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Research Article

Awareness of the Symptoms of Endometriosis among Females in Saudi Arabia: A Cross-Sectional Study

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Abstract

Introduction: Endometriosis is a prevalent, persistent gynecological condition that affects 6-10% of females of the reproductive age group. Marked by the growth of endometrial glands and stroma beyond the confines of the uterus, manifesting in areas, such as the ovaries, fallopian tubes, pelvis, and rarely the abdomen. This study assesses the awareness of endometriosis symptoms among women in Saudi Arabia. It will also explore the association between the level of awareness and sociodemographic characteristics.

Methodology: A descriptive, cross-sectional approach was used, the target sample in this study is women from all cities in Saudi Arabia, aged 18 years or older. The data were collected using an online questionnaire designed by Google Forms and distributed electronically via social media. The questionnaire covered sociodemographic information, awareness of symptoms, and source of information regarding endometriosis.

Results: 1083 respondents were collected in the study. The majority, 55.6% (n=602), demonstrated high knowledge, falling above the 50th percentile. A minority of participants, 15.1% (n=164) were categorized as having poor knowledge (below the 25th percentile). Out of 1083 respondents, 705 (65.1%) had heard of endometriosis, while 378 (34.9%) had not. 1034 (95.5%) had never been diagnosed with endometriosis, and 49 (4.5%) had been diagnosed. a significant association between the level of endometriosis awareness and age, marital status, specialized in medical profession, occupational status (P value <0,001) for all mentioned factors. The income and region were not significantly associated.

Conclusion: Our study highlights that although awareness of endometriosis is relatively high among certain groups, significant gaps remain, particularly regarding specific symptoms and treatment options. The role of digital media in information dissemination is evident. However, the substantial impact of medical professionals on increasing awareness underscores the need for enhanced educational strategies in healthcare settings. Therefore, future studies should focus on targeted educational interventions and improving access to specialized care to bridge these gaps and increase overall awareness and management of endometriosis.

Keywords: Endometriosis; Infertility; Ovulation; Dysmenorrhea

Abbreviations

SD: Standard Deviation; CI: Confidence Interval

Introduction

Endometriosis is a prevalent, persistent gynecological condition that affects 6-10% of females of the reproductive age group. Marked by the growth of endometrial glands and stroma beyond the confines of the uterus, manifesting in areas, such as the ovaries, fallopian tubes, pelvis, and rarely the abdomen [1,2]. Although the etiology of this condition remains unknown, its pathogenesis has been explained by many theories [3,4]. Risk factors associated with endometriosis include low birth weight, Müllerian anomalies, early onset menstruation, shorter menstrual cycles, increased menstrual flow, low body mass index, and nulliparity [5]. Endometriosis is typically associated with chronic pelvic pain described as secondary dysmenorrhea, deep dyspareunia, masses and nodularity of the uterosacral ligament, and infertility. Other symptoms may be found depending on the organ involved, like dysuria and hématuria (if the colon was affected) and diarrhea, constipation, and ténesmes (if the

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colon was affected); frequently, endometriosis may present without noticeable symptoms [3,6-8]. The symptomatic course of the disease may affect the quality of a patient's life as they usually experience psychological, physiological, marital, and social challenges, especially in cases of infertility [6,9,10].

There is no cure for endometriosis, but we can only control symptoms of endometriosis by hormonal therapies aimed at suppressing ovulation and menstruation, surgical interventions, or a combination of both [5,11]. Moreover, the true prevalence of endometriosis is underestimated. It affects 10-15% of women during their reproductive years [3,12].

A previously published study sought to evaluate women's knowledge of endometriosis symptoms in Poland; the results have shown 75.8% and 68.1% of the symptoms indicated by women were infertility and dysmenorrhea. In contrast, dysuria and painful defecation were not perceived as symptoms of endometriosis by the majority (38.7% and 42.9%) [13].

Given the absence of prior research on this topic in Saudi Arabia, we aimed to assess the awareness of endometriosis symptoms among women in Saudi Arabia.

It will also explore the association between the level of awareness and sociodemographic characteristics.

