

Risk Factors for Hemorrhoids Screening Proctoscopy

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ABSTRACT

Background: Hemorrhoids are a common anorectal condition affecting a significant proportion of adults, influenced by various risk factors such as diet, lifestyle, and genetic predisposition. **Objective:** This study aimed to evaluate the risk factors associated with hemorrhoidal disease in patients undergoing screening proctoscopy, identifying significant lifestyle and dietary contributors to its prevalence and severity. **Method:** An interventional study was conducted with 318 patients at Rajshahi Medical College Hospital from July 2017 to June 2020. Patients completed structured questionnaires assessing demographics, dietary intake, physical activity, and comorbidities. Proctoscopy examinations were performed to grade hemorrhoids. Data were analyzed using SPSS, with chi-square tests and logistic regression to assess associations. **Results:** The mean age of participants was 45.2 years (SD \pm 12.7). Hemorrhoids were more prevalent in males (58.0%) compared to females (42.0%) ($p=0.021$). Low fiber intake (<15g/day) was reported by 45.9% of patients, with a hemorrhoid prevalence of 72% ($p < 0.001$), while those consuming more than 25g/day had only 38% prevalence. Sedentary behavior (sitting >8 hours/day) was observed in 32.7% of patients, correlating with a 72% hemorrhoid prevalence ($p=0.008$). Water intake of less than 1.5L/day was reported by 40.3% of patients, with a 68% hemorrhoid prevalence ($p=0.009$), whereas patients consuming more than 2.5L/day had only 40% prevalence. Multivariate analysis confirmed that low fiber intake (OR 3.2), sedentary behavior (OR 2.5), and family history (OR 2.5) were significant predictors. **Conclusions:** Dietary fiber intake, sedentary behavior, and family history are strong predictors of hemorrhoidal disease. Public health initiatives should focus on promoting dietary and lifestyle changes to reduce hemorrhoid prevalence.

Keywords: Hemorrhoids, Proctoscopy, Risk Factors, Dietary Fiber, Sedentary Behavior.

INTRODUCTION

Hemorrhoids, a prevalent anorectal condition, are vascular structures in the anal canal that assist in maintaining continence but can become symptomatic, leading to pain, discomfort, and rectal bleeding. Hemorrhoidal disease is characterized by the swelling and inflammation of these vascular cushions and can be broadly categorized into internal and external types, distinguished by their location relative to the dentate line. [1] Although the exact pathophysiology of hemorrhoids remains a complex interplay of various factors, it is widely accepted that a deterioration of supporting connective tissues and increased venous pressure in the hemorrhoidal cushions

play significant roles. [2] Understanding these underlying mechanisms is essential, given that hemorrhoidal disease affects nearly half of adults over 50 and contributes to substantial healthcare burdens. The prevalence of hemorrhoidal disease varies globally, with higher incidence rates observed in Western countries, largely attributed to dietary habits, particularly low fiber intake, and sedentary lifestyles. [3] Notably, a low-fiber diet is considered a major risk factor, as it can lead to chronic constipation and the resultant straining during defecation, which increases intra-abdominal and venous pressure. Dietary fiber softens stools, reducing the need for straining and helping to prevent hemorrhoidal cushion engorgement and inflammation. Conversely, diets lacking sufficient fiber produce harder stools, which exacerbate the venous pressure within the hemorrhoidal cushions and contribute to symptomatic hemorrhoids. Sedentary behavior further exacerbates hemorrhoidal risks by reducing gastrointestinal motility and leading to venous stasis in the rectal veins, increasing the likelihood of hemorrhoid formation. Indeed, studies consistently identify low fiber intake, chronic constipation, and sedentary lifestyles as primary risk factors for hemorrhoidal disease, highlighting the importance of dietary and lifestyle interventions in its prevention and management.

Hemorrhoidal disease is not only a clinical concern but also a social and psychological one, as its symptoms can significantly impact patients' quality of life. Symptoms of hemorrhoids vary by type and severity but typically include rectal bleeding, prolapse, pain, itching, and discomfort. Internal hemorrhoids, often painless due to their location above the dentate line, are primarily associated with bleeding and prolapse. In contrast, external hemorrhoids, located below the dentate line and richly innervated, are more likely to cause acute pain, particularly if thrombosed, as well as localized swelling and itching. The chronic discomfort and embarrassment associated with hemorrhoidal symptoms often lead patients to delay seeking medical attention, further exacerbating their condition. [4] This underreporting, coupled with the potential for self-treatment through over-the-counter remedies, obscures the true prevalence of hemorrhoidal disease and delays appropriate medical intervention, which is necessary to rule out more severe anorectal pathologies such as colorectal cancer or inflammatory bowel disease. The clinical importance of hemorrhoidal disease is further underscored by the potential for misdiagnosis, given the overlap in symptoms between hemorrhoids and other serious anorectal conditions. Rectal bleeding, for instance, is a hallmark symptom of hemorrhoids but is also a red flag for colorectal malignancies, necessitating thorough examination and differential diagnosis. [5] Screening proctoscopy, therefore, plays a crucial role in not only diagnosing hemorrhoids but also in excluding other potentially life-threatening conditions. Proctoscopic examinations allow for the grading of internal hemorrhoids based on the degree of prolapse, from Grade I, where hemorrhoids remain internal and asymptomatic, to Grade IV, where hemorrhoids prolapse irreducibly and often require surgical intervention. Such classifications are critical for guiding treatment plans and determining the prognosis, with lower-grade hemorrhoids managed conservatively and higher-grade hemorrhoids often necessitating surgical treatment.

