

Prevalence and Management of Dysmenorrhea Among Secondary School Adolescents in Enugu State, Nigeria

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Abstract

Background: Dysmenorrhea is reported to be among the most common gynecological disorders worldwide. The current study aimed to determine the prevalence and management practices for dysmenorrhea among adolescent school girls in Nigeria. The study also aimed to determine the predictors for choosing a management option for dysmenorrhea.

Methods: The study was a cross-sectional descriptive survey conducted in five conveniently selected secondary schools (high schools) in Enugu State. A 12-item questionnaire including a Visual Analog Scale was used to collect data. All data were analyzed using SPSS with significance set at $p < 0.05$.

Results: A total of 1,486 survey questionnaires were completed (88.45% response rate). The mean age of the study respondents was 15.26 ± 1.517 . The prevalence of dysmenorrhea was 51.1%. There was a significant difference ($t = -6.299$, $p < 0.001$) between the ages of the dysmenorrheic girls (15.50 ± 1.466) and the ages of girls who were not dysmenorrheic (15.01 ± 1.529). The mean age of Menarche was 12.64 ± 1.450 . Pain in the waist was the most common symptom reported among the respondents (57.4%, $n = 853$). More than one-third of the respondents reported that they take OTC medications for menstrual symptoms (31.8%, $n = 472$). Age and severity of dysmenorrhea significantly predicted the likelihood of taking a pharmacological agent for dysmenorrhea.

Conclusion: Younger females were more likely to do nothing about menstrual pain. There is a need for adolescents to be educated on the safety and efficacy of different management options for dysmenorrhea early.

Background

Dysmenorrhea is reported to be among the most common gynecological disorders worldwide. It is one of the most burdensome gynecological morbidity in women of reproductive age regardless of age, nationality, and economic status(1,2). Dysmenorrhea is the presence of painful cramps of uterine origin that occur during menstruation and is a common cause of pelvic pain and menstrual disorder(3). Dysmenorrhea has been classified as primary and secondary. Primary dysmenorrhea occurs when the female has a normal pelvic anatomy yet experiences painful menses, it commonly begins during adolescence(4). It is observed only in ovulatory cycles, usually beginning within 6 to 12 months after menarche with no pathology. Secondary dysmenorrhea on the other hand is when menstrual pain is associated with underlying pathology, its onset may be years after menarche. Global studies have reported the prevalence of dysmenorrhea ranging from 16% to 91%(5)(6), with higher rates reported in adolescent populations (7). In Nigeria, the prevalence of dysmenorrhea have been found to range from 42.5% among adolescent school girls in Kano state (8) and as high as 71.8% among adolescents in Kwara state (9).

Dysmenorrhea has been reported to be the commonest menstruation-related short-term school absenteeism among young girls(10). Recurrent school absenteeism impacts negatively on adolescent

girls by reducing contact time for their learning. The reduced contact time for learning may in turn have deleterious effects on the quality of education they receive and has been reported to be of national and economic value(10). Several factors have been cited to affect the severity of primary dysmenorrhea such as age, body mass index, socio-economic status, smoking and family history of dysmenorrhea (11–14).

Self-care management practices adopted by dysmenorrheic girls vary across countries and localities. Pharmacologic agents for primary dysmenorrhea include analgesics such as paracetamol, piroxicam, ibuprofen, diclofenac and mefenamic acid combined oral contraceptive agents (15). Previous literature has shown that most adolescents with dysmenorrhea do not consult a doctor(7,16), thus pointing to its importance as an issue of public health concern. Many studies have consistently reported that adolescent girls self-medicate with over-the-counter (OTC) analgesics for dysmenorrhea(17). Apart from these pharmacological agents, dietary modifications, heat therapy, warm beverages, sleep, massage therapy and keeping warm are popular non-pharmacological measures for managing dysmenorrhea(4). These non-pharmacological pain relief methods are reported to be preferred over pharmacological agents for dysmenorrhea among female students(18,19). A sizeable proportion of females have also been reported to do nothing about their menstrual pain(16). It is unclear what factors may influence the decision to manage menstrual pain or not to. This study aimed to determine the factors that influence the decision to choose pharmacological options or do nothing for menstrual pain. The study also assessed the prevalence of dysmenorrhea among adolescent girls in Enugu State and their preferred management options. The importance of this study is hinged on the need to offer guidance to adolescent school girls on proper management of dysmenorrhea, especially as it could affect their education.

Materials And Methods

Study design

The study was a cross-sectional descriptive survey conducted in five conveniently selected secondary schools (high schools) in Enugu State between November 2019 and February 2020. The questionnaires were distributed to all consenting students.

