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ASSESSING KNOWLEDGE AND AWARENESS LEVEL OF ENDOMETRIOSIS AMONG WOMEN IN SAUDI ARABIA: A CROSS SECTIONAL STUDY.

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Abstract

Background: Endometriosis is a benign condition wherein endometrial like tissue grows outside the uterus and is a common condition affecting women of reproductive age. The condition is associated with symptoms including chronic pelvic pain and infertility, however awareness about the condition is poor especially among young women. The aim of this study was to assess the level of knowledge and awareness of endometriosis in Saudi women and what demographic factors such as the age, education and socioeconomic status might be associated with it.

Methods: A structured questionnaire was distributed online from July to December 2024, using an observational cross-sectional study, on a random sample of 592 Saudi women aged 18 to 45. Demographic characteristics, knowledge of endometriosis, its symptoms and management options were assessed on the questionnaire. SPSS software program was used to analyze data; significance had been set for demographic factors.

Results: Our participants' mean age was 27.1 years, majority of whom (68.6%) were single and mostly from the Western region of Saudi Arabia (51.4%). 59.5% think 'endometriosis is an ordinary disease' and only 12.3% showed an advanced level of knowledge in this disease. Unfortunately, 82.1% recognized that endometriosis severely impacts on their ability to function day to day, but just 13.9% knew the consequences associated with endometriosis left untreated. Among the least aware of diagnostic methods, such as laparoscopy and hormonal treatment, over 60% were. Statistical analysis showed significant relationship of the knowledge levels with age (P=0.010), education (P=0.0001), marital status (P=0.0001) and occupation (P=0.0001). **Conclusion:** The study also demonstrates a notable deficiency in the level of knowledge and understanding about endometriosis amongst women in Saudi Arabia although such prevalence and impact has been observed. Given the findings, focused

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educational intervention is also required to improve understanding of endometriosis specifically among younger women and those with lower educational attainment in order to aid early diagnosis and management. They also need the enhanced public health campaigns to counter misconceptions.

Keywords: Endometriosis, Knowledge, Awareness, Saudi Arabia, Women's health, Reproductive health.

Introduction:

Endometriosis is a benign condition affecting the female genital system, characterized by the persistent development of endometrial-like tissue in locations other than the uterus, such as the pelvic cavity, ovaries, pouch of Douglas, and uterosacral ligaments [1]. Commonly seen in women of reproductive age, it can cause excessive monthly flow, persistent tiredness, dyspareunia, pelvic pain and cramping during menstruation, and non-menstrual pelvic discomfort. Endometriosis is also frequently linked to infertility or sub-fertility [2]. It is prevalent in 25-50% of women with infertility and 71-87% of women with chronic pelvic pain. Although about 40% of adult cases show spontaneous regression within a few months, longer-term studies, including those on baboons, indicate that endometriosis is a progressive disease requiring lifelong management due to its impact on quality of life and its role as a leading cause of gynecological hospitalization and hysterectomy [3,4]. In 2022, research conducted on The Endometriosis Awareness Promotion Project found that only 5–31% of students were aware of the illness, and 42–46% of all students had only recently heard the term "endometriosis" [5]. Studies have also highlighted barriers to diagnosing endometriosis, such as a lack of awareness among healthcare providers and their indifference to the effects of delayed diagnosis on women's well-being and health [6]. Recent research in Australia suggested that misdiagnosis, nondiscriminatory investigations, and practitioners' lack of knowledge are all contributing factors to delays in diagnosing endometriosis [7]. A 2022 study titled "Effectiveness of Adoption of Positive Coping Strategies on Women's Knowledge and Practices Related to Endometriosis" revealed that 79.3% of women had a poor level of knowledge, while 54.7% had a good level of knowledge [8]. Despite its prevalence, endometriosis is frequently misunderstood and underdiagnosed, particularly in certain regions like Saudi Arabia. The proposed study aims to address the limited data on awareness and understanding of endometriosis among women in Saudi Arabia. Current research on endometriosis in this context is scarce, and the level of knowledge and awareness among the general population is not well-documented. Furthermore, delayed diagnosis is a significant issue, often taking up to 10 years or more, negatively impacting quality of life and leading to complications. Understanding current knowledge levels can help identify areas for improving early detection and access to specialized care. The findings could inform the development of targeted educational campaigns, healthcare provider training, and policy initiatives to improve the diagnosis, management, and overall care for women with endometriosis in the country.

Objective:

The study set out to assess the level of knowledge and awareness about endometriosis among women in Saudi Arabia. And to determine the demographic factors (age, education, socioeconomic status) influencing the level of knowledge and awareness about endometriosis among women in Saudi Arabia.

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Materials and Methods:

Study design:
This is an observational cross-sectional study conducted between July to December 2024 in the Kingdome of Saudi Arabia based on structured questionnaire developed by authors.

Study setting: participants, recruitment, and sampling procedure:
study's population includes Saudi adult women over the age of 18 participants were recruited in July-December 2024 from people receiving the questionnaire.

