

ORIGINAL RESEARCH ARTICLE

Assessing the burden of primary dysmenorrhea and its association with quality of life among school adolescents in Jizan, Saudi Arabia: A cross-sectional study

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Abstract

Primary dysmenorrhea affects females worldwide, impairing physical, mental, and social well-being. Related research among Saudi school adolescents remains limited. This cross-sectional study was undertaken to assess the severity levels of primary dysmenorrhea, its association with self-care practices, and the quality of life among 850 school students aged 13–19 years in Jizan City, Saudi Arabia. Data were collected using a pre-tested online questionnaire. Primary dysmenorrhea severity was measured using the Numerical Rating Scale, while quality of life was assessed with the 12-item Short-Form Health Survey. Results showed that 96% of the participants reported primary dysmenorrhea, with moderate pain being the most commonly reported level (64.6%), followed by severe pain (24.6%). Most of the participants used home remedies (91.1%), and 67.2% reported analgesic use, which was strongly associated with pain severity. Only 23.5% sought medical consultation. Quality-of-life scores significantly declined with increased pain severity level, particularly in bodily pain, mental health, and social functioning. These findings emphasize the need for adolescent-focused programs promoting effective lifestyle and self-care management strategies. (*Afr J Reprod Health 2026; 30 [8]: 32-43*).

Keywords: Primary dysmenorrhea, prevalence, pain severity, management, quality of life, adolescents

Résumé

La dysménorrhée primaire affecte les femmes du monde entier, altérant leur bien-être physique, mental et social. Les recherches sur ce sujet auprès des adolescentes scolarisées en Arabie saoudite restent limitées. Cette étude transversale a été menée auprès de 850 élèves âgées de 13 à 19 ans de la ville de Jizan, en Arabie saoudite, afin d'évaluer la sévérité de la dysménorrhée primaire, son lien avec les pratiques d'autosoins et la qualité de vie. Les données ont été recueillies à l'aide d'un questionnaire en ligne prétesté. La sévérité de la dysménorrhée primaire a été mesurée à l'aide de l'échelle numérique d'évaluation de la douleur (EN), tandis que la qualité de vie a été évaluée grâce au questionnaire de santé SF-12. Les résultats ont montré que 96 % des participantes ont déclaré souffrir de dysménorrhée primaire, la douleur modérée étant la plus fréquemment rapportée (64,6 %), suivie de la douleur intense (24,6 %). La plupart des participantes ont eu recours à des remèdes maison (91,1 %) et 67,2 % ont déclaré utiliser des analgésiques, ce qui était fortement corrélé à la sévérité de la douleur. Seules 23,5 % ont consulté un médecin. Les scores de qualité de vie ont diminué significativement avec l'augmentation de l'intensité de la douleur, notamment en ce qui concerne la douleur physique, la santé mentale et le fonctionnement social. Ces résultats soulignent la nécessité de programmes destinés aux adolescentes, promouvant des stratégies efficaces d'hygiène de vie et d'autogestion. (*Afr J Reprod Health 2026; 30 [8]: 32-43*).

Mots-clés: Dysménorrhée primaire, prévalence, intensité de la douleur, prise en charge, qualité de vie, adolescentes.

Introduction

Promoting adolescents' quality of life and psychological transition is one of the key programs on the agenda of the Saudi Ministry of Health and the Ministry of Education's joint plan for school health (academic year 2023-2024).¹ Puberty is characterized by emotional, hormonal, and physical

changes that take place as an adolescent reaches sexual maturity. The onset of menstruation (menarche) is one of the vital signs of an adolescent's reproductive health. It is defined as a recurring physiological process that often begins at puberty between the ages of 8 and 15, during which many health issues might occur, such as irregular cycles, heavy bleeding, and dysmenorrhea.^{2,3}

Dysmenorrhea, despite not being listed as a life-threatening condition, has been indicated in several studies as among the most often reported gynecologic complaints that significantly impact females' quality of life.^{4,5} It is classified into two types: primary and secondary. Primary dysmenorrhea (PD), the leading cause of dysmenorrhea among females, refers to a crampy suprapubic pain that occurs 6–12 months after menstruation onset, without any pelvic condition. Symptoms are consistent across menstrual periods, typically reaching maximum intensity within the first day and potentially lasting up to 3 days.^{6,7} The pain is typically colicky, manifests in the lower abdomen, and may spread to the inner thighs and back. Additional symptoms may accompany dysmenorrhea, including fatigue, perspiration, migraines, nausea, vomiting, lethargy, moderate fever, and diarrhea. Secondary dysmenorrhea (SD) differs in that it is caused by an underlying pelvic disease and primarily affects females over the age of 20.⁶

