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Original Research Article

Prevalence, Risk Factors, and Clinical Characteristics of Dysmenorrhea and Its Impact on Quality of Life Among Young Women

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Abstract:

Background: Dysmenorrhea is a highly prevalent gynecological condition among young women, often underreported and inadequately managed, particularly in low-resource settings. It significantly affects physical, emotional, and social well-being.

Aim: To assess the prevalence, risk factors, and clinical characteristics of dysmenorrhea and evaluate its impact on quality of life among young women.

Methodology: A cross-sectional study was conducted among 148 women aged 18–45 years at a tertiary care hospital in Bihar, India. Data were collected using a structured questionnaire, including a modified DysmenQoL scale. Statistical analysis was performed using SPSS, with significance set at $p<0.05$.

Results: The prevalence of dysmenorrhea was 78.4%. Significant risk factors included longer menstrual duration ($p=0.047$), heavy menstrual flow ($p=0.030$), premenstrual syndrome ($p<0.001$), and positive family history ($p<0.001$). Most participants reported moderate to severe pain with common symptoms such as fatigue and irritability. Quality of life was affected in 74.1% of cases, with greater pain intensity strongly associated with higher impairment.

Conclusion: Dysmenorrhea is highly prevalent and substantially impacts quality of life. Early identification and targeted management strategies are essential to reduce its burden.

Keywords: Dysmenorrhea, prevalence, risk factors, quality of life, young women, menstrual pain, cross-sectional study.

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Introduction

Dysmenorrhea, commonly defined as painful menstruation, represents one of the most prevalent gynecological conditions affecting women of reproductive age worldwide. The prevalence of dysmenorrhea has been reported with a wide range, between 16 percent and 91 percent, with severe pain being experienced by about 2 percent and 29 percent of the people [1]. This broad range can be explained by the dissimilarity of population features, cultural understanding of pain, and methodological strategies employed in research. Interestingly, it has always shown a high prevalence rate in cases of adolescents, aged between 12 and 19 years, which implies that younger women are especially susceptible to menstrual pains and the associated problems [2]. Although dysmenorrhea is a very common condition, it is underreported and is not properly addressed, particularly in low- and middle-income countries like Bihar, India, where the level of awareness and access to healthcare facilities might be low.

Dysmenorrhea can be categorized into two, namely primary and secondary. Primary dysmenorrhea is a condition that usually presents itself in six months following menarche and is associated with recurrent lower abdominal pain that is crampy with no detectable pathology in the pelvis. The discomfort is normally highest on the first two periods of menstruation and takes between 8 to 72 hours and is normally accompanied with systemic symptoms like fatigue, dizziness, nausea among others and insomnia [3]. The pathophysiology is the activation of the

cyclooxygenase pathway that causes the production of more prostaglandins. These biochemical mediators cause uterine muscle contractions, decrease uterine blood flow and activate pain receptors by accumulating anaerobic metabolites. By contrast, secondary dysmenorrhea usually occurs more than two years post menarche, and is linked to underlying pelvic pathologies, including endometriosis, uterine fibroids, ovarian cysts, uterine polyps, or adenomyosis [4]. It is important to make a distinction between the two types so that they can be diagnosed and managed accordingly.

Numerous risk factors have been established that facilitate the occurrence and severity of dysmenorrhea. These are excessive flow of menstruation, positive family history of dysmenorrhea and premenstrual syndrome (PMS) [5]. PMS includes affective, cognitive and somatic symptoms like increased appetite, constipation, nausea, weight gain, headache, breast tenderness, fatigue, restlessness, anxiety and mood changes that precede menstruation. Other risk factors are early menarche, lack of produce of omega-3 fatty acids, and lifestyle choices such as smoking or frequent coffee drinking. On the other hand, normal body mass index and control of stress levels have been found to be protective factors in lessening the risk and intensity of dysmenorrhea. Significantly, early menarches and high rates of dysmenorrhea during adolescence have been found to be predictive of endometriosis in adulthood [6] which brings about the importance of early diagnosis and treatment.

