

## PREVALENCE AND PREDICTORS OF OVERALL IMPACT OF DYSMENORRHOEA ON SCHOOL ACTIVITIES AMONG SENIOR SECONDARY SCHOOL STUDENTS IN OGBOMOSO SOUTH-WEST, NIGERIA

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### Abstract

**Context:** Dysmenorrhoea has been identified as a public health problem due to

its high prevalence, the level of discomfort felt by the sufferer as well as the reduction in the quality of life of female students. It has been identified as the most common menstruation-related cause of short-term school absenteeism among young girls.

**Aim:** To determine the prevalence and overall impact of dysmenorrhea on school activities among senior secondary school students in Ogbomosho, South-West, Nigeria. **Methods and Material:** A community based descriptive cross-sectional study involving female students attending both private and public senior secondary schools in Ogbomosho North, Oyo state. A multistage stratified sampling technique was used and a semi-structured self-administered Questionnaires were administered to 450 participants.

**Statistical analysis used:** The data were analysed using the Statistical Package for Social Science version 22. Chi-square test was used to test for association between categorical variables and Logistic regression analysis was performed to determine the predictors of overall impact of dysmenorrhoea on school activities.

**Results:** The prevalence of dysmenorrhea was 72.4%. Predictors of the overall impact of dysmenorrhea on the school activities were ethnicity, regular menstrual cycle, severity of abdominal pain and vomiting.

Respondents of Yoruba ethnicity, vomiting and those with moderate and severe abdominal pain were more likely to have negative impacts while respondents with regular menstrual cycles were less likelihood to have negative impacts and these were statistically significant.

**Conclusion:** Dysmenorrhoea is a common health problem among senior secondary school students with a prevalence of 72.4%. The respondent's ethnicity, regular menstrual cycle, severity of abdominal pain and vomiting were predictors of overall impact of dysmenorrhoea on school activities.

**Keywords:** Dysmenorrhoea, Prevalence, Overall impact, School activities

## Introduction

Dysmenorrhoea has been identified as a public health problem due to its high prevalence, the level of discomfort felt by the sufferer as well as the reduction in the quality of life of female students [1,2]. Dysmenorrhoea refers to painful menstruation and is a common gynaecologic problem that significantly affects the daily life and academic performance of most of the affected female

students [3-5]. Dysmenorrhoea is characterised by pain in the lower abdomen, extending to the lower back or legs [6,7]. It is often accompanied by sweating, tachycardia, headache, nausea, vomiting, diarrhoea, breast tenderness, and mood changes, which were the most common causes of class absenteeism and difficulty in studying [8-10]. It can be classified into primary dysmenorrhoea in which there is no visible pelvic pathology, or secondary dysmenorrhoea with an identifiable pelvic disorder [11,12]. The possible explanation of the menstrual cramps of dysmenorrhoea has been attributed to excessive production of uterine prostaglandins, particularly of prostaglandins F2 $\alpha$ , which causes myometrial hyper contractility and arterial vasoconstriction [11]. When compared to women without dysmenorrhoea, those women with dysmenorrhoea have higher levels of prostaglandins, most especially within the first 2 days of onset menses [13]. The uterine activity seen during the severe period is greater and more intense than that

experienced in labour and causes a raise in intrauterine pressures well above tissue perfusion thresholds <sup>[14]</sup>.

Dysmenorrhoea is one of the most common gynaecologic disorders among adolescent girls. The estimated burden of dysmenorrhoea worldwide ranges from 50% to 95% <sup>[15,16]</sup>. The variation is considered to be due to studies conducted among different age groups, the use of different definitions and/or the absence of a standard method for measuring the severity of pain <sup>[17]</sup>. Dysmenorrhoea is also the most common gynaecologic disorder which has an impact on academic performance and daily activities of most students <sup>[3,5,10,18,19]</sup>. Worldwide, the prevalence of dysmenorrhoea ranges from 16 to 91%, and 10– 20% of them are of the severe form, which is the leading cause of recurrent school absenteeism (80%), loss of class concentration (66.8%), no active participation (47.4%), inability to do homework (21%), fail in an exam (15.4%), and limited activity (29.9%) <sup>[9,10,20-24]</sup>.