Prevalence studies in this field indicate that dysmenorrhea among females of reproductive age worldwide varies from 16% to 94%, with reported rates of severe pain ranging from 2% to 29%.^{8,9} A review of 50 studies, including 41,140 adolescents and young females, has revealed a wide range of dysmenorrhea prevalence in Arab countries, with rates ranging from 34% in Egypt to 94% in Oman.¹⁰ In Saudi Arabia, the prevalence of PD among females under the age of 19 has been little investigated. More precisely, research has predominantly focused on college students. Recent studies conducted between 2019 and 2023 in various Saudi cities, including Riyadh, Jeddah, Makkah, Al-Taif, and Jazan, revealed that the prevalence of PD among university students ranged from 70% to 90%, while reported severe dysmenorrhea ranged between 27% and 46%.¹¹⁻¹⁵ Despite the high prevalence of PD worldwide, it is often overlooked by healthcare providers and researchers and inadequately managed by affected females.¹⁶

The menstrual self-care strategies varied across nations. A meta-analysis study of the prevalence of different types of self-care among 12,526 young women with dysmenorrhea revealed that more than half of the included females (55%) used self-care, using both pharmaceutical (48%) and non-pharmaceutical (51.8%) methods. The

proportions of analgesic usage did not significantly differ between middle- and high-income countries or between school and university students.¹⁷ Apart from pharmacological methods, Aboualsoltani et al. mentioned acupuncture, heat therapy, psychotherapy, massage therapy, hypnosis, and physiotherapy as effective non-pharmaceutical techniques for reducing the severity of PD symptoms.¹⁸ In addition, lifestyle and dietary adjustments, hot drinks, gentle exercise, rest, and maintaining warmth were frequently mentioned globally as home remedies for managing dysmenorrhea.⁹

Dysmenorrhea causes significant morbidity, leading to detrimental effects on the overall quality of life and imposing a considerable burden on public health.¹⁹ A review involving 55 studies from 2010 to 2024 found that over 80% of young females aged 12-25 with dysmenorrhea experienced physical and psychological challenges, including sleep issues and mood disturbances.⁹ Dysmenorrhea also had significant negative effects on young females' interpersonal connections, academic or professional achievements, daily activities, and engagement in social and leisurely pursuits.^{9,19} Research estimates that 10% to 50% of working or studying females miss one to two days per month due to PD. This leads to substantial financial losses for nations and a decrease in productivity, potentially causing severe global economic impacts.⁸

The relationship between PD and the Health-Related Quality of Life (HRQOL) of school adolescents in Saudi Arabia remains unclear. In response to this gap in the literature, this study aimed to assess the primary dysmenorrhea severity levels and its association with self-care practices and quality of life among Saudi school adolescents. The results will provide fundamental insights into the quality of life and other dimensions of dysmenorrhea coping strategies among Saudi female adolescents, depending on the severity of the condition. This will crucially highlight the need for effectively managing dysmenorrhea.

Methods

Study design and sampling

This study was a school-based, analytical, cross-sectional design conducted from December 2024 to May 2025 in Jizan City, the capital of the Jazan

Region in southwest Saudi Arabia. The study population was the Saudi female school students (aged 13-19 years old) enrolled in the 2024-2025 academic year. The approximate total number of governmental female intermediate and secondary schools in Jizan city was 18 and 11, with 4228 and 4075 Saudi students, respectively. Based on this, the sample size was calculated using Epi-info version 7, considering a 50% expectation of prevalence (to ensure the optimum sample size), 5% precision, and alpha 0.05; the minimum sample size for each school grade was 384. To further strengthen the data and adjust for both non-response rate and other study design biases, the calculated sample size increased by 10% to 845 participants.

Data collection procedures

Data was collected using a web-based self-administered questionnaire on Google Forms. It was distributed to the study population via a QR code, which was created after fulfilling specific ethical and procedural requirements established through a pre-structured collaboration with the General Administration of Education in the Jazan Region. The Office of Education then facilitated the distribution of the QR code to six randomly selected schools. School principals and teachers then contributed substantially in allocating QR codes to adolescents' guardians, requiring their consent for their daughters' participation in filling the online questionnaire.