Materials and Methods

Study Design and Setting

This research employed a cross-sectional study design to assess the awareness of endometriosis symptoms among female in Saudi Arabia. The data were collected through an online questionnaire distributed via Google forms, targeting women from all cities in Saudi Arabia. The questionnaire link was disseminated through various social media platforms to ensure broad participation.

Ethical Considerations

We distributed our survey after obtaining ethical approval on 05/05/2024 from the Biomedical Research Ethics Committee of Umm Al-Qura University, Makkah, KSA (Approval number HAPO-02-K-012-2024-05-2141). Moreover, the study was conducted according to the Declaration of Helsinki's principles. The subjects were informed of their rights to refuse to participate and end their involvement at any time. The study objectives, methods used to collect the data, and assurance of the safety of participants were all explained to the subjects.

In this study, confidentiality and anonymity were maintained by not disclosing the participant's name on the questionnaire and research reports and by keeping the collected data confidential, and not revealing subjects' identities.

Eligibility Criteria

We included in our sample all women who live in the all regions of Saudi Arabia. Individuals under the age of 18 years and those who refused to participate in the survey were excluded from the study.

Sample Size

After we determined our study population, we calculated the sample size using OpenEpi version 3.0. Accordingly, the sample size required for this study was 385. However, we recruited 1083 participants in this study.

Study Tool

This study used both English and Arabic versions of a previously published and validated questionnaire modified to suit the target population [10]. English and Arabic versions were used for statistical analysis and the Arabic version for data collection. The survey included sections on sociodemographic information, awareness of symptoms, and source of information regarding endometriosis. Common symptoms such as dysmenorrhea, dyspareunia, pelvic pain, diarrhea/constipation, and lower back pain were included in the questionnaire. A consent form was obtained from the participants at the beginning of the questionnaire.

Statistical Analysis

The collected data were first cleaned using Microsoft Excel to ensure consistency and remove any incomplete responses. After data cleaning, the data were analyzed using IBM SPSS version 29.0. Descriptive statistics, such as frequencies and percentages, were used to summarize participants' demographic characteristics and their awareness levels. Furthermore, a multivariate analysis was performed to identify sociodemographic factors influencing the awareness of endometriosis symptoms. The level of significance was set at $p<0.05$.

Results

Our study includes 1083 participants, with the age distribution shows that the majority were aged 15-24 years (n=617, 57.0%), followed by those aged 25-34 years (n=175, 16.2%), 35-44 years (n=161, 14.9%), and over 45 years (n=130, 12.0%). Notably, 217 patients (37.5%) were over 50 years old. Regional distribution highlights that most patients were from the West (n=552, 51.0%), followed by the North (n=186, 17.2%), South (n=141, 13.0%), East (n=110, 10.2%), and Central regions (n=94, 8.7%). In terms of marital status, 684 were single (63.2%), 358 were married (33.1%), and 41 were divorced or widowed (3.8%). Educationally, 669 had a Bachelor's degree (61.8%), 294 had high school diploma (27.1%), 45 held a diploma (4.2%), and 75 had a Master's or Ph.D. (6.9%). Additionally, 388 patients (35.8%) were specialized in the medical profession, while 695 were not (64.2%) (Table 1).

Figure 1 shows the sources of information about endometriosis among participants. The majority, 47.7%, reported getting their information from the Internet or social media. Friends or relatives were the source for 24.6% of participants. Doctors provided information to 16.9% of the respondents, while 10.8% relied on medical articles.

Table 2 shows the knowledge and awareness about the signs and symptoms of endometriosis among the participants. When asked if infertility is a complication of endometriosis, 88 (8.1%) strongly disagreed, 540 (49.9%) were neutral, and 455 (42.0%) strongly agreed. Regarding dysmenorrhea (severe pain during menstruation), 101 (9.3%) strongly disagreed, 354 (32.7%) were neutral, and 628 (58.0%) strongly agreed. For dyspareunia (pain during intercourse), 97 (9.0%) strongly disagreed, 519 (47.9%) were neutral, and 467 (43.1%) strongly agreed. Pelvic pain unrelated to menstruation was recognized by 554 (51.2%) as a symptom. Concerning diarrhea/constipation, 271

Table 1: Sociodemographic and other parameters of participants.

