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Identifying the contributing factors in benign anorectal diseases including acute anal fissure and hemorrhoids

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Abstract

Background and objective: Hemorrhoidal disease and anal fissure are the two most frequent entities within benign anorectal diseases, both of which have a negative impact on quality of life. The current study focuses on the potential linkage between various demographic factors and lifestyle and the occurrence of hemorrhoids (HD) and anal fissures (AF).

Methods: This study includes 100 patients (50 HD and 50 AF) and 50 healthy controls. The patients diagnosed based on medical history and physical examination. The participants asked to answer the prepared questionnaire containing toilet choice, dietary choice, hydration status, fecal consistency, anxiety risk, and straining during defecation.

Result: A significant difference was observed in toilet choice between the control group with both HD and AF with P-values of 0.048 (OR = 0.37) and 0.017 (OR = 0.31), respectively. Patients with these conditions were more likely to use a sitting toilet and less likely to use a squatting toilet. Dietary habits differed among the study groups. The difference is significant for the HD group that uses mostly meat (P 0.009) and nearly significant for AF (P 0.070). Whereas anxiety, straining, gender, hydration status, age, and body weight did not show significant differences between groups. However, time spent on the toilet is the risk factor for benign anorectal diseases.

Conclusion: These results suggest that toilet habits and diet may contribute to the development of these conditions. If future research supports this idea, we could say that changing bathroom habits should be recommended to all patients with any degree of HD and AF as part of treatment and as a preventive measure. In addition, spending too much time in the toilet should be avoided, as it could worsen these conditions.

Keywords: Anxiety, Anal fissure, Fecal consistency, Hemorrhoids, Toilet habit.

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Introduction

Benign anorectal disorders comprise a heterogeneous group of conditions affecting the anal canal and rectum, often leading to considerable morbidity and impaired quality of life (1). These conditions, including hemorrhoids (HD), anal fissures (AF)s, anorectal abscesses, fistulas, and rectal prolapse, present with a spectrum of symptoms such as pain, bleeding, perianal swelling, and abnormal discharge (2). The development of these disorders is influenced by multiple factors, including chronic constipation, excessive straining, pregnancy, and certain systemic conditions such as inflammatory bowel disease (3). A thorough understanding of their pathophysiology, clinical manifestations, and evidence-based treatment approaches is essential for improving patient outcomes and minimizing recurrence rates.

Hemorrhoids are a common anorectal condition affecting most people during their lifetime (4). While typically asymptomatic, they become problematic when swollen, thrombosed, or prolapsed. External hemorrhoids usually go unnoticed unless inflamed, appearing as tender, bluish swellings near the anal opening, often causing pain or bleeding (5). Internal hemorrhoids, on the other hand, commonly present with bright red bleeding during bowel movements and may prolapse, especially with activities that increase intra-abdominal pressure, such as heavy lifting, pregnancy, or coughing. In severe cases, prolapse can occur even outside of defecation, requiring medical attention (6).

Anal fissure is one of the most frequent reasons for consultation in surgical clinics and it is one of the most common proctological conditions. It is a primary, seemingly trivial process characterized by the presence of a longitudinal tear extending from the anal margin to the pectinate line (7). Its incidence is the same for both sexes and can affect all ages, although it occurs more frequently in young people and middle-aged adults (8). From an anatomoclinical perspective, it can be classified as acute or chronic. An acute fissure is characterized as a superficial crack or ulcer associated with intense spasm of the internal anal sphincter (IAS) (9). Acute anal fissure is resolved spontaneously or resolved about 6 weeks after treatment. If healing failed, acute anal fissure turns to chronic. A chronic fissure corresponds to a deeper ulcer with hollowed edges that usually require surgery (10). The transverse fibers of the IAS are evident at the base of this ulcer, and it is accompanied by a hypertrophic papilla at its proximal end and a so-called sentinel hemorrhoid at its distal end (8, 11).

https://doi.org/10.15218/zjms.2026.001

Many factors have been shown to be involved in the development of HD and AF. However, the real pathophysiology is not understood well. The study showed that Obesity including high BMI, waist to hip ratio, and waist circumference associated with benign anorectal disorders (12). Conversely, the other studied showed that the obesity does not have the role in the development of benign anorectal diseases (13). Other studies showed that low fiber in diet, straining, lifting heavy weight, and constipation are the risk factor for benign anorectal disorders (3, 14). However the other study connected diarrhea with benign anorectal diseases (15). We aimed to evaluate with this study how common the habit of several lifestyle factors is in patients who have developed hemorrhoids and anal fissure.

Material and Methods

The study included 150 participants. One hundred patients and 50 healthy controls were enrolled. The healthy controls did not have any colorectal problems. The patients include 50 patients with HD and 50 patients with AF who visited Shaqlawa Teaching Hospital and private Clinics from 2023 to 2025. Only the Patients who were diagnosed by specialists were enrolled. A detailed history, a thorough physical and protological evaluation are essentially depended to correctly identify these conditions**.** The patients suspected with colorectal cancer by colonoscopy were excluded.

