



# Exploring the Impacts of Menstrual-Pelvic Pain on School Activity in Rural Secondary School Girls

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## Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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## ABSTRACT

**Aims:** Pelvic pain (PP) during menstruation (Dysmenorrhea) is one of the common complaints of women. menstruation has a great negative impact on the quality of life of women both psychologically, behavioural and social well-being. This study is to determine the prevalence of PP during menstruation among secondary school girls.

**Methodology:** A cross-sectional study design conducted among female students at some selected high schools in Anambra state, South-eastern Nigeria in February 2023. A total of 392 study participants were recruited using a convenience sampling technique. A pretested self-administered structured questionnaire was employed. Microsoft excel and SPSS version 26 were used for data entry and analysis respectively.

**Results:** 392 female adolescent high school students aged between 8-19 years old with a mean age at menarche  $12.85 \pm 1.47$  years. 58.9% reported having their menstrual bleeding lasting for 4 days. The prevalence of PP during menstruation was 86.31% with 29.90% with a numerical pain rating of 10. 39.20% reported taking painkillers gotten over the counter, 71.43% reported the pain affecting their activities in school, majority 32.7% don't socialize with their classmate and 32.0% do not concentrate in classes. While 29.4% do not participate in school outdoor sports activities, 20.3% don't participate in other school social activities. Statistically significant associations existed between PP during menses and age, age at menarche, bleeding length and bleeding intensity ( $p < 0.05$ ). The school participation of Participants with severe PP during menses were significantly affected ( $p = 0.0001$ ).

**Conclusion:** PP during menstruation was highly prevalent in this study, and highly affected the students' participation in school activities. The implication of this study highlights the importance of raising awareness, improving access to healthcare services, integrating menstrual health education into the curriculum, and adopting a multidisciplinary approach to support affected adolescents.

*Keywords: Menstrual; pelvic pain; school girls; rural.*

## 1. INTRODUCTION

Menstruation is a natural phenomenon among matured female in which they experience shedding of blood for 1-7 days from the age of maturity till the age of menopause (which is the age menstruation stops) [1]. Menstruation is usually regarded as a mark of a female's reproductive phase.

Often on a mean, every woman experiences a painful cramping sensation within the lower abdominal region on or before menstruation [2]. Pelvic pain (PP) during menstruation (Dysmenorrhea) is one of the common complaints of women, it is simply a painful menstrual condition that is characterized by a PP during menstruation that lasts 48-72 hours [3]. There are two types of dysmenorrhea, primary and secondary dysmenorrhea. The secondary dysmenorrhea usually occurs as a result of an underlying gynecological diseases such as endometriosis, adenomyosis, uterine myoma, fibroids, pelvic inflammatory disease [3,6]. Primary dysmenorrhea is a painful menstruation that occurs without any gynecological diseases. There are some factors associated with the cause of this type of dysmenorrhea such as stimulation of the type C pain fibers, prostaglandin  $F_{2\alpha}$ , and increased vasopressin

and oxytocin that subsequently enhance the secretion of prostaglandin [7,8].

Generally, PP during menstruation has a great negative impact on the quality of life of women both psychologically, behavioral and social well-being of the person as such individuals usually complain of nausea, vomiting, headache, cramps and sometimes syncope [4,5]. A study in the eastern part of Nigeria reported the prevalence of primary dysmenorrhea as 25% with 25% of them severely disabled to attend school, 53.3% among and 82.3% female university students [9,10,11]. PP during menstruation adversely affects the academic performance of students as proven by a study on female medical students as many severe dysmenorrhea played so many roles in absenteeism in school as proven by some other studies. It's also a great contributing factor to apathy or inactivity in other physical and social school activities [12,13,14].

The primary objective of this study is to explore the reported symptoms associated with PP and their severity, additionally to determine the prevalence of PP. By gathering comprehensive data on the prevalence and characteristics of menstrual pain, this study will contribute to the existing body of knowledge on dysmenorrhea among adolescent girls.