While hemorrhoidal disease has been widely studied, the risk factors specific to patients undergoing screening proctoscopy in different geographic and demographic contexts remain insufficiently explored. The current study aims to fill this gap by examining the risk factors associated with hemorrhoidal disease in patients at Rajshahi Medical College Hospital, identifying lifestyle and dietary contributors that may predispose individuals to this condition. With the healthcare burden associated with hemorrhoids and the potential for significant quality-of-life impacts, understanding these risk factors is critical for developing effective public health strategies that emphasize lifestyle and dietary modifications. Specifically, the study seeks to investigate how fiber intake, water consumption, sedentary behavior, and family history correlate with hemorrhoidal prevalence and severity, providing a foundation for targeted preventive interventions. [6] In recent years, multivariate analyses have emerged as essential tools for understanding the complex risk factors underlying hemorrhoidal disease. Logistic regression models allow for the assessment of multiple variables simultaneously, offering insights into the relative impact of each risk factor. This study uses such statistical tools to analyze the data collected from

structured questionnaires, which include assessments of dietary fiber intake, water consumption, physical activity levels, and familial predisposition. By isolating the effects of each factor, this study not only identifies significant predictors of hemorrhoidal disease but also provides actionable insights for clinical and public health interventions. For instance, low fiber intake and sedentary behavior have previously been identified as significant predictors of hemorrhoids, with odds ratios indicating a substantial increase in risk. [7] The findings of this study could further validate these associations and offer region-specific insights that inform dietary and lifestyle recommendations for populations at risk.

Hemorrhoidal disease management ranges from conservative measures, such as dietary modifications and increased physical activity, to more invasive treatments for advanced cases, including rubber band ligation, sclerotherapy, and hemorrhoidectomy. In recent years, there has been growing interest in minimally invasive procedures, such as Doppler-guided hemorrhoidal artery ligation, which targets the blood supply to hemorrhoidal tissue with fewer postoperative complications than traditional surgeries. However, regardless of the treatment modality, preventive strategies remain essential for reducing the incidence and recurrence of hemorrhoids. As such, public health initiatives aimed at educating patients on the benefits of high-fiber diets and regular physical activity could play a pivotal role in reducing the burden of hemorrhoidal disease on healthcare systems. [8] This study contributes to the literature by focusing on the modifiable risk factors for hemorrhoidal disease in a specific population undergoing screening proctoscopy, providing both clinical and public health insights. While the findings are based on data collected from Rajshahi Medical College Hospital, the study's implications extend to similar healthcare settings where lifestyle and dietary factors are prominent in hemorrhoidal etiology. The study aims to foster a holistic approach to hemorrhoidal disease management, emphasizing the need for preventive measures that address the root causes rather than solely focusing on symptom management. [9] Ultimately, the study hopes to inform healthcare providers and policymakers on effective strategies for reducing the prevalence of hemorrhoidal disease, thus improving patient outcomes and alleviating the strain on healthcare resources.

Aims and Objective

The study aims to identify and analyze key risk factors for hemorrhoidal disease through screening proctoscopy, examining both symptomatic and asymptomatic individuals. Specific objectives include evaluating the influence of demographic, lifestyle, and genetic factors, and assessing proctoscopy's effectiveness as a screening tool for early detection and timely intervention.

LITERATURE REVIEW

Gastrointestinal health plays a crucial role in overall wellness, with diet, lifestyle, and stress significantly influencing bowel habits and digestive functions. Hemorrhoidal disease, one of the most common anorectal conditions, is directly impacted by these factors, leading to symptoms that range from mild discomfort to severe pain and prolapse. One widely used model for understanding gastrointestinal health is the Bristol Stool Chart, which categorizes stool types from hard lumps (Type 1) to entirely liquid stool (Type 7) and is essential for assessing bowel regularity and overall gastrointestinal function. Variations in stool consistency provide valuable insights into dietary habits, hydration, and gut motility, all of which have implications for hemorrhoidal health. [10] A common clinical tool, the chart assists healthcare providers in identifying constipation-related strain, a well-known factor contributing to hemorrhoidal symptoms. Another central concept in gastrointestinal health is the Gut-Brain Axis, which describes the bidirectional relationship between the central and enteric nervous systems, highlighting how stress and emotional well-being influence gut motility and bowel patterns. This theory is particularly relevant for conditions such as irritable bowel syndrome (IBS), where stress exacerbates bowel irregularities and can lead to or worsen hemorrhoidal symptoms. [11] Patients with high-stress levels often experience disrupted bowel habits, which increase intra-abdominal pressure and straining, thereby

elevating their risk for hemorrhoidal disease. Understanding the Gut-Brain Axis has prompted clinicians to consider psychological factors in managing hemorrhoidal disease, especially in patients where stress appears to be a significant factor.

Dietary factors, particularly fiber intake, are critical in gastrointestinal health and hemorrhoid prevention, as described in the Fiber Hypothesis. A high-fiber diet is associated with softer stools, reduced straining, and quicker transit times, which together lower the risk of hemorrhoid formation. Studies show that fiber increases stool bulk, decreases bowel transit time, and alleviates constipation—a primary risk factor for hemorrhoids. Conversely, low-fiber diets, common in Western populations, are linked to increased hemorrhoidal incidence due to hardened stools that necessitate excessive straining during defecation. Research consistently suggests that fiber-rich diets, comprising vegetables, fruits, and whole grains, significantly decrease the prevalence of hemorrhoidal disease and reduce symptom severity among affected individuals. [12]

Multiple pathophysiological theories have been proposed to explain hemorrhoid formation, each highlighting a unique aspect of its development. The Venous Theory suggests that increased pressure within the hemorrhoidal venous plexus causes engorgement of vascular cushions, contributing to hemorrhoid formation. Factors like constipation, pregnancy, and prolonged sitting increase intra-abdominal pressure, directly affecting the hemorrhoidal cushions. Research indicates that when pressure remains elevated in the anal cushions, the veins dilate and engorge, resulting in symptomatic hemorrhoids. The Venous Theory is particularly relevant in understanding why individuals with chronic constipation or sedentary lifestyles face a heightened risk. [13] In contrast, the Mechanical Theory posits that degeneration of connective tissues supporting hemorrhoidal cushions leads to prolapse. Age-related tissue weakening makes hemorrhoidal cushions more susceptible to displacement, explaining why older adults are more prone to hemorrhoids. [14] Studies show that collagen and elastin fibers in the anal cushions degrade over time, compromising their support and allowing for prolapse. This theory is supported by findings that hemorrhoidal disease prevalence increases significantly after age 50, correlating with age-related tissue degeneration.