Questionnaire: A detailed questionnaire was prepared to ask each patient about age, gender, body weight, dietary choice (meat or vegetable), hydration (good, medium, bad), toilet choice, fecal consistency, time remaining in toilet (>10 min or <10 min), anxiety risk, and straining during defecation. Toilet choice was defined by mostly used (>50% toilet visits) the type of toilet either sitting or squatting toilet. For identifying fecal consistency, Bristol stool scale was used (16) in which Bristol type 1assessed as hard and type 2 as soft. Self-rating anxiety scale (SAS) was used to determine the anxiety risk which is developed by Dr. William W. K. Zung (17). The scale consists of 20 items each with for sores and a person with a total raw score of ≥45 is considered to have anxiety.

Ethical Considerations: Ethical approval was obtained from the Ethics Committee of Faculty of medicine, Koya University. As well as, all patients will provide informed consent orally before the start of the study. Finally, the anonymity and confidentiality of the patients are guaranteed throughout the study.

Statistical Analysis: A Chi-Square and Fisher's exact tests were conducted to evaluate the association between gender distribution, toilet choice, dietary preference, and hydration

https://doi.org/10.15218/zjms.2026.001

status among the study groups. For comparison of age and Body weight distribution among control, hemorrhoids, and anal fissure groups, one-way ANOVA with Dunnett's multiple comparisons test was conducted. Then, binary logistic regression was used to identify the predicters for HD and AF. The P-value of <0.05 will be considered statistically significant.

Results

Demographic and Lifestyle Factors in HD and AF

To evaluate the association of several factors, separate comparisons were made between the control group and the HD group, as well as between the control group and the AF group (Table 1).

The proportion of males was nonsignificantly (p-value 0.213, OR = 0.54) higher in the HD group (35/50, 70%) compared to the control group (28/50, 56%), whereas the AF group had a lower proportion of males (19/50, 38%). However, the differences were not statistically significant (P-value 0.108, OR = 2.07). Statistical analysis confirmed that the differences in toilet choice between the control group and both patient groups were significant (Control vs. HD: P value 0.048, OR = 0.37; Control vs. AF: P value 0.017, OR = 0.31). These findings suggest that HD and AF are more common among individuals who use a sitting toilet than those who use a squatting toilet.Dietary habits differed significantly between the control and HD groups. The HD group showed a significantly higher preference for a meat-based diet (88%) compared to the control group (64%) (P value 0.009, OR = 0.24). The same result with nearly significance was observed in AF group (P-value 0.070, OR = 0.39). Although a lower proportion of individuals in the HD group (28%) reported good hydration compared to the control group (46%), this difference was not statistically significant (P = 0.175). Similarly, no significant difference in hydration status was observed between the control and AF groups (P = 0.538).

https://doi.org/10.15218/zjms.2026.001

Table 1. Comparison of demographic, toilet, dietary, and hydration profiles among study groups

	Control n=50	HD n=50	P (Control vs HD) OR (CI)	AF n=50	P (Control vs AF) OR (CI)
Gender					
Male/Female (ratio)	28/22 (1.3)	35/15 (2.3)	0.213 0.54 (0.23-1.29)	19/31 (0.6)	0.108 2.07 (0.92-4.48)
Toilet Choice	**No. (%)**	**No. (%)**	**p‡ OR (CI)**	**No. (%)**	**p‡ OR (CI)**
Sitting toilet	10 (20)	20 (40)	0.048*	22 (44)	0.017*
Squatting toilet	40 (80)	30 (60)	0.37 (0.14-0.90)	28 (56)	0.31 (0.12-0.75)
Dietary choice					
Meat	32 (64)	44 (88)	0.009**	41 (82)	0.070
Vegetable	18 (36)	6 (12)	0.24 (0.08-0.64)	9 (18)	0.39 (0.16-1.00)
Hydration					
Good	23 (46)	14 (28)	0.175	21 (42)	0.538
Medium	14 (28)	19 (38)		19 (38)	
Bad	13 (26)	17 (34)		10 (20)	

Chi-square used for Hydration status and Fisher's exact tests for the rest of the comparison. *P <0.05. HD: hemorrhoids; AF: anal fissure.

https://doi.org/10.15218/zjms.2026.001

Comparison of age and weight among study groups

Figure 1 showed the statistical analysis to reveal the difference in age and weight between the control group and patients with hemorrhoids and anal fissure. The median age for controls, HD, and AF groups are 31.5 years (IQR: 26.0–38.25), 32.0 years (IQR: 25.75–40.25), and 31.0 years (IQR: 22.75–40.0), respectively. Analysis of age showed that there is no statistical difference when comparing patients with hemorrhoids (P-value 0.358) and anal fissure (P-value 0.997) with control group. Similar results were observed regarding the body weight. The HD and AF groups had slightly higher median body weight (70.5 kg, IQR: 59.0–79.25 and 73.0 kg, IQR: 61.0–80.25, respectively) compare to control group (70.5 kg, IQR: 59.0–79.25) however the differences were not statistically significant (Figure 1 B).