## 2. MATERIALS AND METHODS

### 2.1 Study Location

This study was conducted in some selected secondary schools in the Anaocha Local Government areas of Anambra State, Nigeria between January and March 2023. The schools were conveniently chosen, and a total of three public and two private high schools were included. Specifically, one school was selected from each of the following towns: Adazi-enu, Adazi-ani, Akwaeze, Obeledu, and Agulu.

The selection of towns was based on their proximity to the researchers and their classification as rural areas according to the definition provided by National Geographic in 2012. These rural towns are characterized by a small number of homes and buildings, low population density, and a predominantly agricultural-based economy. Agriculture serves as the primary industry in these areas [15].

### 2.2 Study Design

A descriptive cross-sectional study was employed for the purpose of this research.

### 2.3 Sample Size

$$n = z^2 p(1-p) \div e^2$$

where;

$$z = 1.96$$

$$e = 0.05$$

$$p = 0.73 [18]$$

n = 290. However, 392 responses were collected.

### 2.4 Sampling Technique and Study Population

A convenience sampling technique was used to recruit the participants (n=392). A study by Malitha et al. indicated that early menarche often set in within the age of 10-12 and a study by Anikwe et al., showed that menarche to often set in at 13±1.0 years [16,17]. The population includes adolescent female students of the selected schools from the age of 8-19 years old.

### 2.5 Inclusion Criteria

This included female students of the selected schools within the ages of 8-19 with no known pelvic pathology, present in the school during the data collection, and has consented their participation in the study.

### 2.6 Exclusion Criteria

Any students who had a known medical condition or had undergone surgical interventions related to PP or menstrual disorders were excluded from the study. This was done to ensure that the study focused specifically on PP experienced by otherwise healthy high school students. Male students, students below 8 and more than 19 years, or female students who were absent during the time of data collection.

### 2.7 Study Instrument

In this study, a pretested semi-structured questionnaire was utilized to gather data from participants. The questionnaire was derived from existing literature [19,20,21] and consisted of three main parts: socio-demographic characteristics (age, who they live with, occupation and education qualification of their parents/guardian), obstetric/gynecological related characteristics (age at menarche, use of hormonal contraceptives, bleeding length, and symptoms manifested during their period), History of PP during menstruation (regularity of their period, presence of PP, frequency, intensity of pain, duration, and management.), and History of affectation of school activities. It is important to note that the term "primary dysmenorrhea" refers to pain associated with menstruation without any underlying pelvic pathology.

The questionnaire was validated by a panel of experts, and was pretested with 4 students who were later excluded in the study to check its usability as well as to record the average required time of responses.

With a verbal report from the Numeric Rating Scale (NRS); the intensity of menstruation related PP was considered as no pain (NRS = 0), mild pain (NRS = 1–3), moderate pain (NRS = 4–6), and severe pain (NRS = 7–10) [22].

### 2.8 Procedure for Data Collection

In this study, we adhered to ethical guidelines and obtained ethical approval from Nnamdi Azikiwe University Teaching Hospital (NAUTH/CS/66/VOL.16/VER.3/118/2022/045). The research questionnaire was administered primarily at the cluster points, typically in the students' classrooms while they awaited their lectures. To facilitate data collection, we enlisted the assistance of trained research assistants who played a crucial role during the fieldwork process.

Prior to participation, written informed consent was obtained from all participants after providing them with comprehensive information about the research objectives, procedures, and potential risks or benefits involved. We ensured that participants had a clear understanding of their rights and responsibilities as research participants. To maintain confidentiality, the identity and responses of participants were treated with utmost confidentiality and were kept anonymous.

The questionnaire was interviewer-administered to the participants to ensure consistency in data collection and minimize potential errors or biases. This approach allowed us to clarify any ambiguities and obtain accurate responses from the participants. By employing this method, we aimed to enhance the reliability and validity of the collected data.

### 2.9 Procedure for Data Analysis

The data collected were cleaned and analysed using statistical package for the social sciences

(SPSS) version 26. Numerical variables were reported as mean and standard deviation, while categorical data were reported using proportion and percentages. Chi-square test was used to assess the association between categorical variables. Variables with p-value  $\leq 0.05$  in the confidence interval of 95% was taken as being significant.

