

THE RELATIONSHIP BETWEEN HEALTH BELIEF MODEL AND ADOLESCENT ATTITUDES ABOUT SUGAR ADDICTION AND THE RISK OF DIABETES MELLITUS IN STUDENTS OF SMK IDHOTUN NASYI'IN

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ABSTRACT

Adolescents are vulnerable to excessive sugar consumption, which may contribute to sugar addiction and increase the risk of diabetes mellitus. This study aimed to analyze the relationship between the Health Belief Model (HBM), attitudes toward sugar addiction, and diabetes mellitus risk among students at SMK Idhotun Nasyi'in Sugihwaras, Kalitengah, Lamongan. A quantitative cross-sectional study involved 56 students selected through total sampling. Data were collected using HBM, Knowledge, Attitude, and Practice (KAP), and modified Finnish Diabetes Risk Score (FINDRISC) questionnaires and analyzed using the Spearman Rank test. Results showed that 55 respondents (98.2%) had high HBM, while all respondents (100%) had negative attitudes. Diabetes mellitus risk was low in 22 respondents (39.3%), moderate in 19 (33.9%), and high in 15 (26.8%). HBM was significantly associated with diabetes mellitus risk ($p=0.004$; $r=-0.382$), as were attitudes ($p=0.001$; $r=-0.443$). Better HBM and attitudes were associated with lower diabetes mellitus risk.

Keywords: *Health Belief Model, Adolescent Attitudes, Sugar Addiction, Diabetes Mellitus Risk*

INTRODUCTION

Diabetes mellitus is a chronic metabolic disease due to impaired insulin production or work characterized by an increase in blood glucose levels. Today, diabetes risk factors are not only found in adults, but also begin to increase in adolescents. These conditions are associated with a diet high in sugar and fat, consumption of fast food, low physical activity, a sedentary lifestyle, and obesity that can trigger insulin resistance (Dara et al., 2025; Silalahi et al., 2019).

Consuming high-sugar foods and drinks has become part of teen trends, such as packaged drinks, contemporary coffee, and boba. In addition to excessive sugar consumption, the risk of diabetes is also affected by obesity, family history, lack of physical activity, and an unhealthy diet. Therefore, understanding health perceptions through the Health Belief Model (HBM) and adolescents' attitudes towards Sugar Addiction is essential in efforts to prevent diabetes mellitus. HBM includes the perception of vulnerability, severity, benefits, barriers, cues to act, and self-efficacy (Nur Laili, 2023; Julianti et al., 2023).

Previous research has shown that perceptions and beliefs of health based on HBM as well as individual attitudes can influence high-sugar food and beverage consumption behaviors (Dara et al., 2025). However, studies that specifically examined the relationship between HBM and adolescent attitudes toward Sugar Addiction and the risk of diabetes mellitus in vocational school students are still limited. A preliminary study of 20 students in class X of SMK Idhotun Nasyi'in showed that 12 students (60%) often consumed sugary drinks, 8 students (40%) regularly consumed coffee, 3 students (15%) experienced an excess BMI, 11 students (55%) had a family history of diabetes mellitus, and 7 students (35%) had a smoking habit.

Based on this condition, this study aims to determine the relationship between the Health Belief Model and adolescents' attitudes towards Sugar Addiction and the risk of diabetes mellitus in students of SMK Idhotun Nasyi'in. This research is expected to contribute to the development of health science and become a basis for schools and students in improving education, preventing excessive sugar consumption, and efforts to reduce the risk of diabetes mellitus in adolescents.

METHOD

This study used a quantitative design of correlational analytics with a *cross-sectional approach* to determine the relationship between *the Health Belief Model* and adolescents' attitudes about *Sugar Addiction* with the risk of diabetes mellitus. The research population is 56 students in grade XI of SMK Idhotun Nasyi'in, Kalitengah District, Lamongan Regency. The sampling technique uses total sampling, so that all members of the population are made respondents with a sample of 56 students.

Data collection was carried out using three instruments, namely the Health Belief Model (HBM) questionnaire, the adolescent attitude questionnaire on *Sugar Addiction* adapted from Knowledge, Attitude, and Practice (KAP), and the Finnish Diabetes Risk Score (FINDRISC). The HBM questionnaire consisted of 31 items with a total score of 31–126, which were categorized into low (31–62), medium (63–94), and high (95–126). The adolescent attitude questionnaire on *Sugar Addiction* consists of 5 items with a total score of 5–20, with the categories of negative attitudes (5–12) and positive attitudes (13–20). Meanwhile, the risk of diabetes mellitus was measured using a modified FINDRISC questionnaire, with a total score of 0–26, which was categorized into low (0–11), moderate (12–14), and high (15–26) risk.

