

Correlation between primary dysmenorrhea characteristics, age at menarche, anthropometric variables, gynecological history, management attitudes, and quality of life among undergraduates in Nigeria

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ABSTRACT

Context: Menstruation is a natural event that occurs throughout the reproductive years of every woman. Most women during their menstrual period experience pain and discomfort called dysmenorrhea which is the most common gynecological complaint in young women and may result in absences from school, work, and social engagement.

Aims: To study the relationship between BMI, hip circumference, menarcheal age, and management on the severity of dysmenorrhea among undergraduates.

Methods and Materials: A self-administered structured questionnaire having four (4) sections including information on the sociodemographic data, data related to menstrual characteristics, information related to menstrual symptoms, and information on management attitudes of these students were used for data collection.

Statistical Analysis Used: A non-probability convenient method was used to select 400 participants. A self-administered structured questionnaire was used for data collection and data were analyzed with SPSS software version 23.0.

Results: The prevalence of dysmenorrhea was 87.1%, with most commonly felt symptoms being tiredness (72.5%) and mood swings (67.8%). Symptoms lead to decreased social activities (55.8%), low confidence (55.5%), and increased absenteeism (49.5%) from lectures. Although dysmenorrhea has no significant relationship with BMI, it was significantly ($P < 0.05$) higher (197) in participants with smaller hip circumference (0.80–1.00 m) and late (13–14 years) menarche (47.8%). There was a low rate (4.2%) of consultation with the majority (63%) opting for self-medication as previously advised by a relative (23.4%), self (21.1%), and friends (18.9%).

Conclusions: Smaller hip circumference, late age at menarche, and increased BMI can increase the severity of dysmenorrhea which can further affect the quality of life.

Key words: Anthropometric variables; dysmenorrhea; hip circumference; menarche; self-medication; undergraduates.

Introduction

Menstruation is a natural event that occurs throughout the reproductive years of every woman. During this period most women experience dysmenorrhea, the most common

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gynecological complaint in young women that may result in absences from school, work, and social engagement or require medical or surgical treatment.^[1]

Dysmenorrhea is characterized by recurrent lower abdominal cramps and/or dull throbbing.^[2] Primary dysmenorrhea, which is the focus of this study and typically occurs in the first few years after menarche, is not associated with macroscopic pelvic pathology. Secondary dysmenorrhea, on the other hand, results from anatomic or macroscopic pelvic pathology.^[3] As shown in Figure 1, Primary dysmenorrhea occurs as a result of prostaglandin F2 alpha, a potent myometrial stimulant, and vasoconstrictor released by endometrial cells. There seems to be a correlation between dysmenorrhea and prolonged uterine contractions and decreased blood flow to the myometrium.^[4] High serum vasopressin, nitric oxide, and interleukin-6 levels have all been linked in with primary dysmenorrhea.^[5] Besides, poor nutritional diet, lower age, obesity, family history, and reduced frequency of breakfast meals per week have all been linked to this problem.^[6,7]

Degree of pain is not left out in this repertoire of reports as dysmenorrhea has been classified into mild, moderate, and severe grades of pain. Amita *et al.*^[8] reported that 63.29%, 30.37%, and 6.32% of respondents suffered from mild, moderate, and severe grades of pain, respectively. This was contradictory to the findings of Jerry *et al.*,^[9] who reported that 14% severe, 38% moderate, and 49% subjects were mild sufferers. It must be stated that genetic influence also has a significant effect on the severity of dysmenorrhea.^[10]

Menarche signals the maturation of the pubescent female body.^[12] The average age at menarche in 1840 was 16.5 years,

however, there is a falling trend of the age at menarche worldwide.^[13]

Although some researchers have shown no correlation between menarche age and dysmenorrhea,^[14] others have shown a significant correlation between younger age at menarche dysmenorrhea^[15,16]. However, few others have shown the exact opposite to be the truth; both early and late age at menarche tends to predispose a woman to have dysmenorrhea.^[17]

The relationship between anthropometry, body composition and reproductive characteristics in women has been a subject of interest currently. Although some studies^[18-22] have reported an association between body mass index (BMI) and severity of dysmenorrhea, this relationship is still controversial.^[7,23] Some studies excluded obesity as a risk factor for dysmenorrhea^[20,21].

There is a great dearth of information on the relationship between hip-width and dysmenorrhea. The connection between pelvic alignment and dysmenorrhea has been documented.^[24] Singh *et al.*^[25] showed no significant difference when the waist to hip ratio and other variables were compared in each phase of the menstrual cycle between the subjects with dysmenorrhea and subjects without dysmenorrhea.

Dysmenorrhea is a common gynecological problem yet it remains poorly understood and is rarely taken into consideration while assessing students' health and life experiences. It is also a leading cause of absenteeism from lectures, social events, and work,^[1,21] and it has been normal socially for women with dysmenorrhea to suffer in silence hence, there

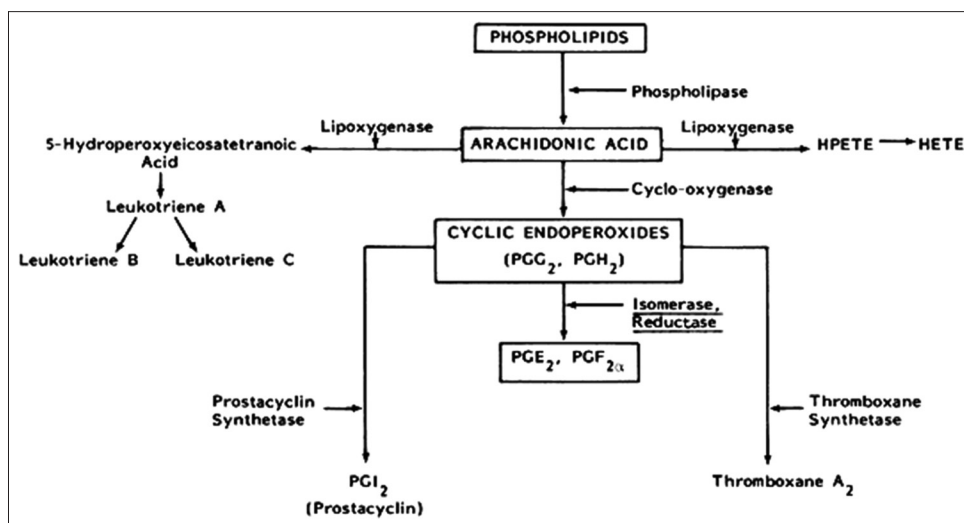


Figure 1: Showing the pathway for the biosynthesis of prostaglandins and related compounds using the arachidonic acid cascade from phospholipids: Hormones, prostaglandins, and dysmenorrhea.^[11]

is a need to evaluate the relationship between dysmenorrhea characteristics, anthropometric variables, gynecological history, and management attitudes on the severity of symptoms among undergraduate students to determine the exact cause of dysmenorrhea among Bowen University students for treatment to be adequate to a greater extent.