### 3. RESULTS

Table 1 summarizes the socio-demographics of the respondents. The majority (57.7%) were between the ages 14-16years, while just 0.8% as the minority were between 8-10 years old. Of the total participants, 340 respondents (86.7%) responded to be living with their parents, while the other 13.3% affirmed to live with their guardian. Business was the major occupation of both the fathers and mothers of the respondents at 40.8% and 64.5% respectively. Majority of the participants reported SSCE as the highest level of education for their fathers and mothers with a prevalence of 53% and 59% respectively.

**Table 1. Socio-demographic characteristic of the respondents**

Variable	Frequency (N=392)	Percentage (%)
Age (years)	8-10 Years old	.8
	11-13 Years old	15.3
	14-16 Years old	57.7
	17-19 Years old	26.3
Who do you live with?	Parents	86.7
	Guardian	13.3
Mother's occupation	Teacher	5.6
	Business	40.8
	Farmer	12.5
	Tailor/Seamstress	1.8
	Engineer	10.5
	Doctor	2.0
	Driver	12.2
	Company worker	5.4
	Clergy/pastor	3.1
	Craft worker	6.1
Father's occupation	Teacher	10.2
	Business	64.5
	Business and farmer	.8
	Farmer	11.2
	Tailor/seamstress	4.6
	Engineer	.5
	Doctor	2.6
	Company worker	4.1
	Clergy/pastor	1.5
Mother's highest level of education	FSLC	19.7
	SSCE	59
	BSC	16.8
	Others	4.6

Variable		Frequency (N=392)	Percentage (%)
Father's highest level of education	FSLC	90	23.0
	SSCE	208	53.0
	BSC	76	19.4
	Others	18	4.6

**Table 2. Gynaecologic history of the respondents**

Variable	Frequency	Percentage (%)
<b>Age at menarche</b>		
<= 11	32	8.2
12 – 15	353	90.1
≥16	7	1.8
<b>Average age at menarche</b>	<b>12.85±1.47 years</b>	
<b>Hormonal contraceptive usage?</b>		
No	351	89.5
Yes	41	10.5
<b>Bleeding length</b>		
1 day	2	.5
2 days	10	2.6
3 days	30	7.7
4 days	231	58.9
5 days	95	24.2
6 days	14	3.6
7 days	10	2.6
<b>Average bleeding length(days)</b>	<b>4.25±0.88 days</b>	
<b>Bleeding intensity</b>		
Heavy	81	20.7
Moderate	183	46.7
Light	111	28.3
Can't remember	17	4.3
<b>Symptoms manifested during menses</b>		
Pelvic pain	247	63.0
Bleeding from back passage when opening the bowel	24	6.1
Lower back pain	38	9.7
Nausea	42	10.7
Fatigue	166	42.3
blood in urine	27	6.9
pain during urination	38	9.7
pain on opening bowel	56	14.3
pain in upper leg or thighs	16	4.1

**Table 3. Respondents' history of pelvic pain during menstruation**

Variable	Frequency	Percentage
Have you had period in the last 3 months?	No	32
	Yes	360
In the last three months have you had pelvic pains during your period?	No	59
	Yes	301
In the last three months, how often was the pelvic pain that came with your period?	Occasionally	69
	Often	89
	Always	143
How long does the pain last for each time?	For some minutes during my period	93
	Less than 5 hours	31

	More than 5 hours during my period	36	11.96
	For a day during my period	74	24.58
	Some days during my period	55	18.27
	Throughout my period	12	4.00
In the last 3months have you taken pain killer prescribed by the doctors for the pain?	No	236	78.41
	Yes	65	21.59
In the last 3months have you taken pain killer gotten over the counter for the pain?	No	183	60.80
	Yes	118	39.20
In the last 3months have you had to lie down for any part of the day or longer because of your period pain?	Never	54	17.94
	Occasionally	97	32.23
	Often	59	19.60
	Always	91	30.23
Visual analogue scale of worst pain in the last 3 months	1	1	0.33
	2	2	0.66
	3	21	6.98
	4	19	6.31
	5	67	22.26
	6	54	17.94
	7	20	6.64
	8	11	3.65
	9	16	5.32
	10	90	29.90
<b>Overall Level of pelvic pain</b>			
Mild pain (< 33.33%)	107	27.3	
Moderate (33.33 - 66.65%)	181	46.2	
Severe pain (≥66.66)	104	26.5	
Average pelvic pain level	<b>45.49±28.48%</b>		

