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AWARENESS AND ACCEPTANCE OF DIGITAL RECTAL EXAMINATION AMONG THE GENERAL POPULATION IN SAUDI ARABIA: A NATIONWIDE CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Digital rectal examination (DRE) is a simple yet essential clinical tool for the evaluation of anorectal and gastrointestinal conditions. Despite its diagnostic value, its utilization remains limited, largely due to low public awareness and multiple psychological and sociocultural barriers. This study aimed to assess awareness and acceptance of DRE among the general population in Saudi Arabia and to identify factors influencing its acceptance.

Methods: A web-based cross-sectional study was conducted among individuals aged 18–75 years across all regions of Saudi Arabia using a snowball sampling technique. Data were collected through a structured, self-administered online questionnaire. The survey assessed sociodemographic characteristics, awareness, acceptance, and perceptions of DRE, as well as knowledge related to hemorrhoids. Statistical analysis was performed using SPSS version 29. Descriptive statistics were used to summarize the data, while inferential analyses, including Chi-square, Mann–Whitney U, and Kruskal–Wallis tests, were applied. Multivariate logistic regression was conducted to identify predictors of awareness. A p-value < 0.05 was considered statistically significant.

Results: A total of 686 participants were included. Overall awareness of DRE was predominantly moderate (53.9%), with 27.1% demonstrating high awareness and 19.0% low awareness. More than half of participants (58.3%) reported that they would refuse DRE if recommended by a physician. Common barriers included shyness (43.1%), fear of the procedure (42.0%), and disgust (30.5%). Awareness was significantly associated with age and employment status ($p < 0.001$), while acceptance was significantly associated with gender, age, and employment status ($p < 0.001$). Males, older individuals, and employed participants were more likely to accept DRE.

Conclusion: Awareness of DRE among the general population in Saudi Arabia is moderate; however, acceptance remains limited due to psychological and sociocultural barriers. These findings highlight a critical gap between awareness and actual practice. Targeted, culturally sensitive educational interventions are essential to improve acceptance and promote early clinical evaluation of anorectal and colorectal conditions.

KEYWORDS: Digital rectal examination (DRE); Awareness; Acceptance; Anorectal conditions; Hemorrhoids; Screening; Saudi Arabia; Cross-sectional study

INTRODUCTION

Benign anorectal conditions, including hemorrhoids, anal fissures, fistulas, and rectal prolapse, frequently present with symptoms that overlap with those of serious malignant diseases such as colorectal cancer. This clinical overlap represents a critical diagnostic challenge, as delayed or inadequate evaluation may lead to missed or late detection of potentially life-threatening conditions [1].

Digital rectal examination (DRE) remains a cornerstone of physical assessment in patients presenting with anorectal and gastrointestinal symptoms [1]. As a simple, low-cost, and minimally invasive procedure, it provides essential diagnostic insights, including the detection of masses, assessment of sphincter tone, and identification of structural abnormalities [3]. Despite its well-established clinical value, DRE continues to be underutilized in routine clinical practice, reflecting a persistent gap between evidence-based recommendations and real-world implementation [5].

Accumulating evidence indicates that patient acceptance of DRE is shaped by a complex interplay of factors, including cultural norms, psychological discomfort, limited awareness, and procedural misconceptions [5,9]. These barriers are particularly pronounced in conservative societies, where modesty, stigma, and sociocultural sensitivities may substantially reduce willingness to undergo intimate clinical examinations [10,11].

In Saudi Arabia, existing literature has largely focused on specific regions or subpopulations, leaving a critical gap in understanding awareness and acceptance at the national level [4,7]. Prior studies have predominantly emphasized knowledge assessment, with limited exploration of the multidimensional determinants—demographic, cultural, and psychological—that influence acceptance behaviors.

Accordingly, this study aims to provide a comprehensive national evaluation of awareness and acceptance of digital rectal examination among the general population in Saudi Arabia, while identifying key determinants influencing acceptance. By integrating both cognitive (awareness) and behavioral (acceptance) dimensions, this study contributes to a more nuanced understanding of barriers to early clinical evaluation and supports the development of targeted, culturally sensitive public health strategies aimed at improving early detection of anorectal and colorectal conditions.

