

Risk factors for dysmenorrhea among Ghanaian undergraduate students

Ayokunle Osonuga¹, Martins Ekor^{1,2}

1. School of Medical Sciences, University of Cape Coast, Ghana.

2. Department of Pharmacology, School of Medical Sciences, University of Cape Coast.

Abstract

Background: Menstrual pain is one of the common gynaecological presentations of women of reproductive age to health care physicians. In Ghana, there exist a paucity of research on the risk factors of dysmenorrhea among older females.

Objectives: Very few studies in Ghana have addressed the risk factors for severe dysmenorrhea among University students. This study aims to identify the common risk factors and associated symptoms of menstrual pain which have been previously not caught the attention of researchers in Ghana.

Methodology: The study was a descriptive cross-sectional study involving to two hundred female undergraduate students of the University of Cape Coast (UCC), Ghana. Data collected and analysed using standardized and acceptable statistical tools. Verbal multidimensional scoring system for assessment of dysmenorrhoea severity was used in this study to assess the severity of dysmenorrhoea

Results: More than half (57.3%) of the respondents having pain beginning within the first two days of their menses. The common risk factors that predicted severity of dysmenorrhea ($p < 0.05$) were quantity of menstrual flow and family history of menstrual pain. The common symptoms that accompanied dysmenorrhea were tiredness, loss of appetite, backache, dizziness, diarrhoea and mood changes ($p < 0.05$).

Conclusion: Dysmenorrhea is a serious public health problem which can be incapacitating. We advocate for more attention to reduce the burden of its negative consequences.

Keywords: Dysmenorrhea, Ghana, risk factors, burden.

DOI: <https://dx.doi.org/10.4314/ahs.v19i4.20>

Cite as: Osonuga A, Ekor M. Risk factors for dysmenorrhea among Ghanaian undergraduate students. *Afri Health Sci.* 2019;19(4):2993-3000. <https://dx.doi.org/10.4314/ahs.v19i4.20>

Introduction

Menstrual disorders are common in women of reproductive age¹. Menstrual pain, is one of such disorders and it happens to be the commonest gynaecological disorder in this group.² Most authors use menstrual pain interchangeably with dysmenorrhoea. However, some others have proposed dysmenorrhoea to be menstrual pain severe enough to cause functional incapacitation or seeking treatment or suggest it's a clinical diagnosis based on History on examination findings by a Physician.¹

Dysmenorrhoea can either be primary or secondary. Primary dysmenorrhoea is painful menses (of varying severity) usually beginning in adolescence in women with nor-

mal pelvic anatomy. It is characterized by cramping pelvic pain beginning shortly after the onset of menses and lasting one to three days.¹⁻³ When an identifiable organ pathology is present, dysmenorrhea is termed secondary. The most common cause of secondary dysmenorrhoea is endometriosis. Other causes include leiomyoma, adenomyosis, ovarian cysts and pelvic congestions.⁴

Prostaglandin-induced increase in uterine activity was first hypothesized as a cause of dysmenorrhoea in 1932. Though the pathophysiology of menstrual pain has not been fully understood, current evidence suggests that prostaglandin F_{2α}, a potent myometrial stimulant and vasoconstrictor, is produced by the secretory endometrium. This substance causes a decrease in myometrial blood flow and induces contraction in order to shed the endothelium in the menstrual phase of the menstrual cycle.¹⁻³

Notably, primary dysmenorrhea is far more common than its secondary counterpart. Though severely dilapidating in some cases, dysmenorrhea still remains a widely

Corresponding author:

Ayokunle Osonuga,
School of Medical Sciences,
University of Cape Coast, Ghana.
Email: ayo.osonuga@gmail.com

under-diagnosed condition. This is partly due to common societal beliefs regarding lack of effective treatments and expectations about the burden of menstruation – as its expected that it should be endured.¹

The prevalence of dysmenorrhea among females have been studied by different workers. Consistently in literature, 20-90% of females of reproductive age experience menstrual pain^{5,6}. Furthermore, these variations in prevalence depend on several factors which we will discuss in this paper.