Subjects and Methods

Sample size and sampling technique

This study was conducted at a private university located in Osun State. The university boasts of approximately 3000 female students from 25 different ethnic groups across Nigeria. Using Taro Yamane's formula for finite population, the sample size required for statistical analysis was calculated.

$$n = \frac{N}{1 + N(e)^2}$$

Where,

n = sample size

N = finite population

e = percentage error, 5% is acceptable for this study

1 = a constant

Therefore, the sample size (*n*) for this study is 353 which was approximated to 400.

Ethical approval

Ethical approval was obtained from the University Research Ethical Committee (BUI/HR/2341). Before the study, the purpose of the study was clearly explained to the participant, thereafter informed verbal consent was obtained and documented. Information taken from students were kept confidential.

Inclusion and exclusion criteria

Students who had attained menarche on or before 14 years of age, students between 15–25 years and students with no weight-related diagnoses (i.e. underweight, overweight, obesity) were included while students who have not started menstruating, those with history of gynecological chronic disorder and those who were pregnant or breastfeeding within 6 months were excluded.

Data collection

A non-probability convenient method was used to select 400 participants from 100–500 levels of female students in all

faculties. The hip circumference was measured as described by Kafaei-Atrian *et al.*,^[26] while BMI was determined as described by Montero *et al.*^[27] using the “WHO International Classification of adult underweight, overweight, and obesity according to BMI.”

Hip circumference was classified into three groups for analysis;

- Group 1: participants with a hip circumference ranging from 0.80 m–1.00 m
- Group 2: participants with a hip circumference ranging from 1.01 m–1.20 m
- Group 3: participants with a hip circumference ranging from 1.21 m–1.40 m

Tools for data collection

1. A self-administered structured questionnaire was used for data collection. This questionnaire included;
 - i. **Four sections.**

Section 1. Information on socio-demographic data (age, age at menarche, etc).

Section 2: Data related to menstrual characteristics (menstrual cycle, blood flow, etc.)

Section 3: Information related to menstrual symptoms

Section 4: Information on management attitudes of these students

ii. Dysmenorrhea self-assessment tool

This included data related to the onset of dysmenorrhea, a region of pain, the severity of pain, etc., The degree of severity of pain was measured using a numeric pain rating scale (NPRS). The NPRS consists of 11 numbers ranging from 0 representing “no pain” to 10 representing “worst pain.” The participants were asked to circle the number that best describes their pain. In this scale, pain feeling ranges from 0–11 referring to no pain (0), mild pain (1–3), moderate pain (4–6), severe pain (7–9), and the worst pain (10).

iii. Quality of life assessment tool for dysmenorrhea

This included data related to:

- i. Adverse symptoms of dysmenorrhea on participants (such as headache, nausea and vomiting, insomnia, etc.)
- ii. Effect of dysmenorrhea on school performances (absenteeism from lectures, level of confidence, and level of concentration)
- iii. Effect of dysmenorrhea on normal daily routine activities (performance in social and sports activities, appetite, and desire to feel alone)

2. Digital weighing scale was used to measure the weight of the participants
3. Tape rule to measure the hip circumference
4. Meter rule to measure the height

Data analysis

Data collected for this study were arranged and analyzed with simple percentages, Chi-square test, correlation test, and frequency count data analysis was performed on 400 completed copies of the questionnaire. A Chi-square test was used to determine the association between blood flow and the severity of dysmenorrhea as well as the relationship between hip circumference and dysmenorrhea. A correlation test was also used to determine the correlation between respondent's BMI and their likelihood of experiencing dysmenorrhea. Statistical Package for Social Sciences (SPSS) software version 23.0 was used for the data analysis.

Results

Around 400 valid questionnaires were retrieved with a 100% response rate.

Section A

Anthropometry

As indicated in Table 1, the majority of the participant's BMI and hip circumference fall into the category of normal weight 46.5% and hip circumference of 0.80–1.00, respectively.

Sociodemographic factors and menstrual characteristics

A frequency of 277 shows that the cycle length of the respondent was between 26–29 days while a frequency of 78 shows a cycle length less than 25 days and a frequency of 45 shows a cycle length greater than 29 days. The measure of the cycle length of menstrual flow was the number of days from the first day of the present period to the first day of the next period.

Table 2 summarizes background data for the total sample. This study is homogenous, in that the participants are generally young and are students of Bowen University, Iwo. Even with the homogeneity, there are ranges of characteristics in this population. The greater proportions of respondents were between the age of 19–22 years followed by 15–18 years and then 23–25 years. The age at menarche ranged from early (less than 9 to 10 years), normal (11–12 years), then late (13–14 years) with the majority (47.8%) having normal age at menarche. Over half of the population experiences pain whether always (38.5%), frequently (29.3%), or not frequently (22.8%) while only 12.8% of the respondents do not experience dysmenorrhea. This is an indication that menstrual pain primarily began at the

Table 1: Anthropometry: BMI (kg/m²) and hip circumference (m)

Anthropometry	Frequency (%)
BMI (kg/m ²)	
Underweight	67 (16.8%)
Normal weight	186 (46.5%)
Over weight	84 (21.0%)
Obese	63 (15.8%)
Total	400 (100%)
Hip circumference (m)	
0.80-1.00 m	197 (49.3%)
1.01-1.20 m	178 (44.5%)
1.21-1.40 m	25 (6.3%)
Total	400 (100%)