BACKGROUND AND LITERATURE REVIEW

Digital rectal examination (DRE) plays a fundamental role in the clinical evaluation of anorectal and gastrointestinal conditions. Several studies have emphasized its diagnostic value in detecting structural abnormalities, anorectal dysfunction, and early signs of serious diseases [3,6]. Despite its clinical importance, evidence indicates that DRE is often underutilized in routine practice, which may contribute to delayed diagnosis and suboptimal patient outcomes [5].

Previous studies have explored public awareness and acceptance of DRE across different populations, revealing considerable variability in knowledge levels and attitudes. For instance, a study conducted in Saudi Arabia reported that although a proportion of participants had heard of DRE, only a small percentage had previously undergone the examination, highlighting a clear gap between awareness and actual clinical uptake [4]. Similarly, international studies have demonstrated that awareness does not necessarily translate into acceptance, suggesting that additional behavioral and contextual factors influence patient decision-making [8].

Psychological and sociocultural factors have been consistently identified as key barriers to DRE acceptance. Fear of pain, embarrassment, and discomfort are among the most commonly reported concerns, while cultural norms and social stigma further contribute to reluctance, particularly in conservative societies [9–11]. These findings indicate that acceptance of DRE extends beyond knowledge alone and is shaped by emotional, cultural, and social dimensions.

In addition, demographic factors such as age, gender, and employment status have been shown to influence both awareness and acceptance of DRE. Studies suggest that older individuals and those with greater exposure to healthcare systems are more likely to accept screening procedures, whereas younger populations tend to demonstrate lower engagement with preventive practices [13,14].

Furthermore, knowledge related to anorectal conditions, including causes and prevention of hemorrhoids, has been explored in several studies, showing that lifestyle factors such as chronic constipation, prolonged sitting, and dietary habits are commonly recognized by the public [12]. However, this knowledge is often fragmented and does not necessarily extend to understanding the role of clinical examinations such as DRE in early diagnosis.

Despite the growing body of literature, most studies have focused on specific regions or targeted populations, with limited evidence addressing awareness and acceptance of DRE at a national level within Saudi Arabia. Moreover, there remains a lack of comprehensive analysis that integrates both awareness and acceptance while examining the influence of multiple determinants simultaneously.

Therefore, this study addresses an important gap in the literature by providing a nationwide assessment of awareness and acceptance of DRE among the general population in Saudi Arabia, with a focus on identifying key factors influencing acceptance behavior.

METHODOLOGY

Study Design and Setting

This web-based descriptive cross-sectional study was conducted to assess the awareness and acceptance of digital rectal examination (DRE) for the clinical evaluation of anorectal conditions among the general population in Saudi Arabia. A snowball sampling technique was employed to recruit participants.

Study Population and Eligibility Criteria

The study included individuals from the general population across all regions of Saudi Arabia, aged between 18 and 75 years of both genders. Participants who did not provide informed consent or did not meet the inclusion criteria were excluded.

Data Collection

Data were collected between April 10, 2024, and June 4, 2024. An online self-administered questionnaire was developed using Google Forms and distributed in Arabic through various social media platforms.

Prior to participation, individuals were informed about the study objectives and provided electronic informed consent. Participation was voluntary, and all responses were collected anonymously.

Questionnaire Design

The questionnaire was designed to ensure clarity, simplicity, and respect for participants' privacy. It consisted of two sections:

Section 1: Demographic characteristics, including gender, age, nationality, region of residence, level of education, employment status, and field of work.

Section 2: A total of 21 multiple-choice questions assessing awareness and acceptance of DRE for the clinical evaluation of anorectal conditions, as well as general knowledge of hemorrhoids.

The questionnaire was adapted from a previously published study after obtaining permission from the corresponding author via ResearchGate [4].

Sample Size

The sample size was calculated using the OpenEpi calculator for clinical research, based on the estimated size of the general population in Saudi Arabia.

Statistical Analysis

Data were analyzed using IBM SPSS version 29 and Microsoft Excel. Descriptive statistics, including mean, standard deviation, frequencies, and percentages, were used to summarize the data.

Inferential statistical analyses were performed to examine associations between variables. The Chi-square test was used to assess relationships between categorical variables, while the Mann–Whitney U test and Kruskal–Wallis test were applied for comparisons involving non-normally distributed data. In addition, multivariate binary logistic regression analysis was conducted to identify independent predictors of awareness.

Statistical significance was set at a p-value of < 0.05.