Inclusion and Exclusion Criteria:
The inclusion criteria were women residing in Saudi Arabia, age ranging from 18 to 45 years, this age range is selected as it encompasses the reproductive years when women are most likely to encounter endometriosis-related symptoms and seek healthcare, Ability to understand and complete the study questionnaire in Arabic or English.Exclusion criteria were males residing in Saudi Arabia, Women less than 18 years old or older than 55 years old, Women with a previous diagnosis of endometriosis, and Women who have undergone hysterectomy or oophorectomy.

Sample size:
From July 2024 to December 2024 was the beginning of data collecting. Data collection involved a target sample of 384 patients (was calculated by Raosoft sample size calculator with 95% degree of confidence and margin of error of 5%).
The sample size was estimated using the formula:
n = P(1-P) * Zα 2 / d 2 with a 95% confidence level.
n: Calculated sample size.
Z: The z-value for the selected level of confidence (1- a) = 1.96.
P: An estimated prevalence of knowledge.
Q: (1 – 0.50) = 50%, i.e., 0.50.
D: The maximum acceptable error = 0.05.
Therefore, the calculated minimum sample size was: n = (1.96)2 X 0.50 X 0.50/(0.05) 2 = 384.

Method for data collection and instrument (*Data collection Technique and Tools)*:
A structured questionnaire was used for the study. This questionnaire was developed after reviewing numerous similar studies, from which the most relevant and significant questions were extracted [5,9–11] . The questionnaire comprised approximately thirty ques6ons and was distributed online to a random sample of Saudi women. It included several sections: the first second inquired about the participants' social and demographic characteristics; the second assessed their knowledge and awareness regarding endometriosis and its associated risk factors; the third focused on their understanding of the symptoms of endometriosis; and the fourth examined their knowledge of the diagnostic and management methods for endometriosis.

Scoring system:
In all, 35 statements served to assess the participant's awareness and degree of knowledge. 10 statements

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for demographics, 19 for knowledge, and 6 for awareness. One point is given for correct answers, and zero points are given for incorrect answers or "I don't know". For scoring, we utilized Likert scales (Dichotomous, five-point scale) The maximum score was 82 and divided as follows: The original Bloom's cutoff points, 80.0%-100.0%, 60.0%-79%, and 59.0%, The participants divided into three groups based on them scores.

Knowledge score varied from 0 to 49 points and was classified into three levels as follows: those with a score of 26 or below were classified as having a low level of knowledge, those with scores between 27 and 35 as having a moderate level of knowledge, and those with scores 36 or above as a high level of knowledge.

Awareness scores varied from 0 to 16 points and were classified into three levels as follows: those with a score of 8 or below were classified as having a low level of awareness, those with scores between 9 and 11 as having a moderate level of awareness, and those with scores 12 or above as having a high level of awareness.

Pilot test:

The questionnaire was distributed on 20 individuals and asked to fill it. This was done to test the simplicity of the questionnaire and the feasibility of the study. Data from the pilot study was excluded from the final data of the study.

Analyzes and entry method:

The data was entered into the device with the "Microsoft Office Excel Software" Windows (2021). The obtained data was transferred to the Statistical Package for Social Science Software (SPSS) tool, version 20 (IBM SPSS Statistics for Microsoft Windows, Version 21.0) for statistical analysis.

Results:

Table (1) displays various demographic parameters of the participants with a total number of (592). Respondents mean age is 27.1years with most people aged 22 to 23 (30.9%) and a big chunk of people on the side of 23 (22.8%). This youthful demographic implies a rapidly growing, dynamic group that could influence prevailing attitudes and behavior in the setting under study. The residential distribution shows a predominance in the Western region (51.4%) while the cultural homogeneity is achieved nationally by an overwhelming majority of participants being Saudi (89.5%). Looking at a person's level of education, the educational front is striking, as a large 57.3% of them have a Bachelor's degree, this represents a relatively high level of academic attainment, however only 4.2% have a post graduate qualification. Around half (50.8%) earn less than 1,000 Saudi riyals monthly, implying that many participants financially constrained. Further contextualization of the challenges and opportunity of this population include the predominance of single people (68.6%) and quite a lot of unemployed (33.4%).

Table (1): Sociodemographic characteristics of participants (n=592)

Parameter		***No.***	***Percent (%)***
Age (Mean:27.1, STD:8.9)	21 or less	135	22.8
	22 to 23	183	30.9
	24 to 35	175	29.6
	More than 35	99	16.7

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Nationality	Saudi	530	89.5
	Non-Saudi	62	10.5
Residential region	Northern region	100	16.9
	Southern region	43	7.3
	Central region	88	14.9
	Eastern region	57	9.6
	Western region	304	51.4
Educational level	Primary school	4	.7
	Middle school	6	1.0
	High school	157	26.5
	Diploma	58	9.8
	Bachelor's degree	339	57.3
	Postgraduate degree	25	4.2
	Uneducated	3	.5
Monthly income	Less than 1000 Saudi riyal	301	50.8
	1000 – 5000	144	24.3
	5001 – 10000	48	8.1
	10001 – 15000	45	7.6
	More than 15000 Saudi riyal	54	9.1
Marital status	Single	406	68.6
	Married	154	26.0
	Divorced	28	4.7
	Widowed	4	.7
Occupation	Student	248	41.9
	Health care sector employee	36	6.1
	Non health care sector employee	81	13.7
	Freelancer	25	4.2
	Unemployed	198	33.4
	Retired	4	.7