A third explanation, the Inflammation Hypothesis, suggests that chronic inflammation within the anal canal exacerbates hemorrhoidal disease, especially when other inflammatory bowel diseases like Crohn's or ulcerative colitis are present. These conditions lead to rectal inflammation, increasing vascular permeability and predisposing patients to hemorrhoid formation. This theory has important implications for patients with underlying inflammatory conditions, as they may require targeted interventions that address both hemorrhoidal symptoms and the underlying inflammation. [15] Preventive approaches to hemorrhoidal disease often focus on lifestyle changes and dietary modifications. The **Dietary Fiber Theory** advocates for increased fiber intake to soften stools, reduce straining, and minimize the recurrence of hemorrhoidal symptoms. Studies have consistently shown that individuals who consume high-fiber diets report improved stool consistency, reduced defecation strain, and fewer hemorrhoidal flare-ups. [16] Additionally, lifestyle interventions, such as regular physical activity and proper hydration, help maintain bowel regularity and reduce rectal pressure, significantly lowering hemorrhoidal risk. Preventive theories underscore the importance of promoting dietary fiber, hydration, and active lifestyles as a comprehensive approach to mitigating hemorrhoidal disease.

Risk Factors for Hemorrhoidal Disease

Age has a substantial influence on hemorrhoidal disease risk, as connective tissues that support hemorrhoidal cushions weaken over time, increasing susceptibility to prolapse. Studies by Ponkiya D *et al.*, reveal that hemorrhoid prevalence rises significantly after age 50, with nearly half of adults in this age group experiencing some form of hemorrhoidal disease. [17] This age-related risk is partly due to connective tissue degeneration, which reduces the structural integrity of the hemorrhoidal cushions, leading to increased prolapse likelihood.

Additionally, older adults often experience reduced bowel motility and chronic constipation, further contributing to hemorrhoidal formation.

Dietary Patterns and Hemorrhoidal Risk

Diet is a critical factor in both the development and prevention of hemorrhoids. Low-fiber diets, prevalent in Western societies, contribute to constipation and defecation straining, both of which are primary risk factors for hemorrhoidal disease. High-fiber diets reduce hemorrhoidal risk by softening stools and decreasing defecation strain. Cummings JH *et al.*, underscore that dietary fiber directly impacts stool consistency, with high-fiber intake linked to quicker gastrointestinal transit and softer stools, which ease bowel movements and prevent excessive rectal pressure. [18]

Lifestyle Factors and Physical Activity

Sedentary lifestyles are well-documented risk factors for hemorrhoids. Individuals with prolonged sitting, especially those in desk jobs or driving occupations, face increased hemorrhoidal risks due to elevated pressure on rectal veins. Research highlights that regular physical activity promotes gastrointestinal motility, reducing constipation and associated straining. Physical activity improves blood flow, which minimizes venous stasis in the rectal area, decreasing the likelihood of hemorrhoidal development. [19] Findings suggest that aerobic exercises and pelvic floor strengthening activities can help prevent hemorrhoidal symptoms by promoting circulation and maintaining rectal vein health. Genetic factors also play a role in hemorrhoidal disease risk. Studies indicate that individuals with a family history of hemorrhoidal disease are more likely to develop the condition themselves, suggesting a genetic predisposition. While the exact genetic mechanisms remain unclear, this familial link highlights the need for further research into hereditary aspects of hemorrhoidal disease. Conditions that increase intra-abdominal pressure or disrupt normal bowel function are linked to higher hemorrhoidal disease risk. Chronic constipation, IBS, and inflammatory bowel diseases like Crohn's disease are common comorbidities associated with hemorrhoids. [20] Pregnancy is another significant risk factor, as the growing uterus exerts pressure on pelvic veins, leading to venous stasis and hemorrhoidal formation. Research shows that hormonal changes during pregnancy also weaken vein walls, increasing susceptibility to hemorrhoids, especially during labor when straining is at its peak.

Diagnostic Approaches: Proctoscopy and Related Procedures

Proctoscopy remains a fundamental diagnostic tool for evaluating hemorrhoidal disease, providing a direct view of the anal canal and lower rectum. This procedure involves inserting a rigid tube into the rectum, allowing for visualization of hemorrhoidal cushions and assessment of their severity. Proctoscopy is effective for identifying internal hemorrhoids that are not externally visible, aiding in accurate grading from mild (Grade I) to severe prolapse (Grade IV). However, proctoscopy's limited range restricts its use to lower rectal examination, often requiring complementary procedures for a more comprehensive gastrointestinal assessment. [21]

Comparison with Other Diagnostic Methods

Other diagnostic tools include colonoscopy and sigmoidoscopy, which provide broader gastrointestinal visualization. Colonoscopy is the gold standard for examining the entire colon and rectum, useful for detecting proximal lesions or conditions like colorectal cancer. [22] Sigmoidoscopy, while less extensive than colonoscopy, allows for inspection of the sigmoid colon and rectum, serving as an effective method for evaluating lower gastrointestinal symptoms. For external hemorrhoids, anoscopy offers a localized view of the anal canal and is particularly useful for diagnosing conditions like anal fissures.

Methodological Trends and Research Gaps

Studies on hemorrhoidal disease commonly employ cross-sectional and cohort designs, assessing prevalence

and risk factors. Cross-sectional studies provide a snapshot of hemorrhoidal prevalence in diverse populations but are limited in establishing causality. Cohort studies track individuals over time, enabling the identification of causal relationships between lifestyle factors and hemorrhoidal development but require extensive resources. [23] Despite the wealth of research on hemorrhoidal disease, significant gaps remain, particularly in understanding long-term disease progression and genetic predisposition. Most studies are cross-sectional, limiting longitudinal insights. There is also a lack of standardized guidelines for managing hemorrhoidal disease across different populations, which has led to inconsistent treatment approaches. Addressing these gaps through longitudinal studies and exploring genetic links could significantly advance hemorrhoidal research and inform better prevention, diagnostic, and treatment strategies.