Ethical Considerations

Ethical approval was obtained from the Institutional Review Board (IRB) of Umm Al-Qura University, Makkah, Saudi Arabia. All participants were informed about the purpose of the study and assured that their data would remain confidential.

RESULTS

A total of 686 participants were included in this study. The majority were female (76.1%), and most participants were aged 18–25 years (67.5%). Most were Saudi nationals (81.5%) and were distributed across all regions of Saudi Arabia, with the highest proportion from the South (26.2%).

Most participants had a university-level education (82.5%), and more than half were students (53.8%) **(Table 1).**

Table 1. Sociodemographic characteristics of participants (n = 686)

Variable	Category	n	%
Gender	Female	522	76.1
	Male	164	23.9
Age	18–25 years	463	67.5
	26–45 years	165	24.1
	46–65 years	54	7.9
	>65 years	4	0.6
Nationality	Non-Saudi	127	18.5
	Saudi	559	81.5
Region	South	180	26.2
	Western	157	22.9
	North	130	19.0
	Central	120	17.5
	Eastern	99	14.4
Education	Primary/Middle	12	1.7
	Secondary	108	15.7
	University	566	82.5
Employment Status	Unemployed	128	18.7
	Employed	189	27.6
	Students	369	53.8

Overall Awareness of DRE

Overall awareness of digital rectal examination (DRE) among participants was predominantly moderate. Specifically, 53.9% demonstrated a moderate level of awareness, while 27.1% exhibited high awareness and 19.0% had low awareness **(Figure 1).**

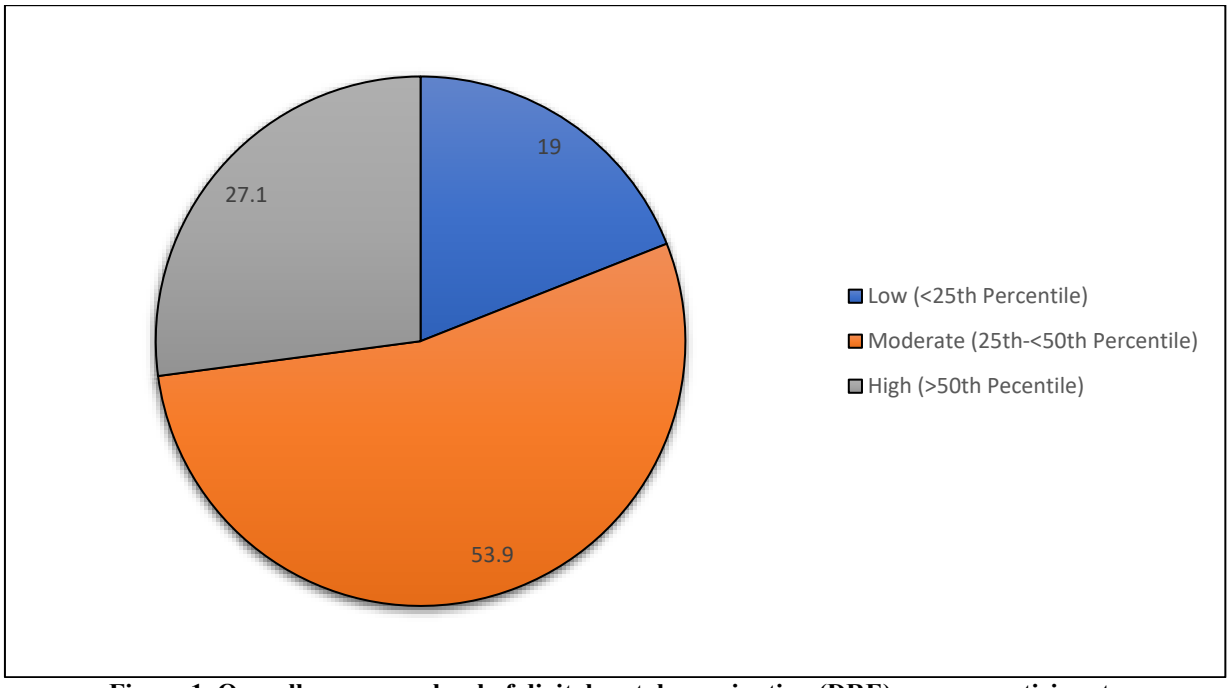

Figure 1. Overall awareness level of digital rectal examination (DRE) among participants

Awareness and Perceptions of DRE

Most participants (78.6%) reported no history of anorectal conditions, while 15.6% had personal experience and 5.8% reported a family history. Awareness of digital rectal examination (DRE) was moderate, with 53.4% having heard of the procedure.

