ORIGINAL ARTICLES

DYSMENORRHEA AMONG UNIVERSITY OF GHANA MEDICAL AND DENTAL STUDENTS: PREVALENCE AND MANAGEMENT OPTIONS

Hasford KE[1]; Amponsah SK[2]; Yawson AE[1]
[1]Department of Community Health; [2]Department of Medical Pharmacology, University of Ghana Medical School, Accra, Ghana

Abstract

Objective: Dysmenorrhea or menstrual pain is a common gynaecological disorder that affects the quality of life of most women in their reproductive years. Many women resort to the use of drugs and other remedies in an attempt to relieve this menstrual pain. The aims of the current study were to determine the prevalence of dysmenorrhea among female students of the University of Ghana Medical and Dental School, and also to identify common management strategies among these students.

Methodology: This was a cross-sectional study conducted in 2020, using an online questionnaire among 170 female students in the University of Ghana Medical and Dental School. Data was coded, stored and analyzed using SPSS version 23.

Results: Prevalence of dysmenorrhea among respondents was 91%; with significant correlation between dysmenorrhea and family history, duration of bleed, onset of pain and duration of pain. Data showed that 89% of students with dysmenorrhea engaged in self-medication. The commonest drug used by respondents with dysmenorrhea was paracetamol. A large number of the respondents who had dysmenorrhea had mood disturbances and majority also reported that dysmenorrhea affected their day-to-day (academic) activities.

Conclusion: Dysmenorrhea was found to be highly prevalent among female medical and dental students, with self-medication being the most common management strategy. Among the various drugs used in management, paracetamol was found to be commonest.

Key words: *Dysmenorrhea, Prevalence, Management, Self-medication*

Introduction

Dysmenorrhea, simply referred to as menstrual pain, is a common gynaecological disorder that affects the quality of life of most women in their reproductive years[1]. Dysmenorrhea affects about 40-80% of women,[2] and is known to have social and economic impact in most countries.[3] There are two types of dysmenorrhea: primary and secondary dysmenorrhea. Primary dysmenorrhea refers to normal physiological pain that occurs during the first few days of menstruation. Secondary dysmenorrhea is pathological, occurs weeks before or after menstruation, and is associated with some pelvic pathology such as the presence of uterine fibroids, endometriosis, or adenomyosis.[4,5]

Dysmenorrhea, according to many studies including one by Fatima *et al.*,[6] is due to the release of prostaglandins (especially prostaglandin E_2 and $F_{2\alpha}$) from the cyclooxygenase (COX) pathway which leads to contractions of the uterine wall.[7] Additionally, the aforementioned contractions reduce blood flow to the uterus. The combination of prostaglandin-induced uterine contractions, ischemia from decreased blood flow to the uterus and hypersensitivity of peripheral nerves leads to dysmenorrhea: which manifests as lower abdominal cramps.

Corresponding Author: **Dr. Seth Kwabena Amponsah**
Department of Medical Pharmacology, University of Ghana Medical School, Accra, Ghana
Phone Number: +233 (0) 243851461
Email Address: skamponsah@ug.edu.gh
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World prevalence of dysmenorrhea, in studies conducted by the World Health Organization (WHO), ranged from 8.8% to 94%[8]. Studies done among Hispanic adolescents in the United States of America and Ghanaian adolescents showed prevalence of 85%[9], and 74.4%,[10] respectively. Dysmenorrhea among University students in Ghana, Ethiopia and a medical college in India recorded prevalence of 83.6%, 71.8% and 67.5%, respectively.[11,12,13] Some risk factors associated with dysmenorrhea include early menarche, positive family history, age less than 20 years, nulliparity, higher socioeconomic status, heavy menses, depression, smoking, anxiety, and lack of physical activity.[12,13,14,15,16] Common associated symptoms of dysmenorrhea include headache, diarrhoea or change in bowel movements, nausea, vomiting, bloating, and backache.[3, 18]

Reports suggest that a lot of women resort to self-medication during episodes of dysmenorrhea. Osonuga *et al.*,[18] found that only 8.9% of women with dysmenorrhea sought medical advice, while 88.7% either practiced self-medication or did nothing. Common drugs known to be administered by women who experience dysmenorrhea include paracetamol, aspirin, ibuprofen, oral contraceptive pills and herbal

medications.[1,19,20] Non-steroidal anti-inflammatory drugs (NSAIDs) are usually first line in the management of dysmenorrhea in many countries.[20] This is due to the fact that these NSAIDs reduce prostaglandin production by inhibition of COX. Examples of common NSAIDs used in the management of dysmenorrhea include ibuprofen, diclofenac, mefenamic acid and naproxen.[20] Furthermore, oral contraceptive pills are known to be effective in the management of dysmenorrhea and work by reducing prostaglandin levels in the lining of the uterus.[1] However, data suggest oral contraceptive pills are not commonly used in Ghana, as most people resort to painkillers and bed rest.[11] Other management modalities include exercise, use of heating pads, and taking of tea or herbs. Certain diets such as high consumption of fish, fruits and fibre are also known to help in the management of dysmenorrhea.[21]