Dysmenorrhea is not only debilitating physically but has a major impact on various aspects of the lives of women. It is a known fact that dysmenorrhea disrupts usual activities and has adverse effects on the general quality of life. Menstrual pain is linked to poor academic performance among students, inability to concentrate in the classroom and high absenteeism. In addition, dysmenorrhea leads to sleep disorders, emotional problems, and difficulty with interpersonal relations [7]. With already limited access to education and employment opportunities as women in socioeconomically diverse areas like Bihar, an added burden caused by dysmenorrhea can fuel gender inequalities and restrict personal and career growth.

Although it has a great influence, dysmenorrhea is not always properly taken care of. Menstrual pain is normalized and seen as an unavoidable aspect of being a woman in most instances, which cause delays in seeking medical attention. The underdiagnosis and under-treatment of this condition are also enhanced by cultural beliefs, lack of awareness and accessibility to healthcare services. Consequently, most women have long-term pain that negatively influences their quality of life and mental health. Nonsteroidal anti-inflammatory drugs (NSAIDs) are the most frequently used pharmacological interventions of dysmenorrhea, which inhibit the production of Prost glands and, thus, decrease uterine contractions and pain. Besides pharmacological treatments, other complementary and alternative therapies are very common. These are non-pharmacological methods like heat treatment (e.g. hot packs, application of hot water, or warm clothes) that have been found to be among the most widely used and effective pain-relieving methods. Lifestyle changes, such as regular exercise and yoga, have also shown potential; a 30-minute yoga session done twice a week in 12 weeks has been shown to have a significant impact on reducing menstrual pain. Other substitute methods such as dietary changes and herbal remedies are also widely used, especially in the traditional context [8].

Considering the multifactorially of dysmenorrhea and its significant effect on the life of women, there is an increasing interest in conducting a study as a combination of investigating the prevalence of dysmenorrhea and its general effects on the quality of life. This is especially applicable in the case of Bihar, India, where sociocultural values, accessibility to healthcare, and the level of education might contribute to the experience and treatment of menstrual disorders. Nevertheless, the relative lack of region-specific data exists, which fully assesses such aspects in young women.

Thus, the current cross-sectional study will evaluate the prevalence, severity and the length of dysmenorrhea among young women in Bihar, India. It also aims at determining the risk factors related to it and also the different approaches that are used in pain management. One of the aims of the investigation is to investigate the effects of dysmenorrhea on the quality of life through a specially developed questionnaire (DysmenQoL) that contains questions aiming at measuring the negative consequences of menstrual pain on health and emotional status, day-to-day activities, social relationships, and work or study performance. In addition, validity and reliability of this questionnaire among the study population are also expected to be evaluated in this study.

Methodology

Study Design: This study was designed as a cross-sectional observational study aimed at assessing the prevalence, risk factors, and clinical characteristics of dysmenorrhea and its impact on the quality of life among young women. The cross-sectional design enabled the collection of data at a single point in time from a defined population to evaluate associations between dysmenorrhea and various contributing factors.

Study Area: The study was conducted in the Department of Obstetrics and Gynecology at Nalanda Medical College and Hospital, Patna, Bihar, India

Study Duration: The study was carried out over a period of six months from April 2025 to September 2025

Sample Size: A total of 148 participants were included in the study. The sample size was determined based on feasibility and the availability of eligible participants during the study period, ensuring adequate representation of the target population.

Study Population: The study population comprised young women of reproductive age (18–45 years) attending the outpatient and inpatient services of the Department of Obstetrics and Gynecology. Participants who consented to take part in the study and completed the questionnaire were included, ensuring that the collected data reflected both symptomatic and asymptomatic individuals with respect to dysmenorrhea.

Sampling Technique: A convenience sampling technique was employed to recruit participants who met the eligibility criteria during the study period. This approach allowed easy access to participants within the hospital setting and facilitated timely data collection.