Table 2: Sociodemographic factors

Sociodemographic factors	Frequency (%)
iii. Age (at nearest birthday)	
15-18 years	130 (32.5%)
19-22 years	246 (61.5%)
23-25 years	24 (6.0%)
Total	400 (100%)
iv. How old were you when you started menstruating?	
>9 years of age	4 (1.0%)
9-10 years	85 (21.3%)
11-12 years	191 (47.8%)
13-14 years	120 (33.0%)
Total	400 (100%)
v. Do you experience menstrual pain?	
Always	141 (35.3%)
Never	51 (12.8%)
Frequently	91 (22.8%)
Not frequently	117 (29.3%)
Total	400 (100%)
vi. When do you start experiencing pain?	
Immediately you started menstruating	154 (38.5%)
6-12 months after you started menstruating	117 (29.3%)
1-2 years after you started menstruating	64 (16.0%)
More than 2 years after you started menstruating	40 (10.0%)
I do not experience the pain	25 (6.3%)
Total	400 (100%)
vii. Do you have any family history of menstrual pain?	
Yes	154 (38.5%)
No	246 (61.5%)
Total	400 (100%)

onset of menarche (38.5%) and most of the respondents do not have a family history of dysmenorrhea (61.5%), both nuclear and extended.

Section B

Menstrual characteristics

The majority of respondents reported regular cycles, among which 68.5% of respondents menstruate 4–5 times in a month and 72.5% experienced monthly periods. Most of the respondents (42.5%) reported that their blood flow before

experiencing pain tends to be normal in which they use 3 to 4 sanitary pads daily [Table 3].

Respondents blood per day

A greater proportion of respondents (50.5%) reported having a normal flow of blood, 32.3% graded their blood flow as being scanty while 16.8% reported heavy blood flood daily and 0.5% did not grade their blood flow. The blood flow was classified based on the number of pad used per day into three (3) categories: scanty/small (1 to 2 pads daily), normal (3 to 4 pads daily), and heavy (5 pads or more) [Figure 2].

Severity of pain

The frequency of pain severity was variable. 63 (15.80%) respondents experience no pain, 62 (16.30%) respondents described the pain as mild, 152 (38.0%) respondents described their pain as moderate, 103 (25.80%) respondents reported severe pain, and 17 (4.30%) respondents described pain severity as worst [Figure 3].

Pain location

As shown in Table 4, pain location was multidimensional and variable. Pain location was mostly in the lower part of the abdomen (54.8%), followed by the lumbar region (25.9%), the thigh region (12%), and the other parts of the body which was not specified (7.3%)

Section C

Symptoms/severity of symptoms

Figure 4a and 4b gives a general pointer to the distribution of participants' symptoms. They mostly prefer bed rest (72.5%) which can be a result of tiredness associated with dysmenorrhea. Participants also experience mood swings (67.8%), body ache including headache and backache (60%), painful/swollen

breast (57.5%), and hyper activeness (47.6%). These symptoms lead to decreased sports and social activities (55.8%), decreased level of confidence (55.5%), anxiety (54.8%), and loss of appetite (54.5%). Absenteeism from lectures also featured prominently in this study (49.5%). Other symptoms and effects of dysmenorrhea on the quality of life of these

Table 3: The menstrual characteristics of the respondent

Menstrual Characteristics	Frequency (%)
i. How many days do you menstruate in a month?	
2-3 days	64 (16.0%)
4-5 days	274 (68.5%)
More than 5 days	62 (15.5%)
Total	400 (100%)
ii. How often do you see your period?	
Monthly (12 times a year)	290 (72.5%)
9 to 11 times a year	75 (18.8%)
5 to 8 times a year	27 (6.8%)
1 to 4 times a year	8 (2%)
Total	400 (100%)
iii. How was your blood flow before you started experiencing pain?	
Less	68 (17.0%)
More	136 (34.0%)
Same	170 (42.5%)
No blood flow	26 (6.5%)
Total	400 (100%)

Table 4: Pain location

Location	Frequency (%)		Total
	Yes	No	
Lower part of the stomach	307 (54.8%)	93 (45.2%)	400 (100%)
Lower back region	145 (25.9%)	225 (74.1%)	400 (100%)
Thigh region	67 (12.0%)	333 (88%)	400 (100%)
Other parts of the body	41 (7.3%)	359 (92.7%)	400 (100%)