Dysmenorrhea affects the well-being and productivity of most women. Dysmenorrhea is known to cause mood disturbances (depression), disruption in social interaction, limitation in sleep, hospital admissions, lack of concentration, inability to study, absenteeism from school and bad grades.[9,11,12,22,23] There is paucity of data on prevalence of dysmenorrhea among female students in medical schools in Ghana, and self-medication practices among these students who have knowledge about drugs. This study determined the prevalence of dysmenorrhea, self-management practices and effects of dysmenorrhea on productivity among medical and dental students of University of Ghana.

Materials and Methods

A cross-sectional study conducted in 2020, was used to assess the prevalence and management strategies of dysmenorrhea in female students of the University of Ghana Medical School (UGMS) and University of Ghana Dental School (UGDS), College of Health Sciences, Accra, Ghana. These 2 schools of the College of Health Sciences (University of Ghana), train medical and dental students. Together, they train over 200 health personnel every academic year with an average student population of 1400 (about 59% females and 41% males); as at the 2020 academic year. Students spend 6 and half years in school to complete their education.
Respondents were female students of the UGMS and UGDS. All female students from levels 100 to 600 in the chosen schools were eligible to partake in the study.

A total of 170 female students were selected for the study based on sample size determination using Cochran's formula,[24] with an estimated prevalence of 0.8 (80%) [2, 9], a margin of error (e) of 0.05 (± 5%), and z value of 1.96 for a 95% confidence interval. A total of 170 female students were selected using convenience sampling technique. This was done by use of an online questionnaire link which was shared with members of each year group. A structured online questionnaire with both close-ended and open-ended questions was used for data collection. The questionnaire consisted of a demographic section, a section to ascertain prevalence of dysmenorrhea, sections for symptoms associated with dysmenorrhea, impact of dysmenorrhea on academic activities and drugs/management strategies employed by these students. The online questionnaire was pre-tested among 10 students in the School of Biomedical and Allied Health Sciences (SBAHS), University of Ghana. Data collected was entered, cleaned and analysed using the Statistical Package for the Social Sciences (SPSS) version 23 and Microsoft Excel 2013. Data was analysed with simple descriptive statistics and presented using tables and graphs to depict frequencies and percentages. Chi-square test was used to assess associations between the study outcome variables and independent categorical variables with 95% confidence intervals.

Approval for the conduct of this study was by the Proposal Review Committee of the Department of Community Health, UGMS **(ID: UGMS-CHDRC/103/2020).** All participants provided informed consent (a column was added to the online questionnaire for participants to indicate whether they consented to the study or not). Confidentiality and anonymity of participating students were ensured throughout the course of the study by use of initials at the name section of the questionnaire.

Results

Out of 170.0 female respondents from the University of Ghana Medical and Dental Schools, 92.0 (54.1%) fell between ages 21-24 years. A majority of the respondents were from the Level 300 class (**Table 1**).

Table 1: Age and Level of Study of Respondents (N=170)

Age	Frequency	Percent (%)
18-20	32.0	18.8
21-24	92.0	54.1
25 - 29	37.0	21.8
30-34	9.0	5.3
Level		
Level 100	9.0	5.3
Level 200	9.0	5.3
Level 300	48.0	28.2
Level 400	39.0	22.9
Level 500	31.0	18.2
Level 600	34.0	20.0

Majority (89.4%) of the respondents had menarche between the ages of 10-14 years. Also, 90.6% of the respondents had their menstrual cycle length ranging

between 21-35 days. The duration of bleeding for most participants was 4-5 days (65.9%) (**Table 2**).

Table 2: Gynaecological History of Student Participants (N=170)

No. of days / years	Frequency	Percentage (%)
Age at Menarche (Years)		
<10 years	9.0	5.3
10-14 years	152.0	89.4
15-19 years	9.0	5.3
Length of Menstrual Cycle		
<21 days	3.0	1.8
21-24 days	24.0	14.1
25-29 days	87.0	51.2
30-35 days	43.0	25.3
>35 days	13.0	7.6
Duration of Bleeding		
2-3 days	18.0	10.6
4-5 days	112.0	65.9
6-7 days	40.0	23.5
Family History of Dysmenorrhea		
Yes	107.0 (62.9%)	62.9
No	63.0 (37.1%)	37.1

A majority (91.0%; n = 155) of the respondents had dysmenorrhea. Among those with dysmenorrhea, 59.3% had menstrual pain beginning on the first day of menstruation, 31.0% of these students had pain prior to menstruation and 5.2% had pain starting on the second day of menstruation. Associated symptoms of dysmenorrhea reported by respondents included: headache, diarrhoea, tiredness, tender breasts, insomnia, perineal pain, fever, body pains, acne, hot flashes, sore throat, blister in mouth, among others. Family history of dysmenorrhea, Duration of bleed/menses, Time of onset of pain and Duration of pain were found to be significantly associated with dysmenorrhea (**Table 3**).