The majority (90.2%) had never undergone DRE. Perceptions regarding its invasiveness varied, with 47.4% disagreeing that it is overly invasive, 17.1% agreeing, and 35.6% remaining uncertain.

More than half of participants (53.9%) perceived cultural or traditional factors as barriers to undergoing DRE. Regarding health-seeking behavior, 60.8% reported that they would not resort to folk medicine.

When asked about willingness to undergo DRE in a screening setting, 27.6% agreed, 34.8% were uncertain, and 37.6% declined **(Table 2).**

Table 2. Awareness and perceptions of digital rectal examination (DRE) among participants (n = 686)

Variable	Category	n	%
History of anorectal conditions	No	539	78.6
	Yes (self)	107	15.6
	Yes (relative)	40	5.8
Have you ever heard of DRE?	No	320	46.6
	Yes	366	53.4
Have you ever undergone DRE?	No	619	90.2
	Yes	67	9.8
Do you think DRE is too invasive?	No	325	47.4
	Yes	117	17.1
	Not sure	244	35.6
Do customs or traditions act as a barrier to DRE?	No	78	11.4
	Maybe	238	34.7
	Yes	370	53.9
Would you resort to folk medicine?	No	417	60.8
	Maybe	190	27.7
	Yes	79	11.5
Would you agree to DRE in a screening clinic?	No	258	37.6
	Maybe	239	34.8
	Yes	189	27.6

Acceptance and Barriers to DRE

More than half of participants (58.3%) reported that they would refuse DRE if recommended by a physician, while 41.7% indicated willingness to accept.
The most commonly reported barriers were shyness (43.1%), fear of the procedure (42.0%), and disgust (30.5%), while lack of symptoms was reported by 17.3%.
Symptoms that would increase acceptance included pain (59.0%), bleeding (57.1%), and the presence of a lump (45.8%), whereas 14.7% indicated that no symptoms would prompt acceptance.
Regarding perceived diagnostic capability, most participants believed that DRE could detect hemorrhoids (62.8%), followed by anal fissures (45.0%), while fewer identified colorectal cancer (34.3%) and prostate cancer (28.1%). Notably, 23.3% were uncertain **(Table 3).**

Table 3. Acceptance and perceived features of digital rectal examination (DRE) among participants (n = 686)

Variable	Category	n	%
If your doctor recommended DRE, would you accept?	No	400	58.3
	Yes	286	41.7
Barriers to screening	Lack of symptoms	119	17.3
	Disgust at the procedure	209	30.5
	Fear of the procedure	288	42.0
	Shyness about exposure	296	43.1
Symptoms prompting acceptance	Pain	405	59.0
	Bleeding	392	57.1
	Lump in anus/rectum	314	45.8
	Change in bowel habits	59	8.6
	None	101	14.7
Conditions detected by DRE	Hemorrhoids	431	62.8
	Anal fissure	309	45.0
	Skin tags	237	34.5
	Colorectal cancer	235	34.3
	Prostate cancer	193	28.1
	Not sure	160	23.3

Knowledge of Hemorrhoids
Awareness of hemorrhoid-related signs and symptoms varied among participants. The most commonly recognized features were dilated anal/rectal veins (47.1%), perianal pain (44.0%), and bleeding during defecation (43.7%). Other recognized symptoms included anal wounds (40.8%) and perianal swelling (38.8%) **(Figure 2).**
Regarding causes, the most frequently identified factors were chronic constipation or diarrhea (62.4%) and prolonged sitting (60.2%). Pregnancy and labor were recognized by 49.4% of participants, while straining during defecation was identified by 47.7% **(Figure 3).**
In terms of prevention, the most commonly recognized strategies were consuming a high-fiber diet (75.5%), defecating when needed (56.9%), and increasing fluid intake (41.0%) **(Figure 4).**