Inclusion criteria

Inclusion criteria were Saudi female school students (13 to 19 years old) who agreed to participate in the study questionnaire and whose guardians provided informed consent. The study also included participants who had at least six consecutive menstrual cycles and reported experiencing menstrual pain in at least three of these cycles.

Exclusion criteria

The participants who reported a history of having undergone surgery around the abdomen or reproductive organs were excluded from the study.

Data collection instruments

The questionnaire was developed based on previous studies and consisted of four sections. In the first

section, participants were asked to state their background information, such as their age, educational level, and the presence of their last menstrual period. The second section included the Numerical Rating Scale (NRS), a widely used tool in clinical research for patients to communicate their pain experience.²⁰ Studies have consistently found the NRS to be a valid and reliable method for assessing dysmenorrhea-related pain intensity in young females.^{19,21} Consistent with the related published research,²²⁻²⁴ the participants were asked to rate the pain that they experienced within 6 to 12 hours of the onset of their menstrual period during the last three months or less on a scale from 0 to 10, where 0 represented "no pain" and 10 reflected "the worst pain imaginable". The pain includes lower abdominal and pelvic pain, lower back pain, and medial or anterior thigh pain. For analysis purposes, the obtained scores were categorized as mild if they fell between 1 and 3 points, moderate if they fell between 4 and 7 points, and severe if they fell between 8 and 10 points.²⁵

The third section included questions that solicited information about self-care practices in coping with dysmenorrhea symptoms. Participants were asked how they managed their pain or discomfort during the last menstrual period. The coping approaches requested in this study involved using home remedies, taking painkillers, seeking medical consultations, and engaging in physical exercise.

In the fourth section of the questionnaire, HRQOL data was acquired using the Short Form-12 Health Survey (SF-12, second version), which is a condensed version of the widely utilized instrument (SF-36).²⁶ A study conducted in Lebanon indicated that the Arabic version of the SF-12 is a reliable, straightforward, and valid tool for evaluating the HRQOL in the general population.²⁷ The questionnaire comprises 12 items that assess eight domains: physical functioning (PF), role physical (RP), bodily pain (BP), general health (GH), vitality (VT), social functioning (SF), role emotional (RE), and mental health (MH). Two summary measures, the Physical Component Summary (PCS-12) and the Mental Component Summary (MCS-12), were derived from these domains. Both domains and summary scores were scaled from 0 to 100, with 0 indicating the lowest level of health and 100 the highest. The PCS-12 and MCS-12 summary scores were transformed to the norm-based scoring, where

a score of 50 represents the average rating for the US general population, with a 10-point difference corresponding to one standard deviation in this population. To ensure clarity and consistency of the questionnaire, a pilot test was conducted among 20 female adolescents prior to its deployment for actual data collection. A threshold of less than 50% was designated to indicate poor quality of life, whereas a score exceeding 50% was considered indicative of fair quality of life.

Statistical analysis

Initially, descriptive analysis was conducted on the study variables to report the prevalence of dysmenorrhea and its related study variables. A Chi-square test of independence was conducted then to examine the association between the three dysmenorrhea severity levels and participants' self-care practices. Ordinal logistic regression was employed to investigate the relationship between the dependent variable (PD pain severity levels), which is an ordinal scale comprising three categories (mild, moderate, and severe), and the independent factors, including age and quality of life-related variables. Compared to binary logistic regression, which only predicts the occurrence or non-occurrence of an event, ordinal logistic regression predicts the probability of an event occurring within each category of the dependent variable. The result provides a deeper understanding of the relationship between the independent and dependent variables under this study.

Ethical approval

Jazan University's Standing Committee for Scientific Research granted ethical approval for this research under reference number REC-45/04/824. Moreover, permission to conduct the study among school students was acquired from the General Administration of Education in the Jazan Region, and participants were informed that their contribution to this research was non-compulsory and that they were free to withdraw at any time. Complete confidentiality of the participants' gathered data was also assured.