		Frequency (n=1083)	Percent
Age	15–24 years	617	57
	25–34 years	175	16.2
	35–44 years	161	14.9
	>45 years	130	12
	>50 years	217	37.5
Regions	West	552	51
	North	186	17.2
	South	141	13
	East	110	10.2
	Central	94	8.7
Marital status	Single	684	63.2
	Married	358	33.1
	Divorced/Widowed	41	3.8
Education	General education	294	27.1
	Bachelor's	669	61.8
	Diploma	45	4.2
	Master's/Ph.D.	75	6.9
Specialized in medical profession	No	695	64.2
	Yes	388	35.8

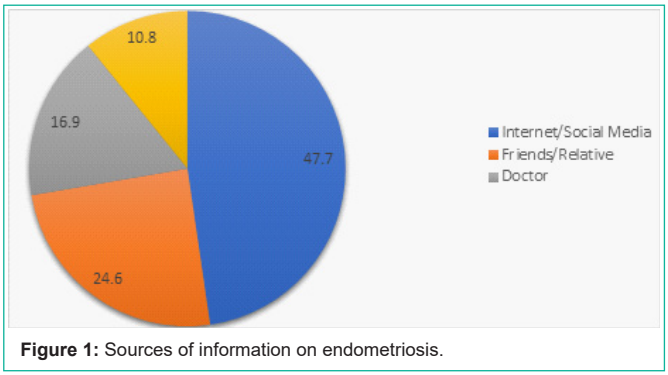

Figure 1: Sources of information on endometriosis.

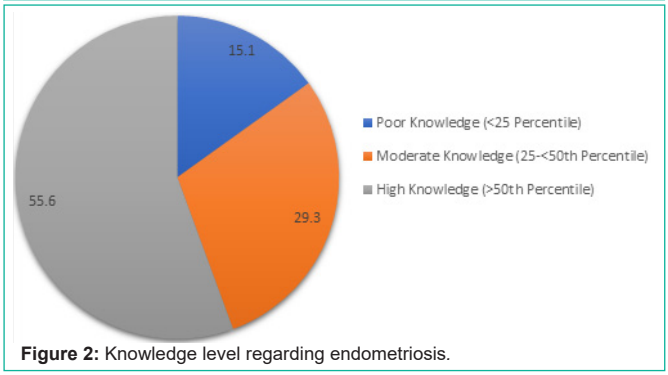

Figure 2: Knowledge level regarding endometriosis.

(25.0%) strongly disagreed, 552 (51.0%) were neutral, and 260 (24.0%) strongly agreed. Lower back pain was identified by 544 (50.2%) as a symptom. Pain during defecation was acknowledged by 276 (25.5%) as a symptom. Lastly, for pain during urination, 213 (19.7%) strongly disagreed, 560 (51.7%) were neutral, and 310 (28.6%) strongly agreed.

Figure 2 shows the knowledge levels about endometriosis among the participants based on their responses to Endometriosis questions provided in questionnaire. A minority of participants, 15.1% (n=164) were categorized as having poor knowledge (below the 25th percentile). Those with moderate knowledge (25th to just below the 50th percentile) comprised 29.3% (n=317) of the respondents. The majority, 55.6% (n=602), demonstrated high knowledge, falling above the 50th percentile

Table 3 shows the awareness about endometriosis and its treatment among the participants. Out of 1083 respondents, 705 (65.1%) had heard of endometriosis, while 378 (34.9%) had not. Regarding diagnosis, 1034 (95.5%) had never been diagnosed with endometriosis, and 49 (4.5%) had been diagnosed. For treatment plans, 49 (4.5%) used pain relievers, 45 (4.2%) relied on hormonal treatments, 45 (4.2%) used contraceptives or other methods, 41 (3.8%) underwent conservative surgeries such as laparoscopy, and 24 (2.2%) pursued fertility treatments.