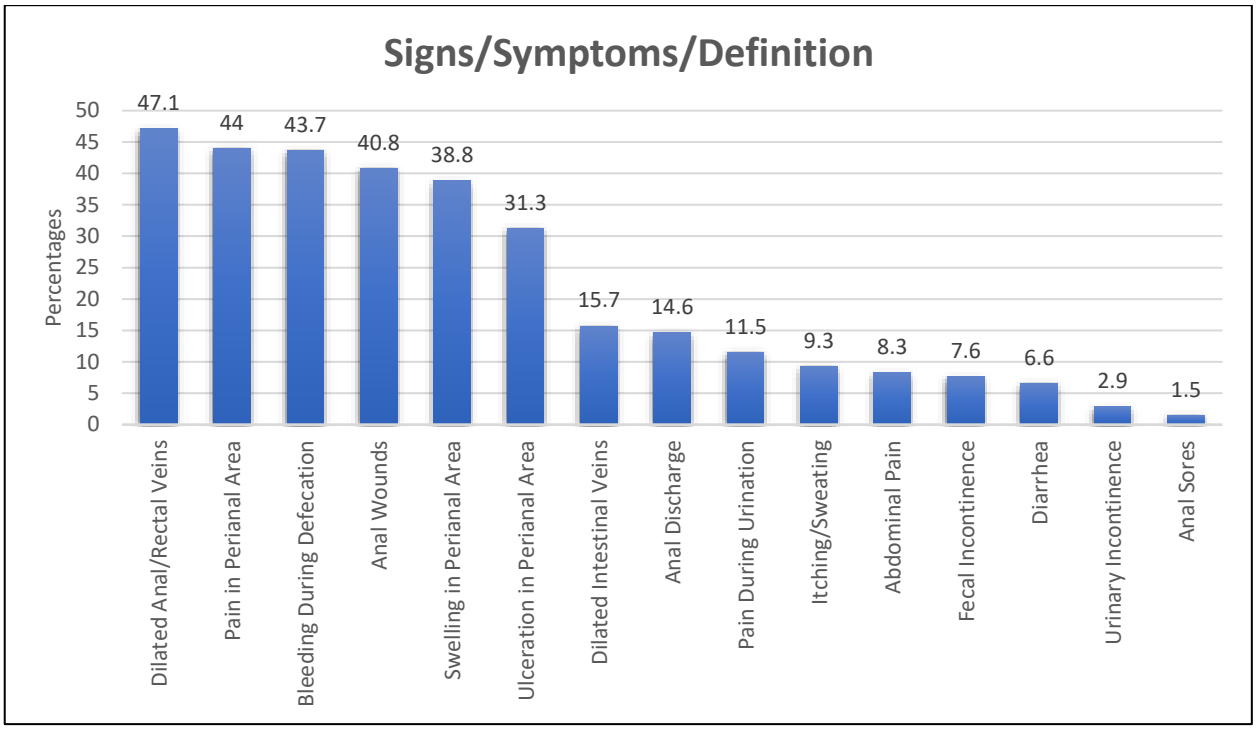

Figure 2. Awareness of signs and symptoms of hemorrhoids among participants

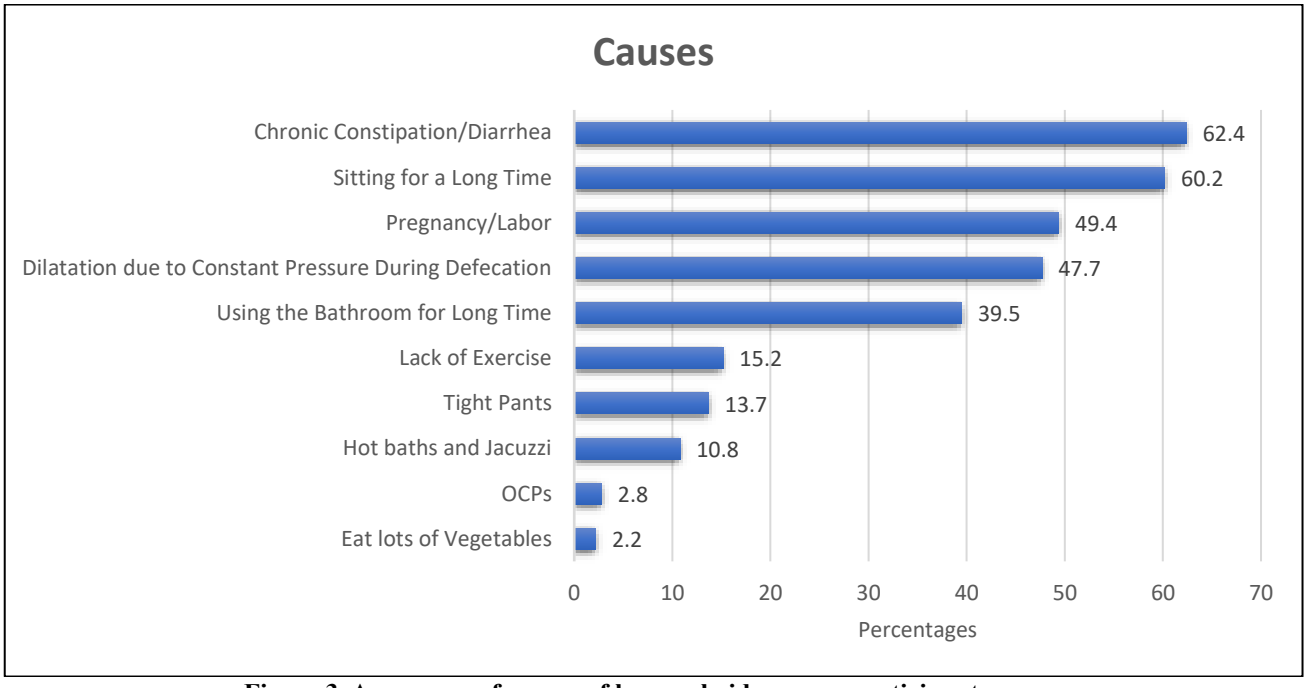

Figure 3. Awareness of causes of hemorrhoids among participants

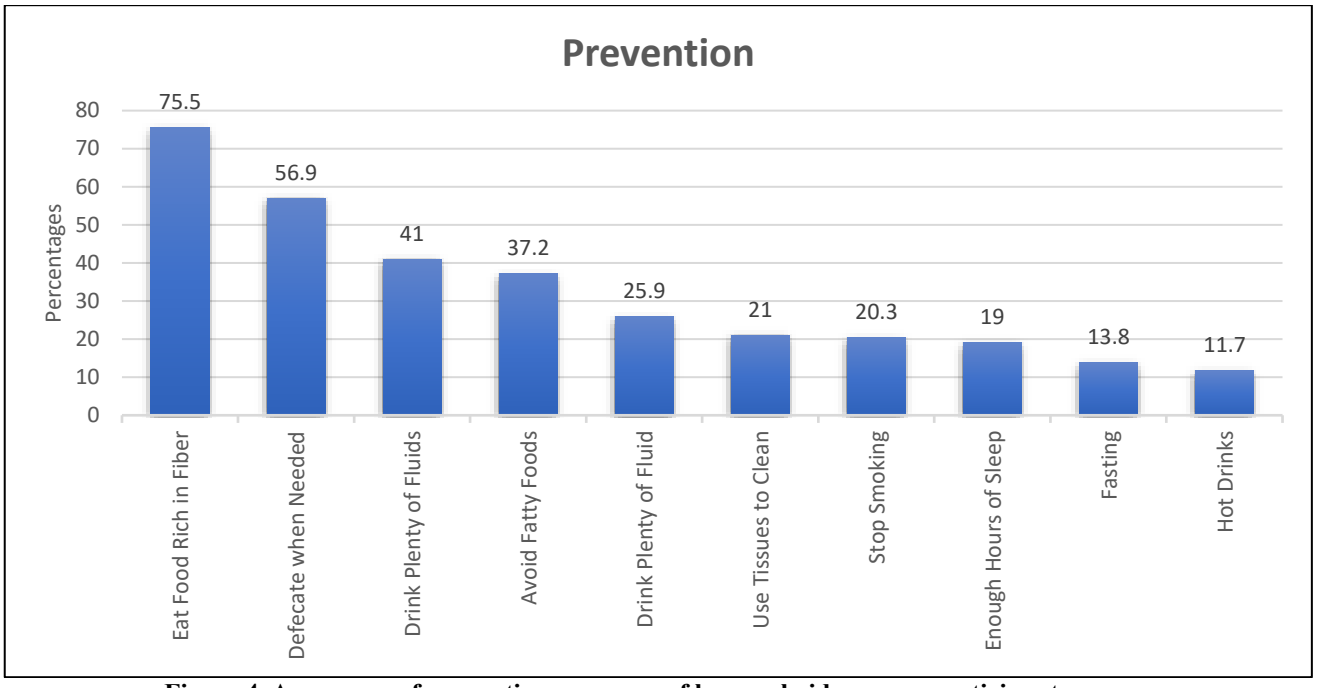

Figure 4. Awareness of preventive measures of hemorrhoids among participants

Factors Associated with Awareness of DRE

Awareness scores did not significantly differ by gender, nationality, region, or educational level ($p > 0.05$).

