



Research Article

# Dysmenorrhea: Predisposing Factors, Effects on Activities and Health-seeking Behavior among University Students in Ibadan, Nigeria

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## Abstract

**Background:** Dysmenorrhea, a common gynecologic complaint among adolescent and young women is of public health importance because of its impact on their regular activities. This study aimed to determine the predisposing factors of dysmenorrhea, its effects, and health-seeking behavior among University students.

**Methods:** This analytic cross-sectional study was conducted among 319 students selected through multistage random sampling technique from major halls of residence in the University of Ibadan, Nigeria. Information on respondents' demographic characteristics, effect of dysmenorrhea on their daily activities, and their health-seeking behavior was collected using a self-administered questionnaire. Data were analyzed using SPSS version 22.0 with level of statistical significance set at  $P < 0.05$ .

**Results:** The mean age of the respondents was  $20.8 \pm 1.91$  years, and the prevalence of dysmenorrhea was 82.1%. The commonest symptom among those experiencing dysmenorrhea was low mood (51.9%). The length of cycle was the only factor associated with the presence of dysmenorrhea ( $P = 0.041$ ). Ninety-two (35.1%) respondents sought medical attention. Severity and duration of pain, duration and heaviness of flow, and previous treatment for sexually transmitted infection were associated with their health-seeking behavior ( $P < 0.05$ ). Class absenteeism, limitation to extracurricular activities, and restriction in relationship with others had significant impact on the students with moderate and severe dysmenorrhea ( $P < 0.05$ ).

**Conclusion:** Despite the high prevalence of dysmenorrhea, less than half of the students sought medical attention even though it affected their class attendance, extracurricular activities, and relationship with others.

**Keywords:** dysmenorrhea, predisposing factors, effect, students, health-seeking behavior

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## 1. Introduction

Dysmenorrhea is the most common gynecologic complaint among adolescent and young women during menstruation, occurring in 60–93% of schoolgirls and young women. It is mainly of two types.[1, 2] The primary dysmenorrhea, a painful menses in women with normal pelvic anatomy usually begins during adolescence.[3] Secondary dysmenorrhea can occur at any time during a woman's life between menarche and menopause. It most often occurs after 25 years of age following a gynecological pathology such as endometriosis, fibroids, inflammatory diseases, cervical stenosis, and adenomyosis.[4–6] Dysmenorrhea is a public health problem because of its high prevalence among women coupled with a high degree of discomfort felt by the sufferers.[7] It is also associated with economic loss to households and nations because of the inability of women in pain to go to work.[8, 9] The prevalence of dysmenorrhea varies greatly across different populations and ethnic groups.[10–12] A prevalence of 60–69.8% in Nigeria, 62% in India, 74.3% in Lebanon, 74.1% in Tanzania, and 84% in Sri Lanka have been documented.[13–16]

Dysmenorrhea is much common in adolescents and has been found to be mild in 72.7% and severe in 17.4%.[14] Major symptoms include pain, mood change, and loss of appetite which adversely affect daily life and school performance, causing recurrent short-term school absenteeism among female adolescents.[7, 17] Age <30 years, low BMI, smoking, earlier menarche (<12 years), longer cycles, heavy menstrual flow, nulliparity, premenstrual syndrome, sterilization, clinically suspected pelvic inflammatory disease, sexual abuse, and psychological symptoms are conditions that increase the risk of dysmenorrhea.[13] Generally,

young adults have poor health-seeking behavior due to their concerns about confidentiality and embarrassment in disclosing their health issues.[18] This reflects among the dysmenorrhic adolescents who in most cases do nothing about their pain with only a few seeking medical attention.[11, 17, 19–21] Dysmenorrhea is still a burden on our young females, and it is against this knowledge that this study aimed to determine the factors predisposing students to dysmenorrhea, its effect on their activities and explores their health-seeking behavior at the University of Ibadan, Nigeria.

## 2. Materials and Methods

This was a four-month analytic cross-sectional study conducted among female undergraduates at the University of Ibadan. A sample size of 319 was obtained using Kish formula, 95% confidence interval, and 5% level of precision and allowing for 10% nonresponse rate. Multistage random sampling technique was used to select the participants across the four major female halls of residence.