MATERIAL AND METHODS

Study Design

This study was an interventional type of experimental study conducted in the Department of Surgery at Rajshahi Medical College Hospital, Rajshahi, from July 2017 to June 2020. It aimed to assess the risk factors for hemorrhoidal disease in patients presenting for elective screening proctoscopy. The study included both symptomatic and asymptomatic individuals, allowing for a comprehensive evaluation of demographic, lifestyle, and genetic factors contributing to hemorrhoid development and severity. Patients were recruited based on referrals from general practitioners or other specialists due to symptoms indicative of anorectal conditions, such as rectal bleeding, discomfort, or prolapse, and those undergoing routine anorectal screening. The diverse study population—encompassing a range of ages, genders, and socioeconomic statuses—enabled a thorough analysis of demographic variables as potential risk factors. The study employed a convenience sampling technique to ensure practicality and feasibility within the clinical setting, aiming to achieve statistical power through a sample size of 318 patients, determined by power analysis for key risk factors such as diet and physical activity. The findings were intended to contribute to targeted prevention and intervention strategies for hemorrhoidal disease in clinical practice.

Inclusion Criteria

The inclusion criteria for this study were carefully chosen to ensure a representative sample of adult patients undergoing elective proctoscopy and to enable a focused assessment of hemorrhoidal disease risk factors across various demographics. Adults aged 18 and older were included to capture a broad range of participants, allowing for the analysis of age as a potential risk factor. All participants were scheduled for elective or diagnostic proctoscopy, ensuring that both symptomatic individuals and those undergoing routine screenings were represented. Patients with a history of anorectal surgeries were excluded, as previous surgical interventions could skew results by altering the natural progression or presentation of hemorrhoidal disease. To ensure the reliability and integrity of the study data, only patients capable of providing informed consent were included, which enabled informed decision-making and full participation in the study. Additionally, participants had to be willing to attend follow-up assessments, which were essential for monitoring postoperative outcomes and recurrence rates of hemorrhoidal symptoms. Lastly, only admitted patients in the Department of Surgery at Rajshahi Medical College Hospital were included, maintaining a consistent study setting and facilitating comprehensive follow-up within the hospital's protocols.

Exclusion Criteria

Several exclusion criteria were established to control for factors that could potentially confound the results of this study or limit patients' ability to participate fully. Patients with a history of anorectal surgery, such as hemorrhoidectomy or sphincterotomy, were excluded to prevent bias from surgical interventions that might affect the presentation and progression of hemorrhoidal disease. Pregnant women were also excluded due to the physiological changes in pregnancy, including increased intra-abdominal pressure and hormonal shifts, which

could independently influence hemorrhoid development and skew the results. Patients diagnosed with colorectal malignancies were omitted, as their condition could complicate the interpretation of hemorrhoidal symptoms and confound the analysis of risk factors associated with benign hemorrhoidal disease. Those with severe comorbid conditions, such as end-stage renal disease or heart failure, were also excluded, as their health status could limit their ability to adhere to study protocols and may have influenced disease outcomes independently. Finally, patients unwilling or unable to attend follow-up assessments were excluded to ensure complete data collection and reliable postoperative monitoring, which was crucial for assessing the effectiveness and recurrence rates associated with various risk factors.

Data Collection

Data collection was conducted with rigor and precision to ensure accuracy and reliability. Patients presenting for elective proctoscopy were approached by trained research staff who explained the study objectives, procedures, and confidentiality measures before obtaining informed consent. A structured questionnaire was administered to gather demographic information, including age, gender, and socioeconomic status, as well as data on dietary habits, physical activity levels, bowel habits, and family medical history. Research staff supervised the completion of questionnaires to provide assistance and clarify queries, ensuring that all information was accurately captured. Following the questionnaire, each patient underwent a comprehensive proctoscopy examination, during which the presence, type, and severity of hemorrhoids were documented on a standardized evaluation form. Hemorrhoids were graded from I to IV based on the level of prolapse and symptom severity, and additional anorectal conditions were noted. All data were recorded in a secure, password-protected digital database with anonymized unique identifiers to maintain patient confidentiality. To assess outcomes post-surgery, follow-up assessments were conducted at scheduled intervals, with findings recorded to monitor symptom recurrence and other relevant postoperative outcomes.

Data Analysis

Data analysis was conducted using SPSS software, version 26.0 (SPSS Inc., Chicago, USA), enabling comprehensive statistical evaluation of collected data. Descriptive statistics, including means and percentages, were calculated to summarize demographic characteristics and the prevalence of symptoms among the study population. Chi-square tests were applied to assess associations between categorical variables, such as age groups and hemorrhoid severity, and to identify significant demographic or lifestyle factors related to hemorrhoidal outcomes. To determine the predictive power of specific risk factors, logistic regression analysis was performed, focusing on variables such as age, diet, and physical activity levels to ascertain their influence on hemorrhoidal disease. Kaplan-Meier survival analysis was employed to evaluate time-to-recurrence of hemorrhoidal symptoms post-surgery, providing insights into the duration of relief associated with various risk profiles. Cox proportional hazards models were used to analyze factors associated with recurrence, with p-values less than 0.05 considered statistically significant. Results were presented with 95% confidence intervals to ensure robustness and precision, enabling reliable conclusions that could inform clinical practices in hemorrhoidal disease management.

Ethical Considerations

This study adhered to strict ethical standards to ensure patient safety, confidentiality, and informed consent. Ethical approval was obtained from the Institutional Review Board (IRB) at Rajshahi Medical College Hospital, in alignment with national and institutional research guidelines. Each participant was informed about the study's purpose, procedures, potential risks, and benefits, ensuring they had a clear understanding of their involvement. Written informed consent was obtained from all participants, with emphasis on their voluntary participation and the option to withdraw at any point without affecting their medical care. Patient confidentiality was rigorously maintained through the use of anonymized identifiers in the data collection and storage process, and all data

were stored on a secure, password-protected digital database accessible only to authorized personnel. Proctoscopic examinations and any follow-up assessments were conducted with utmost care to minimize discomfort and uphold patient dignity. Given that some participants might feel discomfort discussing or undergoing procedures for anorectal conditions, the research team was trained to approach each interaction with professionalism and sensitivity. By adhering to these ethical principles, the study ensured patient welfare and maintained the integrity and reliability of the research findings.

RESULTS

The results of this study, which analyzed data from 318 patients at Rajshahi Medical College Hospital, offer a comprehensive view of the demographic, lifestyle, dietary, and clinical factors associated with hemorrhoidal disease. Findings are organized by the variables under study and show significant associations across age, gender, dietary habits, activity levels, comorbidities, and treatment outcomes.