A significant association was observed with age ($p < 0.001$), with awareness scores increasing across older age groups. In addition, employment status was significantly associated with awareness ($p < 0.001$), with employed participants demonstrating higher awareness compared to students **(Table 4).**

Table 4. Differences in awareness scores of digital rectal examination (DRE) according to participant characteristics

Variable	Category	n	Mean (SD)	p-value
Gender	Female	522	7.30 (2.0)	0.207[a]
	Male	164	7.50 (2.2)	
Age	18–25 years	463	7.15 (2.0)	<0.001[b]
	26–45 years	165	7.73 (2.1)	
	46–65 years	54	7.90 (1.9)	
	>65 years	4	8.00 (0.8)	
Nationality	Non-Saudi	127	7.37 (2.1)	0.904[a]
	Saudi	559	7.35 (2.1)	
Region	South	180	7.33 (2.1)	0.398[b]
	Western	157	7.17 (1.9)	
	North	130	7.72 (2.1)	
	Central	120	7.38 (2.2)	
	Eastern	99	7.15 (2.1)	
Education	Primary/Middle	12	7.50 (2.6)	0.212[b]
	Secondary	108	7.01 (1.9)	
	University	566	7.41 (2.1)	
Employment Status	Unemployed	128	7.58 (2.2)	<0.001[b]
	Employed	189	7.78 (2.1)	
	Students	369	7.05 (1.9)	

[a] Mann–Whitney U test

[b] Kruskal–Wallis test

Predictors of Awareness of DRE (Regression Analysis)

Multivariate logistic regression analysis was performed to identify independent predictors of high awareness of digital rectal examination (DRE). Gender, age, nationality, and education were not significantly associated with awareness ($p > 0.05$).
Employment status was the only significant predictor ($p = 0.034$), with unemployed participants less likely to have high awareness compared to employed individuals (OR = 0.762, 95% CI: 0.592–0.980) **(Table 5).**

Table 5. Multivariate logistic regression analysis of predictors of high awareness of digital rectal examination (DRE)

Variable	B	p-value	OR (Exp(B))	95% CI
				Lower–Upper
Gender (Male)	0.283	0.157	1.327	0.896–1.965
Age	0.263	0.069	1.301	0.979–1.729
Nationality (Saudi)	0.273	0.241	1.314	0.832–2.075
Higher Education	0.089	0.659	1.093	0.737–1.620
Employment Status (Employed vs Unemployed)	-0.272	0.034	0.762	0.592–0.980
Constant	-1.564	0.023	0.209	—

Factors Associated with Acceptance of DRE
Acceptance of digital rectal examination (DRE) was significantly associated with gender, age, and employment status ($p < 0.001$).
Males were more likely to accept DRE compared to females. Acceptance also increased with age, with higher proportions observed in older age groups.
In addition, employed participants showed higher acceptance compared to unemployed individuals and students.
No significant associations were observed with nationality, region, or educational level ($p > 0.05$) **(Table 6).**

Table 6. Association between acceptance of digital rectal examination (DRE) and participant characteristics

Variable	Category	No n (%)	Yes n (%)	p-value
Gender	Female	323 (61.9)	199 (38.1)	<0.001[a]
	Male	77 (47.0)	87 (53.0)	
Age	18–25 years	293 (63.3)	170 (36.7)	<0.001[a]
	26–45 years	86 (52.1)	79 (47.9)	
	46–65 years	20 (37.0)	34 (63.0)	
	>65 years	1 (25.0)	3 (75.0)	
Nationality	Non-Saudi	70 (55.1)	57 (44.9)	0.419[a]
	Saudi	330 (59.0)	229 (41.0)	
Region	South	104 (57.8)	76 (42.2)	0.598[a]
	Western	86 (54.8)	71 (45.2)	
	North	73 (56.2)	57 (43.8)	
	Central	76 (63.3)	44 (36.7)	
	Eastern	61 (61.6)	38 (38.4)	
Education	Primary/Middle	7 (58.3)	5 (41.7)	0.439[a]
	Secondary	69 (63.9)	39 (36.1)	
	University	324 (57.2)	242 (42.8)	
Employment Status	Unemployed	76 (59.4)	52 (40.6)	<0.001[a]
	Employed	86 (45.5)	103 (54.5)	
	Students	238 (64.5)	131 (35.5)	

