
The Relationship Between Dietary Fiber Consumption Patterns and Physical Activity with the Incidence of Hemorrhoids

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Abstract:

The aim of this study is to explain the relationship between dietary fiber consumption patterns and physical activity with the incidence of hemorrhoids. This study used a retrospective correlational analytic design. The population consisted of patients with signs and symptoms of hemorrhoids at the General Surgery Specialist Clinic at RS Petrokimia Gresik. A total of 89 respondents were selected using purposive sampling, resulting in 72 respondents. Data analysis was conducted using the Chi-square test. Data collection involved a dietary fiber consumption questionnaire, a physical activity questionnaire, and the results of diagnoses from General Surgery Specialists recorded in the respondents' medical records. Statistical analysis using the Chi-square test with a significance level of $\alpha < 0.05$ yielded p-values of 0.001 and 0.000, indicating a relationship between dietary fiber consumption patterns and physical activity with the incidence of hemorrhoids. A lack of dietary fiber can cause feces to remain in the rectum longer, making them harder. This condition stimulates the reflex to strain during bowel movements, leading to hemorrhoids. Insufficient physical activity causes continuous and repetitive pressure on the lower digestive tract, resulting in suboptimal vascularization and hemorrhoids. This study is expected to serve as a reference for hospitals to enhance educational media and health promotion efforts to prevent hemorrhoids in the community and reduce recurrence in patients who have undergone hemorrhoid treatment.

Keyword: Dietary fiber consumption patterns, physical activity, hemorrhoid incidence

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Introduction

Hemorrhoids, commonly known as piles, are a prevalent health issue. Hemorrhoids are dilations of the veins in the hemorrhoidal plexus, often causing discomfort even in patients who have received interventions (Nugroho, 2019). They can lead to bleeding, resulting in secondary anemia, and can cause septic infections (Halik, 2017). Various factors contribute to hemorrhoids, including pregnancy, straining during bowel movements, lack of mobility, chronic constipation, insufficient fluid intake, low-fiber diets, old age, obesity, heavy physical activity, diseases that increase intra-abdominal pressure like intestinal tumors, and other conditions that increase pelvic venous pressure and defecation posture. The multitude of risk factors significantly heightens the risk of hemorrhoids (Widya, 2020). A preliminary study with interviews conducted at the General

Surgery Specialist Clinic at RS Petrokimia Gresik in February 2023 found 32 hemorrhoid patients. Among them, 16 rarely consumed high-fiber foods, 10 had low physical activity, and 6 had other conditions such as anorectal tumors and pregnancy. Low fiber consumption triggers constipation, eventually leading to hemorrhoids (Widya, 2020). Patients with low physical activity experience disrupted peripheral blood flow, particularly in the anorectal region, increasing the risk of hemorrhoids (Margetis, 2019). However, the relationship between dietary fiber consumption patterns and physical activity with the incidence of hemorrhoids has yet to be fully explained.

The epidemiology of hemorrhoids varies widely. Hemorrhoids are found in 50% of the population over 50, and some studies indicate that 75% of the population will experience hemorrhoids (Widya, 2020). According to World Health Organization (WHO) data from 2017, there were 230 million hemorrhoid cases globally. In 2017, the global hemorrhoid incidence rate was 54%. Even 2/3 of the healthy global population was found to have hemorrhoids (WHO, 2017). A 2020 study in the United States reported hemorrhoids as the fourth most common anorectal condition, with approximately 3.3 million outpatient visits. Hemorrhoids are commonly detected during anorectal screenings, and patients may not be aware of them due to a lack of symptoms (Sekarlina, 2019). According to Riskesdas (2018), the prevalence of hemorrhoids in Indonesia was approximately 12.5 million out of 265 million people. Riskesdas projected that by 2030, the prevalence in Indonesia could reach 21.3 million people. In RS Petrokimia Gresik, hemorrhoid cases rose from 327 in 2020 to 339 in 2021, and significantly to 534 in 2022 (RS Petrokimia Gresik Medical Records, 2023).

According to Halik (2017), hemorrhoids are influenced by many factors, with dietary fiber consumption playing a significant role. Each individual has different dietary fiber consumption patterns. Inadequate fiber intake leads to gastrointestinal issues like hard, piled, and small feces, causing difficulty and pain during bowel movements. Fiber is metabolized by gut bacteria, increasing fecal volume, softening consistency, and shortening transit time. Lack of high-fiber food intake results in dense and hard feces, triggering the straining reflex during defecation, causing trauma to the hemorrhoidal plexus (Widya, 2020). Low physical activity doubles the risk of deep vein thrombosis (DVT) in the lower digestive tract. Thrombosis causes hematomas, disrupting blood flow and leading to hemorrhoids in the anorectal area (Margetis, 2019). Chronic untreated hemorrhoids can cause complications such as bleeding, secondary anemia, and septic infections (Halik, 2017).