Table 3: Factors Associated with Dysmenorrhea Among Respondents

Variable	Chi Square	P-Value
Age of respondents	1.899	0.594
Age at menarche	2.070	0.355
Cycle length	3.609	0.461
Duration of bleed	9.158	0.010
Family history	3.712	< 0.05
Onset of pain	170.000	< 0.001
Duration of pain	170.000	< 0.001

Of the 155 students who experienced dysmenorrhea, a majority (81.9%) reported decreased activity during episodes of dysmenorrhea. However, most (60.6%) of them did not miss lectures during these periods. Of the 61 respondents who missed school during times of dysmenorrhea, 45 of them (73.8%) often missed school for 1 day, while none of the students missed school for more than 3 days. Out of the respondents who did not miss lectures (n = 94) during episodes of dysmenorrhea, 49 (52.1%) of them went to class without taking medication, while 43 (45.7%) of them used pain reducing remedies. Also, 85.2% (n=52.0) of respondents who missed lectures used analgesics while the remaining 14.8% (n=9) did not. Majority (78.7%; n = 122) of the 155 students who experienced dysmenorrhea said they could not focus in class.

Furthermore, a majority (91.0%) reported that dysmenorrhea did not have any effect on their academic performance. Respondents whose academic performances were affected by dysmenorrhea (9.0%) were asked to cite examples of how dysmenorrhea affected them. Some of the respondents (n = 7) reported that they were unable to study or adequately prepare or revise for examinations because of the pain associated with dysmenorrhea. Others (n = 3) said their inability to focus during examinations due to dysmenorrhea affected their performances. The data also showed that most respondents (122 out of 155), representing 78.7%, experienced mood disturbances during dysmenorrhea. A summary of the effect of dysmenorrhea on academic performance and quality of life of respondents is presented in **Table 4**.

Table 4: Effect of dysmenorrhea on academic performance and quality of life

Variable	Number of respondents	Percentage out of 155 Respondents (%)
Mood disturbances/Depression	122	78.7
Reduced Socialization	106	68.4
Sleep Disturbances	65	41.9
Lack of concentration	97	62.6
Inability to study	83	53.5
Absenteeism from class	54	34.8
Hospital Admission	5	3.2

Of the 155 students who experienced dysmenorrhea, 112 (72.0%) used both pharmacological (**Table 5**) and non-pharmacological (**Figure 1**) methods to manage dysmenorrhea, while 31 (20.0%) used only non-pharmacological methods. Additionally, a majority of the respondents (n = 130) relied on bed rest during

episodes of dysmenorrhea. Common drugs taken by the students included paracetamol (66.1%), ibuprofen (12.7%) and diclofenac (11.9%). None of the students used oral contraceptive pills, aspirin or herbal preparations for dysmenorrhea. A number of the respondents, 105 (89.0%), practiced self-medication.

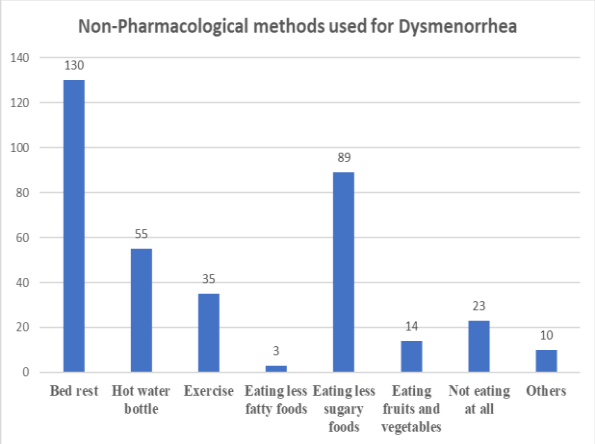

Figure 1: *Non-pharmacological methods used by respondents who experienced dysmenorrhea.*

Table 5: Drugs taken by students to reduce dysmenorrhea.

