

Magnitude of premenstrual dysphoric disorder and associated factors among high school girls, Mekelle, North Ethiopia

Tilahun Belete Mossie¹ Yared Belay Tesfaye², Workua Mekonnen Metekiya¹, Minale Tareke Tegegne³

Abstract

Background: the more severe form of premenstrual syndrome, premenstrual dysphoric disorder is characterized by mood and physical symptoms which impair different aspects of women's life. It still remains less studied public health area in African region, including Ethiopia. With the aim of determining its magnitude and to identify associated factors, this study was carried out.

Methods and Materials: institution based cross sectional study was employed among 181 in school young girls at Ayder secondary and Preparatory school, Mekelle from February to June 2015. Diagnostic and statistical manual of mental disorders 4th edition (DSM IV) was used to assess premenstrual dysphoric disorder; also Zung self-rating anxiety scale was employed to assess anxiety disorder. Self-administered questionnaire prepared in local language (Tigrigna) was used to collect data; after stratifying for grades, systematic random sampling with proportional allocation was employed. Data was analyzed using binary logistic regression through SPSS window 20.

Result: the age of participants lie from 14 to 22 years with mean and median ages of 16.6 and 17 years respectively. The magnitude of premenstrual dysphoric disorder was 30.9% (95% CI, 22.4%-37.8%). Also 16% had anxiety disorder. The age of menarche for the age group 13 to 16 years was about 70.7%; in addition the time of next menses was within 21 to 35 days for 50.8% of the participants. The factors associated with PMDD were early menarche age of 13 to 16 years (AOR=3.11, 95% CI(1.19, 8.12)) and longer duration of menstruation (AOR=2.32, 95% CI(1.07, 5.05))

Conclusion: Premenstrual dysphoric disorder among adolescents was higher. Menstrual health of young school girls particularly those with longer menstruation and in the age group 13 to 16 years need significant public health attention. [*Ethiop. J. Health Dev.* 2015;29(3):170-175]

Key words: Pre-menstruation, Dysphoric disorder, School girls, Ethiopia

Introduction

Premenstrual dysphoric disorder (PMDD) is a combination of both bodily discomfort and emotional/behavioral disturbances that occur shortly a week before the onset of menses, resolving in post menarche days. It is the more severe and disabling form of premenstrual syndrome characterized by anger/irritability, anxiety/tension, feeling tired or lethargic, mood swings, feeling sad or depressed, and increased interpersonal conflicts (1-4)

A research conducted in Jordan among 254 women studying or working in a University showed that the magnitude of PMDD was 10.2%; this was determined by diagnostic and statistical manual of mental disorders (DSM IV). Abdominal cramp, lower back pain and breast pain were the most severe symptoms associated with PMDD (5).

The prevalence of PMDD was 2 - 6% in Icelandic women, aged 20 to 40 years; also cycling nature of menstruation was there in nine-tenth of them; with somatic symptoms being the most displayed cyclic symptoms (6).

A study conducted in Iran to investigate the frequency of premenstrual disorders based on Premenstrual Assessment Scale and also to determine the association

of some demographic and menstrual characteristics with these disorders among 1379 adolescent girls revealed that a total of 814 girls (59%) met the diagnostic criteria for premenstrual dysphoric disorder. Most frequently reported symptoms were back pain, lethargy, fatigue and anxiety. Early menarche and lower education were associated with higher scores (7). A research from India that investigated prevalence, severity and symptom profile of PMDD; and also co morbidity of depression among 221 adolescent in school girls in 2013, using DSM IV as a research tool found out that 12.2% had PMDD out of whom 18.5% also had co morbid depression (8).

In Nigeria there are two different published works with great difference in their results. The recent study among medical students reported that the magnitude of PMDD was 36.1%; PMDD was associated with menstrual pain; however there was no association either with psychiatric disorders or with gynecological disorders (9).

But a prior study in 2008 among University students reported that the magnitude of PMDD was extremely lower than the current finding (6.1%), and it was associated with older age, painful menstruation, and neuroticism. Also high odds of dysthymia (less form of persistent depression), major depressive disorder, panic

¹Mekelle University, College of Health Sciences, Nursing Department, Psychiatry Unit, E-mail: tilahunbe100@gmail.com and werkuaemekonnen@yahoo.com, Mekelle, Ethiopia;

²Jimma University Specialized Hospital, Psychiatry Department, E-mail: yayutig@gmail.com Jimma, Ethiopia;

³Bahir Dar University, College of Medical and Health Sciences, minale23@gmail.com Bahir Dar, Ethiopia

disorder and generalized anxiety disorder were reported (10).