Various risk factors have been described to influence dysmenorrhea and its severity. These include early menarche, Body Mass Index (BMI), Dietary habits, family history, amongst others^{3,5,7}.

In Ghana, very few studies have discussed the burden of dysmenorrhea among females, and those available focus on the adolescent age group. Our study is an attempt to describe the pattern and risk factors for dysmenorrhea among University students.

Methodology

Data collection

The study was descriptive cross-sectional study involving two hundred female undergraduate students drawn from various faculties of the University of Cape Coast, Ghana. Data was collected using a pretested questionnaire to elicit variables of interest and menstrual pain was assessed using standardized Pain scales gotten from research done by other workers. Furthermore, Ethical waiver was granted by the UCC Ethical Review Board before the study. The questionnaire, however, included a consent section in which the respondent appended her signature after the aims and objectives of the study were explained. Assurance of participant's confidentiality was considered and the report included exactly what the respondent gave. No

words or images that could depict or reveal the identity of the respondents was included in the study report.

Statistical analysis

Data gathered were carefully coded and entered into Statistical Package for Social Sciences (SPSS) version 20. Chi-square analysis was used to test the association between the variables of interest, in this case the risk factors of dysmenorrhea (see Table 3). Simple t-test, followed by a multivariate regression was used to determine the p values of risk factors that predict severe dysmenorrhea. Inference was made using 95% confidence interval with 5% error margin and a p-value < 0.05 was considered significant.

Inclusion criteria

- Undergraduate female students >18 years
- Ghanaian by birth
- Females belonging to any one of the colleges of the UCC.

Exclusion criteria

- Undergraduate females
- Previous diagnosis of Secondary dysmenorrhea (PID, fibroid, endometriosis or genital tuberculosis)
- Recent delivery or Miscarriage (Voluntary or Spontaneous) in the last 6 weeks

Pain assessment tool

Verbal multidimensional scoring system for assessment of dysmenorrhoea severity was used in this study as it has been shown to be objective in assessing severity of dysmenorrhoea. This tool defines the severity of dysmenorrhoea based on the table below 13

Results

Grade	Working ability	Systemic symptoms	Analgesia
Grade 0: Menstruation is not painful and daily activity is unaffected	Unaffected	None	Not required
Grade 1: Menstruation is painful but seldom inhibits the woman's normal activity. Analgesics are seldom required. Mild pain	Rarely affected	None	Rarely required
Grade 2: Daily activity affected. Analgesics required and give relief so that absence from work or school is unusual. Moderate pain	Moderately affected	Few	Required
Grade 3: Activity clearly inhibited. Poor effect of analgesics. Vegetative symptoms, e.g. headache, tiredness, nausea, vomiting and diarrhea. Severe pain	Clearly inhibited	Apparent	Poor effect

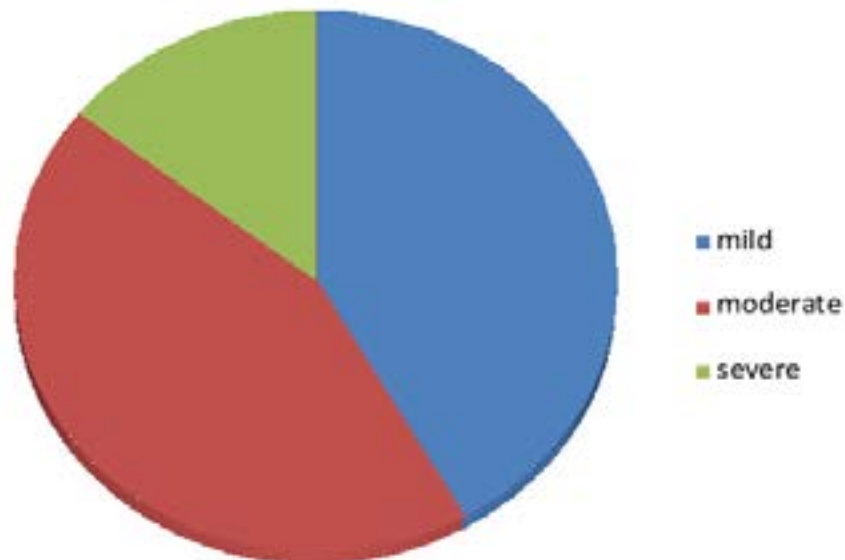
Table 1: Demographic characteristics of respondents