Results

Descriptive results

A total of 850 female adolescents participated; 10 responses were excluded due to incomplete item answers (98.8%). The final sample consisted of 840 participants ages ranging between 13 and 19 years old and (53.1%) from secondary grade. The mean age of the participants was 16.4 ± 1.16 . The overall prevalence of PD in the recruited sample was 96% ($n = 806$). Additionally, the participants were classified according to their pain level into three groups: mild ($n = 87$, 10.8%), moderate ($n = 521$, 64.6%), and severe ($n = 198$, 24.6%). Regarding menstrual pain management methods during the last three cycles, the results indicated that the majority of the participating adolescents did not neglect their menstrual pain (82.38%), while 76.5% of them never sought medical advice. The self-care data revealed that a significant number of participants (48.4%) consistently used home remedies like drinking hot beverages and applying warm compresses to alleviate their menstrual pain. However, half of the participating adolescents (50.9%) indicated that they either never or rarely relied on analgesics for pain relief. Furthermore, 51.5% of the participants reported that they rarely or never exercised to manage their pain (Figure 1).

Table 1 illustrates results of the cross-tabulation of PD pain severity levels with various pain management approaches among the study participants ($N=806$). The results showed significant differences, as female adolescents who reported neglecting menstrual pain were more likely to have moderate pain (69.2%), while a much larger number of those who did not neglect their pain reported severe pain (45.4%). In addition, the chosen pain management approach seems closely associated with pain severity. Regarding pharmacological intervention, those who used analgesics reported a higher percentage of severe pain (29.3%) compared to non-users (14.8%). Likewise, participants who indicated seeking medical help were significantly more likely to report severe pain (38.1%) than those who did not (20.4%).

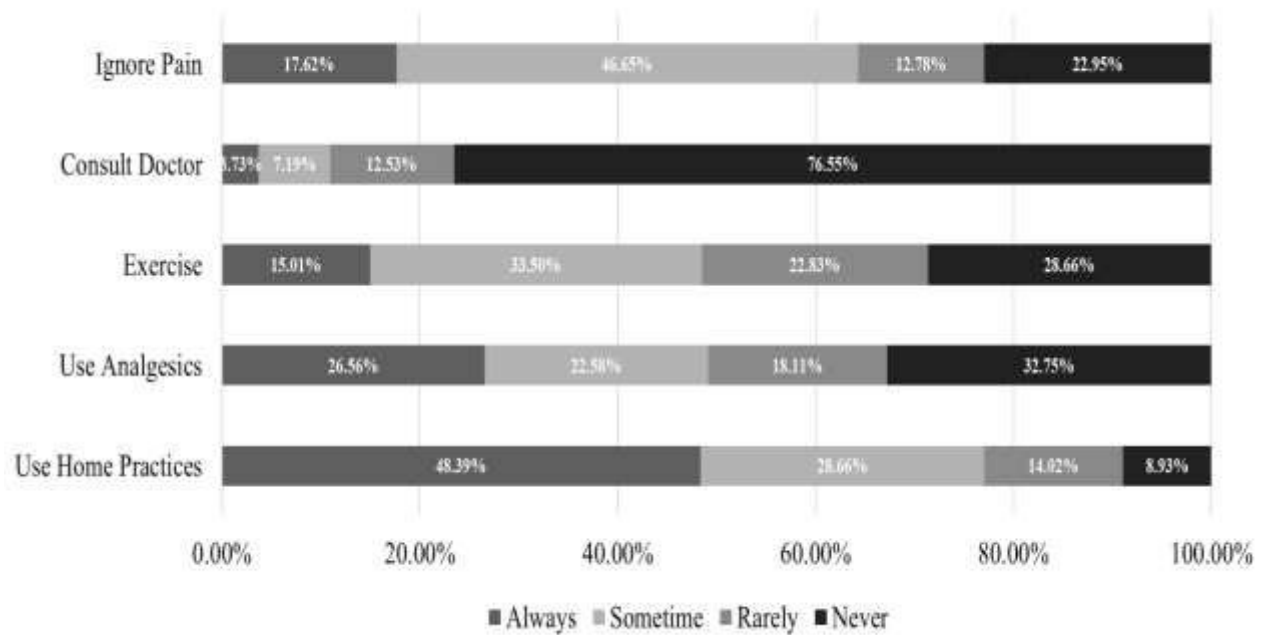


Figure 1: Menstrual pain management methods among the participants (n = 806)

Table 1: Comparison of primary dysmenorrhea pain severity with self-care approaches among the participants (N=806)