Ethical considerations

Approval for the study was sought from the school principals of the selected schools. All respondents who were present in school during the time of data collection and whose parents gave informed consent for participation were included in the study. The study protocol was approved by the Ethics Research Committee of the Faculty of Pharmaceutical Sciences, University of Nigeria Nsukka (FPSRE/UNN/20/0009) and was carried out in accordance with the Helsinki declaration.

Study instrument

The study instrument was a self-administered questionnaire, written in English and included a brief definition of dysmenorrhea. The questionnaire was adapted from previous literature on the topic(20–22).

It contained 12 closed-ended questions organized into three sections. Section A sought respondents' socio-demographic information; section B comprised multiple-choice questions on respondents' menstrual symptoms and severity of menstrual pains and a visual analogue scale from 1-10 assessing severity of menstrual pain. Section C sought information on management options adopted by the adolescent girls for their menstrual symptoms. The questionnaire was validated by experts from the department of clinical pharmacy and pharmacy management, and pre-tested among 20 students not included in the study sample. The Cronbach alpha was 0.69, showing good internal consistency. The questions that generated the results on this study is provided as supplementary material.

Data analysis

Data was analysed using SPSS version 20 (IBM Corporation, Armonk, NY, USA). Descriptive analyses were performed to characterize the sampled population. Regression analysis was carried out to determine predictors of adopting pharmacological management and doing nothing. P-value was significant at <0.05 .

Results

Socio-demographic characteristics of study respondents

A total of 1,486 out of 1,680 survey questionnaires were completed and returned (88.45%). The mean age of the study respondents was 15.26 ± 1.517 . Of the 1,486 girls who filled the survey, 760 (51.1%) reported having experienced Dysmenorrhea. There was a significant difference ($t = -6.299$, $p < 0.001$) between the ages of the dysmenorrheic girls (15.50 ± 1.466) and the ages of girls who were not dysmenorrheic (15.01 ± 1.529). The mean age of Menarche was 12.64 ± 1.450 . Although the girls who were dysmenorrheic had a lower age of menarche (12.61 ± 1.529) than those who were not dysmenorrheic (12.68 ± 1.411), this difference was not statistically significant ($t = 0.836$, $p = 0.816$). The mean severity of menstrual pain score for those who had dysmenorrhea was 5.80 ± 3.323 . Majority of the respondents were in JSS3 (31.1%, $n = 462$). (Table 1).

Table 1: Socio-demographic characteristics of the study respondents

Characteristics	Frequency	Percentage
<i>Class of Study</i>		
JSS1	24	1.6
JSS2	96	6.5
JSS3	462	31.1
SSS1	377	25.4
SSS2	226	22.6
SSS3	191	12.9
<i>Mother's education</i>		
Non-formal education	115	7.7
Primary school	194	13.1
Secondary school	668	45.0
Tertiary	506	34.1

JSS: Junior Secondary School SSS: Senior Secondary School

Menstrual characteristics of study respondents

A total of 760 (51.2%) reported that they had dysmenorrhea. More than a tenth of them reported that their menstruation lasted for more than 5 days (11.1%, n = 164). About three-quarters of them has a moderate menstrual flow (75.8%, n = 1127) and more than one-fifth of them reported that they had an irregular menstrual flow (22.0%, n = 327). Pain in the waist was the most common symptom reported among the respondents (57.4%, n = 853). (Table 2)

Table 2: Menstrual characteristics of study respondents

Variable	Frequency	Percentage
<i>Duration of menstruation</i>		
3-5 days	1322	88.9
>5 days	164	11.1
<i>Type of Menstrual flow</i>		
Scanty	151	10.1
Moderate	1127	75.8
Heavy	208	14.1
<i>Duration of menstrual cycle</i>		
20-30 days	1154	77.7
>30 days	332	22.3
<i>Frequency of menstruation</i>		
Regular	1159	78.0
Irregular	327	22.0
<i>Menstrual symptoms</i>		
Cramping in the lower abdomen	484	32.6
Swollen Abdomen	139	9.4
Pain in the waist	853	57.4
Back ache	172	11.6
Painful/tender breasts	285	19.2
Gastrointestinal disturbances	150	10.1
Swelling in the leg	71	4.8
Headache	474	31.9
<i>Duration of Menstrual symptoms</i>		
1-5 hours	769	51.7
6-12 hours	255	17.2
13-24 hours	179	12.0
25-48 hours	70	4.7
>48 hours	158	10.7

Management options for dysmenorrhea among study respondents

More than one-third of the respondents reported that they take OTC medications for menstrual symptoms (31.8%, n = 472). About one in five respondents reported that they took hot beverages for menstrual pain (19.7%, n = 293) while about a quarter of them said they did nothing when they had menstrual pain (24.9%, n = 370). (Table 3)

Socio-demographic determinants of choosing pharmacological options for management of menstrual symptoms