	Frequency (N=200)	Percentage (%)
<i>Age</i>		
15-19	38	19.0
20-24	126	63.0
25-29	29	14.5
>29	7	3.5

Table 2: Characteristics of Menstrual pain

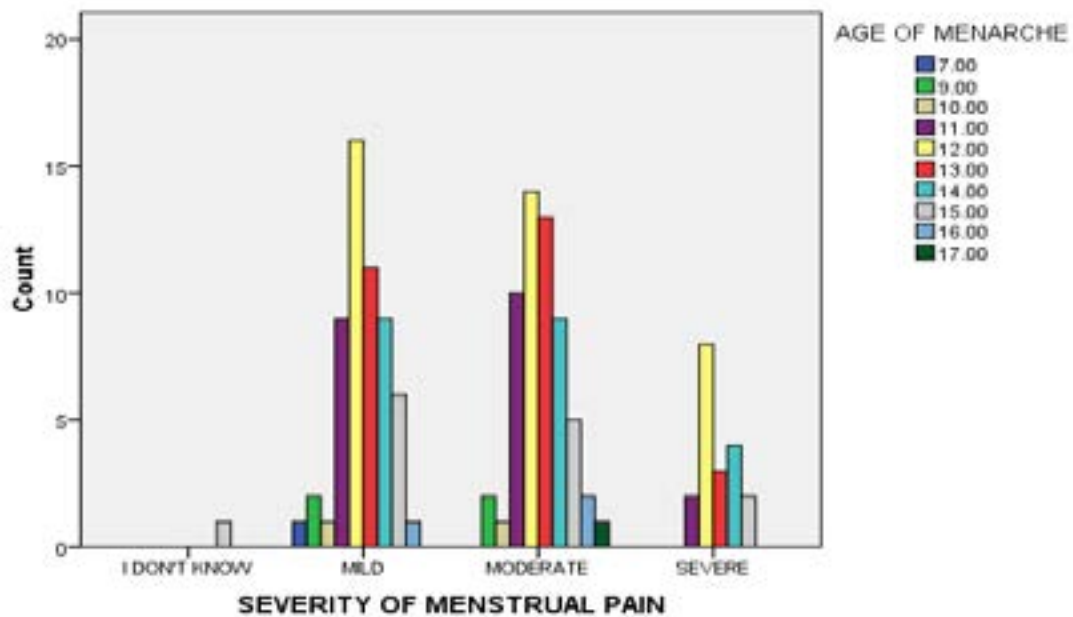
<i>Average duration of dysmenorrhoea (n=150)</i>	Frequency (%)	(n=150)	Percentages
Few hours			19.3
1-2days			
3-4 days	29		57.3
> 4days	86		19.3
<i>Onset of dysmenorrhoea (n=150)</i>	6		4.0
Before menses			
During menses			
Throughout menses	41		26.8
	110		72.8
	29		19.3

Figure 1: Severity of Menstrual Pain



Most respondents had mild (41.5%) and moderate (43.5%) menstrual pain. Only 14.3% of respondents experienced severe dysmenorrhoea. Severity of dysmenorrhoea was determined by the verbal multidimensional scoring system for dysmenorrhoea.