Students who met the inclusion criteria: age >16 years, single with no parous experience or history of bleeding disorders, and absence of chronic illness that may affect the general health were recruited into this study.

A self-administered questionnaire which was validated and pretested among 20 female students of another tertiary institution yielding a validity value of 0.82 using Spearman's formula was used. Information on students' demographic characteristics, effect of dysmenorrhea, and their health-seeking behavior were obtained.

For this study, pain threshold was measured on a scale of 1–10; 1–2 was categorized as mild, 3–6 as moderate, and 7–10 as severe pain.[22]

As operational definitions, medical attention was defined as the willingness of students to seek care with medical personnel – nurses or/and doctors – and class absenteeism referred to as the inability to attend lectures due to pain during menstruation.

Data were cleaned, entered, and analyzed using SPSS version 22.0. Descriptive statistics regarding means and standard deviation were used to present the results and chi-square test was used to determine association between respondents' variables at  $P < 0.05$  level of statistical significance.

### 3. Results

The mean age of the students was 20.8 (SD = 1.91) years and the mean age at menarche was 12.7 (SD = 1.52) years. The prevalence of dysmenorrhea was 82.1% with low mood (51.9%), reduced appetite (39.3%), and breast pain (38.2%) reported as the most common symptoms, while anxiety (11.5%) and poor sleep (16.8%) were least experienced symptoms (Table 1).

A significant proportion (85.9%) of the students whose length of menstrual cycle ranged from 21 to 35 days experienced dysmenorrhea compared with those whose menstrual cycle length was either  $<21$  days (12.6%) or  $>35$  days (1.5%) ( $P = 0.041$ ). Age, age at menarche, heavy flow, alcohol consumption, smoking, and exercising were not associated with dysmenorrhea (Table 2).

Over a third (35.1%) of the students sought medical attention. Students who menstruated for  $<5$  days (73.9%) sought medical attention compared with 26.1% who menstruated for  $\geq 5$  days ( $P = 0.011$ ). Also, a higher proportion (56.5%) of the students with heavy flow sought medical attention compared with those without heavy flow (43.5%) ( $P = 0.022$ ). Pain severity was significantly associated with the students'

health-seeking behavior. Students experiencing moderate to severe pain (87.0%) were likely to seek medical attention compared with 13.0% of them who usually experience mild pain ( $P = 0.005$ ). The duration of pain took a day in about three-quarters of the students who sought medical attention, compared with those whose pain took two days (18.5%) or more (3.3%) ( $P = 0.031$ ). Among the students who sought medical attention, majority (93.5%) had never been treated for a sexually transmitted infection (STI) compared with 6.5% who sought medical attention and had been treated for STI ( $P = 0.044$ ; Table 3).

Ninety-five of the one hundred and seventy students who did not seek medical attention engaged alternative measures to alleviate the pain. The commonest alternatives were the use of self-medicated analgesics (95.8%), avoidance of sugary foods (85.3%), and eating fruits and vegetables (72.6%). The alternative measures least practiced were initiation of sexual intercourse (2.2%) and ingestion of alcohol (9.5%; Table 4).

Class absenteeism, limitation to extracurricular activities, and restriction in relationship with others were significantly affected among students with moderate and severe dysmenorrhea ( $P < 0.05$ ; Table 5).

### 4. Discussion

Dysmenorrhea is the most common symptom of all menstrual complaints and poses a greater burden of disease than any other gynecological complaint. The current study determined the factors predisposing 319 female undergraduate students to dysmenorrhea, their health-seeking behavior, and how dysmenorrhea influenced their activities. The mean age of the respondents (in years) was 20.8 (SD 1.91) and is consistent with

TABLE 1: Symptoms of dysmenorrhea.

Variables	Frequency	Percentage (%)
Headache	59	22.5
Breast pain	100	38.2
Anxiety	30	11.5
Low mood	136	51.9
Anger	73	27.9
Reduced appetite	103	39.3
Poor sleep	44	16.8

\*Multiple responses were reported.

TABLE 2: Bivariate analysis of factors associated with dysmenorrhea among the students.