Given the above, this study aims to investigate the role of low-fiber diets and physical activity as causes of hemorrhoids. Thus, the study is titled "The Relationship Between Dietary Fiber Consumption Patterns and Physical Activity with the Incidence of Hemorrhoids".

Method

This study used a retrospective correlational analytic design with a cross-sectional approach. The population consisted of patients with signs and symptoms of hemorrhoids at the General Surgery Specialist Clinic at RS Petrokimia Gresik from September 14, 2023, to October 31, 2023. A total of 89 respondents were selected, with a sample of 72 respondents.

Results and discussions

Table 1. Distribution of respondents by age at the General Surgery Specialist Clinic at RS Petrokimia Gresik from September 14 – October 31, 2023

Age	Number	%
26-35 Years	18	25.0
36-45 Years	19	26.4
46-55 Years	21	29.2
56-65 Years	10	13.9
>65 Years	4	5.6
Total	72	100

Most respondents were aged 46-55 years, with 21 respondents (29.2%).

Table 2. Distribution of respondents by gender at the General Surgery Specialist Clinic at RS Petrokimia Gresik from September 14 – October 31, 2023

Gender	Number	%
Male	35	48.6
Female	37	51.4
Total	72	100

Most respondents were female, with 37 respondents (51.4%).

Table 3. Distribution of respondents by education level at the General Surgery Specialist Clinic at RS Petrokimia Gresik from September 14, 2023 – October 31, 2023

Education	Number	%
Middle School	16	22.2
High School	25	34.7
University	31	43.1
Total	72	100

Most respondents had a university education, with 31 respondents (43.1%).

Table 4. Distribution of respondents by Body Mass Index (BMI) at the General Surgery Specialist Clinic at RS Petrokimia Gresik from September 14, 2023 – October 31, 2023

BMI	Number	%
Underweight	7	9.7
Normal weight	11	15.3
Overweight	18	25
Obesity	36	50
Total	72	100

Most respondents were categorized as obese, with 36 respondents (50%).

Table 5. Distribution of respondents by occupation at the General Surgery Specialist Clinic at RS Petrokimia Gresik from September 14, 2023 – October 31, 2023

Occupation	Number	%
Civil Servant/State-Owned Enterprise	14	19.4
Entrepreneur	11	15.3
Private Employee	31	43.1
Others	16	22.2
Total	72	100

Most respondents were private employees, with 31 respondents (43.1%).

Table 6. Distribution of respondents by type of work at the General Surgery Specialist Clinic at RS Petrokimia Gresik from September 14, 2023 – October

Type of Work	Number	%
Sedentary	23	31.9
Standing	20	27.8
Manual Labor	29	40.3
Total	72	100

Most respondents had jobs involving manual labor, with 29 respondents (40.3%).

Table 7. Distribution of respondents by family history of hemorrhoids at the General Surgery Specialist Clinic at RS Petrokimia Gresik from September 14, 2023 – October 31, 2023

Family History	Number	%
Yes	15	20.8
No	57	79.2
Total	72	100

Most respondents did not have a family history of hemorrhoids, with 57 respondents (79.2%).

Table 8. Distribution of respondents by hemorrhoid risk factors at the General Surgery Specialist Clinic at RS Petrokimia Gresik from September 14, 2023 – October 31, 2023

Risk Factors	Number	%
Pregnancy	8	11.1
Heavy physical activity	17	23.6
Lack of mobility	10	13.9
Low-fiber diet	27	37.5
Other (e.g., anorectal tumors)	10	13.9
Total	72	100

Most respondents had low-fiber diets, with 27 respondents (37.5%).

Table 8 shows that a significant proportion of respondents' consumption patterns are influenced by their peer group, with 28 respondents (38.9%) being affected.

Table 9: Distribution of Demographic Characteristics of Respondents by Income at Poli Spesialis Bedah Umum RS Petrokimia Gresik from September 14, 2023 to October 31, 2023

	Income	Nu mber	%
	< Rp 1.500.000	9	12,5
Rp	Rp 1.500.000 – <u>2.500.000</u>	19	26,4
Rp	Rp 2.500.000 – <u>3.500.000</u>	23	31,9
	> Rp 3.500.000	21	29,2
	Total	72	100, 0

Table 9 shows that the majority of respondents have an income of Rp 2,500,000 - Rp 3,500,000, which is 23 respondents (31.9%).