Dysmenorrhoea has been identified as the most common menstruation-related cause of short-term school absenteeism among young girls <sup>[25]</sup>. The major associated factors with dysmenorrhoea are early menarche, family history of dysmenorrhoea, anxiety, smoking, premenstrual syndrome, age <20 years, and lack of physical exercise <sup>[9,10,20,22,24,26,27]</sup>. Dysmenorrhoea is associated with significant financial losses which extend beyond the individual level to the future generations and this has been attributed to the cost of medications, medical care, impaired daily activities and decreased productivity <sup>[28]</sup>. In the USA, about 140 million working hours are lost annually as a result of dysmenorrhoea and those sufferers who desire to work during their cramps have been shown to have lower work output <sup>[29]</sup>. An estimation of US \$4.2 billion economic losses occurs as a result of dysmenorrhoea in Japan <sup>[30]</sup>. Despite its common occurrence and significant impacts on day-to- day activities, many

females fail to report pain and/ or seek medical treatment, and this has resulted in under diagnoses and undertreated of dysmenorrhoea <sup>[17,31]</sup>. Previous study revealed that only 14.2% of females seek medical care/advice and this emphasise the need of screening all adolescent girls for menstrual cramps <sup>[32]</sup>.

This study aimed to determine the prevalence and predictors of overall impact of dysmenorrhoea on school activities among senior secondary school students in Ogbomoso South-West, Nigeria.

## Material and Method

### Ethical consideration

The Health Research Ethics Committee of Bowen University Teaching Hospital granted approval for the study (BUTH/REC-1013, dated 3<sup>rd</sup> October, 2023). Consent was obtained from all the participants after a careful explanation of what the research entails. Respondents with moderate to severe dysmenorrhoea were

encouraged and referred to a specialist for appropriate interventions.

## Study Design

A cross-sectional descriptive study design was used to evaluate the associated risk factors of dysmenorrhea and its relationship with school activities among senior secondary school students in Ogbomoso north local government, Oyo state.

The study was conducted in Ogbomoso town, Oyo State. It was founded in the mid-17th century and has five local government areas (LGAs) namely; Ogbomoso North, Ogbomoso South, Orire, Ogo-Oluwa and Surulere LGA. The estimated population of Ogbomoso town is 628,682 according to the World Population Review 2023 with Ogbomoso North Local Government Area having an estimated population of 284,200.

A multistage stratified sampling technique was used with 2 secondary schools each selected from the privates and public schools using simple random sampling (SRS). The sample size for the study was

calculated using the Leslie Kish formula for population greater than 10,000

$$n = \frac{Z^2 pq}{d^2}$$

(Where  $n$  = desired sample size,  $Z$  = standard normal deviate usually set as 1.96 which corresponds to 95% confidence interval,  $p$  = proportion in the target population estimated to have a particular characteristic i.e. 73% or 0.73; the average prevalence of secondary school students affected by dysmenorrhea in Western Nigeria [25]).

A minimum sample size of 333 was determined using the Leslie Kish formula for cross-sectional study designs. A sample size of 450 was utilised after adjusting for design effect. Included in the study were female students who have attained menarche, willing to participate and attends either private or public secondary schools in Ogbomoso North local government. Those who were not willing to participate and yet to attain menarche were all excluded.

Data were collected using a semi-structured self-administered Questionnaire.

Information obtained includes socio-

demographic characteristics, menstrual characteristics and pattern; the severity, duration and location of dysmenorrhoea; knowledge of risk factors of dysmenorrhoea and impact of dysmenorrhoea on school activities. The questionnaire was prepared using Previous, similar published literature.

