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ASSESSMENT OF KNOWLEDGE, ATTITUDE AND PRACTICE REGARDING ADENOMYOSIS AMONG REPRODUCTIVE AGE WOMEN

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ABSTRACT

Background *Adenomyosis is a common gynecological condition affecting women during reproductive age and may cause menstrual abnormalities, pelvic pain, infertility, and psychological distress. Limited awareness of its symptoms, diagnosis, and management may contribute to delayed healthcare-seeking and inadequate disease management.*

Aim *The study aimed to assess the knowledge, attitude, and practice regarding adenomyosis among reproductive-age women.*

Methods *A descriptive cross-sectional quantitative research design was used. A total of 150 respondents were recruited through a convenience sampling technique. Data were collected using a structured questionnaire assessing sociodemographic characteristics, knowledge, attitude, and practice regarding adenomyosis. The collected data were analyzed using descriptive statistics and Chi-square tests.*

Results *Among 150 respondents, 30.7% were aged 31–35 years, 95.3% were female, and 60.0% were married. Knowledge levels showed that 44 respondents had poor knowledge, 79 had moderate knowledge, and 27 had good knowledge. Practice levels showed that 25 respondents had poor, 58 had moderate, and 67 had good practice. Age was significantly associated with knowledge ($\chi^2 = 49.978$, $p < .001$) and practice levels ($\chi^2 = 49.978$, $p < .001$). Attitudes toward adenomyosis were mixed.*

Conclusion *The findings indicated important gaps in knowledge and inconsistent attitudes despite relatively better practices. Structured reproductive-health education may improve awareness, early recognition, and appropriate healthcare-seeking behavior regarding adenomyosis.*

Keywords: *Adenomyosis, Knowledge, Attitude, Practice, Reproductive-age women, Gynecological health, Women's health*

INTRODUCTION

Adenomyosis, a benign but frequently incapacitating gynecological condition, is

characterized by the ectopic development of endometrial glands and stroma into the myometrium (uterine muscle wall) (Vercellini et al., 2014). The uterus's regular architecture is upset by this aberrant endometrial tissue localization, which also causes reactive hypertrophy and proliferation of the surrounding uterine muscle fibers, frequently leading to

generalized uterine enlargement. Although adenomyosis was often thought to be an unintentional histological finding in tissue taken after a hysterectomy, it is now widely acknowledged to be a significant source of gynecological morbidity, especially in women of reproductive age. (Benagiano et al., 2018).

Although reported prevalence varies greatly, studies indicate that 20% to 35% of women in the general population may have adenomyosis. (Bird et al., 2011). However, as the diagnosis has traditionally been established following a hysterectomy, these figures could be underestimates. Improved detection rates due to recent developments in noninvasive imaging methods like magnetic resonance imaging (MRI) and transvaginal ultrasound (TVUS) raise the possibility that adenomyosis is more prevalent than previously believed, particularly in younger, nulliparous women. (Garcia et al., 2018)

There are several ways that adenomyosis might manifest in a clinical context. Persistent pelvic discomfort, dyspareunia (pain during sexual activity), and excessive monthly flow (menorrhea) are common symptoms that many women suffer. Infertility may also be experienced by others. Variability in symptom presentation and intensity often makes management techniques more difficult to implement and delays diagnosis. (Vercellini et al., 2014).

The precise pathophysiology of adenomyosis is still unknown after much investigation, however a number of ideas have been put out. One of the most widely accepted ideas, known as "vaginitis," postulates that excessive peristalsis or recurrent mechanical trauma to the uterus may cause the endometrial basal layer to invade the myometrium. (Leyendecker et al., 2009). By encouraging endometrial development and maybe accelerating the invasive phase, local increases in estrogen levels are believed to further improve this process. (Benagiano et al., 2018).

However, adenomyotic lesions are believed to arise from embryonic Müllerian remnants inside the myometrium, which subsequently differentiate into endometrial tissue, in accordance with the "de novo" idea. Other factors that increase the myometrium's vulnerability to endometrial invasion include tissue damage after delivery or surgery and chronic uterine inflammation. (Chapron et al., 2012).

Even while no one hypothesis can completely explain all of the characteristics of adenomyosis, the interplay of hormonal, mechanical, and inflammatory factors appears to be essential to the pathophysiology of the condition. Adenomyosis could previously only be definitively diagnosed by histological investigation following a hysterectomy, which unavoidably constrained our knowledge of its actual frequency and clinical importance. The diagnosis procedure has been transformed with the advent of sophisticated imaging methods. Because it is inexpensive and simple to perform, transvaginal ultrasonography is frequently employed as a first-line diagnostic tool. Typical ultra-sonographic findings include tiny myometrial cysts, fluctuating myometrial ultrasonography, and a diffusely enlarged uterus.