As shown in figure 1, These data, presented in the figure above, show some insights into how prevalent menstrual cycle pain is among the larger population of 592 who were studied. It is noteworthy that a vast portion of the 249 respondents experienced pain on every menstrual cycle, therefore this may be an area where more investigation concerning management and support strategies for these women may be warranted. It is also said by 51.0% (302) individuals that they get to experience pain occasionally, indicating that most are affected by menstrual discomfort. On the other hand, 6.9% or 41 respondents said they experienced no pain at all.

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Figure (1): Illustrates menstrual cycle pain among participants.

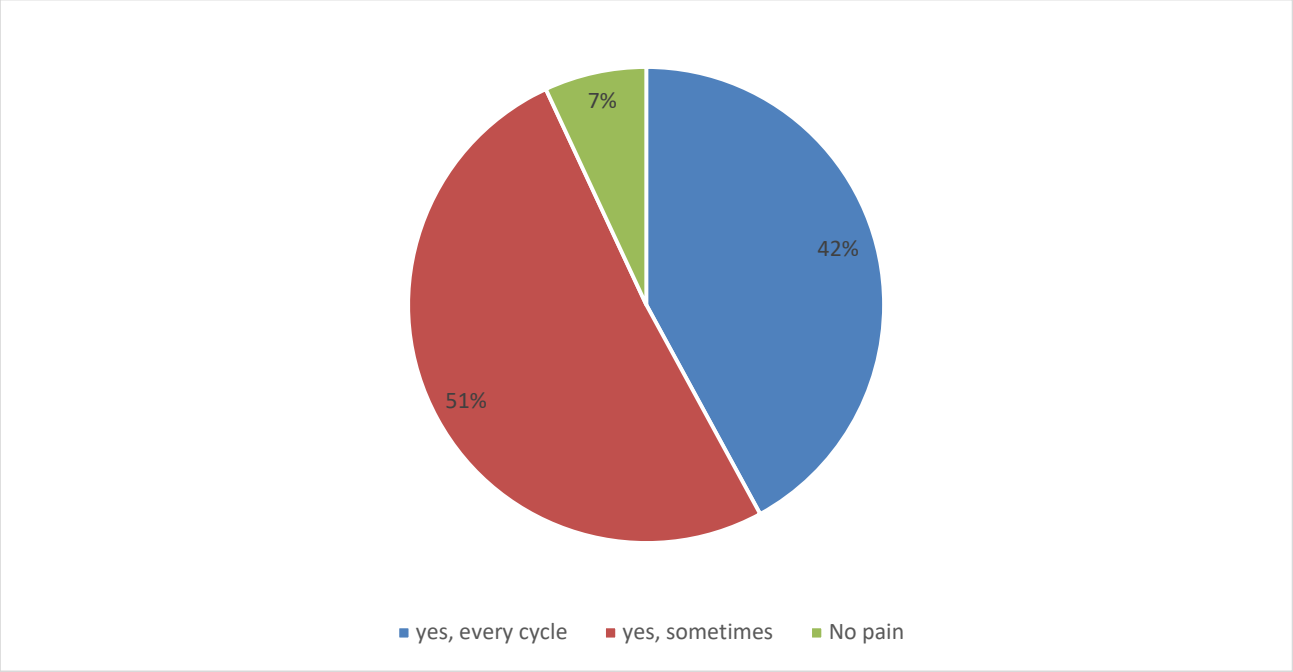

Table 2 which contains the data presented here provides insightful parameters regarding the understanding and awareness of women of endometriosis, a sample size of 592 respondents. Additionally, the almost equal percentage of acknowledging endometriosis as one of the most common diseases—50.7 percent confirming its prevalence—might indicate a swiftness in seeing through a popularly imaginative disease, while half of the population is still unaware of it. Moreover, a daunting 82.1 percent also admit that endometriosis can greatly hamper everyday functions, constituting a main factor of women's health. Taking menstrual cycle pain, a combined 93.1% of people experience pain in some form, adding a large societal burden when looking at it. That said, only 13.9% of people correctly identify that endometriosis left untreated could result in complications. Especially notable is a relatively large number of respondents who do not know how diagnosis and treatment currently work, almost more than 60 percent not knowing that laparoscopy and hormonal therapy play a role.

Table (2): Parameters related to knowledge of endometriosis among women in Saudi Arabia (n=592).