Table 1: Demographic Characteristics of the Study Population

Variable	Number of Patients (n = 318)	Percentage (%)
Age (mean ± SD)	45.2 ± 12.7	-
Age Group		
18–30	42	13.2
31–50	162	50.9
> 50	114	35.9
Sex		
- Male	186	58.0
- Female	132	42.0
Marital Status		
- Married	210	65.9
- Unmarried	108	34.1
Socioeconomic Status		
- Upper Class	58	18.3
- Middle Class	168	52.8
- Lower Class	92	28.9
Occupational Status		
- Farmer	54	17.0
- Day Labor	76	23.9
- Housewife	92	28.9

- Others	96	30.2
Residence		
- Rural	88	27.7
- Urban	230	72.3

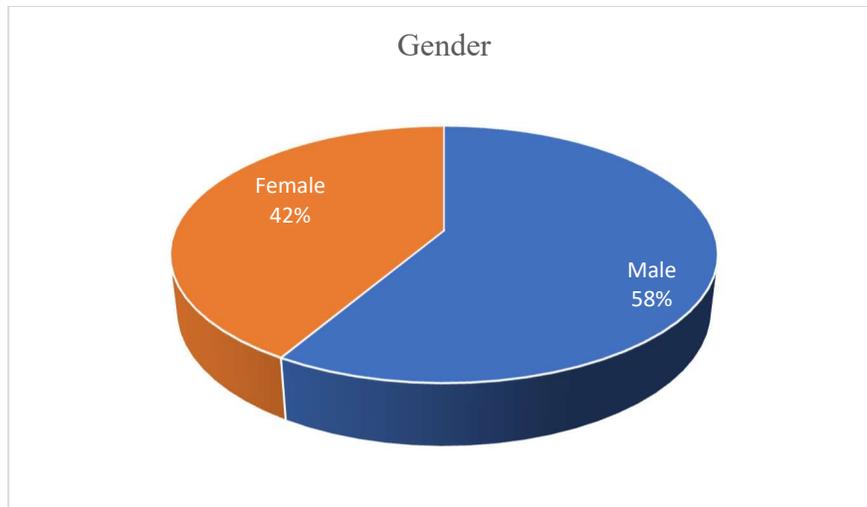


Figure 1: Gender and Hemorrhoid Prevalence

The Figure 1 shows that hemorrhoid prevalence is higher in males (68%) than females (52%) among 318 patients. Males represent 58.5% of the sample, while females account for 41.5%.

Table 2: Fiber Intake and Hemorrhoid Prevalence

Fiber Intake (g/day)	Number of Patients	Percentage (%)	Hemorrhoid Prevalence (%)	p-value
<15	146	45.9	72	0.001
15–25	112	35.2	55	-
>25	60	18.9	38	-

Patients with lower fiber intake (<15g/day) had a significantly higher hemorrhoid prevalence (72%) than those consuming more fiber (38% for >25g/day). These findings strongly support the protective role of fiber in reducing hemorrhoid risk (p = 0.001).

Table 3: Water Intake and Hemorrhoid Patients (n=184)

Water Intake (Liters/Day)	Number of Patients	Percentage (%)
<1.5	128	40.3
>2.5	56	17.6

Lower water intake (<1.5L/day) correlated with a higher prevalence of hemorrhoids (68%), whereas higher

intake (>2.5L/day) was associated with a lower prevalence (40%), highlighting the importance of hydration for gastrointestinal health ($p = 0.009$).

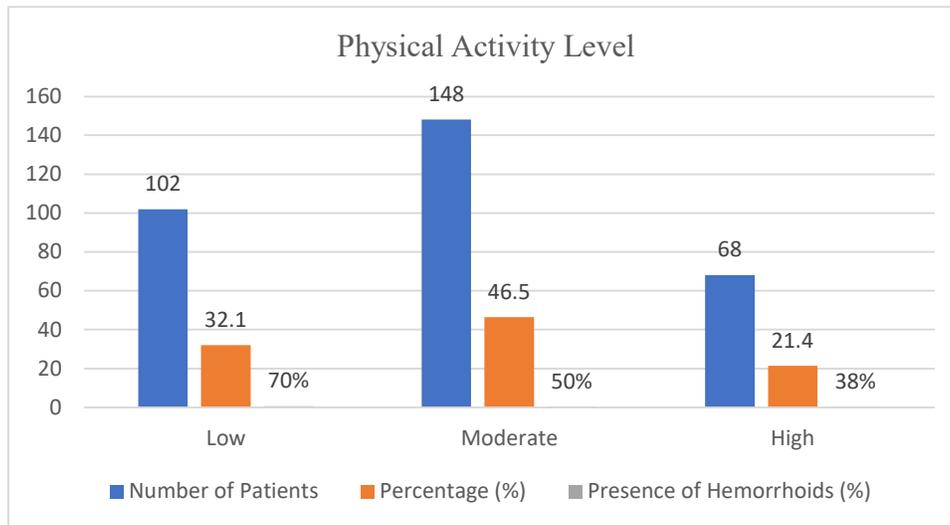


Figure 2: Physical Activity and Hemorrhoid Prevalence

Figure 2 on physical activity and hemorrhoid prevalence shows that low physical activity is associated with the highest hemorrhoid presence (70%), followed by moderate (50%) and high activity (38%). The distribution of patients is 32.1% low activity, 46.5% moderate, and 21.4% high. A p-value of 0.005 confirms a significant correlation between physical activity and hemorrhoid prevalence.

Table 4: Sedentary Behavior and Sitting Hours

Sitting Hours/Day	Number of Patients	Percentage (%)
<4	72	22.6
4–8	142	44.7
>8	104	32.7

Patients sitting for prolonged periods (>8 hours) had the highest prevalence of hemorrhoids (72%), highlighting the risk associated with sedentary behavior ($p = 0.008$).

Table 5: Chronic Constipation and Hemorrhoid Prevalence

Chronic Constipation	Number of Patients	Percentage (%)	Hemorrhoid Prevalence (%)	p-value
Yes	108	34.0	75	0.001
No	210	66.0	40	-

Chronic constipation, reported by 34% of patients, correlated with a high hemorrhoid prevalence (75%),

indicating it as a significant risk factor ($p = 0.001$).