Cultural and psychosocial factors appear to influence the proportion and intensity of physical versus behavioral symptoms, as well as the degree of illness behavior and medical help-seeking associated with premenstrual syndrome. PMDD has been shown to be associated with academic achievement and poor quality of life that is as severe as other psychiatric disorders (1, 11, 12).

Furthermore, PMDD which can impair women's holistic health resulting in poor quality of life is less studied in sub Saharan region, particularly in Ethiopia. Hence it is mandatory to integrate efforts in bridging this gap.

Methods

A school based cross sectional study design was employed from February 2015 until June 2015. It was carried out at Ayder secondary and preparatory school, Mekelle, North Ethiopia. Mekelle city is located in the northern part of Ethiopia in Tigray National Regional State, Mekelle Zone at a distance of 783 km from Addis Ababa. Its astronomical location is 13°32' North latitude and 39°28' East longitude. The city was founded in 1876. It is one of the reform towns in the region and has a city administration, municipality, 7 sub-cities, 33 Kebeles and 105 Ketenas. It has about 104 private and public high schools; and also there are 7 private and public preparatory schools (13).

The source population for this study is all girls who attend secondary and preparatory education (grade 9 to 12) at Ayder secondary and preparatory school; in addition girls who were available and selected randomly during the study period are the population studied. Girls who didn't start menses, seriously medically ill, or pregnant were excluded from the study.

Using single proportion formula with proportion of 86.1% (magnitude of premenstrual syndrome at Addis Ketema Preparatory school, Addis Ababa, Ethiopia (14)), 95% confidence interval and 5% margin of error, the final sample size was 184. After including all classes, students were selected by systematic random sampling technique with proportional allocation to the class size.

As the dependent variable in our study is Premenstrual Dysphoric Disorder, socio demographic factors, gynecological factors, reproductive health factors, and also anxiety disorder are the independent factors which are conceptualized to affect the occurrence of PMDD.

Premenstrual dysphoric disorder: fulfilling the DSM IV criteria for PMDD

In most menstrual cycles during the past year, five (or more) of the following marked symptoms were present for most of the time during the last week of the luteal phase; one of the symptoms should be from the first four symptoms that include depressed mood,

anxiety, affective lability, irritability/anger, lost interest, difficulty to concentrate, decreased energy, change in appetite, sleep disturbance, feeling of being overwhelmed, or other physical symptoms like headache, breast tenderness, joint pain). There should be academic or social problem due to these symptoms (2).

Anxiety disorder: a score of 45 or more on Zung self-rating anxiety scale

In this scale there are 20 questions; also there are four options for each question based on the frequency it occurs (1= a little of the time, 2= some of the time, 3= good part of the time, and 4= most of the time). A total score of 45 or more is considered to screen moderate level of anxiety. Hence we use this cutoff point. (15).

A pre tested, self-administered questionnaire prepared in local language (Tigrigna) was used for data collection. Six Psychiatric Nursing students (after training for one day) collected the data. This process was supervised by Psychiatry professionals; in addition daily data checkup for completeness was carried out before data entry

The collected data was entered and analyzed using SPSS window 20 software. The degree of association with the dependent variable was checked for each independent variable, and those variables with p value of 25% (0.25) were selected for multivariate analysis. In the multivariate analysis, level of significance was determined by adjusted odds ratio.

Ethical consideration: This study was conducted following ethical approval from college of health sciences, Mekelle University; additionally written consent was given from the school director to carry out the research. The purpose of the study was explained to each participant, through assuring confidentiality data was collected with verbal consent respecting their right not to involve in the study (for those under the age of 16 years, parental consent was assured through official letter). Those participants who were screened to have PMDD were referred to the nearby mental health facility.

Result

Socio demographic characteristics: A total of 181 students were involved in the study from a sample size of 184 yielding 98.4% response rates. The age of participants ranged from 14 to 22 years, with mean and median age of 16.64 & 17.0 years respectively.

Most of the respondents which account 170(93.9%), 130 (71.8%), 129 (71.3%) and 161 (89%) were single, earn inadequate money, live together with family and reside in urban area respectively. Maternal educational status of respondent, 69 (38.1%) attended primary school. (Table 1).