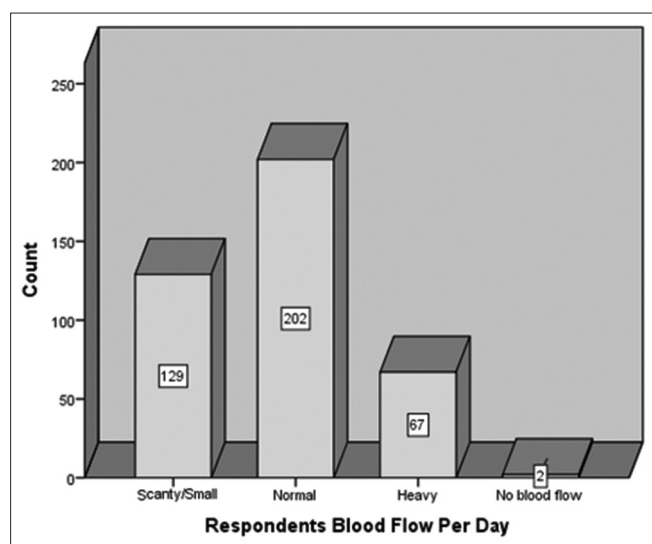


Figure 2: Showing respondent blood per day

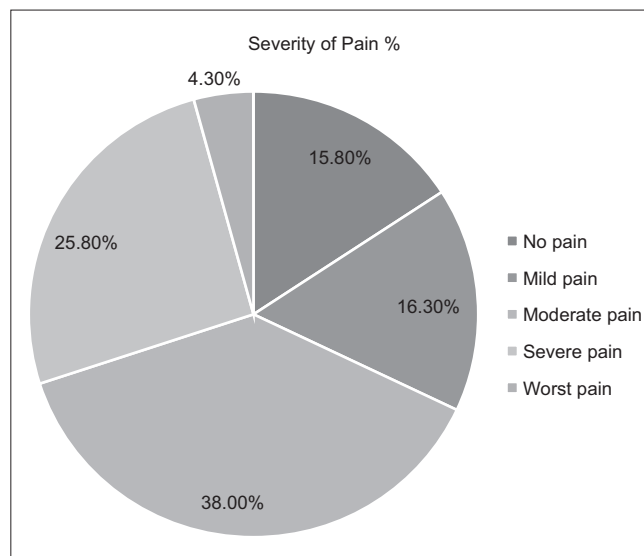


Figure 3: Showing the severity of Pain among respondent

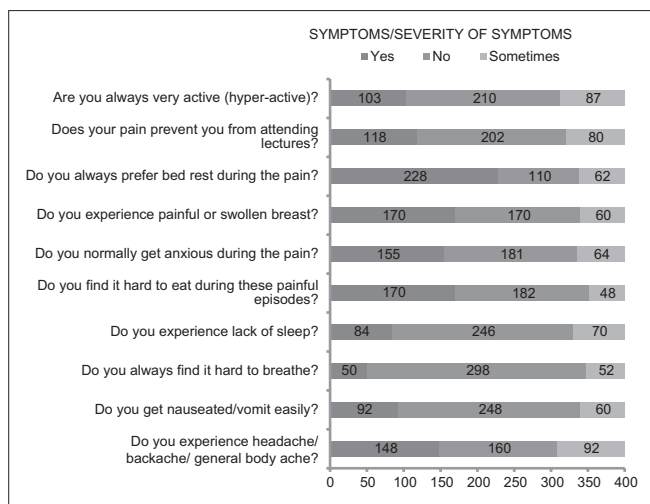


Figure 4a: Associated Symptoms of Respondents with Dysmenorrhea

Table 5: Usual self-care practices of respondents towards dysmenorrhea

Pain management	Frequency (%)		
	Yes	No	Total
I ignore the pain	129 (26.8%)	271 (73.3%)	400 (100%)
I use home remedies e.g., warm water therapy	85 (17.7%)	315 (82.3%)	400 (100%)
I take more fruits than food	30 (6.2%)	370 (93.8%)	400 (100%)
I exercise more	31 (6.4%)	369 (93.6%)	400 (100%)
I use drugs	186 (38.7%)	214 (61.3%)	400 (100%)
I go to the medical center	20 (4.2%)	380 (95.8%)	400 (100%)

students in order of significance include fever/cold, loss of concentration, dizziness, cold sweat, vagina itching, increased appetite, insomnia, nausea/vomiting, and difficulty in breathing. Some of the participants were hospitalized during these painful episodes.

Section D Management attitude

Table 5 shows multiple response questions that summarize how pain is been managed by respondents during their period. Some of the participants (26.8%) ignore the pain and the commonly used method for pain relief is the use of drugs (38.7%). The majority of the participants (73%) used methods to relieving pain. Over one-third of the participants (38.7%) used medications for the management of their pain while 30.3% used none of the pharmacological measures for pain relievers such as home remedies (17.7%), increased fruit intake (6.2%), and increased exercise (6.4%). A little proportion of the population (4.2%) visits the medical center for treatment.

Medication and its effect on blood flow

We established the fact that 34% of the respondents use one (1) drug to reduce their pain, 20% uses two (2) drugs

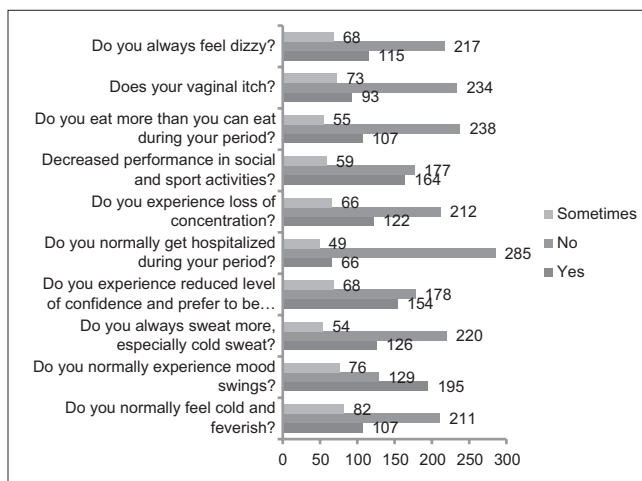


Figure 4b: Associated Symptoms of Respondents with Dysmenorrhea

Table 6: Type of medication, doses, timing, and effect on blood flow

	Frequency	%
How many drug (s) do you use?		
1 drug	136	34.0%
2 drugs	80	20.0%
3 drugs	3	0.8%
5 drugs	1	0.3%
6 drugs	1	0.3%
Do not use any drug	179	44.8%
Total	400	100%
When do you take the medication?		
Before pain starts	53	13.3%
After pain starts	74	18.5%
When pain becomes unbearable	94	23.5%
No need for medicine	179	44.8%
Total	400	100%
How many doses of drugs do you take per day?		
1-2 doses	166	41.5%
3-4 doses	49	12.3%
More than 5 doses	6	1.5%
No need for drugs	179	44.8%
Total	400	100%
When did you start using the pain reliever?		
Immediately I started experiencing menstrual pain	106	26.5%
1-2 years after the pain started	74	18.5%
Over 2 years of experiencing the pain	41	10.3%
No need for a pain reliever	179	44.8%
Total	400	100%
Classify your blood flow months/years after you started using the pain reliever?		
Reduced	44	11%
Normal	151	37.8%
Increased	26	6.5%
No blood flow	179	44.8%
Total	400	100%

and little proportion (1.4%) of the population uses 3–6 drugs. Most of them take medication when the pain becomes