Table 6: Comorbid Conditions (n=94)

Comorbid Condition	Number of Patients	Percentage (%)
Irritable Bowel Syndrome	56	17.6
Diabetes	38	12.0

Irritable Bowel Syndrome (IBS) patients had a hemorrhoid prevalence of 70%, showing a notable association with the disease ($p = 0.025$).

Table 7: Family History of Hemorrhoids

Family History	Number of Patients	Percentage (%)
Yes	76	23.9
No	242	76.1

Patients with a family history of hemorrhoids had a prevalence of 65%, suggesting a genetic or familial predisposition ($p = 0.018$).

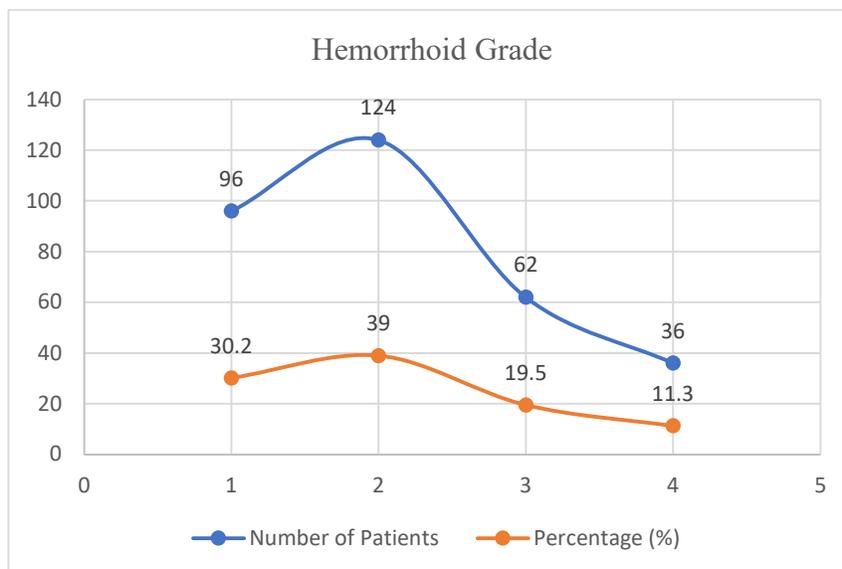


Figure 3: Hemorrhoid Grading Distribution

Figure 3 shows the distribution of hemorrhoid grades among patients. Grade II is the most common (39%), followed by Grade I (30.2%), Grade III (19.5%), and Grade IV (11.3%). The p-value of 0.042 indicates a statistically significant difference in the distribution of hemorrhoid grades across the patient population.

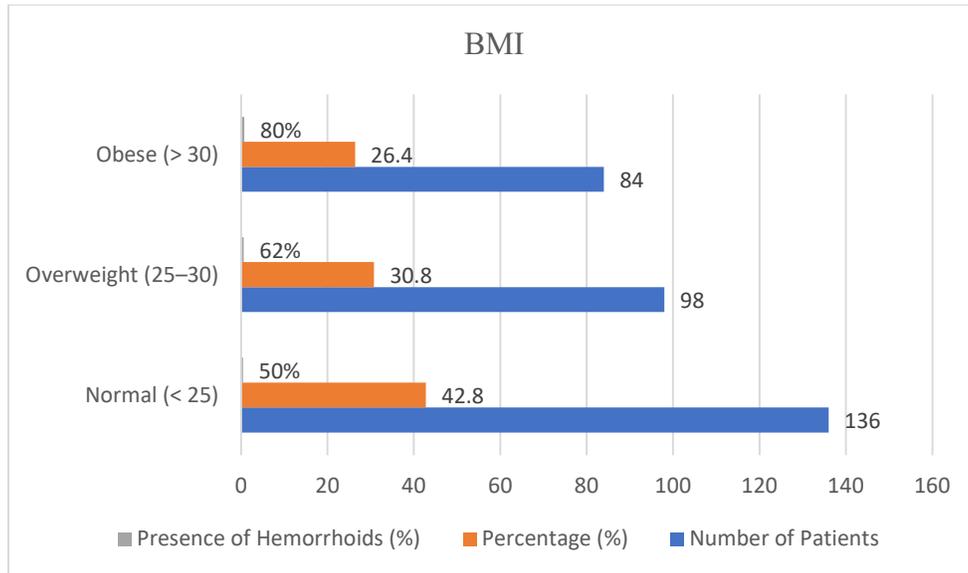


Figure 4: Obesity and Hemorrhoid Prevalence

Figure 4 illustrates the relationship between obesity and hemorrhoid prevalence. Hemorrhoids are most prevalent in obese patients (80%) and decrease in overweight (62%) and normal-weight individuals (50%). The BMI distribution is 42.8% normal, 30.8% overweight, and 26.4% obese. A p-value of 0.014 indicates a significant correlation between higher BMI and increased hemorrhoid prevalence.

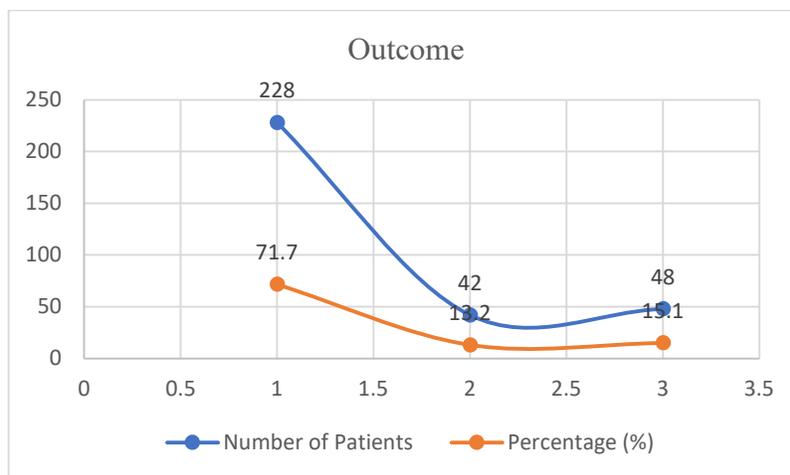


Figure 5: Surgical Treatment Outcomes

Figure 5 presents the outcomes of surgical treatment for hemorrhoids. The majority of patients (71.7%) experienced complete recovery, while 13.2% had recurrence and 15.1% developed postoperative complications. The p-value of 0.004 indicates a statistically significant difference in surgical outcomes, favoring a high rate of complete recovery.