Figure 2: Age of menarche (expressed in years) in relation to severity of dysmenorrhoea among respondents



Severe dysmenorrhoea was more common in those that attained menarche at the age of 12 years. Average age of menarche was 12+0.12

Table 3: Risk factors for dysmenorrhoea among the respondents

Risk factor	p value (dysmenorrhoea)	p value (Increasing severity of dysmenorrhoea)
Chronological age	0.613	0.637
Age of menarche	0.120	0.950
Marital status	0.199	0.845
Parity	0.467	0.947
Smoking	0.312	0.332
Alcohol	0.404	0.217
Exercise	0.062	0.139
Diet	0.761	0.864
Family history of MP	0.088	0.003*
Length of cycle	0.762	0.627
Quantity of Flow	0.241	0.005*
BMI	0.875	0.222

*p<0.05 is statistically significant. MP: Menstrual pain, BMI: Body Mass Index

Table 4: Menstrual symptoms associated with the increasing severity of dysmenorrhoea

Symptom	Frequency (N=200)	Percentages	Severity of Menstrual Pain
Tiredness	67	33.5	0.004*
Loss of Appetite	63	31.5	0.002*
Headache	39	19.5	0.220
Backache	50	25.0	0.003*
Dizziness	30	15.0	0.007*
Bloating	33	16.5	0.077
Diarrhoea	66	33	0.041*
Mood changes	105	52.5	0.000*
Dysmenorrhea	148	74.0	0.000*

*p<0.05 is statistically significant for increased severity of dysmenorrhea

Discussion

This study demonstrated for the first time (by quantitative analysis), in a Ghanaian Tertiary Institution, the burden of dysmenorrhea among female undergraduate students.

From our study, the prevalence of dysmenorrhea was 74% (see table 4). This finding is consistent with a similar study among secondary school students in Ghana⁸. Result from this study is also in agreement with Nigerian^{9,10}, Iranian¹¹, Lebanese¹², Turkish studies¹³.

It was however in sharp contrast with result by Japanese (15.8%)¹⁴, another Lebanese (26.8%)¹⁵, Iranian (38.1%),⁶ Gambian (14%)¹⁶ and Georgian (52%)¹⁷ workers. Higher prevalence was seen in studies by Seven et al. (84.9%)¹⁸, Amaza et al. (87.6%)¹⁹, and the highest was 97% in an Australian survey²⁰.

The reasons suggested for these wide variations in prevalence are numerous. Some of these include: stricter definition of dysmenorrhea, ethnic differences, the method

employed in assessing dysmenorrhea (including chronological age of the respondents) and presence of premenstrual syndrome.^{8,14,17,21} Some researchers have also suggested that studies in older females are less consistent in reporting prevalence.²²

Pain beginning at the onset of menses, lasting for 1 – 2 days observed in this study (see table 2) has also been reported in other studies; this is characteristic of dysmenorrhea.^{8,18}

Verbal multidimensional scoring system for assessment of dysmenorrhoea severity was used in this study as it has been shown to be objective in assessing severity of dysmenorrhoea¹³. The prevalence of mild, moderate and severe dysmenorrhoea in this study was 41.5% 43.5% and 14.3% respectively (see figure 2).

More than half (57.8%) the respondents described their pain to be moderate to severe. This is similar to the 52% observed by Jerry et al²³.

The prevalence rate of 14.3% observed in this study for severe dysmenorrhoea is similar to a report by Harlow et al²⁴ and other studies^{19,22}. This value is slightly only less than other available Ghanaian study (18.8%)⁸. A Nigerian study puts the prevalence of severe dysmenorrhoea as 66% among adolescent girls.⁷ Severe dysmenorrhea was 6.23% in another study²⁵. Cultural differences in pain perception and individual differences in pain threshold are possible reasons for this difference.^{26,25}

Having a female relative with dysmenorrhea significantly increased the likelihood of having severe dysmenorrhoea in this study (see table 4). This again is consistent with available literature thus suggesting that genetics may play a role in prevalence and severity of dysmenorrhoea^{3,22}. Some researchers hypothesize that dysmenorrhea in families is related to conditioned behaviour that is learned from mother or sisters for the possibility of societal reward or that control for pain exists.^{1,22} Similar living patterns and lifestyles in the families is another possibility²⁷.