**Table 4. Menstrual pain and school activities**

<b>Variable</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Does the pelvic pain that occur during your menses affect your participation in school activities?</b>		
No	86	28.57
Yes	215	71.43
Total	301	100.0
<b>If yes, how does it affect your participation in school activities?</b>		
I don't socialize with my classmates	129	32.7
I don't concentrate in the class	126	32.0
I don't participate in school's outdoor sports activities	116	29.4
I don't participate in school's social activities	80	20.3
I don't participate in school's indoor sports activities	89	22.6
I always sleep in the class to feel better when I have pelvic pain	79	20.1
I don't come to school due to the pelvic pain	51	12.9
I don't participate in other extra school's academic activities due to the pelvic pain	62	15.7
I come late to school due to the pelvic pain	21	5.3
I don't do my assignments due to the pelvic pain	20	5.1
I have missed or don't write quizzes due to pelvic pain	9	2.3
I have missed or don't write exams due to pelvic pain	1	.3

**Table 5. The relationship between socio-demographics/gynaecologic history of the respondents and the level of their pelvic pain during menstruation**

		Respondents' level of menstrual pelvic pain				Chi-square ( $\chi^2$ )	df	p-value ( $\leq 0.05$ )
		Mild pain ( $<33.3\%$ )	Moderate pain ( $33.3-66.65\%$ )	Severe pain ( $\geq 66.66\%$ )	Total			
Age	8-10	0(0.0%)	3(100.0%)	0(0.0%)	3(100.0%)	34.41	6	0.0001*
	11-13	22(36.7%)	30(50.0%)	8(13.3%)	60(100.0%)			
	14-16	75(33.2%)	98(43.4%)	53(23.5%)	226(100.0%)			
	17-19	10(9.7%)	50(48.5%)	43(41.7%)	103(100.0%)			
	<b>Total</b>	<b>107(27.3%)</b>	<b>181(46.2%)</b>	<b>104(26.5%)</b>	<b>392(100.0%)</b>			
Age at Menarche	$\leq 11$	1(3.1%)	18(56.3%)	13(40.6%)	32(100.0%)	11.63	4	0.02*
	12 – 15	103(29.2%)	160(45.3%)	90(25.5%)	353(100.0%)			
	$\geq 16$	3(42.9%)	3(42.9%)	1(14.3%)	7(100.0%)			
	<b>Total</b>	<b>107(27.3%)</b>	<b>181(46.2%)</b>	<b>104(26.5%)</b>	<b>392(100.0%)</b>			
Hormonal contraceptive usage	No	96(27.4%)	167(47.6%)	88(25.1%)	351(100.0%)	4.13	2	0.13
	Yes	11(26.8%)	14(34.1%)	16(39.0%)	41(100.0%)			
	<b>Total</b>	<b>107(27.3%)</b>	<b>181(46.2%)</b>	<b>104(26.5%)</b>	<b>392(100.0%)</b>			
Bleeding length	1 day	0(0.0%)	2(100.0%)	0(0.0%)	2(100.0%)	22.64	12	0.031*
	2 days	1(10.0%)	6(60.0%)	3(30.0%)	10(100.0%)			
	3 days	8(26.7%)	19(63.3%)	3(10.0%)	30(100.0%)			
	4 days	55(23.8%)	102(44.2%)	74(32.0%)	231(100.0%)			
	5 days	34(35.8%)	41(43.2%)	20(21.1%)	95(100.0%)			
	6 days	6(42.9%)	4(28.6%)	4(28.6%)	14(100.0%)			
	7 days	3(30.0%)	7(70.0%)	0(0.0%)	10(100.0%)			
	<b>Total</b>	<b>107(27.3%)</b>	<b>181(46.2%)</b>	<b>104(26.5%)</b>	<b>392(100.0%)</b>			
Bleeding Intensity	Heavy	12(14.8%)	47(58.0%)	22(27.2%)	81(100.0%)	15.18	6	0.019*
	Moderate	62(33.9%)	79(43.2%)	42(23.0%)	183(100.0%)			
	Light	29(26.1%)	45(40.5%)	37(33.3%)	111(100.0%)			
	Can't remember	4(23.5%)	10(58.8%)	3(17.6%)	17(100.0%)			
	<b>Total</b>	<b>107(27.3%)</b>	<b>181(46.2%)</b>	<b>104(26.5%)</b>	<b>392(100.0%)</b>			