Data Collection: Data were collected using a structured and pre-tested questionnaire adapted from previously validated tools and modified according to the objectives of the study. The questionnaire consisted of three sections. The first section gathered information on socio-demographic characteristics, lifestyle factors such as diet and physical activity, and menstrual history including cycle regularity and duration. The second section focused on participants who reported dysmenorrhea and collected detailed information regarding the characteristics of menstrual pain, including its frequency, duration, location, associated symptoms, and methods used for pain relief. Pain intensity was assessed using a numeric rating scale ranging from 1 (no pain) to 10 (unbearable pain). The third section assessed the impact of dysmenorrhea on quality of life using a modified DysmenQoL questionnaire comprising 20 statements. Each statement was scored on a scale of 1 to 5, with higher scores indicating a greater negative impact on quality of life.

Inclusion Criteria

- Women aged 18–45 years
- Those who had attained menarche
- Willing to participate and provide informed consent
- Participants who completed the questionnaire fully

Exclusion Criteria

- Pregnant women
- Menopausal women
- Women with known gynecological disorders such as endometriosis, uterine fibroids, ovarian cysts, or pelvic inflammatory disease
- History of gynecological surgeries
- Women with chronic medical or psychiatric illnesses
- Women not menstruating at the time of data collection

Study Procedure: Eligible participants were approached in the outpatient and inpatient departments of the hospital. After explaining the purpose and objectives of the study, informed consent was obtained. The questionnaire was then administered either as a self-reported form or with assistance from the investigator when required. All participants completed the general section, while only those reporting dysmenorrhea proceeded to complete the sections related to pain characteristics and quality of life assessment.

Statistical Analysis: The collected data were entered into and analyzed using Statistical Package for the Social Sciences (SPSS) version 23. Descriptive statistics such as mean, standard deviation, frequencies, and percentages were used to summarize the data. Inferential statistical tests including Chi-square test, independent samples t-test, one-way analysis of variance (ANOVA), and Pearson correlation were applied as appropriate to assess associations between variables. The reliability of the quality-of-life questionnaire was evaluated using Cronbach's alpha, with a value greater than 0.7 considered acceptable. A p-value of less than 0.05 was considered statistically significant."

Result

Table 1 presents the socio-demographic and menstrual characteristics of participants (N=148). The majority of participants were in the 21–25 years age group (68, 45.9%), followed by 18–20 years (42, 28.4%). Most had a normal BMI (18.5–24.9 kg/m²) accounting for 86 (58.1%), while 44 (29.7%) were overweight and 18 (12.2%) were underweight. In terms of education, more than half were undergraduates (84, 56.8%), followed by postgraduates (44, 29.7%) and those with secondary education (20, 13.5%). A large proportion of participants were unmarried (102, 68.9%). Physical activity was irregular or absent in 92 participants (62.2%), while 56 (37.8%) reported regular activity. Most participants had a regular menstrual cycle (118, 79.7%), with 30 (20.3%) reporting irregular cycles. Overall, the study population was predominantly young, educated, unmarried, and had generally normal BMI with mostly regular menstrual patterns.

Table 1: Socio-Demographic and Menstrual Characteristics of Participants (N = 148)		
Characteristics	**Frequency (n)**	**Percentage (%)**
Age Group (years)		
18–20	42	28.4
21–25	68	45.9
26–30	26	17.6
>30	12	8.1
Body Mass Index (BMI)		
<18.5 kg/m²	18	12.2
18.5–24.9 kg/m²	86	58.1
≥25 kg/m²	44	29.7
Educational Status		
Secondary	20	13.5
Undergraduate	84	56.8
Postgraduate	44	29.7
Marital Status		
Unmarried	102	68.9
Married	44	29.7
Others	2	1.4
Physical Activity		
Regular	56	37.8
Irregular/None	92	62.2
Menstrual Cycle		
Regular	118	79.7
Irregular	30	20.3