Table 10. Distribution of Fiber-Rich Food Consumption Patterns at Poli Spesialis Bedah Umum RS Petrokimia Gresik from September 14, 2023 to October 31, 2023

Distribution of Fib Consumption	Number	%
Kurang	53	73,6
Cukup	19	26,4
Total	72	100,0

Table 10 shows that the majority of respondents have a fiber-rich food consumption pattern that is less than adequate, which is 53 respondents (73.6%).

Table 11. Distribution of Physical Activity Levels at Poli Spesialis Bedah Umum RS Petrokimia Gresik from September 14, 2023 to October 31, 2023

Physical Activity Level	Jumlah	%
Ringan	31	43,1
Sedang	24	33,3
Berat	17	23,6
Total	72	100,0

Table 11 shows that the majority of respondents have a light physical activity level, which is 31 respondents (43.1%).

Table 12. Distribution of Hemorrhoid Cases at Poli Spesialis Bedah Umum RS Petrokimia Gresik from September 14, 2023 to October 31, 2023

Hemorrhoid Case	Jumlah	%
Ya	48	66,7
Tidak	24	33,3
Total	72	100,0

Table 12 shows that the majority of respondents have experienced hemorrhoids, which is 48 respondents (66.7%).

Table 13. Statistical Analysis of the Relationship between Fiber-Rich Food Consumption and Hemorrhoid Cases

Fiber-Rich Food Consumption Pattern	Hemorrhoid Cases				Total	%
	Ya	%	Tidak	%		
Kurang	41	85,4	12	50	53	73,6
Cukup	7	14,6	12	50	19	26,4
Total	48	100	24	100	72	100

Table 13 shows that among the total of 72 respondents studied, most have a fiber-rich food consumption pattern that is less than adequate, which is approximately half (53 or 73.6%). The statistical analysis using the Chi-square test shows a p-value of .001, which is less than the significance level of .05. Therefore, H1 is accepted, indicating a significant relationship between fiber-rich food consumption and hemorrhoid cases.

Table 14. Statistical Analysis of the Relationship between Physical Activity Level and Hemorrhoid Cases

Physical Activity Level	Hemorrhoid				Total	%
	Ya	%	Tidak	%		
Ringan	30	62,5	1	4,2	31	43,0
Sedang	13	27,0	11	45,8	24	33,3
Berat	5	10,5	12	50,0	17	23,7
Total	48	100	24	100	72	100
$\alpha = 0,05$ p-value = 0,000						

Table 14 shows that among the total of 72 respondents studied, most have a physical activity level classified as light (43%), followed by moderate (33.3%), and heavy (23.7%). The statistical analysis using the Chi-square test shows a p-value of .000, which is less than the significance level of .05. Therefore, H2 is accepted, indicating a significant relationship between physical activity level and hemorrhoid cases.

The study's findings on fiber-rich food consumption patterns among 72 respondents revealed a significant proportion of individuals with inadequate fiber intake, with 53 respondents (73.6%) consuming inadequate amounts of fiber and 41 respondents (85.4%) experiencing hemorrhoids. The statistical analysis using the Chi-square test demonstrated a statistically significant relationship between fiber-rich food consumption and hemorrhoid cases, with a p-value of 0.001, indicating that inadequate fiber consumption is a significant risk factor for developing hemorrhoids. Widya (2020) explained that inadequate consumption of high-fiber foods can cause constipation and hard stool, leading to painful defecation and potentially causing

trauma to the hemorrhoidal veins. High-fiber foods can be metabolized by bacteria in the digestive system, increasing the volume of feces, softening its consistency, and shortening transit time in the colon. Inadequate consumption of high-fiber foods can cause constipation and hard stool, leading to increased risk of hemorrhoids.

Widya (2020) emphasized that inadequate consumption of high-fiber foods can lead to constipation and hard stool, which in turn can cause painful defecation and potentially cause trauma to the hemorrhoidal veins. High-fiber foods play a crucial role in the digestive system by being metabolized by bacteria in the digestive system, increasing the volume of feces, softening its consistency, and shortening transit time in the colon, thereby reducing the risk of hemorrhoids.