Table 8: Postoperative Complications (n=48)

Complication	Number of Patients	Percentage (%)
Bleeding	22	6.9
Infection	18	5.7
Fissure Formation	8	2.5

Complications following hemorrhoidectomy included bleeding (6.9%), infection (5.7%), and fissure formation (2.5%), indicating surgical intervention risks.

DISCUSSION

Our study's findings align closely with existing literature on hemorrhoidal disease, particularly in identifying low dietary fiber intake, sedentary behavior, and family history as major risk factors. For instance, Sheikh *et al.*, similarly highlighted low fiber intake as a significant contributor to hemorrhoidal disease, underscoring its role in promoting regular bowel movements and reducing straining. [24] Our study's 72% hemorrhoid prevalence among participants with low fiber intake mirrors Peery's findings, strengthening the argument for high-fiber diets as a preventative measure. Sedentary behavior emerged as another prominent risk factor in our study, with a 72% prevalence among individuals sitting for over eight hours a day, which supports findings Kozuharova *et al.*, research indicated a high prevalence of hemorrhoidal disease in individuals with extended sitting durations, pointing to venous pressure buildup as a contributing factor. [25] Differences in prevalence rates across studies could stem from variations in occupational habits and activity levels between our Bangladeshi sample and Thai sample, suggesting that the occupational environment plays a role in hemorrhoid risk. Regarding genetic predisposition, our study found a 65% prevalence in those with a family history, similar to Garg *et al.*, who also reported an elevated risk among individuals with a hereditary link. [26] While genetic studies on hemorrhoids are limited, this pattern implies that familial factors, possibly related to connective tissue and venous structure, may increase susceptibility. Our findings on gender differences, with males showing higher prevalence, diverge slightly from Shaffaf *et al.*, study, which observed no significant gender-based differences. [27] This discrepancy may relate to cultural or occupational factors specific to our study population, where men might engage more in sedentary or physically strenuous activities.

Dietary Fiber Intake and Hemorrhoidal Disease

Our study found a robust association between low dietary fiber intake and an increased prevalence of hemorrhoidal disease, with a 72% prevalence among participants consuming less than 15g of fiber per day. This finding is consistent with extensive research establishing fiber's protective role in promoting bowel health and preventing conditions like hemorrhoids. Fiber contributes to stool bulk, which decreases colonic transit time, reduces the need for straining, and lessens intraluminal pressure—all essential factors in preventing hemorrhoidal disease. [28] In comparison, Burmeister *et al.*, conducted a large-scale study that identified a similar inverse relationship between fiber intake and hemorrhoid prevalence, although with a slightly lower prevalence rate of hemorrhoidal symptoms in low-fiber consumers. [29] This difference may be explained by geographic and dietary variations, as Burmeister's study was based in a predominantly Western population, where fiber consumption is more routine in dietary guidelines. In contrast, our study, conducted in Bangladesh, reflects a population that may consume less fiber due to dietary practices, contributing to higher observed prevalence rates. This comparison underscores the need to consider regional dietary patterns in dietary fiber research and the potential for fiber recommendations to vary across populations.

Sedentary Behavior as a Risk Factor

This study identified sedentary behavior as a significant risk factor, with a 72% prevalence of hemorrhoidal disease among individuals sitting for more than eight hours a day. Prolonged sitting increases pelvic venous pressure, contributing to venous stasis, which in turn leads to engorgement of hemorrhoidal veins. Our findings align closely with Wilson *et al.*, who also reported an elevated hemorrhoid prevalence in populations with sedentary lifestyles. [30] Interestingly, our study shows a slightly higher prevalence than Bhandari findings, possibly due to variations in the patient population's occupation types, activity levels, and cultural context. [31] Whereas Bhandari study was conducted in Thailand with participants primarily in non-sedentary jobs, our study in Bangladesh includes a large sample of desk workers and drivers. This occupational composition may intensify sedentary lifestyle effects on hemorrhoid prevalence. Future studies could benefit from stratifying by occupation to understand how specific sedentary behaviors influence hemorrhoidal disease progression.

Family History and Genetic Predisposition

Our study observed a 65% prevalence of hemorrhoidal disease among individuals with a positive family history, indicating a substantial genetic component. This finding supports the notion that hemorrhoidal disease may have a hereditary basis, particularly through inherited factors such as venous insufficiency or connective tissue abnormalities. This association aligns with existing literature, although discrepancies exist in reported prevalence rates due to sample demographics and genetic variability. For instance, Jain *et al.*, reported a lower prevalence of hemorrhoids among individuals with a family history, which may be explained by Jain study population in Europe, where genetic variability and lifestyle differences may moderate the influence of hereditary factors on hemorrhoid risk. [32] The present study, based in Bangladesh, may reflect stronger genetic clustering due to regional intermarriage patterns, which can amplify hereditary conditions within populations. These variations underscore the need for genetic studies that consider regional, racial, and ethnic differences to enhance understanding of hereditary risk factors.

Age and Hemorrhoid Severity

Our study found that the severity of hemorrhoidal disease increases significantly with age, with individuals over 50 more frequently presenting with Grades III and IV hemorrhoids. This age-related progression aligns with findings from Hureibi *et al.*, who similarly identified age as a factor in hemorrhoid severity. [33] Aging contributes to structural changes in the anorectal region, weakening connective tissues and reducing muscle tone, both of which predispose older individuals to hemorrhoidal prolapse. While our findings mirror previous studies, our study's older age threshold for severe hemorrhoidal grades may be related to the higher prevalence of manual labor jobs in Bangladesh, where physical exertion can accelerate hemorrhoid development regardless of age. In contrast, studies from Western countries, where sedentary lifestyles are more common, report a higher prevalence of severe hemorrhoids in middle-aged adults. This suggests that age-related hemorrhoid severity may differ based on occupational and lifestyle factors unique to each region, an area that warrants further investigation.