Variables	Dysmenorrhea		Total (%) (N = 319)	Chi-square statistic	P-value
	Yes (%) (N = 262)	No (%) (N = 57)			
Age (yrs)				1.749	0.417
<20	58 (22.1)	12 (21.1)	70 (21.9)		
20–24	182 (69.5)	37 (64.9)	219 (68.7)		
≥25	22 (8.4)	8 (14.0)	30 (9.4)		
Mean age	20.8 ± SD = 1.91 years				
Age at menarche				0.019	0.890
<12	48 (18.3)	10 (17.5)	58 (18.2)		
≥12	214 (81.7)	47 (82.5)	261 (81.8)		
Mean age at menarche	12.7 ± SD = 1.52 years				
Length of cycle (days)				6.410	0.041*
<21	33 (12.6)	9 (15.8)	42 (13.2)		
21–35	225 (85.9)	44 (77.2)	269 (84.3)		
>35	4 (1.5)	4 (7.0)	8 (2.5)		
Is flow heavy?				2.662	0.103
Yes	123 (46.9)	20 (35.1)	143 (44.8)		
No	139 (53.1)	37 (64.9)	176 (55.2)		
Do you consume alcohol?				0.223	0.637
Yes	79 (30.2)	19 (33.3)	98 (30.7)		
No	183 (69.8)	38 (66.7)	221 (69.3)		
Do you exercise?				0.003	0.953
Yes	226 (86.3)	49 (86.0)	275 (86.2)		
No	36 (13.7)	8 (14.0)	44 (13.8)		
Do you smoke?				0.120	0.665*
Yes	7 (2.7)	2 (3.5)	9 (2.8)		
No	255 (97.3)	55 (96.5)	310 (97.2)		

\*Fisher's exact test.

a previous study in Ethiopia which reported a similar to  $22.2 \pm 1.7$  years of age reported among mean age of  $20.86 \pm 1.91$  years, which is also

TABLE 3: Bivariate analysis of factors associated with health-seeking behavior of the students.

Variables	Did you seek medical attention?		Total (%) (N = 262)	Chi-square statistic	P-value
	Yes (%) (N = 92)	No (%) (N = 170)			
Age (yrs)				0.185	0.912
<20	19 (20.7)	39 (22.9)	58 (22.1)		
20–24	65 (70.7)	117 (68.8)	182 (69.5)		
≥25	8 (8.7)	14 (8.2)	22 (8.4)		
Age at menarche				0.109	0.741
<12	42 (45.7)	74 (43.5)	116 (44.3)		
≥12	50 (53.4)	96 (56.5)	146 (55.7)		
Is menses regular?				0.012	0.912
Yes	80 (87.0)	147 (86.5)	227 (86.6)		
No	12 (13.0)	23 (13.5)	35 (13.4)		
Duration of flow (days)				6.395	0.011
<5	68 (73.9)	147 (86.5)	215 (82.1)		
≥5	24 (26.1)	23 (13.5)	47 (17.9)		
Is flow heavy?				5.219	0.022
Yes	52 (56.5)	71 (41.8)	123 (48.9)		
No	40 (43.5)	99 (58.2)	139 (53.1)		
Pain severity				7.803	0.005
Mild	12 (13.0)	48 (28.2)	60 (22.9)		
Moderate–severe	80 (87.0)	122 (71.8)	202 (77.1)		
Pain duration (days)				6.938	0.031*
1	72 (78.3)	109 (64.1)	181 (69.1)		
2	17 (18.5)	43 (25.3)	60 (22.9)		
>3	3 (3.3)	18 (10.6)	21 (8.0)		
Ever been treated for STI?				4.072	0.044*
Yes	6 (6.5)	3 (1.8)	9 (3.4)		
No	86 (93.5)	167 (98.2)	253 (96.6)		

STI, sexually transmitted infection.

medical students at a teaching hospital in Ibadan, Nigeria.[23, 24]

In this study, the average age at menarche was 12.7 years, which falls within the range reported in Cairo (12.8 years), India (12.9 years), Thailand (12.1 years), and Nigeria (12.0 years).[3, 7, 25, 26] However, the observed mean age at menarche in this study differs from that reported in other Nigerian studies conducted in different regions of the country: 13.1 years was reported among Igbo, Yoruba, Hausa, and Engenni tribes while

15.32 years and 15.20 years were reported among rural and urban girls in Sokoto, respectively. [27, 28]. Age at menarche is usually influenced by nutrition, social status, and the environment; all of these factors could have played a role in the difference in the age at menarche.[27, 29]. The prevalence of dysmenorrhea was high (82.1%), and agrees with 83.1% reported by Bello *et al.*, among medical students in a teaching hospital in Ibadan, Nigeria.[24] However, this was higher than the 72.1% previously documented in a similar study

TABLE 4: Students' alternative to seeking medical attention.