Parameter		***No.***	***Percent (%)***
Endometriosis is considered one of the most common diseases?	No	292	49.3
	Yes	300	50.7
Is it possible for endometriosis to affect a person's daily activity?	No	106	17.9
	Yes	486	82.1
Do you experience menstrual cycle pain?	yes, every cycle	249	42.1
	yes, sometimes	302	51.0
	No pain	41	6.9
Severity of cyclic pain	Mild, no medication	241	40.7

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	needed		
	Pain, relieved by medication (oral)	285	48.1
	Pain, relieved by medication (injection)	24	4.1
	Pain persists despite medication	42	7.1
Do you know the potential complications of untreated endometriosis?	Yes	82	13.9
	No	405	68.4
	Somewhat	105	17.7
Which of the following are scientifically proven risk factors for developing endometriosis? *	A) Early menarche	153	25.8
	B) Late menopause	194	32.8
	C) Short menstrual cycles (>27)	215	36.3
	D) Family history of endometriosis	339	57.3
	E) Delayed childbearing	181	30.6
	F) Nulliparity	147	24.8
	G) Menorrhagia	253	42.7
Endometriosis can cause Dysmenorrhea (Painful periods)?	• Strongly Agree	241	40.7
	• Agree	196	33.1
	• Undecided	148	25.0
	• Disagree	5	.8
	• Strongly Disagree	2	.3
Endometriosis can't cause Diarrhea or constipation?	• Strongly Agree	38	6.4
	• Agree	71	12.0
	• Undecided	349	59.0
	• Disagree	97	16.4
	• Strongly Disagree	37	6.3
Endometriosis can cause lower back pain?	• Strongly Agree	173	29.2
	• Agree	237	40.0
	• Undecided	167	28.2
	• Disagree	12	2.0
	• Strongly Disagree	3	.5
Endometriosis can cause infertility?	• Strongly Agree	90	15.2
	• Agree	179	30.2
	• Undecided	282	47.6
	• Disagree	36	6.1
	• Strongly Disagree	5	.8
Endometriosis causes chronic pelvic pain not related to menstruation	• Strongly Agree	99	16.7
	• Agree	195	32.9
	• Undecided	249	42.1
	• Disagree	40	6.8
	• Strongly Disagree	9	1.5

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Endometriosis can cause Dyspareunia?	• Strongly Agree	92	15.5
	• Agree	166	28.0
	• Undecided	296	50.0
	• Disagree	34	5.7
	• Strongly Disagree	4	.7
Do you think that we can diagnose endomitriosis clinicly?	Yes	163	27.5
	No	119	20.1
	I don't know	310	52.4
The only way to Diagnose endometriosis is by laproscopy?	Yes	142	24.0
	No	88	14.9
	I don't know	362	61.1
In your opinion, hormonal therapy can be use as treatment for endometriosis?	Yes	178	30.1
	No	55	9.3
	I don't know	359	60.6
The only treatment for endometriosis is surgical therapry?	Yes	86	14.5
	No	130	22.0
	I don't know	376	63.5
Endometriosis is incurable disesase?	Yes	62	10.5
	No	231	39.0
	I don't know	299	50.5
In your opinion, what is the best way to diagnose endometriosis?	Clinically	47	7.9
	Ultrasound	136	23.0
	Laparoscopy	125	21.1
	I don't know	284	48.0
In your opinion, what is the best way to treat endometriosis?	Pain control	42	7.1
	Hormonal therapy	106	17.9
	Surgical therapy	118	19.9
	I don't know	326	55.1

Results may overlap

As shown in figure (2), The data presented regarding awareness of endometriosis by a total sample of 592 subjects gives valuable public knowledge of this condition. In fact, 27.9% (165 participants) said they were hearing about endometriosis for the first time, and we see a huge gap that needs to be addressed in awareness. There we see clearly however that 45.3% (268 participants) did only see the name without additional knowledge of the disease and hence represent a group characterized by limited knowledge which in turn can benefit from educational initiatives. Finally, 26.8% (159 participants) stated familiarity with endometriosis

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Figure (2): Illustrates the definition of endometriosis among participants.