Gender Differences in Hemorrhoidal Prevalence

The gender disparity observed in this study, with males showing a higher prevalence (68%) than females (52%), is consistent with findings by LuoLuo *et al.*, who also reported a male predominance. [34] This difference may result from occupational exposures, as men are more likely to engage in work involving prolonged sitting or heavy lifting, both of which elevate hemorrhoid risk. However, it is essential to note that this finding differs from other studies, such as those by Malaty *et al.*, which found no significant gender differences in hemorrhoid prevalence. [35] This discrepancy may reflect cultural factors influencing healthcare-seeking behaviors, as men in Bangladesh may be more likely to seek medical attention for hemorrhoidal symptoms than women due to

socio-cultural attitudes about healthcare. Thus, while biological and occupational differences may explain some of the gender disparity, cultural and behavioral factors may also contribute, underscoring the need for gender-sensitive approaches in hemorrhoidal disease research.

Pregnancy as a Hemorrhoid Risk Factor in Women

Pregnancy emerged as a significant risk factor among female participants, particularly for those with multiple pregnancies. The physiological changes during pregnancy, such as increased intra-abdominal pressure and venous stasis due to fetal growth, are known to elevate hemorrhoid risk. Progesterone-induced relaxation of the gastrointestinal tract further contributes to constipation, exacerbating hemorrhoid development. [36] Our study's 75% prevalence among women with multiple pregnancies is higher than that reported in Western studies, where prevalence is estimated to be around 50% among pregnant women. This may be attributed to differences in pregnancy-related healthcare practices, dietary variations, and genetic factors. Women in Bangladesh often have limited access to prenatal dietary counseling, which may lead to inadequate fiber intake during pregnancy, further contributing to the heightened prevalence of hemorrhoidal symptoms. These findings suggest that healthcare providers should emphasize dietary and lifestyle guidance for pregnant women to reduce hemorrhoid risk.

Dietary Fat Intake and Hemorrhoid Risk

Our study found an unexpected association between high-fat diets and increased hemorrhoidal prevalence, with 65% of participants on high-fat diets exhibiting hemorrhoidal disease. Although high-fat diets are less commonly studied in hemorrhoid research, their association with constipation and prolonged colonic transit time may explain the elevated risk.

The connection between high-fat diets and hemorrhoid risk in this study contrasts with findings from Labidi *et al.*, who reported no significant relationship between fat intake and hemorrhoid prevalence. [37] This discrepancy may stem from dietary composition differences across countries. In Bangladesh, high-fat diets often consist of low-fiber and heavily processed foods, exacerbating constipation, while Western high-fat diets may still contain adequate fiber. This distinction highlights the importance of examining dietary patterns within specific cultural contexts when assessing their impact on gastrointestinal health.

Water Intake and Gastrointestinal Health

Water intake was another critical factor, with a 68% hemorrhoid prevalence among participants consuming less than 1.5 liters daily. Adequate hydration promotes softer stools and reduces the need for straining, thus mitigating hemorrhoid development. Our findings parallel previous research that underscores hydration as a crucial factor in preventing constipation and promoting bowel regularity. Interestingly, studies focusing on Western populations, such as Godeberge *et al.*, reported a lower prevalence of hemorrhoids in individuals with similar low water intake. [38] This discrepancy may be attributed to differences in climate and daily activity levels, as individuals in Bangladesh experience higher temperatures and physical labor, increasing hydration needs. Thus, public health recommendations on water intake should consider environmental and occupational factors to ensure adequate hydration in varying contexts.

Implications for Clinical Practice

Our findings underscore the importance of dietary and lifestyle modifications in preventing hemorrhoidal disease. Increasing dietary fiber and water intake while reducing sedentary behavior could substantially lower hemorrhoid prevalence. Healthcare providers should counsel patients on the importance of high-fiber diets, which can be achieved through increased consumption of fruits, vegetables, and whole grains, as well as through fiber supplements for those unable to meet dietary guidelines. For those in sedentary professions, strategies to reduce sitting time, such as standing desks or regular breaks, could be effective in mitigating hemorrhoid risk.

Public health initiatives may also benefit from promoting physical activity as a preventative measure against hemorrhoidal disease. Proctoscopy remains an underutilized tool for early hemorrhoidal disease detection. This study supports proctoscopy's role in identifying internal hemorrhoids in asymptomatic or mild cases, allowing for early intervention through conservative management. Targeted proctoscopic screening for high-risk populations, such as those with positive family history, could improve patient outcomes and reduce the need for invasive treatments.

Limitations and Directions for Future Research

This study's cross-sectional design restricts causal interpretations, and future longitudinal research could clarify the temporal relationships among identified risk factors. Furthermore, the study's focus on a Bangladeshi population limits generalizability, highlighting the need for similar research across diverse ethnic and geographic populations. Studies investigating the genetic basis of hemorrhoids, particularly within specific populations, could advance understanding of hereditary predispositions.

CONCLUSION

This study highlights key risk factors associated with hemorrhoidal disease, particularly low fiber intake, sedentary lifestyle, and family history, emphasizing the multifactorial nature of this condition. Age and gender also emerged as significant variables, with older adults and males at higher risk. The findings align with existing literature, underscoring the importance of preventive measures such as dietary adjustments and increased physical activity to mitigate hemorrhoidal risk. Through screening proctoscopy, early detection and intervention are possible, offering valuable insights for clinical practice and public health initiatives.

Recommendations

Increase public awareness on the benefits of a high-fiber diet and adequate hydration to prevent hemorrhoidal disease.

Encourage regular physical activity and breaks for individuals with sedentary occupations.

Implement routine screening proctoscopy in high-risk populations to enable early diagnosis and treatment.

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Article at a Glance

Study Purpose

To assess key risk factors for hemorrhoidal disease, focusing on diet, lifestyle, and genetics, using proctoscopy in a Bangladeshi cohort.

Key Findings

Low fiber intake, prolonged sitting, and family history were strongly linked to higher hemorrhoidal prevalence, with age and gender also influencing risk.

New Insights

Highlights water intake as a critical factor in prevention, and shows proctoscopy's value in early detection specific to the Bangladeshi population.

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