FINDING AND DISCUSSION

RESEARCH RESULT

This study involved 56 students in grade XI of SMK Idhotun Nasyi'in. The results of the study were presented based on three main variables, namely *Health Belief Model* (HBM), adolescents' attitudes about *Sugar Addiction*, and the risk of diabetes mellitus.

Table 1: Demographic Characteristics of Respondents of Grade XI Students of SMK Idhotun Nasyi'in

No	Demographic Characteristics of Respondents	Frequency (F)	Percentage (%)
1	Gender		
	Male	18	32,1%
	Women	38	67,9%
2	Education Level		
	SD	0	0%
	SMP	0	0%
	High School/Vocational School	56	
	College	0	

3	Alcohol Consumption Yes No	0 56	0% 100%
4	Cigarette Consumption Yes No	6 50	10,7% 89,3%
5	Body Mass Index <25 kg/m ² 25-30 kg/m ² >30 kg/m ²	35 19 2	62,5% 33,9% 3,6%
6	Family History Yes No	25 31	44,6% 55,4%
7	Previous Information Pernah Never	56 0	100% 0%
	Total	56	100%

Source: Data primer, 2026

The majority of respondents were women (67.9%) and came from TKJ majors (57.1%). All respondents did not consume alcohol, 89.3% did not smoke, and 76.8% had normal BMI. As many as 55.4% had no family history of diabetes mellitus, while all respondents had obtained information about diabetes mellitus from various sources.

Table 2 : Distribution of *Health Belief Model* in Grade XI Students of SMK Idhotun Nasyi'in

No	<i>Health Belief Model</i>	Frequency	Presentase%
1.	Low	0	0,00%
2.	Medium	1	1,8%
3.	Height	55	98,2%
Total		56	100%

Source: Data primer, 2026

Respondents were in the *high Health Belief Model* category, with a total of 55 respondents (98.2%), so this category was the most dominant.

Table 3 : Distribution of Adolescent Attitudes about *Sugar Addiction* in Grade XI Students of SMK Idhotun Nasyi'in

No	Attitude	Frequency	Presentase%
1.	Negatives	56	100%
2.	Positive	0	0,00%
Total		56	100%

Source: Data primer, 2026

All respondents had a negative attitude with a percentage of 56 (100%).

Table 4 : Risk Distribution of Diabetes Mellitus in Grade XI Students of SMK Idhotun Nasyi'in

No	Risk of diabetes melitus	Frequency	Presentase%
1.	Low Risk	22	39,3%
2.	Medium Risk	19	33,9%
3.	High Risk	15	26,8%
Total		56	100%

Source: Data primer, 2026

Almost half of the respondents with a low-risk diabetes mellitus risk category, namely 22 respondents (38.3%).

Table 5 : Relationship of the Health Belief Model with the Risk of Diabetes Mellitus

HBM	Risk of diabetes melitus						Total	
	Low Risk		Medium risk		High risk			
	F	%	F	%	F	%	F	%
Low	0	0,0%	0	0,0%	0	0,0%	0	0,0%
Medium	1	1,8%	0	0,0%	0	0,0%	1	100%
Height	21	38,2%	19	34,5%	15	27,3%	55	100%
Total	22	39,3%	19	33,9%	15	26,8%	56	100%
P value = 0.004; Correlation coefficient (r) = -0.382								

Source: Data primer, 2026

The results showed that 98.2% of respondents had a high category HBM, with 37.5% having a low risk of diabetes, 33.9% moderate, and 26.8% high. The results of the *Spearman Rank test* showed $p = 0.004$ (<0.05) with $r = -0.382$, so there was a significant association with weak strength and negative direction between HBM and the risk of diabetes mellitus. The better the HBM, the lower the risk of diabetes mellitus.

Table 6 : Relationship of Adolescent Attitudes about *Sugar Addiction* with Diabetes Mellitus Risk

Attitude	Risk of diabetes melitus						Total	
	Low Risk		Medium risk		High risk			
	F	%	F	%	F	%	F	%
Negatives	22	39,3%	19	33,9%	15	26,8%	56	100%
Positive	0	0,0%	0	0,0%	0	0,0%	0	0,0%
Total	22	39,3%	19	33,9%	15	26,8%	56	100%
P value = 0.001; Correlation coefficient (r) = -0.443								

Source: Data primer, 2026

The results showed that 100% of respondents had a negative attitude towards *Sugar Addiction*, with 39.3% having a low risk of diabetes, 33.9% moderate, and 26.8% high. The *Spearman Rank test* showed $p = 0.001$ (<0.05) and $r = -0.443$, so there was a significant association with moderate strength and negative direction between attitude and risk of diabetes mellitus. The better the respondents' attitude, the lower the risk of diabetes mellitus.