Variables	Frequency (N = 95)	Percentage (%)
Use of analgesics		
Yes	91	95.8
No	4	4.2
Use of contraceptive pills		
Yes	6	6.3
No	89	93.7
Body massage		
Yes	38	40.0
No	57	60.0
Having warm shower		
Yes	63	66.3
No	32	33.7
Avoidance of sugary foods or drinks		
Yes	81	85.3
No	14	14.7
Eating of fruits and veggies		
Yes	69	72.6
No	26	27.4
Applying heat pads to the belly		
Yes	56	58.9
No	39	41.1
Taking of alcohol		
Yes	9	9.5
No	86	90.5
Initiation of sexual intercourse		
Yes	2	2.2
No	93	97.8

conducted in eastern Nigeria. [30] It was also slightly higher than 80% reported in China among University students.[31] Nevertheless, the prevalence of dysmenorrhea is difficult to determine because of different definitions of the condition, individual's pain threshold, and also depending on how researchers measured it. According to Kamel *et al.*, it is a condition describing the painful cramps that women feel before or during the

menstrual period.[3] In addition, it is a subgroup of pelvic pain that manifests as painful menstrual flow or a painful menstrual cramp of uterine origin.[1] Another explanation to these varying differences in prevalence could be as a result of the different geographical locations coupled with the fact that dysmenorrhea is a common health complaint among young females. The commonest associated symptom with dysmenorrhea among

TABLE 5: Impact of dysmenorrhea on activities.

Activities	Students with dysmenorrhea (N = 262)	Mild dysmenorrhea (N = 60)	Moderate–severe dysmenorrhea (N = 202)	P-value
Class absenteeism	168 (64.1%)	26 (43.3%)	142 (70.3%)	<0.001
Limited academic performance	121 (46.2%)	22 (36.7%)	99 (49.0%)	0.092
Limited extracurricular activities	163 (62.2%)	30 (50.0%)	133 (65.8%)	0.026
Limited sport activities	125 (47.7%)	25 (41.7%)	100 (49.5%)	0.286
Restrict relationship with others	163 (62.2%)	29 (48.3%)	134 (66.3%)	0.012
Low self-esteem	79 (30.2%)	17 (28.3%)	62 (30.7%)	0.727

the study population was low mood. Other associated symptoms were breast pain, headache, poor sleep, anger, and reduced appetite. While studies in Cairo and Thailand also revealed mood change as the most frequent complaint, a similar study conducted by Ezeukwu *et al.* on primary dysmenorrhea showed pain, inability to sleep, and feeling unhappy as the commonest symptoms.[3, 7, 30] Other documented associated symptoms are nausea/vomiting, headache, sweating, diarrhea, dizziness, and loss of appetite.[11]

Moreover, about a third of the dysmenorrhic students sought medical attention despite the considerable impact it has on their regular activities. This proportion is noticeably high compared with other previous Nigerian studies among a similar population which reported between 7.9% and 12.1% students seeking medical help for dysmenorrhea.[11, 24, 32] This observed improvement in their health-seeking behavior could be attributed to factors such as accessibility, effectiveness, affordability, and prompt attention.[20, 33] In addition, the university has a health center which they can attend and be treated without paying out of pocket and it is affiliated to a teaching hospital where they can easily get specialist care. The number of students who sought medical help is still low which showed

the need to intensify adequate education, counselling, and demystifying the myths regarding the fundamental cause of dysmenorrhea. This will empower them with adequate knowledge, right attitude to seek and opt for an effective treatment.