Table 1: **Socio demographic characteristics of young in school girls, Ayder secondary and preparatory school, Mekelle, Ethiopia, June 2015 (n = 181)**

| Variables | No | % | |
|-----------------------------------|---------------------|-----|------|
| Age in years | <15 | 6 | 3.3 |
| | 15-18 | 162 | 89.5 |
| | >18 | 13 | 7.2 |
| Religion | Orthodox | 165 | 91.2 |
| | Protestant | 5 | 2.8 |
| | Muslim | 11 | 6.1 |
| Ethnicity | Tigre | 179 | 98.9 |
| | Amhara | 2 | 1.1 |
| Marital status | Single | 170 | 93.9 |
| | Married | 8 | 4.4 |
| | Divorced | 3 | 1.7 |
| Residence | urban | 161 | 89 |
| | rural | 20 | 11.0 |
| Grade Level | 9th grade | 37 | 20.4 |
| | 10th grade | 50 | 27.6 |
| | 11th grade | 53 | 29.3 |
| | 12th grade | 41 | 22.7 |
| Maternal educational level | No formal education | 47 | 26.0 |
| | Primary school | 69 | 38.1 |
| | High school | 53 | 29.3 |
| | College/University | 12 | 6.6 |
| Income adequacy | Inadequate | 130 | 71.8 |
| | Partially adequate | 38 | 21.0 |
| | Adequate | 13 | 7.2 |
| Family status | Live together | 129 | 71.3 |
| | Extended family | 39 | 21.5 |
| | Divorced | 13 | 7.2 |

Magnitude of PMDD: Its magnitude among in school girls was 30.9% as determined by DSM IV. About 158 (87.3%) has reported at least one symptom. Decreased energy (fatigability), changes in appetite and decreased interest to usual activities were the most common

symptoms reported by 68.5%, 48.6% and 45.3% of the participants respectively. Feeling of losing control/overwhelming was however the least symptom reported by relatively lower percentage (21%) of participants. (Table 2).

Table 2: **Commonly reported symptoms among young school girls, Ayder secondary and preparatory school, Mekelle, Ethiopia, June 2015**

| Symptoms | No | % |
|---------------------------|-----|------|
| Marked depressed mood | 49 | 27 |
| Marked anxiety | 74 | 40.9 |
| Affective lability | 66 | 36.5 |
| Irritability and anger | 79 | 43.6 |
| Lost interest | 82 | 45.3 |
| Lack of energy | 124 | 68.5 |
| Changes in appetite | 88 | 48.6 |
| Sleep disturbance | 64 | 35.4 |
| Feeling of out of control | 38 | 21 |
| Difficulty to concentrate | 70 | 38.7 |
| Somatic/bodily | 74 | 40.9 |

Menstrual related Factors: The mean age of menarche was 13.7 years; and for about 127 (70.7%) it was between 13 – 16 years. Also on periodicity of menarche, 92 (50.8%) has had their next menstruation

in the next 21 to 35 days. About 116 (64.1%) of the young girls used 2 to 4 pads daily during menstruation. (Table 3).

Table 3: Menstruation related factors of young girls at Ayder secondary and preparatory school, Mekelle, Ethiopia, June 2015

| Variables | | No | % |
|----------------------------------|-------------------|-----|------|
| Age menses started | <13 years | 13 | 7.2 |
| | 13-16 years | 127 | 70.2 |
| | >16 years | 41 | 22.6 |
| Periodicity of menarche | <21 day | 71 | 39.2 |
| | 21-35 days | 92 | 50.8 |
| | >35 | 18 | 10 |
| Duration of menarche | >4 days | 67 | 37.0 |
| | 4 days | 71 | 39.2 |
| | < 4days | 43 | 23.8 |
| Amount of menstruation | Minimal (1 pad) | 49 | 27.1 |
| | Moderate(2-4pads) | 116 | 64.1 |
| | Heavy(>4pads) | 16 | 8.8 |
| Oral contraceptive use | Yes | 17 | 9.4 |
| | No | 164 | 90.6 |
| Sleeping habit (over 24 hr) | Sleep for 6-10 | 81 | 44.8 |
| | Sleep for <6 | 38 | 21 |
| | Sleep for >10 | 62 | 33.2 |
| Tobacco use in the last 3 months | Yes | 11 | 6.1 |
| | No | 170 | 93.9 |
| Alcohol use in the last 3 months | Yes | 13 | 7.2 |
| | No | 168 | 92.8 |

The level of anxiety was assessed using Zung self-rating anxiety scale. Participants with a score of 45 or above out of 80 were determined as having anxiety. The magnitude of anxiety was 16%; and the most commonly reported symptoms include being easily tired, sleep disturbance and unsteadiness.