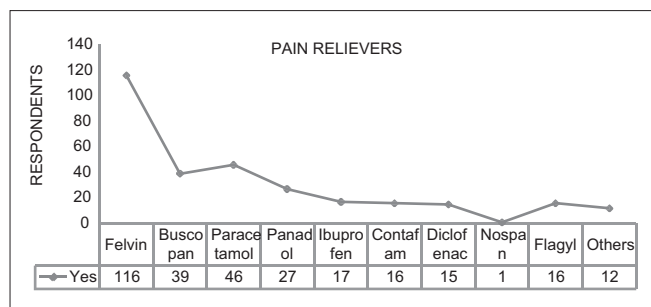


Figure 5: The frequency of drugs commonly used by the respondents is shown in a line graph

unbearable while 18.5% use their medication after the pain starts and 13.3% use their medication before the pain starts. The majority of the respondents started using pain reliever at the onset of menstrual pain. A greater proportion of the population reported a normal blood flow months/years after they started using pain reliever while 11% notices reduction in blood flow and 6.5% noticed an increase in blood flow months/years after they start using the pain reliever [Table 6].

Source of drug prescription

Over one-quarter of the population gets prescriptions from medical personnel, followed by 23.4% from a relative, 21.1% by self, and 18.9% from friends [Table 7]. This means that the majority (63%) of the students self-medicate whether prescribed by self, friends, or relatives. The majority of the students found it convenient to opt for self-medication practice and information previously prescribed by friends and relatives.

Pain relievers used in dysmenorrhea

The pharmacological agents that were used commonly were analgesics [Figure 5]. The most common analgesics used by these students were felvin (38%), followed by paracetamol (15.1%). Other pain reliever used were buscopan (12.8%), panadol (8.7%), ibuprofen (5.6%), contafam (5.2%), flagyl (5.2%), diclofenac (4.9%) etc.

Dysmenorrhea and associated variables

Relationship between BMI and severity of dysmenorrhea

The correlation coefficient for Bowen student’s BMI and dysmenorrhea was 0.091, which means there is no statistical correlation between BMI and dysmenorrhea [Table 8].

Dysmenorrhea is more rampant in the respondents (186) with normal weight followed by those in the overweight group (84) [Figure 6]. Surprisingly, the obese group had the lowest number of the respondent with dysmenorrhea (63). This value is comparable to that of the respondent in underweight (67). The number of the respondent with moderate pain (152) was more than those that reported severe pain (103). Only 17 respondents reported “worst pain.”

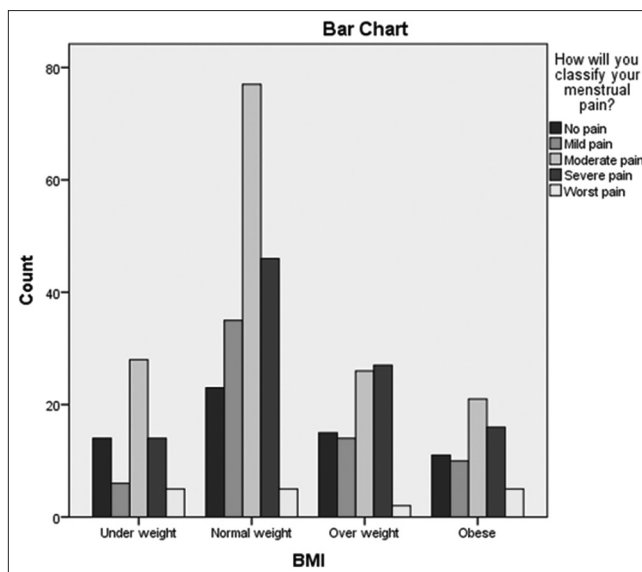


Figure 6: Relationship between BMI and Severity of Dysmenorrhea

Table 7: Personnel that prescribes drugs during dysmenorrhea

	Frequency (%)		
	Yes	No	Total
Which personnel prescribed drug used to relieve the pain?			
Friends	50 (18.9%)	350 (81.1%)	400 (100%)
Relative	62 (23.4%)	338 (77.6%)	400 (100%)
Medical personnel	97 (36.6%)	303 (63.4%)	400 (100%)
Self	56 (21.1%)	344 (78.9%)	400 (100%)

Table 8: The correlation between respondents’ BMI and dysmenorrhea

	Correlations	
	Do you experience menstrual pain?	BMI
Do you experience menstrual pain?		
Pearson Correlation	1	0.091
Sig. (2-tailed)		0.070
n	400	400
BMI		
Pearson’s Correlation	0.091	1
Sig. (2-tailed)	0.070	
n	400	400

Hip circumference and dysmenorrhea

We report a relationship ($P < 0.05$) between the hip circumference and dysmenorrhea as the latter is more rampant (197) in the respondents with a smaller hip circumference of 0.80–1.00 m and lowest (25) in those with a higher hip circumference of 1.21–1.40 m (Shown in Table 9 and Figure 7).

Respondents’ quality of life and dysmenorrhea

There was a significant relationship between dysmenorrhea and the quality of life of female students at Bowen University [Table 10].

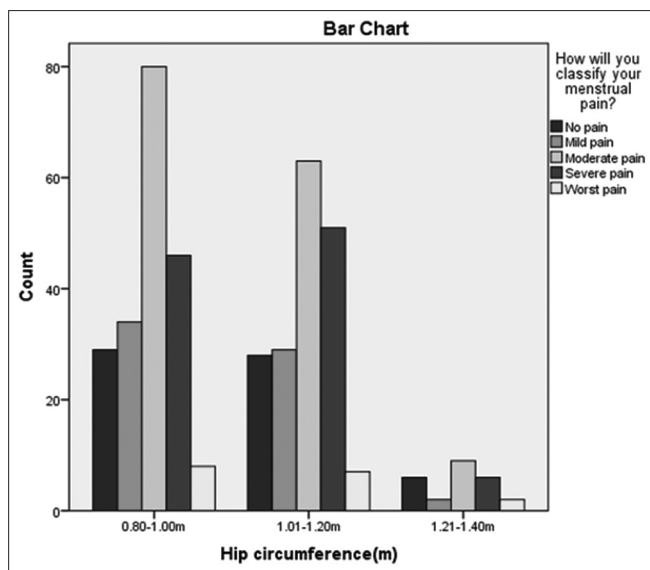


Figure 7: Dysmenorrhea in respondent's HIP circumference

Table 9: Relationship between hip circumference and dysmenorrhea

Correlations		
	Hip circumference (m)	Do you experience menstrual pain?
Hip circumference (m)		
Pearson's Correlation	1	0.024
Sig. (2-tailed)		0.638
n	400	400
Do you experience menstrual pain?		
Pearson's Correlation	0.024	1
Sig. (2-tailed)	0.638	
n	400	400

