

**ORIGINAL ARTICLE**

**The Relationship Between Dietary Fiber Consumption and The Incidence of Obesity in Students of The Faculty of Medicine, Universitas Sumatera Utara**

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**Abstract:** Obesity is caused by the changes in nutrient intake due to dietary changes by populations who have adopted a modern lifestyle, thus increasing the tendency of fat consumption with decreased consumption of fiber and a lack of physical activity. The role of fiber in obesity includes helping indigestion and helping to reduce the occurrence of obesity. This study aims to determine the relationship between dietary fiber consumption and the incidence of obesity in students of the Faculty of Medicine, Universitas Sumatera Utara. This research is analytic observational research with a cross-sectional design. The sample was selected using a non-probability sampling technique, with a sample size of 72 people. The measuring instrument used is a questionnaire. From table 4.4, the research subjects are 72 respondents; 11 respondents are grouped in underweight nutritional status, and all 11 respondents have insufficient fiber consumption. There are 29 respondents who are grouped into a normal nutritional status where 8 respondents have sufficient fiber consumption and 21 respondents have insufficient fiber consumption. A total of 12 respondents were classified as overweight. Seven of the 12 respondents had sufficient fiber consumption, and five respondents had insufficient fiber consumption. There are 20 respondents grouped into the nutritional status of obesity; 10 respondents whose fiber consumption is sufficient; and 10 respondents whose fiber consumption is insufficient. From the results of the Spearman correlation test, a *P*-value of 0,049 was obtained and the RR value was -0,233. There is a weak and unidirectional relationship between dietary fiber consumption and the incidence of obesity in students of the Faculty of Medicine, Universitas Sumatera Utara.

**Keywords:** Dietary fiber, obesity, student

## INTRODUCTION

Obesity is one of the most significant public health problems because its prevalence tends to increase from year to year and has a significant impact on all age groups. Indonesia is a developing country that is experiencing rapid changes in nutrition with an increase in the prevalence of overweight and obesity, which exposes Indonesia to the problem of nutritional burden.<sup>1,2</sup>

Obesity is caused by changes in nutrition due to changes in diet and nutrient intake by populations who have adopted a modern lifestyle, mainly the tendency to increase consumption of fat (especially saturated fat), sugar, sodium, cholesterol, and animal products; decreased consumption of fiber, fruit, and vegetables; and a lack of physical activity. Food is the main factor causing obesity, while physical activity is the second cause. Sufficient food, both in quantity and quality, is the main right for every individual.<sup>2,3</sup>

Food availability can also directly affect obesity. Food access is the ability of households to obtain food, which consists of economic, social, or physical access. Socio-economic status is linearly related to the increase in obesity prevalence; that is, the increase in obesity coincides with an increase in household socio-economic status.<sup>2,5</sup>

Fiber plays a role in maintaining water levels in the digestive tract. Therefore, fiber can help soften the consistency of stools so that they are easy to pass and help to overcome difficulties in bowel movements, prevent hemorrhoids,

and control weight. This can be proven because high-fiber foods produce much less energy than fat and sugar. In addition, fiber also causes feelings of fullness for longer; thereby, food consumption can be reduced.<sup>6,15</sup>

Previous research stated that dietary fiber does not contain nutrients but provides health benefits such as controlling weight or obesity, preventing gastrointestinal disorders, colon cancer (large intestine), and reducing blood cholesterol levels and cardiovascular disease.

Researcher is interested in conducting research that aims to determine the relationship between dietary fiber consumption and the incidence of obesity among students at the Faculty of Medicine, Universitas Sumatera Utara.

## METHOD

This research is analytic observational research with a cross-sectional design. The research was carried out at the Faculty of Medicine, Universitas Sumatera Utara, Medan. The study was carried out from June to December 2021. The population in this study were students of the Faculty of Medicine, Universitas Sumatera Utara, batch 2018. The number of samples used was 72 people based on the Slovin formula. Primary data is the data obtained directly from respondents. The researcher collected primary data in this study by distributing respondent identity sheets containing respondent data such as name, age, gender, weight, and height. Respondents also filled out the Food Frequency Questionnaire (FFQ).

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Secondary data is data obtained from the faculty regarding the number of students in the Faculty of Medicine, Universitas Sumatera Utara, batch 2018. The data was analyzed using the SPSS program. The hypothesis test used is the Spearman correlation test with a  $P$ -value  $< 0.05$  to determine the relationship between dietary fiber consumption and the incidence of obesity.

## RESULT

The majority of the subjects in this study were women, and the majority of the subjects were 21 years old.