Variable	Total	Mild n (%)	Moderate n(%)	Severe n(%)	X ²	p-value	
Neglect pain	No	185 (23.0)	10 (5.40)	91 (49.20)	84 (45.40)	57.78	<0.0001*
	Yes	621 (77.0)	77 (12.40)	430 (69.20)	114 (18.40)		
Involve in physical activity	No	231 (28.7)	24 (10.40)	140 (60.60)	67 (29.0)	3.46	0.177
	Yes	575 (71.3)	63 (11.0)	381 (66.30)	131 (22.80)		
Use analgesics	No	264 (32.8)	47 (17.80)	178 (67.40)	39 (14.80)	33.66	<0.0001*
	Yes	542 (67.2)	40 (7.40)	343 (63.30)	159 (29.30)		
Use home practices	No	72 (8.9)	11 (15.30)	47 (65.30)	14 (19.40)	2.32	0.313
	Yes	734 (91.1)	76 (10.40)	474 (64.60)	184 (25.10)		
Consult a health specialist	No	617 (76.5)	81 (13.10)	410 (66.50)	126 (20.40)	33.01	<0.0001*
	Yes	189 (23.5)	6 (3.20)	111 (58.7)	72 (38.10)		

Note: χ^2 = Pearson’s chi-square test, * Statistically significant (p < 0.05)

However, no statistically significant result (P=0.05) was shown between the three pain severity groups for the non-pharmacological approaches, such as practicing physical activities and home self-management.

Inferential results

The results showed that the quality of life of the majority of participants who suffered from dysmenorrhea was poor in both the physical

component (87.3%) and the mental component (86.7%). The results of the ordinal logistic regression analysis between the PD pain severity levels (mild, moderate, severe) and the quality-of-life-related domains are presented in Table 2. The model was statistically significant, χ^2 (9) = 138.177, p < .0001, indicating that the quality-of-life-related predictors reliably distinguished between PD pain severity levels. In general, both the Physical (PCS-12) and the Mental Component (MCS-12) had significant negative associations with PD pain

Table 2: Ordinal logistic regression analysis of quality-of-life related factors influencing participants' PD pain severity levels.

Variables	B	SE	Wald χ^2	p-value	Exp(B)	95% CI
Age	0.08	0.05	2.91	0.088	1.08	0.98- 1.18
PF	-0.04	0.02	4.75	0.029*	0.96	0.92- 0.99
RP	0.01	0.02	0.21	0.649	1.01	0.97- 1.05
BP	-0.14	0.03	21.86	<0.001*	0.87	0.82- 0.92
GH	-0.09	0.04	6.49	0.011*	0.91	0.84- 0.98
VT	0.002	0.05	0.001	0.971	1.00	0.91- 1.10
SF	-0.01	0.03	4.895	0.027*	0.94	0.88- 0.99
RE	-0.02	0.02	1.72	0.19	0.98	0.94- 1.01
MH	-0.04	0.01	10.50	0.001*	0.99	0.93- 0.98
PCS-12	-0.06	0.01	33.26	<0.001*	0.94	0.92- 0.96
MCS-12	-0.06	0.01	72.26	<0.001*	0.94	0.93- 0.96

Note: B = regression coefficient; SE = standard error; Wald χ^2 = Wald chi-square statistic; Exp(B) = odds ratio; CI = confidence interval. Ordinal logistic regression was performed using the proportional odds model. Note: B = regression coefficient; SE = standard error; Wald χ^2 = Wald chi-square statistic; Exp(B) = odds ratio; CI = confidence interval. Ordinal logistic regression was performed using the proportional odds model.

severity ($p < .0001$). The participants with better quality of life scores were less likely to report severe pain. According to the results, for each one-unit increase in the (PCS-12) and (MCS-12), the likelihood of experiencing a greater pain level decreased by 6.4% (AOR = 0.94, 95% CI: 0.92–0.96, $p < 0.001$) and 5.5% (AOR = 0.94, 95% CI: 0.93–0.96, $p < .001$), respectively. In more detail, the results indicated that 5 out of the 8 (HRQOL) domains had a statistically significant association with PD pain severity levels ($p < .05$). BP was the strongest predictor (AOR = 0.87, 95% CI: 0.82–0.92, $p < .001$), as each unit increase in the BP score was significantly associated with a 13.1% reduction in PD pain severity level. GH was the second strongest predictor (AOR = 0.91, 95% CI: 0.84–0.98, $p < .05$), indicating a 9.1% reduction in the odds of experiencing PD pain severity. SF was also significantly associated (AOR = 0.96, 95% CI: 0.92–0.99, $p < .05$), showing 6.4% decreases in the odds of the outcome for each unit increase in the PF. Finally, both PF and MH had a similar impact on the odds of the outcome, as each unit increase in their scores was significantly associated with a 4% decrease in PD pain severity for the participants. On the other hand, the results indicated that RP, VT, and RE were not significantly ($p > .05$) associated with the PD pain severity of the study participants.