Figure 3 shows the different symptoms experienced by patients with endometriosis (Figure 3). The most commonly reported symptom was diarrhea or constipation, experienced by 73.5% (n=36) of patients. Dyspareunia (pain during intercourse) was reported by 55.1% (n=27), followed by pain during defecation (49.0%, n=24) and pain during urination (46.9%, n=23). Chronic pelvic pain not related to menstruation was reported by 28.6% (n=14). Heavy menstruation or bleeding affected 16.3% (n=8) of patients, and 14.3% (n=7) reported delayed childbearing and difficulty conceiving. Interestingly, 20.4% (n=10) of patients reported having no symptoms at all. Table 4 shows the association of endometriosis awareness scores with various demographic and personal features. Awareness scores significantly decreased with age, from a mean of 27.46 (SD = 4.37) in the 15-24 years group to 25.28 (SD = 4.45) for those over

Table 2. Knowledge and awareness on the signs and symptoms of endometriosis.

		Strongly Disagree	Neutral	Strongly Agree
Is infertility a complication of endometriosis?	N	88	540	455
	%	8.1	49.9	42
Is dysmenorrhea (severe pain during menstruation) a symptom of endometriosis?	N	101	354	628
	%	9.3	32.7	58
Is dyspareunia (pain during intercourse) a symptom of endometriosis?	N	97	519	467
	%	9	47.9	43.1
Is non-menstrual cycle-related pelvic pain a symptom of endometriosis?	N	87	442	554
	%	8	40.8	51.2
Is diarrhea/ constipation a symptom of endometriosis?	N	271	552	260
	%	25	51	24
Is lower back pain a symptom of endometriosis?	N	93	446	544
	%	8.6	41.2	50.2
Is pain during defecation a symptom of endometriosis?	N	225	582	276
	%	20.8	53.7	25.5
Is pain during urination a symptom of endometriosis?	N	213	560	310
	%	19.7	51.7	28.6

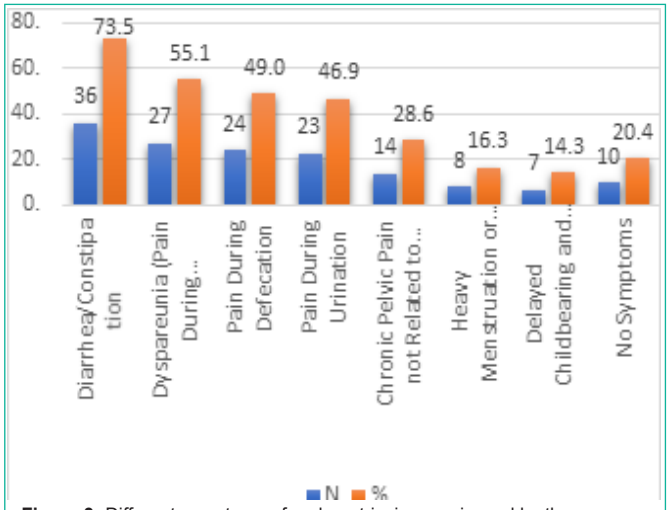

Figure 3: Different symptoms of endometriosis experienced by the participants (n=49).

Table 3: Awareness and prevalence of endometriosis and its treatment.

		Frequency (n=1083)	Percent
Have you ever heard of endometriosis?	No	378	34.9
	Yes	705	65.1
Have you ever been diagnosed with endometriosis?	No	1034	95.5
	Yes	49	4.5
Treatment plan	Conservative surgeries such as laparoscopy	41	3.8
	Contraceptives/ other methods	45	4.2
	Fertility treatments	24	2.2
	Hormonal treatment	45	4.2
	Pain relievers	49	4.5

45 years ($p < 0.001$). Single individuals had higher scores (27.41, SD = 4.56) compared to married (26.21, SD = 4.52) and divorced/ widowed (24.75, SD = 4.18) individuals ($p < 0.001$). Monthly income showed a significant difference, with those earning exactly 100,000 SAR having the highest mean score (28.04, SD = 4.94) ($p = 0.049$). Employment status revealed that students had the highest awareness scores (27.57, SD = 4.35), followed by employees (26.90, SD = 5.00) and the unemployed (25.88, SD = 4.46) ($p < 0.001$). Those specialized in the medical profession had significantly higher scores (28.07, SD = 4.56) compared to those of non-specialized individuals (26.27, SD = 4.47) ($p < 0.001$). Participants familiar with endometriosis scored higher (27.42, SD = 4.91) than those who had not (25.98, SD = 3.72) ($p < 0.001$). Individuals diagnosed with endometriosis had higher scores (29.44, SD = 5.80) than those who were not (26.80, SD = 4.48) ($p < 0.001$). Lastly, awareness scores varied by source of information, with the highest scores among those informed by doctors (28.77, SD = 5.17) and medical articles (28.28, SD = 4.12), and the lowest knowledge was among those informed by friends/relatives (26.00, SD = 4.37) ($p < 0.001$). Other features like region and education didn't affect awareness score.