Table 10: Effect of dysmenorrhea on quality of life of female students of Bowen University

Chi-square tests			
	Value	Df	Asymptotic significance (2-sided)
Pearson's Chi-square	49.105 ^a	6	0.000
Likelihood Ratio	49.074	6	0.000
Linear-by-linear association	9.911	1	0.002
No of valid cases	400		

^a0 cells (0.0%) have expected count less than 5. The minimum expected count is 8.92

Age at menarche of respondents and dysmenorrhea

Dysmenorrhea was more rampant in girls with late menarche (13–14 years) when compared to girls with early menarche (9 years). Although, dysmenorrhea tends to be more rampant in girls with normal menarche age shows (11–12 years), meaning that there was no significant relationship between age at menarche and dysmenorrhea [Table 11].

Respondents' age and dysmenorrhea

Dysmenorrhea was more rampant between the age of 19–22 years with a frequency level of 101 with moderate

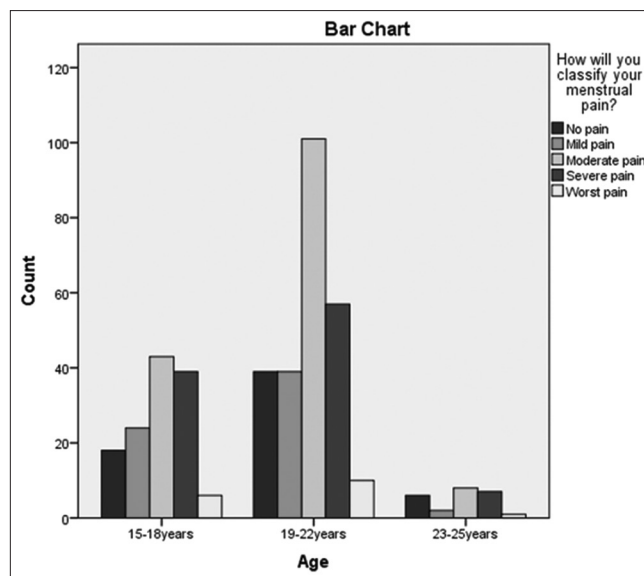


Figure 8: Respondent's Age and Severity of Pain

pain followed by 57 of the respondents with severe pain than mild pain with 39 respondents and worst pain with 10 respondents [Figure 8].

Blood flow and dysmenorrhea

There was a significant relationship ($P < 0.05$) between blood flow and dysmenorrhea as shown in Table 12.

Discussion

Dysmenorrhea is the most common gynecological problem in young female adults and it is the most common complaint during the clinical consultation.^[28] This study clearly shows that the prevalence of dysmenorrhea on female students of Bowen University is 87.1% alluding to the ubiquity of debility among these students. Similar findings were reported by Bello *et al.*^[29] (80%) and Eman,^[30] (76.1%). Previous studies conducted among Nigerian undergraduate students showed a similar prevalence rate.^[31,32]

About BMI, there was no statistically significant difference in dysmenorrhea between the participants, although, there were some indications that the information was trending in a particular direction. This was as per the report by Chauhan and Kala^[33] that link dysmenorrhea to BMI but by extremes in body weight. From our results, dysmenorrhea tends to increase in the overweight and obese groups (36.8%).

We also established a significant relationship between hip circumference and dysmenorrhea. Dysmenorrhea was prevalent in the group with smaller (0.80–1.00 m) hip circumference with a frequency of 168 participants experiencing dysmenorrhea whether mild, moderate, severe, or worst. This could mean that almost more than half of

Table 11: Relationship between menarcheal age and dysmenorrhea

Do you experience menstrual pain? * How old were you when you started menstruating?	Count				
	How old were you when you started menstruating?				Total
	<9 years of age	9-10 years	11-12 years	13-14 years	
	Always	2	32	69	
Never	1	23	14	13	51
Frequently	0	18	40	33	91
Not frequently	1	12	68	36	117
Total	4	85	191	120	400

Table 12: Blood flow effect on dysmenorrhea

	Chi-square Tests		
	Value	Df	Asymptotic significance (2-sided)
Pearson's Chi-square	27.486 ^a	12	0.007
Likelihood ratio	29.578	12	0.003
Linear-by-linear association	1.914	1	0.166
No of valid cases	400		

^a6 cells (30.0%) have expected count less than 5. The minimum expected count is 0.09

the young female adults throughout the world suffer from dysmenorrhea and need attention more attention than initially thought.

Almost half (70.1%) of the participants started menstruating before the age of 12 with the majority (47.8%) having a normal gynecology age (11–12 years) and experiences of dysmenorrhea are most common immediately after menarche. Most of the participants (61.5%) did not have a family history of dysmenorrhea.