Discussion

Dysmenorrhea is one of the most common causes of gynecological morbidity in females of reproductive

age, and PD is the most prevalent form among adolescents. The repercussions transcend them, impacting society and leading to a significant annual decline in productivity.²⁸ The joint plan of the Saudi school health programs prioritizes improving the quality of life for school adolescents by strengthening school-based reproductive health education. This study investigated the association between PD pain severity levels and the HRQOL among the Saudi female school adolescents (aged 13-19 years old). Our results indicate that the dysmenorrhea burden, with a prevalence of 96% and a mean pain score of 5.94 (SD = 1.92), as assessed by the NRS, is at its highest reported level compared to the recently reported global prevalence rate range between 42 to 94% among adolescent population.⁹ A similar recent study conducted among boarding school students in Indonesia revealed an elevated prevalence of 96.2%, indicating that certain adolescent groups may encounter dysmenorrhea at considerably higher rates than the global estimate.²⁹

The distribution of pain intensity is another critical epidemiological parameter that stands beside the assessment of prevalence. Mild dysmenorrhea is expected and may be considered a manageable experience; however, the presence of moderate and severe pain poses a significant public health burden. In accordance with the results of previous global studies, the majority of our participants reported experiencing a moderate level of PD.^{25,30} Of particular interest, severe pain was

reported more frequently than mild pain in this study (24.6% vs 10.8%, respectively), and similar findings were reported in other recent studies conducted among Arab and Asian adolescents.^{29,31,32} Other studies among adolescents in France,³³ Nigeria,³⁴ and Indonesia,³⁰ have revealed the opposite pattern, where severe pain was reported only as 8.9%, 4.7%, and 10.8% among their study participants, respectively. The present findings position our study group within the upper prevalence and severity strata of documented dysmenorrhea epidemiology.

Challenges persist in generating comparable analyses of the PD magnitude across global clinical and academic studies. Literature suggests that the experience of menstruation pain is subjective and poses challenges for precise measurement. Despite experiencing considerable discomfort, many young females perceived their pain as a natural part of their menstrual cycle, reducing the need for medical consultation and limiting the capture of scientific data.^{8,16,35} The discrepancy in the reported prevalence of PD might also be attributed to the diversity of study populations, the use of inconsistent definitions of the condition, and the absence of standardized methods for determining its severity.^{16,36,37} Researchers proposed that perception and expression of pain are identified based on adolescents' experiences, which may be influenced by various factors beyond menstruation, such as genetic, psychological, developmental, socioeconomic, and cultural aspects.^{34,38}

A notable finding emerged regarding the disparity between dysmenorrhea's highly prevalent rate and active pain management implementation. Less than one-quarter of the participants in this study took measures to manage their pain. The disparity gap between symptomatic presentation and treatment engagement reflects a considerable weakness in dysmenorrhea management infrastructure. The participants appear habituated to their pain or misconceive the condition, its associated pain, and underlying causes, leading them to choose a passive approach to coping with it. Evidence suggests that, within some cultural contexts such as Arab, females may normalize or underestimate severe menstrual pain due to cultural beliefs, distrust of healthcare systems, or past adverse experiences.^{31,38} A recent systematic review has highlighted the need to study the

association between PD severity levels and the perception of symptom normality.⁹

Self-care involves independent actions to maintain overall well-being, utilizing healthcare providers and individual efforts to improve health status.²⁰ Research documented that self-care and symptom management options, both pharmaceutical and non-pharmaceutical, are underutilized, even though they are effective. Additionally, when adolescents do engage in self-care, they often fail to choose evidence-based options that match the severity of their symptoms.¹⁷ Our findings appear to align with these suggestions, as the vast majority of the participants (91.1%) opted for home remedies to manage PD symptoms, with no significant association to pain severity. This rate surpasses those reported in other global studies, which ranged from 6% to 64%.⁹ An opposite pattern was observed among Western adolescents as the use of medicines exceeds that of home remedies.^{9,36} Our results demonstrated that the selection of coping strategies is intricately linked to pain intensity; as pain levels increase, the participants are significantly more likely to seek professional help and use medication. This is supported by literature, as pain treatment strategies are primarily influenced by symptom profiles.⁹