Table 5 shows the adjusted predictors of high awareness about endometriosis using multivariate analysis. Age was a significant predictor, with each one-year increase in age reducing the odds of high awareness ($B = -0.361$, $p < 0.001$, $Exp(B) = 0.697$, 95% CI = 0.589-0.824). Regional differences were not significant predictors ($B = 0.022$, $p = 0.646$, $Exp(B) = 1.023$, 95% CI = 0.930-1.125). Marital status (married) did not significantly predict awareness ($B = 0.179$, $p = 0.217$, $Exp(B) = 1.196$, 95% CI = 0.900-1.591). Higher education was also not a significant predictor ($B = 0.024$, $p = 0.783$, $Exp(B) = 1.025$, 95% CI = 0.862-1.217). Higher income approached significance ($B = 0.207$, $p = 0.063$, $Exp(B) = 1.231$, 95% CI = 0.989-1.531). Being a student significantly increased the odds of high awareness ($B = 0.191$, $p = 0.040$, $Exp(B) = 1.211$, 95% CI = 1.009-1.453). Specialization in a medical profession was a significant predictor ($B = 0.411$, $p = 0.009$, $Exp(B) = 1.508$, 95% CI = 1.108-2.052). Having heard of endometriosis before was strongly associated with higher awareness ($B = 0.668$, $p < 0.001$, $Exp(B) = 1.950$, 95% CI = 1.482-2.565). Being diagnosed with endometriosis was the strongest predictor ($B = 1.100$, $p = 0.002$, $Exp(B) = 3.003$, 95% CI = 1.508-5.981). The constant was not significant ($B = -0.542$, $p = 0.095$, $Exp(B) = 0.582$).

Table 4: Association of endometriosis awareness score with different features.

		N	Mean	SD	Significance Value
Age	15–24 Years	617	27.46	4.37	<0.001b
	25–34 Years	175	26.87	4.76	
	35–44 Years	161	26.2	4.9	
	>45 Years	130	25.28	4.45	
Region	West	552	26.94	4.68	0.384 b
	North	186	26.44	4.18	
	South	141	27.05	4.62	
	East	110	27.52	4.97	
	Central	94	26.79	4.21	
Marital status	Single	684	27.41	4.56	<0.001 b
	Married	358	26.21	4.52	
	Divorced/Widowed	41	24.75	4.18	
Education	General education	294	26.72	4.23	0.601 b
	Bachelor's	669	27.04	4.71	
	Diploma	45	26.31	4.7	
	Master's/Ph.D.	75	26.93	4.74	
Monthly income	< 100,000 SAR	903	26.78	4.54	0.049 b
	100,000 SAR	82	28.04	4.94	
	> 100,000 SAR	98	27.18	4.55	
Employment	Unemployed	327	25.88	4.46	<0.001 b
	Employed	229	26.9	5	
	Student	527	27.57	4.35	
Specialized in medical profession	No	695	26.27	4.47	<0.001 a
	Yes	388	28.07	4.56	
Heard of endometriosis before	No	378	25.98	3.72	<0.001 a
	Yes	705	27.42	4.91	
Ever diagnosed with endometriosis before	No	1034	26.8	4.48	<0.001 a
	Yes	49	29.44	5.8	
Source of information	Internet/social media	457	26.49	4.41	<0.001 b
	Friends/Relatives	236	26	4.37	
	Doctor	162	28.77	5.17	
	Medical articles	104	28.28	4.12	

SD: Standard Deviation, *(a) Mann–Whitney U Test, (b) Kruskal–Wallis Test.*

Table 5: Adjusted predictors of high awareness regarding endometriosis (multivariate analysis).