Female students who reported having dysmenorrhea have 1.458 odds of taking drugs for pains compared to those who reported that they had no dysmenorrhea (95% CI: 0.532, 0.884; p = 0.004). For every increase in age, the odds of taking drugs for dysmenorrhea increases by 10.6% (95% CI: 1.001,1.222; p = 0.048). For every increase in age at menarche, the odds of taking drugs for dysmenorrhea decreases by 9.6% (95% CI: 0.834, 0.980; p = 0.015). For every increase in the severity of dysmenorrhea, the odds of taking drugs increases by 9.3% (95% CI: 1.055, 1.132; p = <0.001). (Table 4)

Table 3: Management options for dysmenorrhea among study respondents

Variable	Frequency	Percentage
Take drugs	472	31.8
Reduce sugar intake	430	28.9
Heat therapy	349	23.5
Hot beverage	293	19.7
Sleep	493	33.2
Massage therapy	134	9.0
Exercise	298	20.1
Herbal concoction	91	6.1
Nothing	370	24.9

Table 4: Socio-demographic determinants of choosing pharmacological options for dysmenorrhea

Independent variables	S.E.M	B	95% CI for EXP (B)		Sig
			Lower	Upper	
Age	0.051	1.106	1.001	1.222	0.048*
Class of Study					0.750
JSS1	0.472	1.893	0.750	4.775	0.176
JSS2	0.325	0.963	0.510	1.821	0.908
JSS3	0.225	1.117	0.719	1.734	0.623
SSS1	0.215	1.191	0.780	1.816	0.418
SSS2	0.202	1.072	0.721	1.592	0.732
Age at Menarche	.041	0.904	0.834	0.980	0.015*
Dysmenorrhea present	0.130	0.686	0.532	0.884	0.004*
Severity of dysmenorrhea	.018	1.093	1.055	1.132	<0.001**
Constant	0.900	0.254			0.128

Socio-demographic predictors of doing nothing for management of menstrual symptoms

For every increase in age, the odds of doing nothing for dysmenorrhea decreases by 12.3% (95% CI: 0.784,0.980; p = 0.021). For every increase in age at menarche, the odds of doing nothing for dysmenorrhea increases by 10% (95% CI: 1.002, 0.980; p = 1.209). For every increase in the severity of dysmenorrhea, the odds of doing nothing decreases by 4.7% (95% CI: 0.917, 0.990; p = 0.013). (Table 5)

Table 5: Socio-demographic predictors of doing nothing for dysmenorrhea

Independent Variables	S.E.M	β	95% C.I.for EXP(B)		Sig
			Lower	Upper	
Age	.057	.877	.784	.980	0.021*
Class of Study					0.010
JSS1	.480	1.176	.459	3.010	0.736
JSS2	.356	.437	.218	.877	0.020*
JSS3	.237	.773	.486	1.230	0.278
SSS1	.235	.516	.325	.819	0.005*
SSS2	.213	.844	.556	1.281	0.425
Age at Menarche	.048	1.100	1.002	1.209	0.046*
Dysmenorrhea present	0.138	0.936	0.714	1.226	0.630
Severity of dysmenorrhea	.019	.953	.917	.990	0.013*
Constant	.977	1.284			0.798

Discussion

The prevalence rate of dysmenorrhea in this study (area; Eastern Nigeria) was 51.1%. This rate is lower than found among secondary school girls in Western Nigeria (73%) but higher than the rates recorded among adolescent girls in Northern Nigeria (42.5%) (10)(23). The rate recorded in the current study is lower than found among Mexican and Nigerian university students where the prevalence rate were 62.4% and 53.3% respectively(20,24). The different rates recorded may be due to the different ages of the girls surveyed in the various studies and perhaps, the different ways of assessing dysmenorrhea. The mean age of Menarche in this study was 12.64. It is slightly higher than the mean menarcheal age of African American girls in the United States (12.2 years) and lower than the menarcheal age of girls in Western Nigeria (12.5) and Caucasian girls (12.9 years)(25,26). Genetic, racial, environment and anthropometric factors have been cited as factors influencing maturational timing in adolescents(27). The mean age of menarche among the girls who had dysmenorrhea was significantly less than that of girls who did not have dysmenorrhea. This difference has been observed in previous studies(20,24,28,29) and has been attributed to a longer exposure to uterine prostaglandins(30).