Table 2 presents the prevalence and associated risk factors of dysmenorrhea among participants (N=148). The overall prevalence was high, with 116 (78.4%) participants reporting dysmenorrhea. Menstrual cycle regularity did not show a significant association (p=0.177). However, duration of menstruation was significantly associated (p=0.047), with higher prevalence seen in those with longer durations (>5 days: 36 cases). Menstrual flow also showed a significant relationship (p=0.030), with dysmenorrhea more common in participants with heavy flow (40 cases). Premenstrual syndrome had a strong association (p<0.001), with 88 cases among those affected. Similarly, a positive family history was significantly linked to dysmenorrhea (p<0.001), observed in 80 participants. Overall, factors such as longer menstrual duration, heavy flow, presence of premenstrual syndrome, and family history were significantly associated with dysmenorrhea.

Table 2: Prevalence and Risk Factors of Dysmenorrhea (N = 148)				
Variables	**Dysmenorrhea Yes (n=116)**	**Dysmenorrhea No (n=32)**	**Total n (%)**	**p-value**
Prevalence	116	32	148 (100)	—
Menstrual Cycle				
Regular	90	28	118 (79.7)	0.177
Irregular	26	4	30 (20.3)	
Duration of Menstruation				
≤3 days	12	8	20 (13.5)	0.047*
4–5 days	68	18	86 (58.1)	
>5 days	36	6	42 (28.4)	
Menstrual Flow				
Normal	62	22	84 (56.8)	0.030*
Heavy	40	4	44 (29.7)	
Light	14	6	20 (13.5)	
Premenstrual Syndrome				
Present	88	10	98 (66.2)	<0.001*
Absent	28	22	50 (33.8)	
Family History				
Yes	80	8	88 (59.5)	<0.001*
No	36	24	60 (40.5)	

Table 3 presents the clinical characteristics and quality of life among dysmenorrhea participants (n=116). The majority experienced pain since menarche (70, 60.3%), while 46 (39.7%) reported later onset. Pain occurred every cycle in 76 participants (65.5%) and occasionally in 40 (34.5%). Regarding duration, most reported pain lasting 1–2 days (62, 53.4%), followed by <24 hours (28, 24.1%) and >2 days (26, 22.5%). Moderate pain intensity was most common (64, 55.2%), followed by severe (38, 32.7%) and mild (14, 12.1%). Common associated symptoms included fatigue (74, 63.8%), irritability (68, 58.6%), headache (56, 48.3%), and nausea (42, 36.2%). Overall, quality of life was affected in a majority of participants (86, 74.1%), while 30 (25.9%) reported no impact, indicating a substantial burden of dysmenorrhea on daily life.

Table 3: Clinical Characteristics and Quality of Life Among Dysmenorrhea Participants (n = 116)

Characteristics	Frequency (n)	Percentage (%)
Onset of Pain		
From menarche	70	60.3
Later onset	46	39.7
Frequency of Pain		
Every cycle	76	65.5
Occasional	40	34.5
Pain Duration		
<24 hours	28	24.1
1–2 days	62	53.4
>2 days	26	22.5
Pain Intensity		
Mild	14	12.1
Moderate	64	55.2
Severe	38	32.7
Associated Symptoms		
Fatigue	74	63.8
Nausea	42	36.2
Headache	56	48.3
Irritability	68	58.6
Quality of Life Impact		
Affected	86	74.1
Not affected	30	25.9

Table 4 shows the relationship between pain intensity and quality of life among participants (n=116). Among those with mild pain (n=14), only 4 (28.6%) reported affected quality of life, with a mean pain score of 3.8 ± 0.9 and mean DysmenQoL score of 42.5 ± 12.3. In the moderate pain group (n=64), a higher proportion, 44 (68.8%), experienced impaired quality of life, with increased mean pain score (5.9 ± 1.1) and DysmenQoL score (56.7 ± 13.8). All participants with severe pain (n=38) reported affected quality of life (100%), with the highest mean pain score (8.4 ± 1.0) and DysmenQoL score (71.2 ± 14.5). Overall, increasing pain intensity was associated with a greater negative impact on quality of life and higher DysmenQoL scores.