	B	Significance	Exp(B)	95% Confidence Interval	
				Lower	Upper
Age	−0.361	0	0.697	0.589	0.824
Regions	0.022	0.646	1.023	0.93	1.125
Marital status (Married)	0.179	0.217	1.196	0.9	1.591
Higher education	0.024	0.783	1.025	0.862	1.217
Higher income	0.207	0.063	1.231	0.989	1.531
Employment (Student)	0.191	0.04	1.211	1.009	1.453
Specialized in a medical profession	0.411	0.009	1.508	1.108	2.052
Heard of endometriosis before	0.668	0	1.95	1.482	2.565
Diagnosed with endometriosis before	1.1	0.002	3.003	1.508	5.981
Constant	−0.542	0.095	0.582		

Discussion

Endometriosis affects up to 10% of reproductive-age females, it is characterized by endometrial tissue growth outside the uterus [14]. According to Parasar et al. (2017), various endometriosis symptoms, include pelvic pain, dysmenorrhea, and infertility, varying with organ involvement [15]. Diagnosis requires laparoscopy, with treatment options focusing on symptom management [16]. In Saudi Arabia, awareness of the endometriosis symptoms remains understudied. Our study aims to assess this awareness and explore its association with sociodemographic factors among Saudi Arabian women.

Our study found that most participants were aged 15–24 years (57.0%), with a notable portion over 50 years old (37.5%). The previous highlight that the endometriosis awareness among the young people of the reproductive years (20-40 years) was the highest due to its high prevalence in this age group. Similarly, Kristjansdottir et al. (2023) shows that the age-specific incidence was highest in the age-group 30–34 (19.5/10,000 person year) [17]. The awareness of the disease appears to be age-related, as the explained age was a significant incorporating part in the multi-variant analysis, with the older generation being more unaware (B= -0.361, $p < 0.001$, Exp(B) = 0.697). This finding aligns with literature suggesting that older individuals, particularly those past the reproductive age, might have reduced engagement or health seeking behaviors with conditions like endometriosis. Jahan et al. (2022) shows that health seeking behavior is reduced with old age and effective strategies should be implemented to improve access to healthcare services for older individuals [18]. Regional distribution showed that most participants were from the West (51.0%). However, regional differences did not significantly affect awareness scores, aligning with the fact that indicates regional disparities in health literacy but not necessarily in awareness of specific conditions like endometriosis. Marital status significantly impacted awareness, with single individuals showing higher scores compared to married and divorced/widowed individuals (B = 0.179, $p < 0.001$). However, Iannotti et al. (2012) shows that earlier medical-seeking behavior was seen in married compared to single persons, and particularly in married men [19]. Educational attainment did not significantly predict awareness levels, contradicting some studies that associate higher education with increased health literacy. Our results suggest that while education is important, it does not directly translate to higher awareness about endometriosis. However, Saad et al, (2023) shows that educational strategies are essential for bridging the endometriosis knowledge gap [20]. Since we did not find a correlation between the level of education and awareness, its essential to focus on awareness regardless the educational level.

Notably, knowledge levels about endometriosis symptoms revealed that most participants demonstrated high knowledge (55.6%). This is somewhat higher than findings from other studies, which often report lower levels of knowledge, particularly about less visible symptoms such as dyspareunia and pelvic pain not related to menstruation. Szymańska et al. (2021) shows that only 33% of participants considered their knowledge sufficient or good. Very good knowledge was declared by 4.5% of women [21]. Our findings demonstrate that a substantial portion of participants is aware of the symptoms associated with gastrointestinal (GI) disturbances and dysmenorrhea. Specifically, 73.5% of participants identified diarrhea/constipation as a symptom, and 58.0% recognized dysmenorrhea, indicating relatively high awareness of these conditions. However, despite these figures, gaps in symptom recognition remain. A notable 25.0% of participants did not recognize diarrhea/constipation as a symptom, and almost half (49.0%) failed to identify pain during defecation, pointing to significant deficiencies in awareness. When comparing these findings to other study in the literature, several key differences and similarities emerge. For instance, a comparable study reported that 84.1% of participants recognized dysmenorrhea, a higher proportion than our finding of 58.0% [13]. This suggests that while dysmenorrhea awareness is generally high, our participants had relatively lower recognition of this condition, highlighting a potential area for improved education in our population. Conversely, our study reported a much higher rate of recognition for diarrhea/constipation (73.5%) compared to the other study, where only 36.4% of participants identified these symptoms [13]. This discrepancy may suggest that in our population, there is a greater emphasis or better understanding of gastrointestinal symptoms associated with menstrual disorders. Both studies, however, show significant shortcomings in recognizing the symptoms of pain during defecation. In our study, 49.0% of participants failed to identify this as a symptom, while the other study reported an even higher proportion (65.1%) of participants not recognizing this symptom [13]. These figures underscore the need for enhanced awareness campaigns.