### Statistical Analysis

The data were analysed using the Statistical Package for Social Science version 22. Frequency tables were generated, and the Chi-square test was used to test for association between categorical variables. A value of  $P < 0.05$  was considered as statistically significant. Logistic regression analysis was performed to determine the predictors of overall impact of dysmenorrhoea on school activities.

### Results

A total of 450 respondents were recruited and all the 450 respondents completed the questionnaires and had adequate data for analysis. This translates to a response rate of 100%.

**Table 1** showed the socio-demographic characteristics of the respondents and revealed that the mean age of the

respondents was  $15.33 \pm 1.662$  years. The age group, class, religion, tribe and marital status with the most respondents were 13-18 years (92.6%), SS3 222(49.3%), Christianity 388(86.2%), Yoruba 422(93.8%) and single 446(99.1%) respectively.

Table 1: Socio-demographic characteristics of respondent

Variables	Categories	Frequency	Percent
Age Group	10-12 years	16	3.6
	13-15 years	209	46.4
	16-18 years	208	46.2
	>18 years	17	3.8
	Mean $\pm$ SD = $15.33 \pm 1.662$		
Class	SS1	134	29.8
	SS2	94	20.9
	SS3	222	49.3
Religion	Christian	388	86.2
	Islam	58	12.9
	Traditional	4	0.9
Ethnicity	Hausa	14	3.1
	Yoruba	422	93.8
	Igbo	14	3.1
Marital status	Single	446	99.1
	Married	4	0.9

**Table 2** shows the gynaecological information of the respondents. The mean age at menarche was  $12.87 \pm 1.186$  years. Just above three-fifth (64.7%) attained menarche at 13-15 years; about four-fifth of the respondents 394(87.5%) had regular menstrual cycle; 271(60.2%) had polymenorrhoea; 321(71.3%) had their last menstrual flow lasting between 3-5 days; 369 (82.0%) used <3 pads per day; 417 (92.7%) had no sexual intercourse; 235(52.3%) had no family history of dysmenorrhoea; 326 (72.4.%) experience dysmenorrhoea; half of respondents 163(50.0%) experience moderate menstrual pain; 214(65.6%) experienced the pain on the same day as menstrual flow; 240(73.6%) stated that the duration of pain last only for the first day with 237(72.7%) experiencing lower abdominal pain. Concerning the onset of pain from menarche, just above two-fifth 146(44.8%) stated 6-12 months while 132(40.5%) can't remember; 189(58.0%) experienced the pain within age 14-16 years with Mean $\pm$ SD =  $13.51 \pm 1.317$ .

**Table 2: Gynaecological characteristics of respondents**

Variables	Categories	Frequency	Percent
Age at first menstruation	10-12 years	153	34.0
	13-15 years	291	64.7
	>15 years	6	1.3
	<b>Mean±SD = 12.87±1.186</b>		
Regular menstrual cycle	Yes	394	87.5
	No	44	9.8
	I don't know	12	2.7
Menstrual Cycle length	≤ 20 days	271	60.2
	21-35 days	161	35.8
	≥36 days	18	4.0
Duration of last Menstruation	1-2 days	88	19.6
	3-5 days	321	71.3
	5-7 days	39	8.7
	>7 days	2	0.4
No of pads used per day	<3	369	82.0
	3-7	71	15.8
	>7	10	2.2
Sexual intercourse	Yes	33	7.3
	No	417	92.7
Family history of painful menstruation	Yes	207	46.0
	No	235	52.2
	I don't know	8	1.8
Menstrual cramps/pain	Yes	326	72.4
	No	120	26.7
	I don't know	4	0.9
Severity of menstrual pain	Mild	99	30.4
	Moderate	163	50.0
	Severe	64	19.6
Onset of menstrual pain	The same day as menstrual flow	214	65.6
	One day after menstrual flow	65	19.9
	Two days after menstrual flow	31	9.5
	1-2 weeks before flow	16	4.9
Duration of menstrual pain	The first day	240	73.6