A binary logistic regression analysis was conducted to evaluate the association between fecal consistency, time spent in the toilet, anxiety risk, and straining during defecation with the likelihood of developing hemorrhoids and anal fissures.

Hemorrhoids Model

The logistic regression model for hemorrhoids (table 2) demonstrated that spending more than 10 minutes in the toilet was a statistically significant predictor (P = 0.007), with an odds ratio (OR) of 3.838 (95% CI: 0.573–10.249). This indicates that individuals who spend more than 10 minutes in the toilet are approximately 3.8 times more likely to develop hemorrhoids compared to those who spend less time. Conversely, fecal consistency (hard stools), anxiety risk, and frequent straining were not statistically significant predictors (P >0.05), suggesting that these factors did not independently influence the likelihood of developing hemorrhoids in this analysis.

Results of Binary Logistic Regression Analysis

https://doi.org/10.15218/zjms.2026.001

Table 2. Binary Logistic Regression Results for Hemorrhoids

Variable	B	S.E.	Wald	Sig.	Exp (B)	95% CI
Fecal_Hard	0.406	0.491	0.683	0.408	1.501	0.573-3.932
Time_>10min	1.345	0.501	7.203	0.007	3.838	0.573-10.249
Anxiety_Risk	0.257	0.501	0.302	0.583	1.293	0.517-3.235
Straining (Frequent)	0.733	0.494	2.200	0.138	2.081	0.790-5.481
Constant	-1.419	0.516	7.546	0.006	0.242	

B: Regression coefficient; SE: Standard error; CI: Confidence interval.
*P <0.05. Hemorrhoids as the dependent and remaining parameters as independent variables.

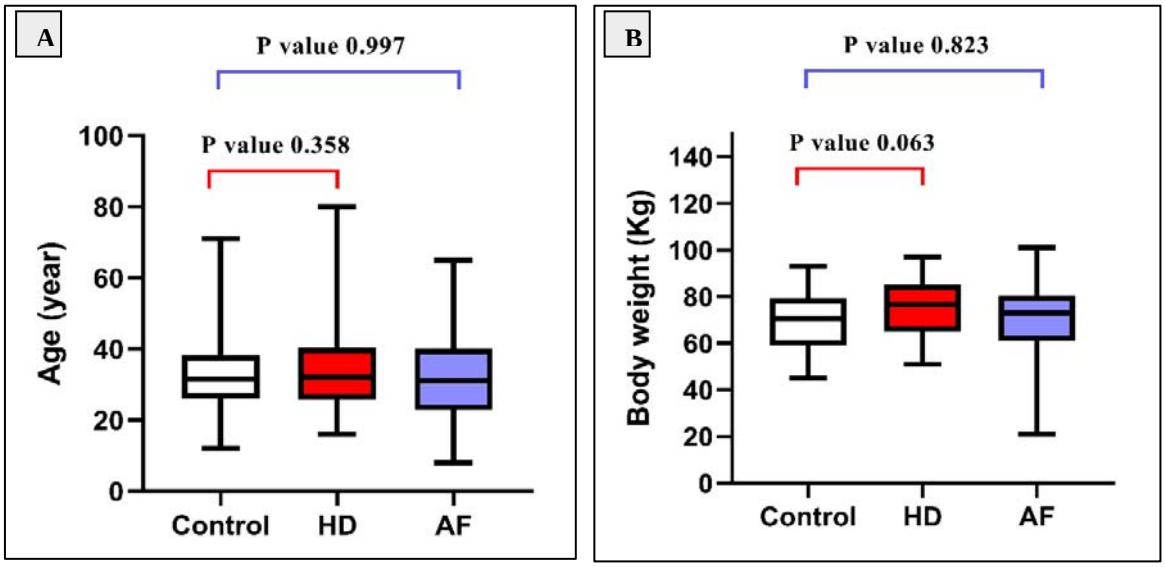

Figure 1. Comparison of age and body weight distribution among control, hemorrhoids, and anal fissure groups. The data are represented as median and interquartile ranges. Boxes represent the interquartile range (25th to 75th percentile). HD: hemorrhoids; AF: anal fissure.

https://doi.org/10.15218/zjms.2026.001

Anal Fissure Model

In the logistic regression model for anal fissure (table 3), a similar trend was observed. Time spent in the toilet (>10 minutes) remained a significant predictor (P = 0.006), with an OR of 3.831 (95% CI: 1.465–10.019). This suggests that individuals who remain in the toilet for extended periods have a substantially higher likelihood—nearly four times greater—of developing an anal fissure compared to those who spend less time. In contrast, hard stool consistency, anxiety risk, and frequent straining during defecation did not show statistically significant associations with anal fissure occurrence (P >0.05), implying that these factors were not independent contributors to the condition in this study.