The presence of a heavy menstrual flow (table 4) was another risk factor for determining the severity of dysmenorrhoea. The current thinking is that it is associated with an increase in concentration of circulating prostaglandins, which in turn increase the severity of menstrual pain.^{1,2,3} Alcohol use, smoking and higher body mass index have been identified as risk factor for the severity and prevalence of dysmenorrhoea²². These were not so in this study (see table 4) and some other studies.^{2,18,21}

We concur with Ju et al^{22,30} who suggested that mixed results have been observed for many of the risk factors for dysmenorrhoea, though no reason was given immediately for this.

Menstrual characteristics of females are known to be risk factors for dysmenorrhoea. It is generally postulated that dysmenorrhoea begins 6-12 months after menarche, peaking during the late teens and early twenties¹¹. Thereafter, its prevalence and severity then declines gradually with age influenced partly by increasing parity in later years of a woman's life.^{2,11} This study showed no significant relationship between the chronological age, parity of the respondents and the prevalence and severity of dysmenorrhoea (see table 4). The reason for this deviation from what is generally presumed is immediately not known.

We however wish to point out some interesting find-

ings. Though a younger population was used in the other Ghanaian study⁸, their prevalence rate was just about the same with this present study and a Nigerian study²⁸. Meanwhile, a Hong Kong²⁹ and Nigerian study¹⁹ with similar study population to this study reported a higher prevalence (80%, 87% respectively). Yet another Nigerian⁷ and Georgian study⁵ with a younger (adolescent) population had much lower prevalence rate of dysmenorrhoea (64.3%, 52% respectively).

Ceteris paribus, these latter studies should have reported higher prevalence rate to the present study like the Australian study^{20,29} as a lower prevalence rate perhaps ought to have been obtained in this study just as the Lebanese study with similar age of respondents to ours.¹⁵ Furthermore, Nigerian², Georgian,⁵ Lebanese¹² and studies found a negative association between age and dysmenorrhoea while an Italian study found a positive relationship between age and dysmenorrhea.³⁰ The statistically insignificant effect of chronological age on prevalence of dysmenorrhea in this present study tallies with result from French³¹, Lebanese¹⁷ and a Hong Kong studies²⁹.

It can therefore be inferred that the relationship between the chronological age of females and the prevalence of dysmenorrhoea may be more complex than we think and generalization of results from epidemiologic studies should be done with caution.

Most of the undergraduate students recruited in this study were in their early twenties (table 1), this is in variance with the average age observed in the other Ghanaian study involving adolescents and similar to a Nigerian study 2. The average age of menarche was 12.7+ 0.12 years with a range of 7-17 years (Figure 1). This is in agreement with findings in Nigerian and Ghanaian studies^{7,8}. Higher age of menarche has been observed by others.^{2,21}

The age of menarche did not correlate with having dysmenorrhoea in the present study (see table 4). Unsal et al.¹³, Okoro et al.² and Gumanga⁸ findings were consistent with this. Other studies however showed a correlation between age of menarche and dysmenorrhoea.²²

Dysmenorrhea is associated with other menstrual symptoms. In a study among adolescent girls, they described these symptoms as negative menstrual experiences¹³. The commonest associated symptoms with menses are

shown in table 4. The trend is similar to reports by other workers^{13,18}. In this study, about 80% of respondents with mood changes during menses had dysmenorrhoea (not shown) and it significantly predicted the severity of dysmenorrhea, along with dizziness, loss of appetite, diarrhoea and fatigue (table 3).

Also, it was established in this study that severe dysmenorrhoea was associated with heavy menstrual flow (table 4). The resulting anaemia from menorrhagia may be the reason for the dizziness, fatigue and anorexia experienced by the females especially those with severe dysmenorrhoea. Prostaglandins do not only stimulate uterine contractions during menses, they can cause contraction of bowel smooth muscle resulting in nausea and vomiting¹⁷ as observed also observed in this study (table 3).