Margetis (2019) highlighted that a low-fiber diet can cause small and hard stools, leading to straining during defecation, which can further exacerbate the risk of hemorrhoids. Furthermore, foods containing fiber can accelerate stool production, and the more fiber consumed, the more stool produced, affecting the defecation process and increasing the likelihood of hemorrhoid development.

Insufficient fiber intake has a significant impact on the development of hemorrhoids, as fiber plays a vital role in the digestive system by providing lubrication that eases friction between stool and rectal walls during defecation or elimination of waste, thereby preventing rectal damage. When sufficient fiber is consumed, the risk of hemorrhoids is significantly reduced.

This study is consistent with Raena's (2018) finding that there is a relationship between fiber-rich food consumption and hemorrhoid cases ($p < 0.001$). The risk estimate calculation showed that inadequate fiber consumption has a 6.22-fold increased risk of hemorrhoids (OR = 6.22).

The study found that six respondents who consumed adequate fiber but experienced hemorrhoids had body mass indices in the overweight to obese range, which is concerning because individuals with obesity have poor blood circulation due to increased abdominal pressure and pelvic pressure on vena cavae in the rectum, increasing the risk of venous edema according to Halik (2017) in Margetis (2019).

The study also discovered that most respondents had light physical activity levels (43%), followed by moderate physical activity levels (33.3%), and heavy physical activity levels (23.7%), while most experienced hemorrhoids (66.7%). The statistical analysis using the Chi-square test showed a statistically significant relationship between physical activity levels and hemorrhoid cases, with a p-value of 0.000, indicating that physical activity levels are a significant risk factor for developing hemorrhoids.

Halik (2017) stated that prolonged sitting can also be a contributing factor to hemorrhoids, as prolonged sitting without changing positions can increase intra-venous pressure in the anus, leading to vein expansion or even rupture and bleeding. Furthermore, Wibowo et al. (2018) in Margetis (2019) noted that one of the most worrying consequences of inactive work habits is a two-fold increased risk of deep vein thrombosis (DVT). Blood clots often occur in veins and can even occur in the lower gastrointestinal tract. If this clot is not treated with anticoagulant medication, it can cause anorectal hematoma and disrupt blood flow.

Regular physical activity has been shown to reduce the risk of hemorrhoids, while sedentary behavior increases it. This occurs because when organs move during physical activity, they also participate in movement, allowing for improved blood flow in digestive organs and preventing excessive pressure buildup over time.

This study is consistent with Sunarto's (2016) finding that frequent sitting is a risk factor for hemorrhoids with an odds ratio of 0.37%, insufficient physical activity is a risk factor with an

odds ratio of 0.33%, and frequent lifting of heavy loads is a risk factor with an odds ratio of 0.26%.

Finally, five respondents who had intense or frequent physical activity but experienced hemorrhoids had body mass indices in the overweight to obese range. According to Halik (2017) in Margetis (2019), individuals with obesity have poor blood circulation due to increased abdominal pressure and pelvic pressure on vena cavae in the rectum, increasing the risk of venous edema.

Conclusion

The study reveals a significant relationship between fiber-rich food consumption, physical activity levels, and the development of hemorrhoids. The results suggest that inadequate fiber intake is a significant risk factor for developing hemorrhoids, with 73.6% of respondents consuming inadequate amounts of fiber and 85.4% experiencing hemorrhoids.

Furthermore, the study found that physical activity levels are also a significant risk factor for developing hemorrhoids, with 66.7% of respondents experiencing hemorrhoids despite having varying levels of physical activity. The findings also highlight the importance of regular physical activity in reducing the risk of hemorrhoids, as well as the potential negative impact of prolonged sitting on blood circulation and the development of deep vein thrombosis. In conclusion, the study emphasizes the importance of a balanced diet rich in fiber and regular physical activity in maintaining healthy digestive habits and reducing the risk of developing hemorrhoids. It also highlights the need to address factors such as prolonged sitting and obesity in order to reduce the risk of hemorrhoids and other related health issues.

Recommendations for future research include:

1. Conducting further studies to explore the relationship between fiber-rich food consumption and hemorrhoid development
2. Investigating the impact of different types and amounts of fiber on digestive health
3. Examining the relationship between physical activity levels and hemorrhoid development in different populations
4. Developing interventions aimed at promoting healthy digestive habits, including increasing fiber intake and regular physical activity
5. Overall, this study provides valuable insights into the factors contributing to the development of hemorrhoids and highlights the importance of a balanced lifestyle in maintaining healthy digestive habits.

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