\* Statistically significant

**Table 6. The relationship between the respondents' school activities affectation to the level of their pelvic pain during menstruation**

		Respondents' level of menstrual pelvic pain				Chi-square ( $\chi^2$ )	df	p-value ( $\leq 0.05$ )
		Mild pain ( $<33.3\%$ )	Moderate pain ( $33.3-66.65\%$ )	Severe pain ( $\geq 66.66\%$ )	Total			
school activities affectation by menstrual pelvic pain	No	102(57.6%)	58(32.8%)	17(9.6%)	177(100.0%)	156.2	2	0.0001*
	Yes	5(2.3%)	123(57.2%)	87(40.5%)	215(100.0%)			
	<b>Total</b>	<b>107(27.3%)</b>	<b>181(46.2%)</b>	<b>104(26.5%)</b>	<b>392(100.0%)</b>			



Table 2 summarizes the gynaecologic history of the respondents. The age at menarche for most of them were between 12-15 years with a mean age at menarche of about  $12.85 \pm 1.47$  years. Only 10.5% of the respondents have used hormonal contraceptive. Majority of them have menstrual bleeding length of 4-5 days (83.1%), with an average bleeding length (days) of about  $4.25 \pm 0.88$  days.

With respect to bleeding intensity, majority fell between light and moderate bleeding (75.0%), however only 20.7% experienced heavy menstrual bleeding. Pelvic pain and fatigue were the commonest symptoms they manifest during their menses with a prevalence of 63.0% and 42.3% respectively.

Table 3 summarizes the respondents' history of pelvic pain during menstruation. 360(91.8%) saw their menses in the last 3 months; of which about 301(83.6%) had pelvic pain during their period. Most experienced the pelvic pain always during their period (47.5%); however, about 1/3<sup>rd</sup> reported the pelvic pain to last for just some minutes. Majority have not taken any prescribed painkillers for the pelvic pain (78.4%), nor over-the-counter painkiller (60.8%). Only 17.9% never have to lie down for any part of the day because of the period pain; and also, about 1/3<sup>rd</sup> rated their pelvic pain ten (10) being the worst pain they felt in the last 3 months.

Overall, approximately half of the respondents' experienced moderate pelvic pain (46.7%), with a mean pain score of about  $45.49 \pm 28.48\%$ .

Table 4 summarizes how the menstrual pain affected their school activities. A great majority (71.4%) of the respondents reported that the pelvic pain during their menses affected their participation in school activities. The commonest school activities affected include: inability to socialize with classmates (32.7%), inability to concentrate in the class (32.0%), inability to participate in outdoor and indoor sports activities, with a prevalence of 29.4% and 22.6% respectively.

Table 5 the relationship between socio-demographics of the respondents and the level of their pelvic pain during menstruation at the bivariate level using chi-square test of statistical significance. Statistically significant associations existed between pelvic pain during menses and age, age at menarche, bleeding

length and bleeding intensity; as respondents within the age range 17 -19 years, those that achieved menarche earlier, those with bleeding length of 4 days and light menstrual flow have severe pelvic pain during menses compared to others.

Table 6 summarizes the relationship between the respondents' pelvic pain during menstruation and school activities affectation at the bivariate level using chi-square test of statistical significance. Statistically significant association existed between respondents' pelvic pain during menses and school activities affectation as the school activities of those with severe pelvic pain during menses were affected.