We have put the prevalence of menstrual pain in Ghana at 74% in a previous study³¹. The impact of dysmenorrhea on the activities of female undergraduates including student absenteeism and poor academic performance have also been documented³². Unfortunately, despite the high use of analgesics in our previous work, pain control was sub-optimal³³.

Indeed, dysmenorrhea, especially when severe has adverse consequences that ought not to be overlooked. Patients should be managed on individualistic basis. Hence, the need for widespread public education to encourage females with dysmenorrhoea to seek medical care. Healthcare workers' attitude to patients who report with dysmenorrhea should also be humane so as to encourage them to seek treatment, especially when it is severe.

References

1. Rehman H, Begum W, Anjum F, Tabasum H. Approach to dysmenorrhea management in ancient ages and its current relevance. *International Journal of Herbal Medicine*. 2013; 1 (4): 88-91
2. Okoro RN, Malgwi H, Okoro GO. Evaluation of factors that increases the severity of dysmenorrhea among University female Students in Maiduguri, North Eastern Nigeria. *The Internet Journal of Allied Health Sciences and Practice*. 2013; 11(4):1-10
3. Omidvar S and Begum K. Characteristics and Determinants of Primary Dysmenorrhea in Young Adults. *American Medical Journal*. 2012; 3 (1): 8-13.
4. Okoro RN, Malgwi H, Okoro GO. Self-reported

- knowledge of Dysmenorrhoea and its Negative Academic impacts among a group of female students of University of Maiduguri, North Eastern Nigeria. *Novel Science International Journal of Medical Science*. 2012; 1(7): 220-225
5. Gagaa T, Tkeshelashvili B, Gagaa D. Primary dysmenorrhea: prevalence in adolescent population of Tbilisi, Georgia and risk factors. *J Turkish-German Gynecol Assoc* 2012; 13: 162-8
6. Baghianimoghadam MH, Loo AM, Falahzadeh H and Alavijeh MM. A Survey about the Prevalence of Dysmenorrhea in Female Students of Shahid Sadoughi University of Medical Sciences and their Knowledge and Practice towards it. *Journal of Community Health Research*. 2012; 1:93-98
7. Sulayman HU, Ameh N, Adesiyun AG, Ozed-Williams IC, Ojabo AO, Avidime S et al. Age at menarche and prevalence of menstrual abnormalities among adolescents in Zaria, northern Nigeria. *Annals of Nigerian Medicine*. 2013; 7(2): 66-70
8. Gumanga SK and Kwame-Aryee R. Menstrual characteristics in some adolescent girls in Accra, Ghana. *Ghana Med J*. 2012; 40: 3 -7 PubMed
9. Thomas KD, Okonofua FE, Chiboka O. A Study of the menstrual patterns of adolescents in Ile-Ife, Nigeria. *Int J Gynaecol Obstet*, 1990; 33: 31-33.
10. Odujinrin OM, Ekinwe EO. Epidemiological survey of menstrual patterns amongst adolescents in Nigeria. *West Afr J Med* 1991; 10: 244-249
11. Janghorbani M and Zarkoob S. Epidemiology of primary dysmenorrhea in Kerman, Iran. *M./Rf*. 1994; 8(3): 167-171
12. Attieh E, Maalouf S, Richa S, Kesrouani A. Premenstrual syndrome among Lebanese medical students and residents. *Int. J Gynecol Obstet* 2013;121(2):184-5.
13. Unsal A, Ayranci U, Yozun M, Calik E. Prevalence of dysmenorrhea and its effect on quality of life of female university students. *Ups J Med Sci*. 2010; 115(2): 138-14
14. Ohde S, Tokuda Y, Takahashi O, et al. Dysmenorrhea among Japanese women. *Int J Gynaecol Obstet*. 2008;100(1): 13-17.
15. Kabbara R, Ziade F, Gannage-Yared M. Prevalence and etiology of menstrual disorders in Lebanese university students. *Int J Gynaecol Obstet*. 2014; 126(2): 177-178
16. Walraven G, Ekpo G, Coleman R, et al. Menstrual disorders in rural Gambia. *Stud Fam Plann*. 2002; 33(3):261-8
17. Gagaa T, Tkeshelashvili B, Gagaa D. Primary dysmenorrhea- Leading problem of Adolescent Gynecology (Review). *Georgian Medical News*. 2012; 6(207): 7-14