They mostly (277) had menstrual cycle duration between 21–29 days with a regular menstrual pattern as 72.5% of them see their period every month and 68.5% of them menstruate 4–5 times in a month. We did not expect this regularity as menstruation is often irregular at early and late reproductive ages.^[34] This is a good sign as irregular and/or midcycle bleeding patterns could have indicated endocrine dysfunction and uterine abnormalities which have been linked to infertility, some types of cancers, diabetes, and cardiovascular disease.^[34]

We could state at this juncture that blood flow could influence dysmenorrhea as shown in our results.^[35] The respondents (16.8%) in this study reported heavy blood flow. Bleeding is heavy if it lasts for more than 7 days and/or the individual loses up to 80 mL of blood per menstrual cycle.^[36] Unsurprisingly, this is a common trend among

adolescents. These categories of women have significantly lower perceived general health and do not fully participate in school, work and athletic, and social activities.^[36] Broadly, the International Federation of Gynecology and Obstetrics defined it as excessive menstrual blood loss that interferes with a woman's physical, emotional, social, and material quality of life.^[36,37]

From our results, while tiredness is the most common symptom, many of the respondents suffered from anxiety, loss of appetite, headache, dizziness, nausea and vomiting, diarrhea, insomnia, and sweating. These results agree with a study conducted by Enam.^[38]

These symptoms led to decreased sports and social activities, decreased level of confidence, absenteeism from lectures, and hospitalization. In academic life, students tended to be absent from lectures, experiences decreased level of concentration as they are distracted from lectures.^[39]

In our study, about 40% of the girls reported absenteeism from lectures because of the associated pain and symptoms. This finding agrees with that of Hanan and Suzan^[39] and Farotimi *et al.*,^[32] Even though the symptoms were of moderate severity in the majority of students, they reduced the day-to-day activities thus requiring measures to control or abate these symptoms.

A non-steroidal anti-inflammatory drug helps in dysmenorrhea by decreasing intrauterine pressure and reducing prostaglandin F2 alpha levels in menstrual fluid. However, at higher doses, these class of drugs induces oxidative stress by lowering superoxide radicals, induce apoptosis, decrease nitric oxide synthase, decrease proinflammatory cytokines, and causes changes in the cellular membrane.^[40]

Despite the high proportions of sufferers in our study, only 4.2% of participants had sought medical intervention. This trend was reported in Ghana^[41] and Nigeria^[32] and could suggest a need for increased awareness against self-medication because the majority of dysmenorrhea affected individuals (38.7%) self-medicated.

This may have contributed to the low physician consultation rate, even lower than previously reported. Creating awareness regarding the danger of self-medication may be helpful.

Within the Hispanic culture, medical information is passed from mother to daughter and home remedies are often tried before seeking medical advice and this agrees with our study which showed that some students (23.4%) reported

medications were recommended by relatives (especially mothers).

Historically, menstruating women have been regarded as inferior, a view that persists in some cultures. Dysmenorrhea, on the other hand, is often seen as “normal” by many healthcare personnel, students, and parents. This has contributed to the sufferer’s hesitation to seek for medical help. This could also be attributed to the traditional folk’s beliefs passed from generations affecting the healthcare of millions of women of menstrual age where menstruation is viewed by many as a burden women must bear and hence, no matter how excruciating dysmenorrhea can be, it is considered as an inescapable plight.^[32]

We conclude that:

- i. Dysmenorrhea is highly prevalent among Bowen University female students.
- ii. They experience several symptoms severe enough to affect their quality of life as school performances, confidence, and concentration level decreased as well as performances in social and sports events.
- iii. Dysmenorrhea has no significant relationship with BMI but does relate to smaller hip circumference.
- iv. Dysmenorrhea tends to be higher in girls with late menarche than those with early menarche but this relationship is of no significant effect on dysmenorrhea.

We recommend that:

- i. Reproductive health education should not only focus on primary and secondary school students but should also be extended to university undergraduate. Besides, appropriate counseling and management should be established among these students to help them cope with the excruciating effects of dysmenorrhea.
- ii. Awareness about pharmacological and nonpharmacological pain relief during menstruation should increase and the importance of visiting medical personnel or clinic when pain is severe, unbearable and interfering with daily activities should be overemphasized and also the negative effects of self-medications.
- iii. Parents, health providers, and school/hostel administrative should be well enlightened on reproductive health to meet the needs of the students
- iv. The entire public should be enlightened to reduce the stigma caused by dysmenorrhea and to know how to help and care for those suffering from.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient (s) has/have

given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

References

1. Parveen N, Majeed R, Zehra N, Rajar U, Munir AA. Attitude and knowledge of medical students of Isra University about dysmenorrhoea and its treatment. *J Ayub Med Coll Abbottabad* 2009;21:159-62.
2. Harlow SD, Park M. A longitudinal study of risk factors for the occurrence, duration and severity of menstrual cramps in a cohort of college women. *Br J Obstet Gynaecol* 1996;103:11-34.
3. Dawood MY. Dysmenorrhea. *Clin Obstet Gynecol* 1990;33:168-78.
4. Durain D. Primary dysmenorrhea: Assessment and management update Characteristics of menstrual cycle and of the fertile phase. *Fertility Sterility* 2004;40:773-8.
5. Shilpa K, Shilpa D. Dysmenorrhea. *Obstet Gynecol Reprod Med* 2011;21:311-6.
6. Eittah HA. Effect of breakfast skipping on young female’s menstruation. *Health Sci J* 2014;8:469-84.
7. Salmalian H, Saghebi R, Moghadamnia AA, Bijani A, Faramarzi M, NasiriAmiri F. Comparative effect of thymus vulgaris and ibuprofen on primary dysmenorrhea: A triple-blind clinical study. *Caspian J Intern Med* 2014;5:82-8.
8. Amita S, Dukhu K, Harminder S, Bithika N, Prabhakar S, Pavan T. Prevalence and severity of dysmenorrhea: A problem related to menstruation, among first and second year female medical students. *Indian J Physiol Pharmacol* 2008;52:389-97.
9. Klein JR, Litt IF. Epidemiology of adolescent dysmenorrhea. *Pediatrics* 2011;68:661-4.
10. Latthe P, Mignini L, Gray R, Klan K. Factors predisposing woman to chronic pelvic pain: Systematic review. *Br Med J* 2006;332:749-55.
11. Dawood MY. Overall approach to the management of dysmenorrhea. In Dawood MY, editor. *Dysmenorrhea*. Baltimore: Williams and Wilkins; 1981. p. 261.
12. Wong LP, Khoo EM. Dysmenorrhea in a multiethnic population of adolescent Asian girls. *Int J Gynecol Obstet* 2010;108:139-42.
13. Tarimobo, Micheal O, Osah Onyemauche, Nwolim, John P. Age at menarche in Nigerian adolescent girls case study: Igbo, Yoruba, Hausa and Engenni tribes of Nigeria. *Eur J Pharm Med Sci* 2019;5:364-8.
14. Akbarzadeh M, Tayebi N, Abootalebi M. The relationship between age at menarche and primary dysmenorrhea in female students of Shiraz schools. *Shiraz E-Med J* 2017;18:4520.
15. Rostami M. The study of dysmenorrhoea in high school girls. *Pak J Med Sci* 2007;23:928-31.
16. Kindi RA, Bulushi AA. Prevalence and impact of dysmenorrhoea among Omani high school students. *J Pediatr Adolesc Gynecol* 2009;22:365-71
17. Muluneh AA, Nigussie TS, Gebreslasie, KZ, Anteneh KT, Kassa ZY. Prevalence and associated factors of dysmenorrhea among secondary and preparatory school students in Debremarkos town, North-West Ethiopia. *BMC Womens Health* 2018;18:57.
18. Hacker NF, Gambone JC, Hobel CJ. Hacker and Moore’s Essentials of Obstetrics and Gynecology. 5th ed. Philadelphia: Saunders Elsevier;