## 4. DISCUSSION

### 4.1 Socio-demographics

Menstrual health plays a crucial role in the overall well-being of adolescent girls. A comprehensive understanding of menstrual patterns and characteristics and the prevalence of PP is essential for promoting reproductive health in this population. The study encompassed a representative sample of 392 adolescent girls aged 8 to 19 years. The inclusion of a substantial number of participants within this age range enhances the generalizability and reliability of the study findings. Consequently, the results hold significant implications for understanding menstrual health in a broader context.

The majority of our participants (86.7%) reported living with their parents, indicating a relatively high proportion of adolescents residing with their biological parents. The remaining respondents lived with their guardians, suggesting a diverse range of family structures within the studied population. When examining the educational background of the parents, we found that a significant number of fathers and mothers had a business inclination as their occupation. This finding suggests a prevalence of entrepreneurial pursuits among the parents of our participants, which may have justifications for the socioeconomic context (rural) in which these adolescents are raised.

Additionally, a substantial proportion of the fathers (64.5%) and mothers (40.8%) had attained a senior school certificate as their highest level of education. These educational

attainment levels indicate a moderate level of formal education among the parents in our sample. It is worth noting that the prevalence of PP among high school students cannot be solely attributed to living arrangements or the educational background of their parents.

PP is a multifactorial condition influenced by various biological, psychological, and social factors [20,21]. However, these findings provide valuable insights into the sociodemographic characteristics of the study participants and contributed to our understanding of the contextual factors that may influence the experience of PP among high school students.

The findings of this study revealed a distribution of age at menarche as follows: 8.2% of the students experienced menarche before the age of 11, 90.1% between the ages of 12 and 15, and 1.8% at or after the age of 16. These results indicate that the majority of the students in our sample experienced menarche during the typical age range of adolescence.

## 4.2 Gynaecological History

The finding regarding the mean age at menarche ( $12.85 \pm 1.47$  years), in our study, is similar to that of some other similar studies [23,24,25,26], but slightly lower than the findings of some other similar studies [27,28] and contributes to the existing body of literature on adolescent development and provide insights into the timing of this physiological event among high school students. Future research could explore potential factors influencing the age at menarche, such as nutritional status, socioeconomic status, and psychosocial factors, to gain a more comprehensive understanding of the determinants and implications of early or late menarche in this population.

Another noteworthy observation from the study was the low prevalence of hormonal contraceptive use, with only 10.5% of the respondents reporting its utilization. This indicates that the majority of adolescent girls in the study were not employing hormonal contraceptives for contraception or other purposes. This finding may be associated with their parental financial status, their level of exposure, knowledge, and accessibility to these contraceptives. However, further investigation is warranted to elucidate the factors influencing

contraceptive decision-making within this demographic.

The study examined both the duration and intensity of menstrual bleeding among participants. The findings indicate that most respondents experienced menstrual bleeding lasting for 4-5 days, with an average bleeding duration of approximately  $4.25 \pm 0.88$  days. Furthermore, a significant majority (75%) reported light to moderate menstrual bleeding, while only 20.7% experienced heavy menstrual bleeding. These results suggest that heavy menstrual bleeding is less prevalent among adolescent girls in the studied population.

In addition to the menstrual characteristics, we examined some common symptoms that occur during their menstruation. A greater population 247 and 166 reported the occurrence of PP and fatigue respectively during their menstruation, while the least population reported bleeding from the back passage when opening the bowel.

We investigated the occurrence of menstruation among our respondents in the past 3 months. The findings revealed that a substantial majority of participants, specifically 91.8%, reported having had menstruation during this period. This high prevalence suggests that the study sample represents a population that experiences regular menstrual cycles.

The confirmation of menstruation in the past 3 months indicates that the study participants were within the target demographic for investigating menstrual-related symptoms and experiences. These findings align with the expected occurrence of menstruation in individuals of the reproductive age group. Menstruation is a natural physiological process that typically occurs on a monthly basis in individuals with regular menstrual cycles. The high proportion of respondents reporting recent menstruation supports the validity and reliability of the data collected in relation to menstrual health and related variables.

## 4.3 Prevalence of Pelvic Pain During Menstruation

We observed a high prevalence of PP during menstruation among our respondents, with 83.61% reporting experiencing this symptom which is similar to the findings of Grandi et al.