Drugs Used for Dysmenorrhea	Frequency	Percent (%)
Paracetamol	78	66.1
Ibuprofen	15	12.7
Diclofenac	14	11.9
Others		
Piroxicam	4	3.4
Naproxen	2	1.7
Ponstan (Mefenamic acid)	3	2.5
Folic Acid	1	0.85
Buscopan	1	0.85
Total	**118**	**100**

Discussion

From the current study, prevalence of dysmenorrhea among University of Ghana Medical and Dental students was 91.0%. This is high but consistent with global prevalence rates which range from 16.0% to 91.0%.[8,11,25,26] The prevalence of dysmenorrhea in this study was relatively high as compared to 60.9% and 50.9% in other studies done in various medical and dental schools across the globe.[27,28] Differences in prevalence may be due to sample size variations among the various studies. Prevalence of dysmenorrhea has been found to have some association with factors such as age, family history, early or late menarche, smoking, etc.[29] In this study, however, duration of bleeding ($p=0.010$), onset of pain ($p<0.001$) and duration of pain ($p<0.001$) were found to be significantly associated with dysmenorrhea prevalence. These factors have also been reported in studies done by Kural *et al.*[30] In the current study, a majority of students had dysmenorrhea on the first day of menstruation. This was consistent with literature which suggests that pain is normally in the first 2 days, and this pain is as a result of increased release of prostaglandins leading to intense uterine contractions.[9, 32, 33]

The commonest symptoms associated with dysmenorrhea in this study were diarrhoea, tiredness, nausea, bloating, loss of appetite and headache. These symptoms are consistent with findings in other studies conducted in Saudi Arabia and India[4, 34]. Respondents in the current study did not report breast changes as symptoms associated with dysmenorrhea, as has been reported elsewhere.[11] In this study, 81.9% of students were less active during dysmenorrhea. This did not prevent them from attending lectures, as only 39.3 % of them missed lectures.

It is noteworthy, however, that those (72.2%) who attended lectures could not focus in class during episodes of dysmenorrhea because of the pain, discomfort and the symptoms associated with condition. It can be speculated that lecture attendance may have been as a result of attendance sheets that had to be signed during each lecture. The effect of dysmenorrhea on school attendance in this study was consistent with some other studies conducted in schools in Italy and one Indian district where absenteeism was 37.9% and 47.9% respectively.[15, 35]

In relation to effect of dysmenorrhea on academic performance, majority (91.0%) of the respondents reported that dysmenorrhea did not affect their academic performance, even though a number of them had to miss lectures. On the contrary, studies done by Fatima *et al* and Acheampong *et al.*[6, 23] have reported poor academic performance among students as a result of episodes of dysmenorrhea.

Furthermore, 78.7% of the respondents had mood disturbances/depression during dysmenorrhea. Reports suggest that university students may often be under stress which is likely to trigger depressive moods, or even suicide ideation.[36, 37] Dysmenorrhea is also known to aggravate depression, anxiety disorders and other psychological disorders.[8, 38] There is therefore a need for increased psychosocial support for females in schools. Hospital admissions among respondents in this study was not common as was the case in the study done at the University of Cape Coast, Ghana.[22]

Paracetamol was the most common drug (66.1%) used by students for dysmenorrhea. Other studies have reported NSAIDs as the most effective drugs for dysmenorrhea.[13, 39] The use of paracetamol as first-line

treatment for dysmenorrhea has been reported by another study which was conducted in Ghana.[11] Paracetamol being common among medical and dental students in the current study could be as a result of knowledge these students have of possible adverse effects (peptic ulcer and nephrotoxicity) associated with continuous use of NSAIDs. Although aspirin, herbal medication and oral contraceptive pills are used in other parts of the world to manage dysmenorrhea, none of the students reported using these agents in this study.

For non-pharmacological methods, bed rest was the most common method used and corroborated a study done in the northern part of Ghana.[11] Reports suggest some association between high sugar intake and dysmenorrhea.[29, 40] In the current study, some of the students took in less sugary foods during dysmenorrhea.

Self-medication was highly prevalent (89.0%) among respondents in this study. This could be as a result of possible long hours spent at health facilities, a challenge in many resource-poor countries.[41]

In a study conducted among medical and paramedical students, self-medication was found to be more prevalent among medical students.[6] Additionally, most of the analgesics used by respondents in the current study are over-the-counter medicines, as such, medical students with knowledge of drugs can easily get these drugs. In this study, 74.5% of the students reported using multiple remedies. Some used only pharmacological, while others used a combination of pharmacological and non-pharmacological. A study conducted in Canada, after assessing effectiveness of a number of management strategies for dysmenorrhea, concluded that a combination of pharmacological and non-pharmacological methods (including surgery if necessary) should be used to effectively manage dysmenorrhea.[42]

Conclusion

There was a high prevalence of dysmenorrhea among University of Ghana Medical and Dental students. During episodes of dysmenorrhea, a combination of pharmacological and non-pharmacological methods was used by respondents in this study. Overall, dysmenorrhea caused morbidity and affected the day-to-day activities of female students.

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