- 2009.
19. Adull Hakim NH, Muniandy ND, Ajau D. Nutritional status and eating practices among University students in selected Universities in Selangor, Malaysia. *Asian J Clin Nutr* 2012;4:77-87.
 20. Amirkhani Z, Akhlaghdoust M, GelarehRabie S, Jangholi E, Sadeghi M, Ghenaat F. Relation between fluoxetine and menstrual cycle disorders. *J Fam Reprod Health* 2012;6:95-8.
 21. Docanto MM, Ham S, Corbould A, Brown KA. Obesity- associated inflammatory cytokines and prostaglandin E2 stimulate glucose transporter mRNA expression and glucose uptake in primary human adipose stromal cells. *J Interferon Cytokine Res* 2015;35:600-5.
 22. Muzaffet T, Umut GB, YusufAG, Kurtulus O. The relationship between obesity and primary dysmenorrhea: Does increase in body mass affect dysmenorrhea? *Clin Exp Obstet Gynecol* 2017;44:777-81.
 23. Unsal A, Tozun M, Aslan G, Ayranci U, Alkan G. Evaluation of dysmenorrhea among women and its impact on quality of life in a region of western turkey. *Pakistan J Med Sci* 2010;26:142-7.
 24. Kim MJ, Baek IH, Go B-HO. The relationship between pelvic alignment and dysmenorrhea. *J Phys Ther Sci* 2016;28:757-60.
 25. Singh K, Srivasta D, Misra R, Tyagi M. Relationship between primary dysmenorrhea and body composition parameters in young female. *Int J Health Sci Res* 2015;5:150-5.
 26. Kafaei-Atrian M, Mohebbi-Dehnavi Z, Sayadi L, Asghari-Jafarabadi M, Karimian-Taheri Z, Afshar M. The relationship between the duration of menstrual bleeding and obesity-related anthropometric indices in students. *J Edu Health Promot* 2019;8:81.
 27. Montero P, Bernis C, Fernandez V, Castro S. Influence of body mass index and slimming habits on menstrual pain and cycle irregularity. *J Biosoc Sci* 1996;28:15-323.
 28. Afreen F, Mamatha KR, Banapura A, Kavitha R. Self medication practice in primary dysmenorrhea among medical and paramedical students- A cross-sectional questionnaire study. *Natl J Physiol Pharmacy Pharmacol* 2017;7:458-63.
 29. Bello FA, Akinyotu OO, Odunbamowo KH. Dysmenorrhea among female students at a teaching hospital in South-Western Nigeria. *Trop J Obstet Gynaecol* 2017;34:129-33.
 30. Enam M. Epidemiology of dysmenorrhea among adolescent students in Assuit city, Egypt. *Life Sci J* 2012;9:348-53.
 31. Olowookere AE, Oginni MO, Olajuba AO, William AE, Irinoye OO. Menstrual disorder: The implication on health and academic activities of female undergraduates in a federal University in Nigeria. *J Nurs Educ Pract* 2014;4:126-5.
 32. Farotimi AA, Esike J, Nwozichi CU, Ojediran TD, Ojewole FO. Knowledge, attitude and healthcare seeking behavior towards dysmenorrhea among female students of a private university in Ogun State, Nigeria. *J Basic Clin Reprod Sci* 2015;4:33-8.
 33. Chauhan M, Kala J. Relation between dysmenorrhea and body mass index in adolescents with rural versus urban variation. *J Obstet Gynaecol India* 2012;62:442-5.
 34. Dasharathy SS, Mumford SL, Pollack AZ, Perkins NJ, Mattison DR, Wactawski-Wende J, Schisterman EF. Menstrual bleeding patterns among regularly menstruating women. *Am J Epidemiol* 2012;175:536-45.
 35. Osayande AS, Mehulic S. Diagnosis and initial management of dysmenorrhea. *Am Family Physician* 2014;89:341-6.
 36. O'Brien SH. Evaluation and management of heavy menstrual bleeding in adolescents: The role of the hematologist. *Blood* 2018;132:2134-42.
 37. Munro MG, Critchley HO, Fraser IS. The FIGO systems for nomenclature and classification of causes of abnormal uterine bleeding in the reproductive years: Who needs them? *Am J Obstet Gynecol* 2012;207:259-65.
 38. Lacovides S, Avidon I, Baker FC. What we know about primary dysmenorrhea today: A critical review. *Human Reprod Update* 2015;21:762-78.
 39. Harlow SD, Campbell OM. Epidemiology of menstrual disorders in developing countries: A systematic review. *BJOG* 2004;111:6-16.
 40. Livshits A, Seidman DS. Role of non-steroidal anti-inflammatory drugs in gynecology. *Pharmaceuticals* 2010;3:2082-9.
 41. Gumanga SK, Kwame-Aryee RA. Menstrual characteristics in some adolescent girls in Accra, Ghana. *Ghana Med J* 2012;41:1-7.