Notably, the sources of information about endometriosis were predominantly from the Internet or social media (47.7%), followed by friends or relatives (24.6%). This mirrors trends observed in health information-seeking behaviors, where digital platforms play a critical role in disseminating health information [22]. However, only 16.9% of participants received information from doctors, which underscores a potential gap in medical outreach and patient education. This finding suggests that while digital platforms provide a substantial amount of information, the role of healthcare professionals remains crucial in delivering accurate and comprehensive education about endometriosis. Moreover, this low diagnosis rate in our study as compared to previous article highlights the underdiagnosis of

endometriosis, partly due to its complex and often nonspecific symptoms [23-25]. 4.5% of the participants have been diagnosed with endometriosis and received treatment 4.5% of them treated with pain relievers, 4.2% hormonal treatment, 2.2% had fertility treatments and 3.8% conservative surgeries such as laparoscopy The multivariate analysis identified several significant predictors of high awareness. This aligns with the facts that medical professionals and prior exposure to information about endometriosis significantly enhance awareness. The strongest predictor was a prior diagnosis of endometriosis, highlighting the critical role of personal experience in understanding the disease. Conversely, factors, such as age, education, and regional differences had less impact on awareness, suggesting that while demographic factors influence health literacy, personal experience and direct medical exposure play a more pivotal role in awareness about endometriosis.

Limitations

There are several limitations of our study which reliance on self-reported data, potentially leading to reporting bias. Additionally, most responses from west region that may limit generalizability to broader populations. Further studies needed to determine awareness in other areas.

Conclusion

Our study highlights that while awareness about endometriosis is relatively high among certain groups, significant gaps remain, particularly regarding specific symptoms and treatment options. The role of digital media in information dissemination is evident, yet the substantial impact of medical professionals on increasing awareness underscores the need for enhanced educational strategies within healthcare settings. Future research should focus on targeted educational interventions and improving access to specialized care to bridge these gaps and increase overall endometriosis awareness and management.