A notable percentage of the adolescents in this study (67.2%) reported using analgesics, and its usage was significantly associated with pain severity. This estimate is consistent with previously reported prevalence ranges of medication use during menstrual pain among young females (50%–70%).⁹ Literature showed that adolescents are increasingly adopting over-the-counter (OTC) medications due to convenience, perceived safety, or hesitance to get professional assistance.³⁶ The accessibility of OTC analgesics among this age group is particularly concerning. Lack of healthcare supervision may result in misdiagnosis and improper treatment, leading to overuse and dependence, especially among adolescents who may be unaware of the side effects and risks associated with self-medication.³⁶

Over 76% of the participants did not consult a health specialist for their pain. Research in Saudi Arabia suggested that low consultation rates may be linked to the sensitive nature of dysmenorrhea, cultural norms, and reluctance to engage with male health providers.¹² Similarly, a study in France identified multiple barriers to seeking medical care, including the belief that dysmenorrhea is a natural

aspect of the menstrual cycle and that no effective remedy exists.³³ Such factors may hinder timely care-seeking and promote reliance on self-care practices, calling for future research to assess such barriers. It also draws attention to the importance of developing culturally appropriate and evidence-based menstrual school health education and services.

The Terminology Action Group of the Global Menstrual Collective has defined menstrual health as “a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity in relation to the menstrual cycle”.³⁹ Dysmenorrhea can significantly disrupt the everyday activities of young females for several days and lead to a decline in their overall quality of life.^{16,36} The concept of quality of life encompasses multiple dimensions, including physical health, psychological well-being, emotional state, social relationships, and overall life satisfaction.¹⁰

In this study, the overall quality of life score of the participants significantly declined as the severity of the PD increased, which aligns closely with the results of three other Asian studies. One of these, conducted in Japan,²⁵ employed the WHO/QOL-26 tool, the second from China used the 36-item Short-Form Health Survey,⁴⁰ while the third utilized the PedsQL scale and conducted in Indonesia.³⁰ Notwithstanding the variation in evaluation instruments, these studies, including ours, demonstrated a reliable tendency: higher dysmenorrhea levels were significantly associated with lower levels of quality of life among schoolgirls. This consistency across various assessments enhances the robustness of the observed association and emphasizes the credibility of the results.

This study revealed that PD severity did not significantly impact all HRQOL dimensions, but physical functioning, bodily pain, general health, social functioning, and mental health. Another study utilizing the SF36 assessment tool showed similar aspects, as school adolescents with PD showed significantly lower scores in the role-physical, bodily pain, general health, and social functioning domains compared to those without the condition.⁴⁰

This study indicated a strong association between pain severity and the bodily pain domain score, highlighting a significant physical burden. Beyond cramping pain, adolescents experience additional symptoms such as fatigue, weakness,

nausea, headache, and gastrointestinal disturbances.⁶ Consistent with earlier literature,^{41,42} this study showed that adolescents' capacity to perform and engage in daily activities, including physical task accomplishment, social connectivity, and fulfillment of social roles, was significantly reduced among those who reported moderate and severe pain compared to the mild dysmenorrhea group. Similarly, a study from Egypt that used the Visual Analog Scale to evaluate the severity of dysmenorrhea found that school adolescents (aged 12 to 18) with moderate and severe pain experienced a significantly greater adverse impact on their physical and social activities compared to those who reported mild pain.⁴² School absenteeism is a concerning matter associated with PD, with studies showing that more than 60% of affected adolescents miss school during menstruation. Additionally, many attend schools while in pain, resulting in decreased concentration and academic performance, as well as persistent long-term educational disadvantage.^{11,30,31,43}

The "pain-mood dyad" suggests that dysmenorrhea is a composite disorder where physical pain and mood alterations coexist and exacerbate each other. Dysmenorrhea and mood changes require a comprehensive understanding of their phenomenology and their correlation, as they are integral components of monthly discomfort.⁴⁴ The present study found mental health as the strongest (HRQOL) domain associated with PD severity. However, a study with a similar design to ours produced contrasting results, showing no significant differences in the mental health component summary between adolescents with dysmenorrhea and those without it.⁴⁰ Global literature has supported our finding that dysmenorrhea is significantly associated with adolescents' psychosocial well-being, causing distress and considerably impairing their capacity to engage in academic, recreational, and social activities.⁴³ A recent school-based survey in Sweden indicated that dysmenorrhea is strongly associated with mental health issues. The prevalence ratio of severe dysmenorrhea was significantly higher among adolescents with depression (2.60), anxiety (2.89), self-injury (1.87), and suicide ideation (1.75) compared to their peers.⁴⁵ Another recent study among Polish adolescents also indicated a positive association between dysmenorrhea severity and mental health predictors, including self-harm,