[a] Chi-square test

DISCUSSION

The present study demonstrated that awareness of digital rectal examination (DRE) among the general population was predominantly moderate, indicating that, despite its clinical importance, awareness remains suboptimal. This

finding is consistent with previous studies suggesting that public education regarding DRE remains a global challenge [7].

A notable gap was identified in participants' understanding of the diagnostic role of DRE, particularly in relation to malignant conditions. Only 28.1% recognized its role in detecting prostate cancer, reflecting limited awareness of its broader clinical applications. In contrast, higher awareness levels have been reported in other settings, highlighting variability across populations [8].

Despite moderate awareness, actual exposure to DRE was markedly low, indicating a gap between awareness and practice. Psychological barriers, including fear and embarrassment, were among the most commonly reported obstacles, consistent with previous literature identifying these factors as key deterrents to undergoing DRE [9].

Cultural influences further contributed to reduced acceptance, with more than half of participants perceiving societal norms and traditions as barriers. This underscores the significant role of sociocultural context in shaping attitudes toward intimate medical examinations [10,11].

Participants demonstrated greater awareness of DRE in relation to benign conditions, such as hemorrhoids and anal fissures, compared to malignant diseases. This pattern reflects a limited perception of DRE as a comprehensive diagnostic tool. Similar findings have been reported in Saudi Arabia, where awareness of its role in detecting colorectal cancer remains relatively low [4]. Additionally, previous studies have emphasized the clinical value of DRE in evaluating defecatory disorders, including constipation and fecal incontinence [3].

Knowledge regarding the causes and prevention of hemorrhoids was largely consistent with existing literature. Lifestyle-related factors such as chronic constipation and prolonged sitting were commonly identified, while increased fiber intake was widely recognized as a preventive measure. These findings support existing evidence on the role of lifestyle behaviors in anorectal conditions [12].

Demographic factors revealed distinct patterns in awareness and acceptance. Older age and employment status were significantly associated with higher awareness levels, likely reflecting increased exposure to healthcare systems. Similar trends have been reported in previous studies, where older individuals demonstrated greater engagement in preventive health practices [13].

Although gender was not significantly associated with awareness, it influenced acceptance, with females more likely to decline DRE compared to males. Additionally, employed participants demonstrated higher acceptance than students and unemployed individuals, suggesting that socioeconomic and sociocultural factors play a critical role in shaping willingness to undergo DRE [14].

Overall, these findings highlight a critical gap between awareness and actual acceptance of DRE, underscoring the need for targeted, culturally sensitive interventions to improve knowledge, reduce psychological barriers, and promote early clinical evaluation of anorectal and colorectal conditions.

Limitations

Several limitations should be acknowledged. First, the study was conducted among the general population in Saudi Arabia, with a predominance of female participants, which may limit the generalizability of the findings. Second, the cross-sectional design precludes the establishment of causal relationships. Additionally, the use of self-reported data may introduce response bias, potentially affecting the accuracy of the results.

Recommendations

Future research should adopt longitudinal designs to assess changes in awareness and acceptance of DRE over time. Interventional studies are also needed to evaluate strategies aimed at improving awareness and reducing barriers to acceptance. Public health efforts should focus on culturally sensitive educational campaigns to enhance understanding of DRE and promote its acceptance among the general population in Saudi Arabia.

CONCLUSION

This cross-sectional study assessed awareness and acceptance of digital rectal examination (DRE) among the general population in Saudi Arabia. Although awareness was moderate, significant psychological, cultural, and demographic barriers continue to influence acceptance.

These findings highlight a critical need to improve both awareness and acceptance of DRE. Addressing these barriers through targeted, culturally appropriate educational interventions is essential to promote early detection and improve clinical outcomes of anorectal and colorectal conditions.

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