the research, This research has obtained ethical approval from the Health Research Ethics Commission (KEPK) with Number: KEPK. BKL/396/05/20.

In its implementation, the researcher was assisted by four research assistants to support the smooth collection of data. Before the research activity was carried out, the researcher gave *a briefing* to all assistants regarding the research objectives, implementation flow, techniques for delivering information to respondents, procedures for filling out questionnaires, blood sugar check procedures during and the division of their respective tasks. *This briefing* aims to equalize perceptions so that the entire data collection process is carried out in a standardized, consistent, and in accordance with the established research procedures.

The data collection process begins with the identification of prospective respondents who meet the research inclusion criteria. Respondents who met the criteria were given an explanation of the research objectives, research benefits, research procedures, potential risks and benefits of research, and respondents' rights during the study. The researcher also explained that all data obtained will be kept confidential and only used for research purposes. After receiving this explanation, respondents who were willing to take part in the study were asked to sign an *informed consent* sheet as proof of their willingness to participate voluntarily without any coercion from any party.

During the data collection process, the researcher obtained about 50 respondents daily who met the research criteria and were willing to become respondents. This number is adjusted to the availability of students who are present at the school at the time of the research and the schedule that has been set by the school.

After the respondents agreed to participate in the study and signed an *informed consent* sheet, the researcher measured their weight and height using a calibrated measuring device to obtain a Body Mass Index (BMI) value. Furthermore, respondents were asked to fill out a questionnaire that included demographic data, diet, and smoking habits according to the conditions experienced.

After the respondents agreed to participate in the study, the respondents were asked to fill out a *modified Beverage Intake Questionnaire* (BEVQ) to assess the consumption habits of artificially sweetened beverages. This questionnaire was used to measure the frequency of consumption of various types of sweetened drinks in the past month, including sweetened juices or fruit-flavored drinks, soft *drinks*, sports drinks, sweetened tea, sweetened coffee, and sweetened milk. The researcher accompanies the respondents during the filling out of the questionnaire to ensure that all questions are well

understood and answered according to the actual conditions. The results of filling are then calculated based on the frequency of consumption of sweetened drinks in the past month and are categorized into high consumption and low consumption based on the value that has been set.

After filling out the BEVQ questionnaire, respondents were asked to fill *out the Food Frequency Questionnaire* (FFQ) to assess *junk food consumption habits*. This questionnaire contains a list of different types of fast food and processed foods that are often consumed by teenagers. Respondents were asked to answer the frequency of consumption of each type of food in the past month. The results of filling out the FFQ are then calculated and categorized based on the median value of the consumption score. Respondents with scores above the median were categorized as having *frequent junk food* consumption habits, while respondents with scores equal to or below the median were categorized as having infrequent *junk food consumption* habits.

The next stage is to check Blood Glucose Current (GDS) levels using a digital glucometer. Before the examination was carried out, the researcher explained the examination procedure to the respondents. Blood sampling is carried out on the fingertips using a disposable sterile lancet while still paying attention to the principles of safety and infection prevention. The results of the examination are recorded on the observation sheet and used to determine the risk status of hyperglycemia. Respondents with blood glucose levels at ≥140 mg/dL were categorized as at risk of hyperglycemia, while respondents with blood glucose levels at <140 mg/dL were categorized as not at risk of hyperglycemia.

During the data collection process, the researcher accompanied the respondents to ensure that there were no errors in filling out the questionnaire. Obstacles faced during the study included the limited time of the respondents due to teaching and learning activities, the possibility of incompleteness in filling out the questionnaire, and differences in the respondents' understanding

of the questions given. To overcome these obstacles, the researcher provided a clear explanation of the procedure for filling out the instrument, gave respondents the opportunity to ask questions if there were questions that were not understood, and edited all questionnaire sheets that had been filled.

After all the data is collected, the researcher processes the data through several stages, namely *editing*, *coding*, *sorting*, *data entry*, and *cleaning*. The *editing stage* is carried out to check the completeness and consistency of the data obtained. The *coding* stage is carried out by providing code for each research variable according to the predetermined category. Furthermore, the data is tabulated and entered into the IBM SPSS Statistics version 27 program to be re-checked for possible input errors, duplicate data, or missing data.

The data that has been declared complete and clean is then analyzed using the IBM SPSS Statistics program. Univariate analysis was carried out to describe the frequency and percentage distribution of each research variable. Furthermore, a bivariate analysis was carried out using *the Chi-Square test* with a confidence level of 95% ($\alpha = 0.05$) to determine the relationship between the consumption habits of artificially sweetened drinks and the risk of hyperglycemia as well as the relationship between *junk food consumption habits* and the risk of hyperglycemia in adolescents at SMA Negeri 1 Bengkulu City. In addition, the *Odds Ratio* (OR) value is calculated to determine the amount of risk of consumption of artificially sweetened beverages and *junk food* to the occurrence of hyperglycemia.

B. Univariate Analysis

Univariate analysis was carried out to describe the frequency distribution of each research variable. This analysis aims to provide an overview of the condition of the respondents as well as the distribution of the data obtained as a basis for further analysis.

1. **Overview of Frequency Distribution of Characteristics of Age, Gender, BMI, Smoking History and DM History of Respondents at SMA Negeri 1 Bengkulu**

Table 5. 1 Characteristics of Respondents in High School

Yes	Variabel	Frequency (n)	Percentage (%)
1	**Age**		
	17 – 25 Years	78	40,2
	12 – 16 Years	116	59,8
2	**Gender**		
	Male	76	39,2
	Women	118	60,8
3	**IMT**		
	Normal	153	78,9
	Obesity	41	21,1
4	**Smoking**		
	Smokers	17	8,8
	Non-Smokers	177	91,2

Number of respondents = 194

Based on Table 5.1, In age characteristics, most of the respondents were in the age group of 12–16 years, while almost half of the respondents were 17–25 years old.