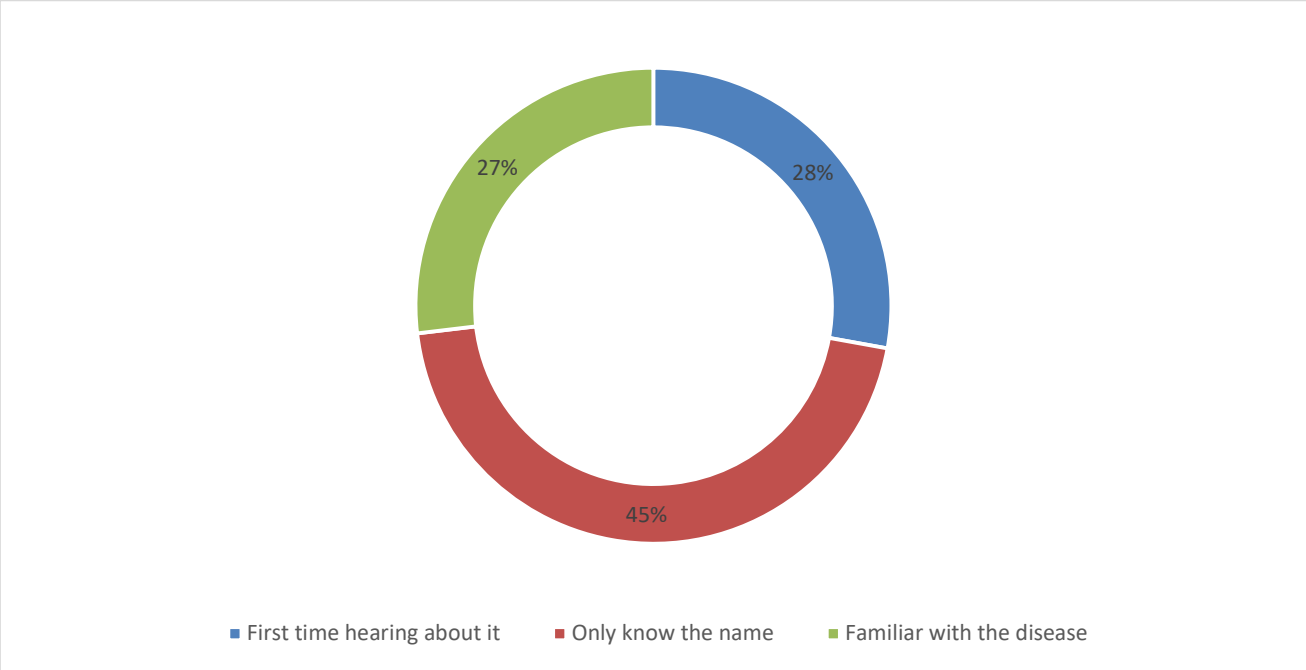

Table 3 illustrates the amount of awareness women in Saudi Arabia have about endometriosis, as indicated by the answers from 592 participants. Notably, 27% said they were hearing about endometriosis for the first time and 45% claimed to only know its name, suggesting parents are very poorly informed of the impacts of endometriosis. For 51.4% of participants, Internet was the sole source of information used. However, this lack of awareness is likely to stem from widespread misconceptions as 70.3 per cent of respondents wrongly believed menstrual pain was something that is normal (for a woman), rather than a possible sign of endometriosis. What's more, alarmingly 83.4 percent reported never once receiving educational materials from healthcare providers or attending any kind of workshop.

Table (3): participants' awareness of endometriosis among women in Saudi Arabia (n=592).

Parameter		***No.***	***Percent (%)***
Do you know what endometriosis is?	First time hearing about it	165	27.9
	Only know the name	268	45.3
	Familiar with the disease	159	26.9
Source of knowledge about endometriosis *	Television	42	7.1
	Internet	304	51.4
	Magazines/newspapers	27	4.6
	Posters	11	1.9
	Classroom	112	18.9
	Friends	112	18.9
	Family	79	13.3

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	Personal experience	3	0.5
	Others	163	27.5
What do you think the reasons for lack of knowledge? *	insufficient information in the media	360	60.8
	belief that menstrual pain is normal for women, not a symptom	416	70.3
	no information from the physician about the disease	203	34.3
	no education in school about menstrual pain and women's health issues	405	68.4
Do you believe that menstrual pain should be taken seriously among women?	• Strongly Agree	379	64.0
	• Agree	158	26.7
	• Undecided	45	7.6
	• Disagree	8	1.4
	• Strongly Disagree	2	.3
Have you ever received educational materials about endometriosis from a healthcare provider or attended any workshops or seminars about women's reproductive health?	No	494	83.4
	Yes	98	16.6
Awareness of dysmenorrhea	First time hearing about it	226	38.2
	Only know the name	171	28.9
	Familiar with the symptoms	195	32.9

Results may overlap

In Table 4, we present data that reveal some very valuable insights into the rate of knowledge among Women in Saudi Arabia regarding Endometriosis. And a mere 9.3 percent of respondents had a high knowledge level regarding this condition, which raises an obvious gap in awareness. Instead, the majority of participants, or 48.1%, had moderate knowledge, while there were 42.6% that had low knowledge.

Table (4): Shows knowledge of endometriosis among women in Saudi Arabia score results.

	Frequency	**Percent**
High knowledge level	55	9.3
Moderate knowledge	285	48.1
low knowledge level	252	42.6
Total	592	100.0

The data contained in Table 5 shows significant information of awareness of endometriosis in Saudi Arabian women. 11% of respondents had a high level of awareness meaning that a large part of the population doesn't know very much about this medical condition. For example, 46.3% participants have moderate awareness level, which means the most participants have fair clarification of endometriosis, but not capable of well managing or advocating. Studies an alarmingly high 42.7% of women are

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lacking in knowledge of the importance of screening.

Table (5): Shows awareness of endometriosis among women in Saudi Arabia score results.

	Frequency	**Percent**
High awareness level	65	11.0
Moderate awareness	274	46.3
Low awareness level	253	42.7
Total	592	100.0

Table (6) shows that knowledge of endometriosis among women in Saudi Arabia has statistically significant relation to age (P value=0.010), educational level (P value=0.0001), marital status (P value=0.0001), and occupation (P value=0.0001). It also shows statistically insignificant relation to nationality, residential region, and monthly income.