References

1. Soliman AM, Yang H, Du EX, Kelley C, Winkel C. The direct and indirect costs associated with endometriosis: a systematic literature review. Hum Reprod. 2016; 31: 712–722.
2. Fassbender A, Burney RO, O DF, D'Hooghe T, Giudice L. Update on Biomarkers for the Detection of Endometriosis. Biomed Res Int. 2015; 2015: 130854.
3. Saunders PTK, Horne AW. Endometriosis: Etiology, pathobiology, and therapeutic prospects. Cell. 2021; 184: 2807–2824.
4. Sasson IE, Taylor HS. Stem Cells and the Pathogenesis of Endometriosis. Ann N Y Acad Sci. 2008; 1127: 106.
5. Allaire C, Bedaiwy MA, Yong PJ. Diagnosis and management of endometriosis. C Can Med Assoc J. 2023; 195: E363.
6. Agarwal SK, Chapron C, Giudice LC, Laufer MR, Leyland N, Missmer SA, et al. Clinical diagnosis of endometriosis: a call to action. Am J Obstet Gynecol. 2019; 220: 354.e1-354.e12.
7. Seracchioli R, Mabrouk M, Guerrini M, Manuzzi L, Savelli L, Frascà C, et al. Dyschezia and posterior deep infiltrating endometriosis: analysis of 360 cases. J Minim Invasive Gynecol. 2008; 15: 695–699.
8. Villa G, Mabrouk M, Guerrini M, Mignemi G, Montanari G, Fabbri E, et al. Relationship between site and size of bladder endometriotic nodules and severity of dysuria. J Minim Invasive Gynecol. 2007; 14: 628–632.
9. Pessoa De Farias Rodrigues M, Pessoa De Farias Rodrigues M, Lima Vilarino F, De Souza Barbeiro Munhoz A, Da Silva Paiva L, Da Silva Paiva L, et al. Clinical aspects and the quality of life among women with endometriosis and infertility: a cross-sectional study. BMC Womens Health. 2020; 20: 124.
10. Laganà AS, Condemi I, Retto G, Muscatello MRA, Bruno A, Zoccali RA, et al. Analysis of psychopathological comorbidity behind the common symptoms and signs of endometriosis. Eur J Obstet Gynecol Reprod Biol. 2015; 194: 30–33.
11. Khadawardi K, Khadawardi K. Endometriosis as a Cause of Primary Infertility in Western Regions of Saudi Arabia. Open J Obstet Gynecol. 2020; 10: 333–340.
12. Wellbery C. Diagnosis and Treatment of Endometriosis. Am Fam Physician. 1999; 60: 1753–1762.
13. Kotowska M, Urbaniak J, Falęcki WJ, Łazarewicz P, Masiak M, Szymusik I. Awareness of Endometriosis Symptoms-A Cross-Sectional Survey among Polish Women. Int J Environ Res Public Health. 2021; 18: 9919.
14. Kelley AS and MB Moravek. *Diagnosis and Management of Endometriosis*, in *Handbook of Gynecology*, D. Shoupe, Editor. Springer International Publishing: Cham. 2023: 363-372.
15. Parasar P, P Ozcan and KL Terry. *Endometriosis: Epidemiology, Diagnosis and Clinical Management.* Curr Obstet Gynecol Rep. 2017; 6: 34-41.
16. Allaire C, Bedaiwy MA, Yong PJ. Diagnosis and management of endometriosis. Cmaj. 2023; 195: E363-E371.
17. Kristjansdottir A, Rafnsson V, Geirsson RT. Comprehensive evaluation of the incidence and prevalence of surgically diagnosed pelvic endometriosis in a complete population. Acta Obstetricia et Gynecologica Scandinavica. 2023; 102: 1329-1337.
18. Jahan N, Akter S, Heme MA, Chandra D, Polly A, Siddiqua L, et al. Healthcare-seeking behavior of marginalized older people in urban slums: a cross-sectional survey study in Khulna City, Bangladesh. BMJ Open. 2022; 12: e066376.
19. Lee-Iannotti JK, Ingall TJ, Aguilar MI, Capampangan DJ, Dodick DW, Kiernan TJ. *Abstract 3196: Effect Of Marital Status On Health-seeking Behavior Following Onset Of Acute Stroke Symptoms.* Stroke. 2012; 43: A3196-A3196.
20. Saad M, Rafiq A, Jamil A, Sarfraz Z, Sarfraz A, Robles-Velasco K, et al. Addressing the Endometriosis Knowledge Gap for Improved Clinical Care—A Cross-Sectional Pre- and Post-Educational-Intervention Study among Pakistani Women. Healthcare. 2023; 11: 809.
21. Szymańska J, Dąbrowska-Galas M. An assessment of Polish women's level of knowledge about endometriosis: a pilot study. BMC Women›s Health. 2021; 21: 404.
22. Hunsche E, Gauthier M, Witherspoon B, Rakov V, Agarwal SK. Endometriosis symptoms and their impacts on the daily lives of US women: Results from an interview study. Int J Women's Health. 2023; 15: 893-904.
23. Jeyaraman M, Ramasubramanian S, Kumar S, Jeyaraman N, Selvaraj P, Nallakumarasamy A, et al. Multifaceted Role of Social Media in Healthcare: Opportunities, Challenges, and the Need for Quality Control. Cureus. 2023; 15: e39111.
24. Mousa M, Al-Jefout M, Alsafar H, Becker CM, Zondervan KT, Rahmioglu N. Impact of Endometriosis in Women of Arab Ancestry on: Health-Related Quality of Life, Work Productivity, and Diagnostic Delay. Front Glob Women's Health. 2021; 2: 708410.
25. Hudson N. The missed disease? Endometriosis as an example of 'undone science'. Reprod Biomed Soc Online. 2022; 14: 20-27.