Factors Associated with PMDD: Age at menarche and longer duration of menstruation were significantly

associated with PMDD. Menarchial age of 13 to 16 years was a stronger risk factor when compared to the age group of above 16 years old (AOR=3.11, 95% CI(1.19, 8.12)). In addition, those who had longer menstrual duration for more than 4 days were more prone to develop PMDD than participants with shorter menstrual duration (AOR= 2.32, 95% CI (1.02, 5.05)). (Table 4).

Table 4: Degree of association between premenstrual dysphoric disorder and other factors, Ayder secondary and preparatory school, Mekelle, Ethiopia, June 2015

| Variables | | PMDD | | AOR (95% CI) | p-value |
|---------------------------|-----------------|------|-----|---------------------------|--------------|
| | | Yes | No | | |
| Income | Inadequate | 46 | 84 | 2.13 (0.92, 4.89) | 0.75 |
| | Adequate | 10 | 41 | | |
| Duration of menses | ≤ 4 days | 37 | 101 | 2.32 (1.07, 5.05)* | 0.033 |
| | > 4 days | 19 | 24 | | |
| Age at menarche | Before 13 years | 4 | 10 | 1.98 (0.05, 4.57) | 0.526 |
| | 13 to 16 years | 45 | 76 | 3.11 (1.19, 8.12)* | 0.020 |
| | After 16 years | 7 | 34 | 1 | |
| Current cigarette smoking | Yes | 6 | 5 | 3.98 (0.55, 28.68) | 0.17 |
| | No | 50 | 120 | | |
| Current alcohol drinking | Yes | 7 | 6 | 1.49 (0.28, 7.89) | 0.64 |
| | No | 49 | 119 | | |
| Contraceptive use | Yes | 8 | 9 | 1.3 (0.34, 5.11) | 0.696 |
| | No | 48 | 116 | | |

AOR= Adjusted odds ratio, CI= Confidence interval, * significantly associated

Discussion

In our current study the magnitude of PMDD was 30.9%. Literatures across the world deducted that the magnitude of PMDD has huge gap ranging from 10% in Jordan to 36% in Nigeria and 59% in Iran (5, 7, and 9). In our current study it was 30.9% which is higher than the Jordan (10%), and India (12.2%) findings (5, 6 and 8). However, it is lower than those of Nigeria (36%) and Iran (59%) reports (7, 9). This discrepancy can be due to distinct socio economic characteristics besides the difference in methods and materials.

Menarche age of 13 to 16 years when compared to late menarche age of above 16 years was significantly associated with developing PMDD which is in line with that of Iran finding (7). A prior study on menstrual cycle stated that the menstrual cycle appears to have impact on fear related symptoms among women with psychological distress (16). The wider the time period menstruation stayed, the more intense will be emotional disturbance; this may be the possible reason for longer duration of menses.

However, anxiety disorder, use of different psycho active substances and other socio economic factors were not associated with developing PMDD unlike earlier studies in different parts of the world (5, 6, 7, and 10).

Former studies also found that PMDD have significant association with Menstrual pain, having depressive disorder, and having anxiety disorder among Nigerian medical students, early menarche and lower educational level in Iran were the other factors strongly associated with PMDD (7, 8). In addition post-traumatic stress disorder, nicotine dependence, anxiety and traumatic events; on the other hand lower educational level, history of depression, cigarette smoking and working out of home were the risk factors mentioned in a community based survey (17, 18, 19, 20).

Somatic (bodily) symptoms were the most widely reported symptoms in our study; this finding is similarly supported by prior investigations from Iceland, Iran, and Jordan (5, 6, and 7). As well symptoms interfere with school activity in 36.5% of the students; this is similarly reported in a prior study that 51.2% had distress in school activity (12).

Limitation

The fact that the sample size for this study was small may affect generalization of the finding to similar settings.

Conclusion:

Overall based on the study we have concluded that the magnitude of premenstrual dysphoric disorder is high when compared to global figures. As well early age of menarche and longer duration of menstruation were significantly related to PMDD.

Recommendations

To Regional Bureau of Education and other stake holders in the sector, it is significant to integrate menstrual health with different intervention packages

at school; with emphasis to girls in the age group of 13 to 16 years and those with longer menstrual duration.

Competing interest

We the authors declare that we have no any competing interest.

Author's contribution

TBM, YBT, and WMM worked on conceiving and designing the study, TBM, YBT, WMM and MTT collected, analyzed and interpreted data, TBM and MTT drafted the manuscript for important intellectual content, All authors read the draft manuscript and approved the final copy for submission.

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