18. Seven M, Guvenc Akyuz GA and Eski F. Evaluating Dysmenorrhea in a Sample of Turkish Nursing Students. *Pain Management Nursing*. 2014; 15(3): 664-671
19. Amaza DS, Sambo N, Zirahei JV, Dalori MB, Japhet H and Hamdlat T. Menstrual Pattern among Female Medical Students in University of Maiduguri, Nigeria. *British Journal of Medicine and Medical Research*. 2012; 2(3): 327-337
20. Parker MA, Sneddon AE, Arbon P. The menstrual disorder of teenagers (MDOT) study: determining typical menstrual patterns and menstrual disturbance in a large population based study of Australian teenagers. *BJOG*. 2010;117(2): 185–192.
21. Oral E, Kirkan TS, Yazici E, Gulec M, Cansever Z, Aydin N. Premenstrual Symptom Severity, Dysmenorrhea, and School Performance in Medical Students. *Journal of Mood Disorders* 2012; 2(4):143-52
22. Ju H, Jones M and Mishra G. The prevalence and Risk factors of Dysmenorrhea. *Epidemiologic Reviews*. 2014; 36(1): 104-113
23. Jerry R, Klein JR, Iris F and Litt IF. Epidemiology of Adolescent Dysmenorrhea. *Pediatrics*. 1981; 68: 661-664 PubMed
24. Harlow SD, Ephross SA. Epidemiology of menstruation and its relevance to women's health. *Epidemiol Rev*. 1995;17(2):265 PubMed –286
25. Singh A, Kiran D, Singh H, Nel B, Singh P and Tiwari P. Prevalence and severity of dysmenorrhea: A problem related to menstruation among first and second year medical students. *Indian J Physiol and Pharmacol*. 2008; 52(4):389-397
26. El-Gilany A, Badawi K, El-Fedawy S. Epidemiology of dysmenorrhea among adolescent students in Mansoura, Egypt. *Eastern Mediterranean Health Journal*. 2005; 11: 155-163
27. Tavallae M, Joffres MR, Corber SJ, et al. The prevalence of menstrual pain and associated risk factors among Iranian women. *J Obstet Gynaecol Res*. 2011;37(5):442 PubMed –451
28. Ezeukwu AO, Elochuckwu PU, Ojukwu CP. Self-reported pain strategies for primary dysmenorrhea used by Nigerian female undergraduates. *International Journal of Recent Scientific Research*. 2014; 5(1): 261-265
29. Chia CF, Lai JHY, Cheung PK et al. Dysmenorrhea among Hong Kong University students: prevalence, impact and management. *Hong Kong Med J*. 2013; 19: 222-8 PubMed
30. Rigon F, De Sanctis V, Bernasconi S, Bianchin L, Bona G, Bozzola M, et al. Menstrual pattern and menstrual disorders among adolescents: an update of the Italian data. *Ital J Pediatr* 2012;38
31. Osonuga A and Ekor M.N. The menstrual characteristics of undergraduate students in a Ghanaian Public University. *Jos Journal of Medicine*. 2018; 12(1): 57-63
32. Osonuga A and Ekor M.N. The Impact of Dysmenorrhea on activities of Ghanaian Undergraduate Students. *Trop J Obstet Gynaecol*. 2018; 35(3): in print. Available online from: <http://www.tjogonline.com/aheadofprint.asp>. Accessed: 10th Oct, 2018
33. Osonuga A, Ekor MN and Odusoga OA. Patterns and predictors of management strategies of dysmenorrhea among Ghanaian undergraduate students. *N Niger J Clin Res*. 2018; 7(12): 39-42