	2-3 days	69	21.2
	All throughout the period	17	5.2
<b>Location of the pain</b>	Lower abdominal pain	237	72.7
	Pelvic pain	48	14.7
	Back pain	28	8.6
	Groin pain	13	4.0
<b>Onset of pain from the first menstruation</b>	6-12 months	146	44.8
	1-2 years	28	8.6
	2-6 years	20	6.1
	Not remember	132	40.5
<b>Age at pain onset</b>	11-13 years	189	58.0
	14-16 years	132	40.5
	>16 years	5	1.5
<b>Mean±SD = 13.51±1.317</b>			

**Table 3** shows the knowledge of risk factors among the respondents. The result revealed that majority of the respondent were not aware of the risk factors and this was reflected by great number of the respondents said no to variables such as no history of smoking 402(89.3%); not live around smokers 361(80.2%); no history of alcohol consumption 399(88.7%). Other risk factors to which the respondents had poor knowledge were family history of menstrual cramps and consumption of lots of caffeine.

**Table 3: Knowledge of Risk Factors for dysmenorrhoea**

Variables	Yes n(%)	No n(%)
History of smoking	48(10.7)	402(89.3)
Live around Smokers	89(19.8)	361(80.2)
History of alcohol consumption	51(11.3)	399(88.7)
History of painful menstruation in the family (extended or nuclear)	215(47.8)	235(52.2)
Consumption of lot of caffeine (energy drinks, coffee, soda)	146(25.3)	304(67.6)

**Table 4** shows the impact of menstruation pain on the school activities. About half 161(49.4%) of the respondents stated that menstrual pain had negative impact on their school activities; 137(85.1%) were absent from classes due to menstrual pain. Other negative effects of menstrual pain were inability to study 116 (72.0%); inability to pay attention in class 134 (83.2%); lower academic performance 100(62.1%); reduced class participation 89(55.3%); reduced sporting participation 111(68.3%); reduced socialization 93(57.8%) and 66(41.0%) stated that they've been punished for something done under the influence of pain.

**Table 4: Impact of Menstruation pain on School Activities**

Variables	Categories	Frequency	Percent
Menstrual pain has impact on my academic performance	Yes	161	49.4
	No	165	50.6
Absent in classes	Yes	137	85.1
	No	24	14.9
Inability to study	Yes	116	72.0
	No	45	28.0
Inability to pay attention in class	Yes	134	83.2
	No	27	16.8
Lower academic performance	Yes	100	62.1
	No	61	37.9
Reduced class participation	Yes	89	55.3
	No	72	44.7
Reduced sporting participation	Yes	111	68.9
	No	50	31.1
Reduced socialization	Yes	93	57.8
	No	68	42.2
Punished for something done under the influence of pain	Yes	66	41.0
	No	95	59.0

**Table 5** shows the predictors of the overall impact of dysmenorrhea on the academic activities of the respondents revealed that respondents that belong to the Yoruba ethnicity was a significant predictor being 9 times more likely to have negative impact than those from Igbo tribe at (AOR 8.637, 95% CI 1.357–54.986,  $P=.022$ ). Respondents with regular menstrual cycle were significant predictors (AOR 0.055, 95% CI 0.006–0.500,  $P=0.010$ ).

Respondents with mild and moderate abdominal pain were significant predictors with (AOR 6.351, 95% CI 2.148–18.772,  $P=.001$ ) and (AOR 2.737, 95% CI 1.050–7.138,  $P=.001$ ) and being 6 and 3 times more likely to experience negative impact respectively. Respondents that experienced vomiting was a significant predictor with (AOR 0.103, 95% CI 0.020–0.522,  $P=.006$ ).