Table 4: Relationship Between Pain Intensity and Quality of Life (n = 116)

Pain Intensity	n	QoL Affected n (%)	Mean Pain Score (±SD)	Mean DysmenQoL Score (±SD)
Mild	14	4 (28.6%)	3.8 ± 0.9	42.5 ± 12.3
Moderate	64	44 (68.8%)	5.9 ± 1.1	56.7 ± 13.8
Severe	38	38 (100%)	8.4 ± 1.0	71.2 ± 14.5

Table 5 presents the methods of pain relief used by participants along with reliability analysis (n=116). The most commonly used method was NSAIDs, reported by 72 participants (62.1%), followed by hot application in 64 (55.2%) and rest/sleep in 52 (44.8%). Exercise or yoga was practiced by 28 participants (24.1%), while 12 (10.3%) reported no treatment. The reliability analysis showed a high Cronbach's alpha value of 0.89, indicating good internal consistency of the tool, and the validity assessed by Pearson correlation was statistically significant ($p < 0.001$). Overall, pharmacological methods were most preferred, and the assessment tool demonstrated strong reliability and validity.

Table 5: Methods of Pain Relief and Reliability Analysis (n = 116)		
Variable	**Frequency (n)**	**Percentage (%)**
Pain Relief Methods		
NSAIDs	72	62.1
Hot application	64	55.2
Rest/Sleep	52	44.8
Exercise/Yoga	28	24.1
No treatment	12	10.3
Reliability Parameter	**Value**	
Cronbach's Alpha	0.89	
Validity (Pearson correlation)	$p < 0.001$	

Discussion

The current investigation revealed that dysmenorrhea was a very common disorder among young females (78.4%), which is generally consistent with the previous literature but a bit lower compared with the 83.7% prevalence in the comparative study and the over 90 percent prevalence in some world estimates (De Sanctis et al., 2015) [9]. Likewise, prevalence rates of dysmenorrhea have been observed to be as high as 60-85 percent among populations of university students, suggesting that dysmenorrhea is a highly common gynecological issue in various populations (Hu et al., 2020; Ozerdogan et al., 2009) [10,11]. The minimal difference observed in the prevalence of our results with those of the previous studies could be explained by differences in the size of the sample, cultural perception of pain, and reporting. However, the overall high prevalence in all studies supports the importance of dysmenorrhea as a common social health concern".

Regarding risk factors, our research found that duration of menstruation, heavy menstrual flow, premenstrual syndrome (PMS), and family history, were significantly associated, which is in line with the available literature. It has been noted in the past that family history and heavy menstrual bleeding were excellent predictors of dysmenorrhea (Aktaş, 2015; Hu et al., 2020) [12,10] . Similarly, the high correlation between PMS and dysmenorrhea in our study is corroborated by prior research that indicates similar hormonal and prostaglandin-mediated pathways in both conditions (Duman et al., 2022) [13]. Nevertheless, contrary to the finding of some studies that indicated strong correlations with menstrual cycle irregularity (Hu et al., 2020) [10], our results did not reveal a statistically significant correlation ($p = 0.177$), indicating that irregularity of the menstrual cycle might not be a predictable variable in all populations.

The outcome of our results also revealed that other lifestyle-related factors including irregular physical activity were prevalent among participants but not statistically tested as a risk factor. Conversely, past studies have implicated lifestyle behaviors like smoking, use of caffeine, physical inactivity, and unhealthy eating habits as causes of dysmenorrhea (Duman et al., 2022; Hu et al., 2020) [13,10]. Also, underweight or overweight status was shown to be at risk in previous studies (Ozerdogan et al., 2009) [11], whereas our sample was mainly normal weight, which might be the reason why the association was not strong in this area. These disparities point to the multifactorial character of dysmenorrhea and indicate that risk factors can be different based on the population factors and environmental factors.