Some of the students utilized other means to relieve the pains rather than seek medical help. Alternate measures used to alleviate their dysmenorrhic pains include avoidance of sugar or sugary substance intake, intake of fruits and vegetables, taking a warm shower, application of warm pads/bottles to the belly and use of self-medicated analgesics. Similar strategies were used by students studied in Indonesia and Oman.[34, 35] Self-medication was the norm of most of the respondents and this has been the pattern in previous studies.[22, 36] This might be because they are unaware of the side effects of these drugs.

Majority of the study respondents that sought medical help did so on the first day of menses than the subsequent days. This could be because dysmenorrhea could become worse as the period progresses.[24] Another factor identified to be associated with seeking of medical attention was previous treatment of STI. This may have been due to prior information received when they



were treated for STI and the fear of recurrence, thereby improving their health-seeking behavior. Furthermore, it has been shown that pelvic inflammatory disease, sexual abuse, and psychological symptoms were associated with increased risk of dysmenorrhea.[13]

Of note, the observed factors associated with the students' health-seeking behavior were duration of flow, heavy flow, pain severity, pain duration, and having been treated for STI. This is consistent with reports of Farotimi *et al.* and Chia *et al.*[11, 31]

The only predictor of dysmenorrhea revealed in this study was the length of menstrual cycle. It corroborates the finding of several studies in which length of menstrual cycle and some other factors such as respondents' age at menarche and duration of menses were significantly associated with dysmenorrhea.[37–39] Similarly, some other studies reported duration of menses in days and not length of cycle as factors associated with dysmenorrhea among adolescents in Korea and Ethiopia.[36, 40]

The findings that dysmenorrhea significantly affected student activities like extracurricular activities, class attendance, and relationship with others correlates with the results from similar studies.[8, 9, 11, 31] Likewise, in a Portuguese study, the dysmenorrhic participants reported having limitations in their daily activities.[41] It is therefore pertinent to note that dysmenorrhea impairs quality of life. Also, the students' performance plays a vital role in generating highest quality graduates who will become great leaders and force for their country, so they are responsible for the social improvement and country's economic development.

This study is not without limitations. First, the study was conducted in a university campus, therefore the outcome may not exactly apply to

adolescents in other settings. Also, respondents' family history of dysmenorrhea and barriers to seeking medical help which could provide information on their health-seeking behavior was not explored. Despite these limitations, this study revealed a high prevalence of dysmenorrhea which signifies a condition of public health importance especially among female students. It is recommended that future studies should compare prevalence of dysmenorrhea and coping strategies between female students and out-of-school youths to make the findings generalizable. Additionally, future studies should attempt to differentiate primary dysmenorrhea from secondary dysmenorrhea in order to compare the prevalence of each and determine which has a greater effect on the students' quality of life.

The study revealed a high prevalence of dysmenorrhea and that it was significantly associated with the length of menstrual cycle. Its negative impact reflected on the daily activities of the students indicating an important health problem that requires attention. The students' health-seeking behavior was poor and factors such as menstrual flow, heaviness of flow, pain duration, pain severity, and history of STI treatment were associated with their health-seeking behavior. It is therefore recommended that knowledge about effective treatment should be implemented through public health efforts (such as health education programs targeting families and community at large). In addition, the government should ensure female students are introduced to health topics bordering this condition very early in their school curriculum for effective awareness. The teachers of young females just attaining puberty should teach them what menstruation is all about including coping strategies in case of



dysmenorrhea. The teachers should also have a forum where such issues can be discussed with parents since parents' understanding and knowledge will also help in equipping these young females. It is also important that medical personnel who encounter those who seek medical attention should assure them that it is a common experience among females in their age group as this will prepare them psychologically in managing the pain.

## Declarations

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## Ethical Considerations

Ethical approval was obtained from the University of Ibadan/University College Hospital institutional ethics committee (approval number: 15/0366) and a written informed consent was obtained from every participant. They were also assured of confidentiality as well as their right to withdraw from the study at any time without any consequence.

## Competing Interests

None.

## Availability of Data and Material

Data are available upon reasonable request to corresponding author.

## Funding

None.

## Abbreviations and Symbols

BMI: Body mass index

STI: Sexually transmitted infection

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