However, because of its greater sensitivity and specificity, magnetic resonance imaging (MRI) has emerged as a superior imaging modality because the endometrial and myometrial junctional zone has been well defined. The primary diagnostic criteria for adenomyosis is thought to be densely interdigitated bands, which are often larger than 12 mm (Garcia et al., 2018; Chapron et al., 2012). Additional diagnostic challenges arise from the unpredictability of imaging results and the frequent co-occurrence of adenomyosis with other uterine illnesses, such as leiomyomata (fibroids) or endometriosis. Accordingly, a thorough assessment that integrates imaging results with clinical presentation is necessary for a precise diagnosis (Vercellini et al., 2014).

Adenomyosis's clinical impact goes beyond its immediate gynecological symptoms. Women who experience excessive monthly flow and chronic pelvic discomfort may miss work, engage with people less, and experience psychological anguish, all of which can have a substantial negative influence on their quality of life (Benagiano et al., 2018).

Adenomyosis' s link to infertility and unfavorable pregnancy outcomes further emphasizes the significance of prompt diagnosis and a successful treatment strategy. Each patient's symptoms,

reproductive objectives, and general health are taken into consideration when treating adenomyosis. In general, women who wish to maintain their fertility are advised to practice conservative management. Medical treatment includes the use of nonsteroidal anti-inflammatory drugs (NSAIDs) to control pain in addition to hormonal treatments like oral contraceptives, progestins, and gonadotropin-releasing hormone (GnRH) agonists that try to lessen menstrual blood loss and relieve pain (Vercellini et al., 20). When conservative therapy is unsuccessful or a woman has finished having children, surgical treatment may be considered. Uterine-preserving surgeries like adenomyomectomy and uterine artery embolization are becoming more and more common, especially among women who wish to maintain their fertility, even if adenomyosis may still be treated with a hysterectomy alone (Chapron et al., 2012).

Methods

A cross-sectional quantitative study was conducted among reproductive-age women attending the gynecology wards of different hospitals in Lahore. The study was conducted over a period of four to six months. A total of 150 reproductive-age women were recruited using a simple random sampling technique. The sample size was determined using the Raosoft sample size calculator with a 95% confidence level, 5% margin of error, and 50% response distribution. Eligible participants were women within the defined reproductive age group who were present at the selected study settings, willing to participate, able to understand the questionnaire language, and able to provide informed consent. Women outside the specified age range, those who were critically ill or medically unstable, unable to respond to the questionnaire, unwilling to participate, or involved in pilot testing were excluded. A structured cross-sectional survey questionnaire was used to assess sociodemographic characteristics, knowledge, attitude, and practice regarding adenomyosis.

Data Collection Procedure

After obtaining the required administrative and ethical permissions, data collection was initiated at the selected hospitals. Eligible women were approached by the researcher and were informed about the purpose and objectives of the study. The voluntary nature of participation and the participants' right to refuse or withdraw at any stage were explained. Written informed consent was obtained before distributing the questionnaire. Participants were given adequate time to read and complete the questionnaire. The researcher remained available to clarify questions without influencing responses. Appropriate assistance was provided to participants who experienced difficulty completing the questionnaire. The names of participants were not recorded to maintain privacy and confidentiality. After completion, questionnaires were checked for completeness, collected, coded, and securely stored for analysis.

Data Analysis Procedure

The collected data were checked for completeness, coded, and entered into the Statistical Package for the Social Sciences (SPSS) version 27 for analysis. Descriptive statistics were used to summarize the participants' sociodemographic characteristics and knowledge, attitude, and practice scores. Categorical variables were presented as frequencies and percentages, while continuous variables were summarized using means and standard deviations where applicable. Overall knowledge, attitude, and practice levels were presented using frequency and percentage distributions. Chi-square tests were applied to determine associations between knowledge, attitude, practice levels, and selected sociodemographic characteristics. Statistical significance was determined at a p-value of less than 0.05.