**Table 5: Predictors of overall impact of dysmenorrhea on school activities of the respondents**

Variables	AOR	95% C.I.		P-value
		Lower	Upper	
Class (ref. SS3)				
SS1	1.814	0.741	4.441	0.192
SS2	0.398	0.151	1.051	0.063
Ethnicity (ref. Igbo)				
Hausa	2.890	0.241	34.693	0.403
Yoruba	8.637	1.357	54.986	<b>0.022*</b>
Regular menstrual cycle (ref. I don't know)				
Yes	0.055	0.006	0.500	<b>0.010*</b>
No	0.224	0.021	2.407	0.217
Sexual intercourse (ref. No)				
Yes	0.443	0.117	1.681	0.231
Family history of painful menstruation (ref. I don't know)				
Yes	0.291	0.028	3.062	0.304
No	0.284	0.026	3.081	0.301
Painful periods (Menstrual cramps) (ref. I don't know)				
Yes	5.036	0.307	82.675	0.257
No	1.750	0.097	31.655	0.705
If yes, how painful? (ref. Severe)				
Mild	0.918	0.306	2.752	0.879
Moderate	1.691	0.694	4.120	0.247
Age at pain onset (ref. >16 years)				

<b>11-13 years</b>	0.333	0.034	3.211	0.341
<b>14-16 years</b>	0.144	0.016	1.320	0.087
<b>Abdominal pain (ref. I don't know)</b>				
<b>Yes</b>	0.324	0.053	1.981	0.222
<b>No</b>	1.580	0.256	9.768	0.623
<b>Rate the Abdominal pain (ref. mild)</b>				
<b>Severe</b>	6.351	2.148	18.772	<b>0.001*</b>
<b>Moderate</b>	2.737	1.050	7.138	<b>0.039*</b>
<b>Loss of appetite (ref. No)</b>				
<b>Yes</b>	0.625	0.307	1.272	0.195
<b>Lower back ache (ref. I don't know)</b>				
<b>Yes</b>	-	-	-	-
<b>No</b>	-	-	-	-
<b>Diarrhea (ref. I don't know)</b>				
<b>Yes</b>	-	-	-	-
<b>No</b>	-	-	-	-
<b>Vomiting (ref. No)</b>				
<b>Yes</b>	0.103	0.020	0.522	<b>0.006*</b>
<b>Fatigue (ref. I don't know)</b>				
<b>Yes</b>	-	-	-	-
<b>No</b>	-	-	-	-
<b>Breast ache (ref. No)</b>				
<b>Yes</b>	0.622	0.259	1.493	0.288
<b>Dizziness (ref. I don't know)</b>				
<b>Yes</b>	0.109	0.000	-	1.000
<b>No</b>	0.129	0.000	-	1.000
<b>Facial pimples (ref. I don't know)</b>				
<b>Yes</b>	-	-	-	-
<b>No</b>	-	-	-	-
<b>Heat sensation (ref. No)</b>				
<b>Yes</b>	1.072	0.474	2.423	0.867
<b>Pain in the thigh (ref. No)</b>				
<b>Yes</b>	0.584	0.257	1.328	0.199
<b>Mood swings (ref. I don't know)</b>				
<b>Yes</b>	-	-	-	-
<b>No</b>	-	-	-	-

AOR- Adjusted odd ratio, CI – confidence interval, P -Probability value, \*-significant at  $P < .05$

## Discussion

Dysmenorrhoea has been identified as a public health problem due to its high prevalence, the level of discomfort felt by the sufferer as well as the reduction in the

quality of life of female students <sup>[1,2]</sup>. This present study assessed the prevalence and the overall impacts of dysmenorrhoea on school activities among senior secondary school students in Ogbomoso north local

government. The prevalence of dysmenorrhoea in this present study is 72.4%. The respondent's ethnicity, regular menstrual cycle, severity of abdominal pain and vomiting were predictors of overall impact of dysmenorrhea on school activities. The prevalence of dysmenorrhea in this present study is similar to studies conducted in Ile-Ife and Osogbo where the prevalence was 72.3% and 77.8% [33,34] respectively but differed from that in Eastern Nigeria with a prevalence of 25% [35]. The prevalence rate in this current study was lower compared to that observed among medical undergraduates in Ibadan, where dysmenorrhea prevalence was 82.1% [36]. The difference may be partly explained by the study population which were undergraduates who are likely to be older with tendencies toward having high number of secondary dysmenorrhea when compared to this indexed study. The difference may also be accounted for by the lack of a universally accepted, standard definition of dysmenorrhoea. It is