Table 3. Binary Logistic Regression Results for Anal fissure

Variable	B	S.E.	Wald	Sig.	Exp (B)	95% CI
Fecal_Hard	0.300	0.479	0.393	0.531	1.350	0.528-3.449
Time_>10min	1.343	0.491	7.495	0.006	3.831	1.465-10.019
Anxiety_Risk	-0.159	0.458	0.120	0.729	0.853	0.347-2.094
Straining (Frequent)	0.367	0.456	0.646	0.422	1.443	0.590-3.531
Constant	-0.890	0.473	3.544	0.060	0.411	

B: Regression coefficient; SE: Standard error; CI: Confidence interval. *P <0.05. Anal fissure as the dependent and remaining parameters as independent variables.

Discussion

Benign anorectal diseases such as hemorrhoids and anal fissure, are a very frequent reason for consultation in both primary care and specialized care practices. These diseases have a negative impact on the quality of life of the patients. Hemorrhoids are defined as the distal displacement and venous distension of normal hemorrhoidal cushions however the anal fissure is the longitudinal crack in the anal skin (18). The current study Focus on the potential linkage between various demographic factors and lifestyle and the occurrence of hemorrhoids and anal fissures. The results revealed significant connection between specific variables, shedding light on possible role of dietary habits, hydration status, and toilet choice in the occurrence of these conditions.

In our study, there is no difference in age between the benign anorectal diseases and the control group. However, the study showed that the increasing age may have role in the development of benign anorectal

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disorders as increasing age decreases the anal resting pressure (19). Further studies and more sample size required to explain it. Moreover, the association of gender with benign anorectal disorders is still negotiable. Studies showed high prevalence of benign anorectal disorders among females (20) but other study showed that gender is not associated with benign anorectal diseases especially hemorrhoids (21).

These findings suggest that HD and AF are significantly more common among individuals who use a sitting toilet than those who use a squatting toilet. The reports support our results because the anorectal angle in the sitting toilet is increased that make the movement of faeces difficult from colon to anus (22). Thus, increasing the angle increses the straining during defecation and also increases more pressure inside colon that may even cause diverticulosis (23). In addition, our results showed that time remaining in the toilet is linked to benign anorectal diseases. Hence, remaining in the toilet for longer period of time is the significant predictor for both hemorrhoids and anal fissure which also reported by other study (24). The reason may be due to more pressure exertedon anal cushions that negatively affect the supporting tissues (25).

The fecal consistency despite of non-significant effect but in our results it is reveald that hard faeces is the risk factor for the development of both hemorrhoids and anal fisure.Hard stool could increase the pressure on the veins of the lower body this could finally lead to benign anorectal disease (26). In addition, hard stool could degenerate the anal supportive tissue because hard stool remain in the anal canal for long periord of time that could finally lead distal displacement of anal cusions (27). Regarding the anxiety, the association is non significant which is parallel with the results of other study by Huang *et al* (28). In contrast, other study showed the link between psychological disorders and the benign anorectal diseases (29) because it makes changes in the normal gastrointestinal movement that leads to constipation (30).

The meat based diet was more common among HD an AF groups however there is no significant connection of meat based diet with the anorectal diseases in oure study, but it has been reported that the fiber rich diet dicreases bowel transit time that prevent constipation thus dicrease the likeyhood of developing the anorectal diseases (31). The fiber supplimentation is one of the depended ways to mange hemorroids and anal fissure (32). In this study, there is no signifcant association of hydration status and straining during defecation. However, other study showed that decreased water intake and straining during defecation is stongly associated with benign

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anorectal disease (33). Other researches required to confirm the results of this study. The future study could focus also on the colllagen effect as benign anorectal diseases have been reported in Ehlers-Danlos syndrome (34).

Conclusion

Both anal fissure and hemorrhoidal disease have a negative impact on the quality of life of patients. This study provides valuable insights into the potential influence of many lifestyle factors on benign anorectal diseases. Several factors were not significantly associated however individuals with HD and AF were significantly more likely to use a sitting toilet than those in the control group. This suggests that using a sitting toilet might be associated with an increased risk of developing these conditions. Our findings suggest that a preference for a meat-based diet and the use of sitting toilets may be associated with an increased risk of these conditions. Encouraging a balanced diet rich in fiber, and educating individuals on optimal spending time in toilet could help reduce the development or worsen of these conditions.

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Competing interest

The author declares that he has no competing interests.

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