Results

Demographic Analysis

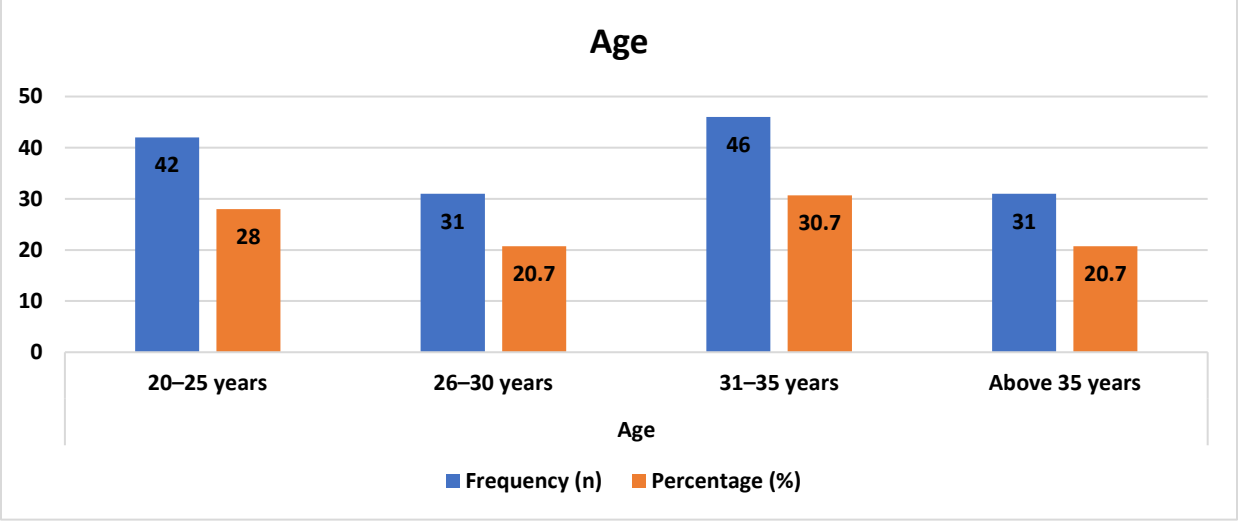
A total of **150 respondents** participated in the study. The largest proportion of respondents was aged **31–35 years** (**30.7%**), followed by those aged **20–25 years** (**28.0%**). Most respondents were

female (95.3%) and married (60.0%). Regarding educational qualification, the largest proportion had an intermediate-level education (28.0%). In terms of occupation, 60.7% of respondents were employed, while 39.3% were engaged in housework. Among employed respondents, the largest proportion reported a job duration of more than 15 months (44.0%).

Table 1: Demographic Characteristics of the Respondents (n = 150)

Variable	Category	Frequency (n)	Percentage (%)
Age	20–25 years	42	28.0
	26–30 years	31	20.7
	31–35 years	46	30.7
	Above 35 years	31	20.7
Gender	Male	7	4.7
	Female	143	95.3
Marital Status	Single	60	40.0
	Married	90	60.0
Educational Qualification	Matric	35	23.3
	Intermediate	42	28.0
	Graduation	24	16.0
	Master's	23	15.3
	PhD	26	17.3
Occupation	Any job	91	60.7
	House job	59	39.3
Duration of Job	1–10 months	35	23.3
	10–15 months	49	32.7
	Above 15 months	66	44.0
Total		**150**	**100.0**

Figure 4.1. Age of Participants



The highest proportion of respondents (30.7%) was aged 31–35 years, followed by 28.0% who were aged 20–25 years. Respondents aged 26–30 years and above 35 years each represented 20.7% of the sample.

The findings showed that knowledge regarding adenomyosis varied considerably across the assessed items. Only 37.3% correctly identified menorrhagia and dysmenorrhea as typical clinical manifestations. Similarly, 39.3% correctly recognized ultrasonography and MRI as diagnostic

approaches. Approximately half of the respondents correctly identified pharmacological and surgical treatment options (**52.0%**) and pharmacological management (**52.0%**). Knowledge regarding the possibility of infertility was also limited, with **49.3%** providing a correct response. Overall, the findings indicated gaps in respondents' knowledge regarding the symptoms, diagnosis, management, chronic nature, and potential complications of adenomyosis.