diagnosed merely based on a student's perception of pain, which is highly subjective, difficult to quantify and might be caused by non-menstrual events. Furthermore, it may be a result of the socioeconomic and cultural differences in individuals' pain perception and lifestyle factors. Most of the respondents 92.6% were within the age range 13-18 years. This age range falls within adolescence age which signifies the transition from childhood to adulthood and during this period girls attain menarche which represents a landmark event in pubertal development [25].

Gynecological information of the respondents revealed that just above three-fifth attained menarche at 13-15 years with Mean  $\pm$  SD = 12.87 $\pm$ 1.186. This aligns with the typical age range of menarche. Just above four-fifth of respondents had regular menstrual cycle and about two-fifth had a cycle day of 21-35 days. The higher prevalence of shorter cycles might be a

contributory factor to the increased discomfort and pain experienced by the students. About one-fifth had their last menstrual period fewer than 3 days and four-fifth used <3 pads per day. These findings were in contrast to a study by Mesele et al. in which fewer number of respondent's attained menarche at 13-14years, had regular menstrual cycle and use less than 3 pads per day while higher number of their respondents had duration of menstrual flow of < 3days when compared to this present study.<sup>37</sup> The variation could be due to the difference in study methodology as their respondents were undergraduate students in Eastern Ethiopia [37].

Majority of the respondents had poor knowledge of risk factors of dysmenorrhea and this is as shown by higher percentages of participant who disagreed that history of smoking (89.3%); living around smokers (80.2%); history of alcohol consumption 39: > /9(88.7%);

family history of dysmenorrhea (52.2%) and excessive consumption of caffeine (67.6%) are not risk factors of dysmenorrhoea.

About half of the respondents with dysmenorrhea stated that menstrual pain had impact on their school activities. The impacts ranged from absent in classes (85.1%); inability to study (72%); inability to pay attention in class (83.2%); lower academic performance (62.1%); reduced class participation (55.3%); reduced sporting participation (68.9%); reduced socialization (57.8%) and punished for something done under the influence of pain (41.0%). These findings are similar to a study carried out by Konjengbam e.tal. in which school activities were negatively impacted by dysmenoorrhoea [38].

Predictors of the overall impact of dysmenorrhea on the academic activities of the respondents revealed that respondents of Yoruba ethnicity were significant predictors and 9 times more likely to have negative impact than those from Igbo tribe

at (AOR 8.637, 95% CI 1.357–54.986,  $P=.022$ ). Respondents with regular menstrual cycles were significant predictors with less likelihood to have negative impacts (AOR 0.055, 95% CI 0.006–0.500,  $P=.010$ ). Respondents with severe and moderate abdominal pain were significant predictors with (AOR 6.351, 95% CI 2.148–18.772,  $P=.001$ ) and (AOR 2.737, 95% CI 1.050–7.138,  $P=.001$ ) and being 6 and 3 times more likely to experience negative impact respectively. Respondents that experienced vomiting was a significant predictor with (AOR 0.103, 95% CI 0.020–0.522,  $P=.006$ ).

### **Conclusion/Recommendations**

Dysmenorrhoea is a common health problem among senior secondary school students. The prevalence of dysmenorrhoea in this present study is high (72.4%). The respondent's ethnicity, regular menstrual cycle, severity of abdominal pain and vomiting were predictors of overall impact of dysmenorrhoea on school activities. Knowledge of risk factors of

dysmenorrhoea was generally poor among the respondents

Awareness should be created among senior secondary school authorities and teachers about the impact of dysmenorrhoea on school activities / performance in order to provide psychological and academic guidance, and managing mechanisms for the affected students. Also, awareness should be created among the senior secondary school students on the risk factors of dysmenorrhoea.

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### **Conflicts of interest**

There are no conflicts of interest.

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