**Table 4.1 Distribution of Characteristics of Research Subjects**

Variable	(n = 72)	P Value
Age	21 (20 – 24)	0,000 <sup>1</sup>
Sex, n (%)		
Female	45 (62,5%)	
Male	27 (37,5%)	

Description:

<sup>1</sup>: Kolmogorov-Smirnov Test

The nutritional status of the research subjects was determined by a median weight of 61 kg and a median height of 165 cm. There were 11 respondents grouped into underweight nutritional status, and as many as 29 respondents were grouped into normal nutritional status. There are 12 respondents who are grouped into the overweight nutritional status and 20 respondents who are grouped into the obese nutritional status.

**Table 4.2 Nutritional Status of Research Subjects**

Variable	(n =72)	P Value
Weight, kg	61 (39 - 130)	0.012 <sup>1</sup>
Height, cm	165 (148 – 183)	0.012 <sup>1</sup>
Nutritional status, n (%)		
Underweight	11 (15.3%)	
Normal	29 (40.3%)	
Overweight	12 (16.7%)	
Obesity	20 (27.8%)	

Description:

<sup>1</sup>: Kolmogorov-Smirnov Test

The frequency of fiber consumption is divided into 2 categories, sufficient fiber consumption and insufficient fiber consumption. There are 25 (34.7%) respondents whose fiber consumption is sufficient and 47 (65.3%) respondents with insufficient fiber consumption. The majority of respondents consume insufficient fiber.

**Table 4.3 Fiber Consumption Distribution of Research Subjects**

Fiber Consumption Percentage	n	
Sufficient <sup>1</sup>	25	34.7%
Insufficient <sup>2</sup>	47	65.3%
Total	72	100%

Description:

<sup>1</sup>: Sufficient fiber consumption (25.0 – 38.0 g/day)

<sup>2</sup>: Insufficient fiber consumption (2.0 – 24.9 g/day)

The research subjects were 72 respondents. 11 (15.3%) of those were classified as underweight, and 11 more had insufficient fiber consumption. There are 29 (40.3%) respondents who are grouped in a normal nutritional status where 8 (11.1%) respondents have sufficient fiber consumption and 21 (29.2%) respondents have insufficient fiber consumption. A total of 12 (16.6%) respondents were

classified as overweight; 7 (9.7%) of the 12 respondents had sufficient fiber consumption; and 5 (6.9%) of the respondents had insufficient fiber consumption. There are 20 (27.8%) respondents grouped in the nutritional status of obesity; 10 (13.9%) respondents whose fiber consumption is sufficient; and 10 (13.9%) respondents whose fiber consumption is insufficient. From the results of the Spearman correlation test, a *P*-value of 0.049 was obtained, and the RR value was -0.233, so it can be concluded that dietary fiber intake has a low correlation and is unidirectional with the incidence of obesity.

**Table 4.4 Relationship Between Fiber Consumption and The Incidence of Obesity**

Nutritional Status	Fiber Sufficient n(%)	Consumption Insufficient n(%)	Total, n (%)	<i>P</i> -value	RR
Underweight, n (%)	0(0.0%)	11(15.3%)	11(15.3%)	0.049 <sup>1</sup>	-0.233
Normal, n (%)	8(11.1%)	21(29.2%)	29(40.3%)		
Overweight, n (%)	7 (9.7%)	5 (6.9%)	12(16.6%)		
Obesity, n (%)	10 (13.9%)	10 (13.9%)	20(27.8%)		
<b>Total</b>	<b>25 (34.7%)</b>	<b>47 (65.3%)</b>	<b>72 (100%)</b>		

Description:

<sup>1</sup>: Spearman Correlation Test

## DISCUSSION

Based on research conducted on 72 students of the Faculty of Medicine, Universitas Sumatera Utara batch 2018, the results show that there is a relationship between dietary fiber consumption and the incidence of obesity.<sup>8,9,15</sup> These results are consistent with the hypothesis that there is

a relationship between dietary fiber consumption and the incidence of obesity.<sup>10,11</sup> The results of the Spearman test obtained have a significant *P*-value of 0.049 and an RR value of -0.0233, which is a low correlation and is unidirectional. This research is in line with Santoso's research in 2011 regarding Food Fiber and Its Benefits for Health, which states that dietary fiber does not contain nutrients but provides health benefits, mainly helping in weight control or obesity, preventing gastrointestinal disorders, colon cancer (large intestine), as well as reducing blood cholesterol levels and cardiovascular disease.<sup>7,12</sup> According to theory, fiber helps regulate the body's use of sugar and aids in the maintenance of hunger.<sup>4,13,14</sup> Through this study, it was concluded that the lower the fiber consumption, the higher the incidence of obesity.

## CONCLUSION

The majority of respondents' age was 21 (59.7%) in Medical Faculty students who participated in this study. The majority of respondents' gender was female (62.5%) among Medical Faculty students who participated in this study. The majority of nutritional status was normal (40.3%) among the medical faculty students who participated in this study. The majority of dietary fiber consumption was insufficient (65.3%) in the Medical Faculty students who participated in this study. There is a low and unidirectional relationship between dietary fiber consumption and the incidence of obesity in medical faculty students who participated in this study.

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