[29] but slightly higher in similar studies [28,30]. This result indicates that menstrual pain is a prevalent issue within our study population and warrants further attention and investigation.

Furthermore, among those experiencing menstrual pain, a significant proportion, specifically 47.51%, reported that the pain occurred consistently throughout the duration of their menstrual bleeding. This suggests that for almost half of the individuals who experience menstrual pain, it is a persistent and ongoing symptom that accompanies the entire duration of their menstrual cycle.

In addition to the participants experiencing pain throughout their entire menstrual bleeding, a substantial number, comprising 29.57%, reported the pain to occur often during this period. This indicates that for these individuals, menstrual pain is a recurring symptom that may vary in intensity or frequency but is consistently present during their menstrual cycles.

Moreover, a smaller percentage of respondents, specifically 22.92%, reported experiencing pain occasionally during their menstrual bleeding. This suggests that for this group, menstrual pain is not a constant symptom but rather occurs infrequently or intermittently during their menstrual cycles.

Our findings shed light on the duration, management, and impact of this symptom among our respondents. Among the participants who reported experiencing PP during their menstrual periods, a significant proportion, comprising 93 individuals, reported that the pain lasted only for a few minutes. This suggests that for a considerable number of individuals, the PP experienced during menstruation is relatively short-lived and may not have a prolonged impact on their daily activities.

In contrast, 74 respondents reported that the PP during their period lasted for a day. This indicates that for a considerable subset of individuals, the duration of PP extends beyond a few minutes and may persist throughout a significant portion of their menstrual cycle.

When examining the management of PP, our study revealed that a notable majority, specifically 78.41% of respondents, reported not taking analgesics for their PP based on a doctor's prescription. This suggests that many

individuals either did not seek medical intervention or received alternative forms of pain management for their menstrual PP which may be associated with their level of education, parental education, and financial status. On the other hand, 39.20% of participants reported obtaining analgesics over the counter to alleviate their PP. This indicates that a substantial proportion of individuals self-medicate with over-the-counter analgesics to manage their menstrual PP. This finding is relatively lower than the findings of Ortiz et al. [31,32].

Furthermore, we assessed the impact of PP on individuals' daily activities and found that 17.94% of respondents reported never having to lie down due to period pain. In contrast, 32.23% reported lying down occasionally, 19.60% reported lying down often, and 30.23% reported lying down always due to their period pain. These results highlight the varying degrees to which PP during menstruation can interfere with individuals' ability to carry out their regular activities, with a significant proportion experiencing a need to lie down for a portion or the entirety of the day.

Among the subjects who participated in our study, a significant majority reported NRS scores indicating varying degrees of pain intensity. Specifically, 29.90% of participants reported a NRS score of 10, which represents the highest level of pain on the scale. This suggests that a substantial subset of individuals experienced the most severe pain imaginable. This study revealed that approximately 46.2% of respondents reported moderate PP during their menstrual cycles, with a mean pain score of approximately  $45.49 \pm 28.48\%$ .

Various demographic factors, including age, age at menarche, hormonal contraceptive usage, bleeding length, and bleeding intensity, have been identified as potential contributors to the experience of PP among adolescent girls [33,34,35,36]. This study's statistical analyses demonstrated significant associations between PP and several variables, including age, age at menarche, bleeding duration, and bleeding intensity.

Notably, female students between the ages of 17-19 years experienced more severe pain, and least mild pain when compared to other female students. While no significant association was found between the age at menarche and PP during mensuration, a finding

which is contrary to that of some similar studies where age at menarche showed a significant association with menstrual pain characteristics. [37,38], our study suggests no association between age at menarche and PP following the findings of Akbarzadeh et al. [39].

The findings of this study indicate a notable association between the use of hormonal contraceptives and the presence of severe PP during menstruation among female high school students. Specifically, our results reveal that approximately 39.0% of the participants who reported using hormonal contraceptives experienced severe PP during their menstrual cycles. While this finding is contrary to that of [40,41] This observation suggests a potential link between the use of hormonal contraceptives and an increased likelihood of experiencing intense PP during menstruation. The association between hormonal contraceptives and PP is consistent with previous research in this area. Several studies have suggested that the use of hormonal contraceptives, such as oral contraceptive pills or hormonal intrauterine devices, may impact menstrual-related symptoms, including PP [42,43]. The hormones present in these contraceptives can affect the uterine lining, hormone levels, and prostaglandin production, which are factors known to influence menstrual pain [44,45].