Table (6): Relation between knowledge of endometriosis among women in Saudi Arabia and sociodemographic characteristics.

Parameters		***Knowledge level***		***Total (N=592)***	***P value****
		High or moderate knowledge	**low knowledge level**		
Nationality	Saudi	299	231	530	0.143
		87.9%	91.7%	89.5%	
	Non-Saudi	41	21	62	
		12.1%	8.3%	10.5%	
Age	21 or less	84	51	135	0.010
		24.7%	20.2%	22.8%	
	22 to 23	111	72	183	
		32.6%	28.6%	30.9%	
	24 to 35	103	72	175	
		30.3%	28.6%	29.6%	
	More than 35	42	57	99	
		12.4%	22.6%	16.7%	
Residential region	Northern region	56	44	100	0.264
		16.5%	17.5%	16.9%	
	Southern region	31	12	43	
		9.1%	4.8%	7.3%	
	Central region	54	34	88	
		15.9%	13.5%	14.9%	
	Eastern region	32	25	57	
		9.4%	9.9%	9.6%	
	Western region	167	137	304	
		49.1%	54.4%	51.4%	
Educational	Primary school	3	1	4	0.0001

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level		0.9%	0.4%	0.7%	
	Middle school	2	4	6	
		0.6%	1.6%	1.0%	
	High school	91	66	157	
		26.8%	26.2%	26.5%	
	Diploma	14	44	58	
		4.1%	17.5%	9.8%	
	Bachelor's degree	214	125	339	
		62.9%	49.6%	57.3%	
	Postgraduate degree	15	10	25	
		4.4%	4.0%	4.2%	
	Uneducated	1	2	3	
		0.3%	0.8%	0.5%	
Monthly income	Less than 1000 Saudi riyal	168	133	301	0.279
		49.4%	52.8%	50.8%	
	1000 – 5000	85	59	144	
		25.0%	23.4%	24.3%	
	5001 – 10000	23	25	48	
		6.8%	9.9%	8.1%	
	10001 – 15000	27	18	45	
		7.9%	7.1%	7.6%	
	More than 15000 Saudi riyal	37	17	54	
		10.9%	6.7%	9.1%	
Marital status	Single	254	152	406	0.0001
		74.7%	60.3%	68.6%	
	Married	70	84	154	
		20.6%	33.3%	26.0%	
	Divorced	16	12	28	
		4.7%	4.8%	4.7%	
	Widowed	0	4	4	
		0.0%	1.6%	0.7%	
Occupation	Student	174	74	248	0.0001
		51.2%	29.4%	41.9%	
	Health care sector employee	32	4	36	
		9.4%	1.6%	6.1%	
	Non health care sector employee	38	43	81	
		11.2%	17.1%	13.7%	
	Freelancer	8	17	25	
		2.4%	6.7%	4.2%	
	Unemployed	86	112	198	
		25.3%	44.4%	33.4%	
	Retired	2	2	4	
		0.6%	0.8%	0.7%	

P value was considered significant if ≤ 0.05.

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Table (7) shows that awareness of endometriosis among women in Saudi Arabia has statistically significant relation to nationality (P value=0.021), age (P value=0.0001), residential region (P value=0.008), marital status (P value=0.001), and occupation (P value=0.0001). It also shows statistically insignificant relation to educational level and monthly income.

Table (7): Awareness of endometriosis among women in Saudi Arabia in association with sociodemographic characteristics.

Parameters		***Awareness level***		***Total (N=592)***	***P value****
		High or moderate awareness	**Low awareness level**		
Nationality	Saudi	312	218	530	0.021
		92.0%	86.2%	89.5%	
	Non-Saudi	27	35	62	
		8.0%	13.8%	10.5%	
Age	21 or less	72	63	135	0.0001
		21.2%	24.9%	22.8%	
	22 to 23	125	58	183	
		36.9%	22.9%	30.9%	
	24 to 35	105	70	175	
		31.0%	27.7%	29.6%	
	More than 35	37	62	99	
		10.9%	24.5%	16.7%	
Residential region	Northern region	48	52	100	0.008
		14.2%	20.6%	16.9%	
	Southern region	28	15	43	
		8.3%	5.9%	7.3%	
	Central region	40	48	88	
		11.8%	19.0%	14.9%	
	Eastern region	39	18	57	
		11.5%	7.1%	9.6%	
	Western region	184	120	304	
		54.3%	47.4%	51.4%	
Educational level	Primary school	3	1	4	0.822
		0.9%	0.4%	0.7%	
	Middle school	2	4	6	
		0.6%	1.6%	1.0%	
	High school	89	68	157	
		26.3%	26.9%	26.5%	
	Diploma	35	23	58	
		10.3%	9.1%	9.8%	
	Bachelor’s degree	195	144	339	
		57.5%	56.9%	57.3%	
	Postgraduate degree	14	11	25	
		4.1%	4.3%	4.2%	