In terms of gender characteristics, most of the respondents were female, while almost half of the respondents were male.

Based on body mass index (BMI), a small percentage of respondents are obese. On the habit of smoking, a small percentage of respondents smoked.

2. **Overview of the Distribution of Frequency of Consumption Habits of Artificially Sweetened Beverages and *Junk Food* Consumption Habits of Respondents at SMA Negeri 1 Bengkulu**

An overview of the consumption habits of artificially sweetened beverages and *junk food consumption* habits in the respondents was obtained through filling *out the Beverage Intake Questionnaire* (BEVQ) and *Food Frequency Questionnaire* (FFQ). This data was used to determine the level of consumption of artificially sweetened beverages and the frequency *of junk food* consumption in respondents who were the research sample

Table 5. 2
Distribution of Frequency of Consumption Habits of Artificially Sweetened Beverages and *Junkfood Consumption Habits* of Respondents at SMA Negeri 1 Bengkulu City

Variabel	Frequency (N)	Percentage (%)
Artificial sweetened drinks		
Height	179	92,3
Low	15	7,7
Junk food		
Frequent	43	22,2
Rare	151	77,8
Number of respondents = 194		

Based on Table 5.2, almost all respondents have a habit of consuming high-category artificially sweetened beverages, while a small percentage of respondents have a habit of consuming low-category artificially sweetened beverages.

In addition, almost all respondents had a habit of consuming *junk food* in the non-risky category, while a small percentage of respondents had a habit of consuming *junk food in* the risky category.

C. Bivariate Analysis

Bivariate analysis was performed to determine the relationship between independent variables and the incidence of Type 2 DM. The statistical test used in this study is *the Chi-Square test*, with a significance level (α) of 0.05. If the value of p is <0.05, then it can be concluded that there is a significant relationship between the independent variable and the dependent variable.

1. Analysis of the Relationship between Artificial Sweetened Beverage Consumption Habits and the Risk of Hyperglycemia at SMA Negeri 1 Bengkulu

Analysis of the relationship between the consumption habits of artificially sweetened beverages and the risk of hyperglycemia was carried out using *the Chi-Square test* to determine whether or not there is a significant

relationship between the consumption of artificially sweetened beverages (BEVQ) and the risk of hyperglycemia in respondents at SMA Negeri 1 Bengkulu.

Table 5. 3
Analysis of the Relationship between Artificial Sweetened Beverage Consumption Habits and the Risk of Hyperglycemia at SMA Negeri 1 Bengkulu

Variabel	Risky		No Risk		Total	*p-value*
	(n)	(%)	(n)	(%)		
Artificial sweetened drinks						
Height	105	58,7	**74**	41,3	**179**	*0,688
Low	8	53,3	7	46,7	15	
Number of respondents = 194						

Chi-Square test

Based on Table 5.3, most of the respondents with the habit of consuming high-category artificially sweetened beverages were included in the group at risk of hyperglycemia, while almost half were not at risk. In the category of low consumption of artificially sweetened beverages, most of the respondents were at risk of hyperglycemia, while almost half were not at risk.

The results of *the Chi-Square* test showed a *p-value* of 0.688 (*p>0.05)*, so it can be concluded that there is no significant relationship between the consumption of artificially sweetened beverages (*BEVQ)* and the risk of hyperglycemia in SMA Negeri 1 Bengkulu students.

Thus, the consumption habit of artificially sweetened beverages based on the results of this study was not proven to be significantly related to the risk of hyperglycemia in respondents at SMA Negeri 1 Bengkulu.

2. Analysis of the Relationship between *Junk Food Consumption* and the Risk of Hyperglycemia at SMA Negeri 1 Bengkulu

Analysis of the relationship between the consumption habits of artificially sweetened beverages and the risk of hyperglycemia was carried out

using *the Chi-Square* test to determine whether or not there is a significant relationship between *junk food* consumption (FFQ) and the risk of hyperglycemia in respondents at SMA Negeri 1 Bengkulu.

Table 5. 4
Analysis of the Relationship between *Junkfood Consumption* and the Risk of Hyperglycemia at SMA Negeri 1 Bengkulu

Variabel	Risky		No Risk		Total	OR	*p-value*
	(n)	(%)	(n)	(%)			
Junk food							
Frequent	36	83,7	7	16,3	43	4,942	*0,000
Rare	77	51,0	74	49,0	151		
Number of respondents = 194							

Chi-Square test

Based on Table 5.4, almost all respondents with *junk food* consumption habits are often included in the group at risk of hyperglycemia, while a small percentage are not at risk. In the category of infrequent *junk food* consumption , most respondents were at risk of hyperglycemia, while almost half were not at risk.

The results of *the Chi-Square* test showed a *p-value* of 0.000 (*p<0.05), so it can be concluded that there is a significant relationship between junk food consumption* habits (*FFQ*) and the risk of hyperglycemia in SMA Negeri 1 Bengkulu students. *An Odds Ratio* (*OR*) value of 4.942 showed that respondents with frequent *junk food* consumption habits had a 4.942 times greater risk of hyperglycemia than respondents with infrequent *junk food* consumption habits. Thus, the more often respondents consume *junk food*, the greater the risk of hyperglycemia.