It is important to note that although a significant association was observed between hormonal contraceptive use and severe PP during menstruation, causality cannot be determined from this study alone. Further research is needed to explore the underlying mechanisms and potential confounding factors that may contribute to this association. Additionally, it is crucial to consider individual variations in response to hormonal contraceptives, as the impact on PP may vary among different individuals.

Further, we investigated the association between bleeding duration, bleeding intensity, and PP during menstruation, and contrary to our initial hypothesis, our findings revealed no significant association between bleeding duration and PP during menstruation, as well as between bleeding intensity and PP during menstruation. The majority of our participants reported a menstrual bleeding duration of 4-5 days and moderate and light bleeding. Despite the relatively consistent range of these variables, there was no statistically

significant relationship observed with PP during menstruation.

There could be several factors contributing to the lack of association observed in our study. It is plausible that other factors, such as hormonal fluctuations, psychosocial aspects, or individual pain thresholds, may play a more significant role in determining the experience of PP during menstruation in this particular population. Moreover, individual variations and subjective interpretations of pain perception may have influenced our results.

It is essential to acknowledge the limitations of our study. The cross-sectional design limits our ability to establish causality or examine the temporal relationship between bleeding intensity and pelvic pain. Additionally, relying on self-reported data introduces the possibility of recall bias or subjective interpretations of pain and bleeding intensity.

#### **4.4 Affectation of School Activities By Pelvic Pain Occurrence During Menstruation**

Our study revealed a significant impact of pelvic pain during menstruation on the participation of female adolescents in school activities. A substantial majority comprising of 71.4% of our majority reported experiencing limitations in their engagement in various school-related tasks due to pelvic pain.

Among the affected school activities, the inability to socialize with classmates was reported by 32.7% of the participants. This suggests that pelvic pain not only has physical ramifications but also affects the social dynamics within the school environment. Difficulties in establishing and maintaining social connections during menstruation can have a negative impact on a student's sense of belonging and overall educational experience.

Furthermore, 32.0% of the respondents expressed an inability to concentrate in the classroom. Menstrual-related pelvic pain can lead to discomfort, distraction, and decreased focus, potentially hindering academic performance and impeding the learning process for these adolescents. In terms of physical activities, both outdoor and indoor sports activities were affected, with a prevalence of 29.4% and 22.6%, respectively. This suggests that the pain experienced during menstruation

may limit their ability to actively participate in sports, leading to reduced physical fitness and missed opportunities for skill development, teamwork, and overall personal growth.

12.9% of our respondents, reported not attending school at all due to the PP associated with their menstrual cycles. This suggests that the severity of the pain experienced by some individuals is significant enough to warrant absenteeism as shown in similar studies [11,39], potentially leading to educational gaps and decreased academic achievement. Additionally, 5.3% of the participants reported arriving late to school due to PP, while 5.1% expressed challenges in completing their assignments. These findings highlight the potential impact of menstrual-related PP on punctuality and academic productivity.

Furthermore, 2.3% of the respondents reported missing quizzes due to the pain, indicating that the discomfort associated with menstruation can directly affect their academic assessments and potentially contribute to lower grades or performance evaluation.

## 5. CONCLUSION

These results of this study underscore the pressing need to address menstrual-related PP among female adolescents in rural secondary schools. Efforts should be made to raise awareness, provide appropriate support and resources, and implement interventions that mitigate the impact of this pain on students' academic engagement, social interactions, and overall well-being.

## CONSENT

Written informed consent was obtained from all participants after providing them with comprehensive information about the research objectives, procedures, and potential risks or benefits involved.

## ETHICAL APPROVAL

In this study, we adhered to ethical guidelines and obtained ethical approval from Nnamdi Azikiwe University Teaching Hospital (NAUTH/CS/66/VOL.16/VER.3/118/2022/045).

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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