Table 2: Knowledge Regarding Adenomyosis Among Respondents (n = 150)

Sr. No.	Knowledge Item	Correct n (%)	Incorrect n (%)
1	Typical clinical manifestations include menorrhagia and dysmenorrhea	56 (37.3)	94 (62.7)
2	Women of reproductive age are not the primary demographic affected	95 (63.3)	55 (36.7)
3	Adenomyosis can cause psychological and physiological distress	56 (37.3)	94 (62.7)
4	Ultrasonography and MRI are diagnostic approaches	59 (39.3)	91 (60.7)
5	Treatment may include pharmacological or surgical options	79 (52.0)	72 (48.0)
6	Pharmacological management may include analgesics, oral contraceptives and progestogens	78 (52.0)	72 (48.0)
7	Hysterectomy may be considered for definitive treatment in symptomatic cases	74 (49.3)	76 (50.7)
8	Adenomyosis can potentially contribute to infertility	74 (49.3)	76 (50.7)
9	Adenomyosis is not typically associated with psychological or physiological discomfort	102 (68.0)	48 (32.0)
10	Adenomyosis is a chronic condition requiring long-term management	63 (42.0)	87 (58.0)
11	Healthy diet, regular exercise and follow-up can improve the condition	67 (44.7)	83 (55.3)
12	Adenomyosis does not possess malignant transformation potential	68 (45.3)	82 (54.7)

The overall knowledge assessment showed that **79 respondents had moderate knowledge**, **44 had poor knowledge**, and **27 had good knowledge**. Among respondents aged 20–25 years, 25 had moderate knowledge and 15 had good knowledge. Among those aged 31–35 years, 21 had poor knowledge, 18 had moderate knowledge, and 7 had good knowledge. The reported chi-square analysis demonstrated a statistically significant association between age and knowledge level (**χ^2 = 49.978, p < 0.001**).

Table 3: Association Between Age and Overall Knowledge Level (n = 150)

Age Group	Poor n	Moderate n	Good n	Total
20–25 years	2	25	15	42
26–30 years	17	9	5	31
31–35 years	21	18	7	46
Above 35 years	4	27	0	31
Total	**44**	**79**	**27**	**150**

Chi-square test: $\chi^2 = 49.978$, **p < 0.001**

The attitude findings demonstrated variation in respondents' perceptions regarding adenomyosis. A total of **71 respondents (47.3%)** either strongly agreed or agreed that women of childbearing age should have a basic understanding of adenomyosis. Similarly, **79 respondents (52.6%)**

either strongly agreed or agreed that a healthy lifestyle could contribute to prevention and treatment. Regarding adherence to treatment and regular follow-up, **74 respondents (49.0%)** reported agreement or strong agreement. However, considerable proportions selected neutral, disagree, or strongly disagree responses across several items, indicating that favorable attitudes were not consistent among all participants.

Table 4: Attitude Regarding Adenomyosis Among Respondents (n = 150)

Sr. No.	Attitude Statement	Strongly Agree n (%)	Agree n (%)	Neutral n (%)	Disagree n (%)	Strongly Disagree n (%)
1	Women of childbearing age should have a basic understanding of adenomyosis	43 (28.7)	63 (42.0)	9 (6.0)	22 (14.7)	13 (8.7)
2	Adenomyosis can lead to serious adverse outcomes and should be taken seriously	27 (18.0)	24 (16.0)	33 (22.0)	37 (24.7)	29 (19.3)
3	Healthy lifestyle, sleep, exercise and positive mindset can contribute to prevention and treatment	41 (27.3)	38 (25.3)	28 (18.7)	18 (12.0)	25 (16.7)
4	Controlling body weight and reducing abortions can help prevent adenomyosis	44 (29.3)	30 (20.0)	20 (13.3)	27 (18.0)	29 (19.3)
5	Following treatment plans, medication schedules and regular checkups is important	44 (29.0)	30 (20.0)	20 (13.3)	27 (18.0)	29 (19.3)

The practice findings indicated variable levels of health-related practices among respondents. Only **27.3%** of respondents reported that they always or often sought information regarding adenomyosis through books, the internet, or healthcare professionals. In contrast, **68.0%** reported that they were always or often sensitive to unusual symptoms such as menstrual pain, prolonged periods, or increased menstrual flow. Similarly, **52.0%** reported that they always or often sought medical assistance when experiencing unusual symptoms. Regular exercise was reported as an always or often practice by **52.0%** of respondents.