suicidal ideation, anxiety, panic attacks, and increased stress levels.⁴⁶ A recent study revealed that women experiencing high menstrual pain anticipated greater maximum pain levels and reported higher psychological distress more than a week prior to menstruation compared to controls. This association is concerning as experiencing pain triggers psychological distress, which in turn increases subsequent pain perception through anticipatory anxiety and undesirable outcomes.⁴⁷ Our findings, along with other studies we've discussed, reinforce that adequate management of dysmenorrhea may play a protective role in supporting adolescents' mental well-being. Psychological interventions focusing on pain anticipation and emotion regulation may support the overall management of PD.

Strengths and limitations

This is among the pioneer studies to explore the prevalence of PD and its association with health-related quality of life among the Saudi female school students. PD is a common yet insufficiently researched female's health concern, particularly in cultures where menstrual pain is normalized and not adequately reported, highlighting a gap in the existing literature regarding context-specific evidence. This study utilized validated and widely used tools to assess pain severity and quality of life, enhancing the reliability and comparability of the results with existing literature. The large sample size is another key strength, enhancing statistical power and robustness of findings. Also, utilizing the ordinal logistic regression allowed for a more nuanced analysis of the association with increasing pain severity levels, rather than relying solely on dichotomous or mean-based comparisons.

Some limitations in the study ought to be highlighted, including the cross-sectional nature, which does not allow for causal inferences. The high prevalence of PD observed in this research might be partially attributed to the methodological challenges. Selection bias was potentially introduced due to the use of an online, self-administered questionnaire, as only adolescents with internet access and parental consents have been inclined to participate. The online tool may also lead to over-reporting of symptoms due to misunderstanding of the PD definition and lack of clinical validation. Participants may have limited

ability to accurately recall the pain intensity and its effects over the last menstrual cycles and be influenced or assisted by their parents, which may introduce additional potential biases to the results. Limitations are a natural part of the research process, yet the findings are nonetheless useful and offer important perspectives on the health issue. Future research should delve deeper into the relationship between PD and HRQOL by utilizing a mixed-methods approach and examining moderating and mediating factors to improve the validity and generalizability of the findings.

Implications to public health practice

The findings of this study enhance our understanding of the association between HRQOL and PD among the Saudi school adolescents. The observed association points out the need for routine screenings of menstrual pain severity in primary healthcare and school health services to facilitate the early identification and proactive interventions for those affected. Healthcare providers should acknowledge dysmenorrhea as a critical health issue that requires comprehensive assessment and management, focusing on pain severity evaluation and its functional impact on physical and psychological well-being. They also should promote non-pharmacological approaches tailored to the adolescents' preferences, values, and circumstances. School-based health education initiatives should address dysmenorrhea as more than a normal reproductive process, reinforcing its potential effect on multiple dimensions of quality of life. Targeted health education programs should focus on addressing misconceptions about menstrual pain, enhancing knowledge of availability and effectiveness of the pharmacological and non-pharmacological pain management methods, reducing stigma, and building self-efficacy in self-management while encouraging timely medical consultation.⁴⁸

Conclusion

Primary dysmenorrhea among school adolescents has received remarkably little scientific attention. As a result, it remains an inadequately comprehended health condition that most young females merely perceive as a typical aspect of their monthly cycle. PD affects a substantial majority of

the participants in this study, and its severity considerably reduces their HRQOL dimensions, including physical functioning, bodily pain, general health, social functioning, and mental health. The study points out the importance of holistic school-based health promotion programs that focus on addressing the reproductive health needs of schoolgirls in Jizan. Such interventions need to revolve around enhancing menstrual health knowledge, skills, and practices informed by evidence-based dysmenorrhea coping approaches. Involving adolescents, school staff, families, and health providers in the design and implementation of these interventions improves their feasibility, acceptability, sustainability, and effectiveness.

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Conflict of interest

The author declares no conflict of interest.

Author contribution

Conception, design, data collection, analysis and preparation of the manuscript was done by AA.

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