When it comes to clinical features, our research revealed that most participants developed pain during menarche (60.3%), and during all the cycles (65.5%), which is also in line with the primary dysmenorrhea concept described in previous literature (De Sanctis et al., 2015) [9]. Mostly moderate (55.2) and severe (32.7) pain in our research is similar to the results of Ullah et al. (2021) [14], where the majority of the participants experienced moderate to severe pain. Nevertheless, the percentage of severe pain in our study was a bit lower than that of the 39.1% in the comparative study, which implies that there might be some differences in pain perception and reporting in different populations. The related symptoms that were evident in our participants, including fatigue, irritability, headache, and nausea, are also well-documented and show the systemic effect of the release of prostaglandins during menstruation (Sahin et al., 2014) [15].

One of the most important results of our research is that dysmenorrhea has a significant influence on the quality of life, and 74.1% of the participants who had it were affected negatively. This is similar to the 73.9 percent reported in the comparison study and in line with the wider literature that dysmenorrhea is a highly disruptive condition, which has a significant impact on the functioning of daily life, emotions, and socialization (Armour et al., 2020; Schoep et al., 2019) [16,17]. In addition, we found a strong gradient correlation between intensity and the impairment of quality of life with all participants reporting severe pain associated with negative consequences. This is in line with other researchers utilizing standardized instruments like the SF-36 and WHOQOL which have revealed that the severity of pain

correlates with worse physical, emotional, and social health outcomes (Hashim et al., 2020; Mizuta et al., 2023) [18,19].

Compared to previous research, our means of moderate and severe dysmenorrhea were a bit less but had a similar pattern of higher quality of life impairment with higher pain intensity (Ullah et al., 2021) [14]. This consistency adds further evidence to the existence of dose-response to severity of pain and disruption in life. Also, the high rate of fatigue and irritability symptoms in our study aligns with the previous studies, where more than half of the participants had similar symptoms, which once again point to the multidimensionality of dysmenorrhea (Sahin et al., 2014) [15].

The effects on the academic and day-to-day activities in earlier studies give additional background to our results. As an example, Armour et al. (2020) [16] indicated high rates of absenteeism and low academic achievement in young women with severe menstrual pain, whereas Schoep et al. (2019) [17] also concluded that one in three women had to cancel their daily activities because of menstrual symptoms. In our study, we did not explicitly measure absenteeism; however, the large percentage of those reporting quality of life impairment implies comparable functional limitations. These analogies demonstrate the larger social and economic consequences of dysmenorrhea.

Regarding management practices, our results that the most frequently used methods were NSAIDs, hot application, and rest are in line with other studies, in which pharmacological and non-pharmacological modalities are often used together (Duman et al., 2022) [13]. Nevertheless, the comparatively low exercise or yoga utilization in our study is in opposition to the literature that exercise might be having protective effect due to regular physical activity (Hu et al., 2020) [10]. This gap represents a possible health education and intervention area.

The reliability (Cronbachs alpha = 0.89) and validity of our assessment tool can be compared to the validation done on other quality of life tools in gynecology research (Hashim et al., 2020) [18]. Although the comparison study proposed the DysmenQoL score, our results are also in line with the significance of applying standardized and reliable instruments to evaluate the effects of dysmenorrhea in all its complexity. Altogether, our investigation and prior studies indicate that dysmenorrhea is very common, predetermined by a variety of risk factors, and greatly affects the quality of life, which is why specific interventions and better understanding should be developed.

Conclusion

The study concludes that dysmenorrhea is very common in young women and is a serious gynecological issue that impacts on daily lives and health. Various menstrual and familial predictors, such as longer menstrual duration, abnormal menstrual bleeding, presence of premenstrual symptoms and positive family history were found to be significant predictors of its occurrence, but cycle regularity was not significant. Most affected individuals had recurrent and moderate-severe pain, which tended to start early in life and was associated with several physical and emotional symptoms. These symptoms significantly impaired quality of life, and the level of pain was strongly associated with negatively affecting life. Although there were different management techniques including medications and non-pharmacological, it is important to note that a significant percentage of people still had a lot of discomfort, and this necessitated better awareness, early intervention, and overall management techniques in order to minimize the burden of dysmenorrhea.

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