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	Uneducated	1	2	3	
		0.3%	0.8%	0.5%	
Monthly income	Less than 1000 Saudi riyal	171	130	301	0.151
		50.4%	51.4%	50.8%	
	1000 – 5000	84	60	144	
		24.8%	23.7%	24.3%	
	5001 – 10000	22	26	48	
		6.5%	10.3%	8.1%	
	10001 – 15000	24	21	45	
		7.1%	8.3%	7.6%	
	More than 15000 Saudi riyal	38	16	54	
		11.2%	6.3%	9.1%	
Marital status	Single	255	151	406	0.001
		75.2%	59.7%	68.6%	
	Married	69	85	154	
		20.4%	33.6%	26.0%	
	Divorced	13	15	28	
		3.8%	5.9%	4.7%	
	Widowed	2	2	4	
		0.6%	0.8%	0.7%	
Occupation	Student	156	92	248	0.0001
		46.0%	36.4%	41.9%	
	Health care sector employee	30	6	36	
		8.8%	2.4%	6.1%	
	Non health care sector employee	38	43	81	
		11.2%	17.0%	13.7%	
	Freelancer	16	9	25	
		4.7%	3.6%	4.2%	
	Unemployed	97	101	198	
		28.6%	39.9%	33.4%	
	Retired	2	2	4	
		0.6%	0.8%	0.7%	

P value was considered significant if ≤ 0.05.

Discussion

Endometriosis is a confounding condition that affects women's health, and most pronounced in the reproductive age group. In the present study, the focus was to assess knowledge and awareness among Saudi Arabian women about endometriosis as influenced by demographic factors such as age, education and socioeconomic status. However, our findings indicate a concerning void in parenthood in thinking and understanding endometriosis that mirrors studies in other population groups.

Specifically, our results indicate that most participants appreciated the common nature of endometriosis disease, but a substantial proportion demonstrated poor understanding of the disease and its management. More specifically, only 13.9 percent understood that untreated endometriosis can cause complications, and more than 60 percent were unaware of diagnostic or treatment options (such as

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laparoscopy or hormonal therapy). Previous work describing a lack of awareness for endometriosis among women worldwide fit well with these findings. For example, in a study in Poland, we showed that many women were also unaware of the symptoms and treatment for endometriosis [15], and thus educational interventions are urgently needed. Gremillet et al. also stressed on the importance of misinformation and a lack of awareness in contributing to underdiagnosis and management of endometriosis [14] and can be disastrous for woman's health. Our study also revealed that a significant portion of respondents, 27%, were hearing about endometriosis for the first time, while 45% only recognized its name. This lack of familiarity is alarming, particularly given the high prevalence of endometriosis among women with chronic pelvic pain and infertility [18]. The Internet emerged as the primary source of information for 51.4% of participants, which raises concerns about the reliability of the information accessed. Misconceptions about menstrual pain being a normal experience, as reported by 70.3% of respondents, further complicate the situation. This aligns with findings from Almuhanna et al., who noted that public awareness campaigns are crucial in dispelling myths and improving knowledge about various health conditions [13].

Knowledge and awareness levels were strongly influenced by demographic factors in our study. Analysis of significance of knowledge of endometriosis using statistical methods demonstrated that it was significantly related to age, educational level, marital status, and occupation. Consistent with earlier work, we also find higher awareness rates within more educated populations [16]. For example, a multicenter study in ten countries demonstrated that educational interventions improved women's knowledge of endometriosis [16]. But in contrast, we found no significant relationship between knowledge and factors, such as nationality or monthly income, indicating that targeted educational efforts may better target educational attainment instead of socioeconomic status.

Still, the present study was limited. The cross-sectional design also does not permit the formation of causal relationships between demographic factors and knowledge levels. Moreover, one might rely on self-reported data that could provide a bias, since participants are overestimating their knowledge and awareness levels. In addition, the study sample was made up of young women and this group may not fully reflect the overall population of women in Saudi Arabia. Future research should cover a broader spectrum in its demographic and understand awareness at all levels better.

The study also indicates that further educational and resource development is necessary among women in Saudi Arabia to elevate awareness and comprehension of endometriosis. According to Westin et al., education programs designed for healthcare providers are essential for accurate diagnosis and prompt treatment of endometriosis [17]. Furthermore, social media and community outreach could powerfully conquer the misinformation propagated towards endometriosis in the society [12].

Conclusion:

In conclusion, our study concludes with a large knowledge and awareness gap of endometriosis amongst women in Saudi Arabia based on hereditary and demographic factors. The findings underscore the need to target educational interventions to improve awareness and understanding among women of endometriosis in order to achieve improved health outcomes. Fixing a gap in knowledge about the condition is as important to improve individual health as to deliver this condition's magnitude in societal terms.

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Ethical approval:

After fully explaining the study and emphasizing that participation is optional, each participant gave their informed consent. The information gathered was safely stored and utilized exclusively for study.

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Conflict of interests:

The authors declare no conflict of interest.

Informed consent:

Written informed consent was acquired from each individual study participant.