Table 5: Practice Regarding Adenomyosis Among Respondents (n = 150)

Sr. No.	Practice Item	Always n (%)	Often n (%)	Sometimes n (%)	Occasionally n (%)	Never n (%)
1	Seek information about mechanisms, symptoms and risks of adenomyosis	15 (10.0)	26 (17.3)	35 (23.3)	55 (36.7)	19 (12.7)
2	Seek to understand treatment options and read medication information	15 (10.0)	26 (17.3)	35 (23.3)	55 (36.7)	19 (12.7)
3	Discuss prevention and management with other women	44 (29.3)	41 (27.3)	19 (12.7)	24 (16.0)	22 (14.7)

4	Remain alert to unusual menstrual pain, prolonged periods or increased flow	61 (40.7)	41 (27.3)	17 (11.3)	15 (10.0)	16 (10.7)
5	Promptly seek medical assistance for unusual symptoms	42 (28.0)	36 (24.0)	20 (13.3)	33 (22.0)	19 (12.7)
6	Seek emotional support from family, friends or healthcare professionals	40 (26.7)	36 (24.0)	20 (13.3)	32 (21.3)	22 (14.7)
7	Maintain a regular exercise routine	35 (23.3)	43 (28.7)	20 (3.3)	31 (20.7)	21 (14.0)

Discussion

The survey studied knowledge, awareness, and behavior of adenomyosis for 150 women of childbearing age. The age demographic reported the majority of respondents in the 31-35 age bracket at 30.7%. Next, were respondents in the 20-25 age demographic at 28.0%. The majority were female (95.3%) and (60.0%) were married. Concentrating the participants in this age demographic is justified given that adenomyosis is increasingly being identified in younger women and is being linked with symptoms of menstruation, pelvic pain and reproductive challenges. According to Bourdon et al. (2021), adenomyosis affects women in the reproductive age bracket and may have significant clinical implications in relation to pain, abnormal uterine bleeding, and fertility. Given the demographic distribution of the respondents, the study was well placed to assess knowledge and health-seeking behaviors with respect to adenomyosis. The findings of the study also indicate the need to include adenomyosis in reproductive health educational programs for women of childbearing age.

The findings of the current study indicated that there were major gaps in participant's knowledge on adenomyosis. Menorrhagia and dysmenorrhea were known to only 37.3% of the respondents as common clinical symptoms, while 39.3% identified the role of ultrasonography and magnetic resonance imaging as the investigative methods. There was a general lack of knowledge on the chronicity of adenomyosis, as only 42.0% of the respondents recognized the condition as one that requires long-term treatment. These findings are in accordance to those of Ren et al. (2024), where there was notable lack of knowledge in the target population of Chinese reproductive age women, where the mean score for knowledge was 3.54 ± 3.72. In their study, women's knowledge of adenomyosis was inadequate, and their findings were in line with previous studies regarding the lack of knowledge in this area of reproductive health. Due to the cross study nature of this research, it is hypothesized that there is limited knowledge relating to adenomyosis in multiple cultures. Contrastingly, it is expected that women of reproductive age would possess more knowledge relating to common gynecologic ailments. It is known that menstruation with pain and heavy menstrual bleeding are significant clinical symptoms of adenomyosis.

The present analysis classified knowledge as poor in 44 respondents, moderate in 79 respondents, and good in 27 respondents. A significant relationship between knowledge and age (χ^2 = 49.978, $p < .001$) was noted. Most participants in the 20-25-year age bracket had knowledge recorded as moderate, while most of the respondents with poor knowledge were in the 31-35-year bracket. This finding was similar to Ren et al. (2024). In their study, reproductive-age women had inadequate knowledge, and knowledge was documented as a significant factor for attitudes and practices. In their study, knowledge had a direct effect on attitudes and practices. The age association in the current study suggested that information regarding reproductive health may be accessed differently across age groups, and influenced by life experiences. The results also indicated that the assumption that knowledge improves with age is incorrect and that poor knowledge can be recorded for women in the 31-

35 year age group. The complexity of the diagnosis and the clinical presentation of adenomyosis documented by Chapron et al. (2020) may be one of the reasons for the inadequate recognition of the disease by women and healthcare users.

The findings regarding perception showed varied responses towards adenomyosis. About 70.7% of respondents agreed or strongly agreed women in their reproductive years should know at least a little about adenomyosis. More than half the participants agreed or strongly agreed prevention and treatment could stem from adequate sleep, regular exercise, and a good attitude. Almost half advocated adherence to treatment plans, including medications and check-up appointments. Unlike these results, Ren et al. (2024), described negative attitudes of Chinese women of reproductive age, in general, regarding uterine adenomyosis. Their average attitude score was 20.96 ± 3.19 within a range of 5–25; the authors were of the opinion that extensive educational programs were needed. The more encouraging response to a few attitude indicators in this research, compared to Ren et al. (2024), could stem from the differences in educational level, cultural background, health education, and previous experiences in the health care system and gynecology. The research conducted by Vannuccini et al. (2019) also recognized the need for health education because the symptoms of adenomyosis can be severe and managing the reproductive health of patients demands it.