DISCUSSION

1. **Health Belief Model in Students of SMK Idhotun Nasyi'in:** Almost all respondents had a *high category Health Belief Model* (HBM), namely 55 respondents (98.2%). This shows that most respondents have a good belief in the importance of preventing the risk of diabetes mellitus. These results are in line with research by Istaniya Sumantri (2022) which shows that good HBM is associated with better diabetes mellitus prevention behaviors in adolescents. According to Murphy et al. (2020), perceptions of vulnerability, severity, benefits, barriers, *cues to action*, and *self-efficacy* can shape a person's health behavior.
2. **Adolescent Attitudes about Sugar Addiction:** All respondents in this study had a negative attitude towards *Sugar Addiction*. This condition shows that although all respondents have obtained information about diabetes mellitus, this information has not fully formed a positive attitude towards the prevention of excessive sugar consumption. These results are in line with the research of Mareta et al. (2025) which showed a relationship between attitude and the consumption of *sugar-sweetened beverages* in adolescents. Other research has also shown that education can increase knowledge and attitudes about sugar consumption.
3. **Risk of Diabetes Mellitus in Students:** The risk of diabetes mellitus in respondents consists of low, medium, and high categories. The difference in risk level is related to the risk factors that respondents have, such as BMI, family history of diabetes mellitus, smoking habits, physical activity, and lifestyle. In this study, the risk of diabetes mellitus was measured using FINDRISC which considered several of these risk factors.
4. **Relationship of the Health Belief Model with the Risk of Diabetes Mellitus :** The results showed a significant relationship between HBM and the risk of diabetes mellitus ($p = 0.004$; $r = -0.382$), with the strength of the weak relationship and negative direction. This means that the better the HBM, the lower the risk of diabetes mellitus. These results are in line with the research of Istaniya Sumantri (2022) which shows that HBM is related to diabetes mellitus prevention behavior in adolescents. However, the strength of the weak relationship suggests that the risk of diabetes mellitus is not only related to HBM, but also to other factors such as BMI, family history, physical activity, diet, and biological factors.
5. **Relationship of Attitudes about Sugar Addiction with Diabetes Mellitus Risk:** The results showed a significant relationship between attitudes about *Sugar Addiction* and the risk of diabetes mellitus ($p = 0.001$; $r = -0.443$), with moderate and negative direction relationship strength. This suggests that the better the attitude towards the prevention of *Sugar Addiction*, the lower the risk of diabetes mellitus. These results are supported by research by Mareta et al. (2025) who found a significant relationship between attitudes and consumption of sugary drinks in adolescents.
6. **Research Limitations:** This study has several limitations. Data collection was carried out through Zoom Meeting because the research took place during school holidays so that the interaction between researchers and respondents was less than optimal. The study also only involved grade XI students so it could not compare the results based on different grade levels. In addition, the age of the respondents is relatively homogeneous, so the comparison of diabetes risk by age group cannot be done in depth.

7. **Research Implications:** The results of the study show the need for continuous health education regarding sugar consumption, *Sugar Addiction*, and the prevention of diabetes mellitus in adolescents. Schools can use the results of the research as evaluation materials to improve education about healthy eating and diabetes prevention. Further research is suggested to add variables such as knowledge, diet, physical activity, nutritional status, and family history and use different research designs to obtain more comprehensive results.

CONCLUSION

1. Most of the students had a *high category of Health Belief Model*, which was 55 respondents (98.2%).
2. All students had a negative attitude towards *Sugar Addiction*, which was 56 respondents (100%).
3. The risk of diabetes mellitus consisted of 22 respondents (39.3%) with low risk, 19 respondents (33.9%) with medium risk, and 15 respondents (26.8%) with high risk.
4. There was a significant association between *the Health Belief Model* and the risk of diabetes mellitus ($p = 0.004$; $r = -0.382$), with weak relationship strength and negative direction.
5. There was a significant association between attitudes about *sugar addiction* and the risk of diabetes mellitus ($p = 0.001$; $r = -0.443$), with moderate and negative relationship strengths.

RECOMMEDATIONS

- For Students: Increase awareness to limit the consumption of high-sugar foods and beverages and implement a healthy lifestyle.
- For Schools: Increase education and promotive activities regarding *Sugar Addiction*, sugar consumption, and diabetes mellitus prevention.
- For Next Researchers: Develop the research by adding other factors, such as diet, physical activity, nutritional status, and family history.

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