Data and materials availability:

All data associated with this study are present in the paper.

References:

1. Sukhbir Singh, MD; Ahmed M. Soliman, MS, PhD;Yasmine Rahal, MSc; Catherine Robert, MBA;Isabelle Defoy, PhD;Paul Nisbet, PhD;Nicholas Leyland, MHCM M 1Clinical. Endometriosis in Saudi Arabia; Prevalence, Presentation, Complications, and Updated Management: Simple systematic review. Vol. 10, International Journal of Pharmaceutical and Phytopharmacological Research. 2020.
2. Singh S, Soliman AM, Rahal Y, Robert C, Defoy I, Nisbet P, et al. Prevalence, Symptomatic Burden, and Diagnosis of Endometriosis in Canada: Cross-Sectional Survey of 30 000 Women. J Obstet Gynaecol Canada. 2020;42(7):829–38.
3. As-Sanie S, Black R, Giudice LC, Gray Valbrun T, Gupta J, Jones B, et al. Assessing research gaps and unmet needs in endometriosis. Am J Obstet Gynecol. 2019;221(2):86–94.
4. Moradi M, Parker M, Sneddon A, Lopez V, Ellwood D. The Endometriosis Impact Questionnaire (EIQ): A tool to measure the long-term impact of endometriosis on different aspects of women's lives. BMC Womens Health. 2019;19(1):1–11.
5. Khan KN, Ogawa K, Iwasa K, Kuroboshi H, Okimura H, Koshiba A, et al. A targeted educational programme improves fundamental knowledge of menstrual pain and endometriosis in young women: The Endometriosis Awareness Promotion Project. Reprod Biomed Online. 2022;45(6):1216–29.
6. Medina-Perucha L, Pistillo A, Raventós B, Jacques-Aviñó C, Munrós-Feliu J, Martínez-Bueno C, et al. Endometriosis prevalence and incidence trends in a large population-based study in Catalonia (Spain) from 2009 to 2018. Women's Heal. 2022;18.
7. O'Hara R, Rowe H, Fisher J. Managing endometriosis: a cross-sectional survey of women in Australia. J Psychosom Obstet Gynecol. 2022;43(3):265–72.
8. Mohamed El Sayed S, Mohamed El Sayed M, Badawy A. Effectiveness of adoption of positive

ISSN:1624-1940
http://magellanes.com/

coping strategies on women's knowledge and practices related to endometriosis. Tanta Sci Nurs J. 2022;24(1):153–71.
9. 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 Sep;18(18).
10. Yuksel Ozgor B, Azamat S, Berkay EG, Türeli D, Ozdemir I, Topaloğlu S, et al. Epidemiology of Endometriosis Awareness in Turkey. Cureus. 2023;
11. Szymańska J, Dąbrowska-Galas M. An assessment of Polish women's level of knowledge about endometriosis: a pilot study. BMC Womens Health. 2021 Dec;21(1).
12. Algamdi, M., Gonzales, A., & Farah, E. (2021). Awareness of common cancer risk factors and symptoms in saudi arabia: a community-based study. Asian Pacific Journal of Cancer Prevention, 22(6), 1813-1819. https://doi.org/10.31557/apjcp.2021.22.6.1813
13. Almuhanna, A., Alomar, M., & Alsalman, H. (2018). Public awareness towards renal stone causes, symptoms and management amongst saudis. The Egyptian Journal of Hospital Medicine, 70(4), 544-548. https://doi.org/10.12816/0043804
14. Gremillet, L., Netter, A., Sari-Minodier, I., Miquel, L., Lacan, A., & Courbière, B. (2022). Endometriosis, infertility and occupational life: women's plea for recognition.. https://doi.org/10.21203/rs.3.rs-2222257/v1
15. Kotowska, M., Urbaniak, J., Falęcki, W., Łazarewicz, P., Masiak, M., & Szymusik, I. (2021). Awareness of endometriosis symptoms—a cross sectional survey among polish women. International Journal of Environmental Research and Public Health, 18(18), 9919. https://doi.org/10.3390/ijerph18189919
16. Nnoaham, K., Hummelshøj, L., Webster, P., D'Hooghe, T., Nardone, F., Nardone, C., … & Zondervan, K. (2011). Impact of endometriosis on quality of life and work productivity: a multicenter study across ten countries. Fertility and Sterility, 96(2), 366-373.e8. https://doi.org/10.1016/j.fertnstert.2011.05.090
17. Westin, M., Wikberg, C., Björkelund, C., Ariai, N., Lindahl, A., & Hange, D. (2022). Bridging the gap: can a patient questionnaire together with staff education increase diagnostics of endometriosis in primary care? -a pilot study.. https://doi.org/10.21203/rs.3.rs-2258804/v1
18. Zaidan, A., Hindi, M., Bishara, A., Alolayan, S., & Abduljabbar, H. (2018). The awareness regarding the episiotomy procedure among women in saudi arabia. Materia Socio Medica, 30(2), 193. https://doi.org/10.5455/msm.2018.30.193-197