The responses to the practice findings showed a lot of diversity. Only 27.3% of the sample reported that they always or often looked for information regarding adenomyosis through books, the internet, or by talking to healthcare professionals. The same percentage reported that they always or often looked for information regarding treatment options. Recognition of symptoms showed a clearer pattern, where 68.0% reported that they always or often recognized the symptoms of atypical menstrual cycles and the symptoms of extended or excessive menstrual bleeding. About 52.0% reported that they always or often went to the doctor to seek help for atypical symptoms. The findings are in some degree of contradiction to Ren et al. (2024), who reported inadequate practices toward uterine adenomyosis in reproductive-age women. The reported contradiction may be from the phrasing and scoring of the instruments, differences in healthcare systems, cultural practices, and study populations. Results reported in this study suggest that the respondents are able to identify abnormal symptoms of menstruation, but do not have enough information about the symptoms. In addition, the respondents are not actively looking for information. This symptom recognition pattern is clinically significant because both abnormal uterine bleeding and Chronic Pelvic Pain (CPP) are symptoms of adenomyosis that women may normalize and may not be symptomatic enough to warrant a medical consultation with a specialty gynecologist (Bourdon et al., 2021).

The current research found a significant correlation between age and level of practice (χ^2 = 49.978, df = 6, $p < .001$). Respondents between the ages 20 to 25 showed good practice (n = 26). Participants over the age of 35 also showed a good practice, though the highest number of respondents showing moderate practice were in the age group 31 to 35. The group showing poor practice were respondents in the age cohort of 26 to 30. According to Ren et al. (2024), knowledge had a direct impact on practice where attitudes also had a direct significant impact on practice. This allows the current research to make the findings that there may be demographic and educational gaps in relation to reproductive health. As seen from the non-linear relation of practice to the different age groups, health behavior may not be determined solely by age. Some of the contributing factors may be reproductive experience, some level of frustration with healthcare, exposure to gynecological services, and health literacy. The absence of good practice is made worse by the findings of Horton et al. (2019), who found that reproductive concerns with adenomyosis had important adverse reproductive outcomes and showed the clear need for good practice in reproductive health.

The results stressed the importance of raising awareness of adenomyosis among women of reproductive age. Respondents demonstrated a

relatively moderate understanding of adenomyosis, which is concerning. Good knowledge had very little representation. Attitudes were somewhat contradictory. Positive awareness, healthy lifestyle, treatment adherence, attending regular checkups, and negative perceptions of the seriousness and management of adenomyosis. Practice levels were relatively better, as 67 of the respondents were identified as having good practice, 58 as having moderate practice, and 25 as having poor practice. This study and Ren et al. (2024) described the imperative need for education. Ren et al. (2024) overall described poor practice of women of reproductive age. Liu et al. (2025) showed that adenomyosis significantly affects one's ability to conceive and the reproductive journey, and therefore advocates that all women are made aware of the symptoms of the condition of adenomyosis and are encouraged to seek a diagnosis. Community-based educational activities that involve gynecological clinics, community health activities, and digital health education, can help to educate the community on symptoms of adenomyosis, diagnosis, management, and treatment, as well as safe healthcare-seeking practices. This study advocates that adenomyosis be incorporated into reproductive health education during all phases rather than focused on women who have finally received the diagnosis.

Conclusion

The study comes to the conclusion that women of reproductive age had low to moderate levels of awareness, attitude, and practice about adenomyosis. Delays in diagnosis and treatment are a result of many women's ignorance about the causes, symptoms, and available treatments. Despite a generally positive attitude toward illness prevention, proactive information-seeking and practical involvement in health-promoting practices were lacking. The results highlight the critical need for nurse-led counseling sessions, community health awareness initiatives, and educational interventions to advance knowledge and early adenomyosis detection.

Recommendations

1. **Health Education Programs:** Hold informational meetings about adenomyosis symptoms, risk factors, and available treatments for women who are of reproductive age.
2. **Community Outreach:** Launch initiatives led by nurses to encourage regular gynecological exams and knowledge of reproductive health.
3. **Training for Healthcare Professionals:** Teach midwives and nurses how to recognize and treat adenomyosis cases early.
4. **Media Awareness:** Disseminate correct facts and dispel myths about the illness by using print and digital media.
5. **Additional Research:** Support interventional and longitudinal research to assess how well educational interventions work to enhance women's habits and understanding.

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