Pain in the waist was the most common symptom reported among the respondents. This is contrary to findings from previous studies where abdominal cramping is reported to be the most common symptom of dysmenorrhea(20). Menstrual pain has been attributed to inflammatory response mediated by a cascade of Prostaglandins and Leukotrienes(31). About one-third of the study respondents reported that they took over the counter drugs for their menstrual pain. This proportion is quite lower than recorded in other studies among Saudi Arabian university students(21) where two-thirds of the students reported

using pharmacological agents for dysmenorrhea. However, the proportion of students who reported using pharmacological agents for dysmenorrhea is higher than reported among Indian students where about a quarter used pharmacological agents whereas the majority depended on herbal concoctions and other non-pharmacological measures(18). In this study, very few female students reported that they used herbal concoctions for dysmenorrhea. The two most commonly reported non-pharmacological measure adopted by the adolescents in this study were sleeping and reducing sugar intake. The respondents may prefer to sleep as dysmenorrhea has been shown to be associated with disturbed sleeping patterns and poor sleep efficiency(32,33). Insomnia severity has been reported to be directly associated with severity of dysmenorrhea(34). Sleep impairment is reported to increase the risk of pain and increase pain severity through heightened increased central pain sensitivity, and by increasing mood disturbance, depressive symptoms, and attention to pain(35). There have been mixed results on the effect of diet on dysmenorrhea. A study by Najafi et al., concluded that the risk of dysmenorrhea was increased by a diet characterized by a high consumption of sugars, salty snacks, sweets and desserts, tea and coffee, salt, fruit juices and added fat (36). Conversely, another study by Monday et al., has shown that there is no relationship between diet and the incidence and severity of dysmenorrhea(37).

Age was a predictor for management of dysmenorrhea with pharmacological agents as older female students were ten times more likely to take medications than younger students. Students who had a later age of menarche were almost ten times less likely to take pharmacological agents for dysmenorrhea than their counterparts with an earlier age of menarche. This is expected as an earlier age of menarche are more likely to have dysmenorrhea than females with a later age of dysmenorrhea. Severity of dysmenorrhea was a significant predictor for choosing pharmacological agents for managing dysmenorrhea. This is consistent with findings from a previous study among Ghanaian university students where severity of menstrual pain predicted the use of pharmacological agents(38). For every increase in the severity of dysmenorrhea, the odds of taking drugs increased by 9.3%.

About one-quarter of the respondents revealed that they did nothing to relieve the menstrual pain. This proportion is lower than reported in a study among Ghanaian adolescents where almost 50% of the study respondents did nothing about their menstrual pain(16). Doing nothing may be rooted in traditional beliefs that pain associated with menstruation is normal and should be borne silently. Previous literature have shown that the family plays an integral role in healthcare decision making and contributes to direct care of patients(39,40) and more so in dysmenorrhea among adolescents(17). Age was also a significant predictor for choosing not to do anything to manage dysmenorrhea. Older female students were 12.3 times less likely to do nothing about dysmenorrhea compared to their younger counterparts. This may be because the younger females are not aware or have not been taught about the menstrual cycle. Thus, it is important that information about menstruation and dysmenorrhea be provided to females early enough. For every increase in age at menarche, the odds of doing nothing for dysmenorrhea increased by 10%, meaning that girls who had a later menarcheal age were more likely to do nothing about dysmenorrhea. Severity of dysmenorrhea was also a significant predictor for doing nothing to alleviate menstrual pain as students with a more severe dysmenorrhea were about five times less likely to do nothing about it

compared to students with a less severe dysmenorrhea. For every increase in the severity of dysmenorrhea, the odds of doing nothing decreases by 4.7%.

The strength of the study lies in the large number of study respondents sampled and the high response rate. However, like most cross-sectional studies, it suffers the limitation of inability to establish temporal precedence. Also, the subjective nature of the measure for the prevalence and severity of dysmenorrhea may have led to recall bias and possibly, an overestimation or underestimation of the disorder. Also, other factors which may affect menstrual outcome such as obesity and stress were not considered in the present study. The convenient sampling method may also affect generalizability of study findings.

Conclusion

The prevalence of dysmenorrhea among the respondent adolescents was moderately high and is a pointer to the continuing importance of dysmenorrhea as a public health problem among adolescents. Despite the efficacy of pharmacological agents for the relief of pain from dysmenorrhea, more than a quarter of the students in these females reported that they did nothing to abate their menstrual pain. Younger females were more likely to do nothing about menstrual pain. There is a need for adolescents to be educated on the safety and efficacy of different management options for dysmenorrhea early. The study findings indicate that interventions to increase awareness about dysmenorrhea and its management should be tailored towards younger females who are more likely not to manage their dysmenorrhea adequately. Older females (who are sometimes the source of health care information for their relatives or younger students) should also be educated on the safety and efficacy of different management options for dysmenorrhea to ensure that they are transferring the right practice to the younger ones who come to them seeking advice. The school teachers can assist the students with information on dysmenorrhea and reliable management practices.

Declarations

Availability of data

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

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Competing interests

The authors declare that they have no competing interests.

Author Contributions:

The Authors adhered to the ICMJE definition of authorship. The specific contribution is described as follows; DOA & OAE study design and manuscript drafting. OAE data collection. DOA and MIE Data elaboration and description of results. All authors read and approved the manuscript.

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