Premenstrual dysphoric disorder and associated factors among university graduating class female students in Ethiopia: A cross-sectional study

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Abstract

Objectives: Premenstrual dysphoric disorder is a somatopsychic condition that develops about a week before the start of menstruation and is brought on by fluctuating sex steroid levels that follow an ovulatory menstrual cycle. Therefore, this study aimed to assess the magnitude of premenstrual dysphoric disorder and associated factors among Haramaya University graduating class female students, in eastern Ethiopia.

Methods: An institutional-based cross-sectional study was conducted from 1 to 30 November 2022 among Haramaya University graduating class female students using a simple random sampling technique. The data were cleaned, coded, and entered into the Epi-data 3.01 before being exported and analyzed with Statistical Package of Social Science 20 versions. The premenstrual dysphoric disorder was assessed by the diagnostic criteria of the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Revision. To identify associated factors a bivariable logistic regression analysis was conducted to determine the association between each independent variable and the outcome variable. The multivariable logistic regression model includes all variables with a p-value of less than 0.25 in the bivariate logistic regression analysis. The adjusted odds ratio with a 95% confidence interval was computed when the p-value was less than 0.05, which was considered statistically significant.

Results: Out of 282 samples, 274 study participants were involved providing a response rate of 97.2%. The prevalence of premenstrual dysphoric disorders was 64.6% (95% CI: 59.5–70.4). Participants with the irregular menstrual cycle (AOR = 2.24; 95% CI: 1.26–4.34), heavy menstrual flow (AOR = 2.53; 95% CI: 1.84–7.59), moderate menstrual flow (AOR = 2.29; 95% CI: 1.02–5.26), severe menstrual pain (AOR = 5.69; 95% CI: 1.86–7.42) and those who have depressive symptoms (AOR = 2.46, 95% CI: 1.08–5.68) were variables associated with premenstrual dysphoric disorders.

Conclusion: The prevalence of premenstrual dysphoric disorder was relatively high. Severe menstrual pain, menstrual irregularity, heavy menstrual flow, and a history of depression had significant associations with premenstrual dysphoric disorder. It will be better if higher institution administrators design and implement methods to screen and intervene premenstrual dysphoric disorder among female students.

Keywords

Prevalence, premenstrual dysphoric disorder, associated factors, female students, Harar, Ethiopia

Introduction

Premenstrual dysphoric disorder (PMDD) is a somatopsychic condition brought on by fluctuating levels of sex steroids that occur along with an ovulatory menstrual cycle. It starts around a week before the start of menstruation and is marked by irritation, mental instability, headache, anxiety, and depression as well as bodily symptoms like edema,

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weight gain, breast soreness, syncope, and paresthesia.[1] PMDD and premenstrual syndrome have uncertain origins. However, biological reasons that have been linked to PMDD include heredity, sociocultural factors, central nervous system sensitivity to reproductive hormones, and abnormal brain neurochemicals.[2] Additionally, since serotonin is naturally present in the brain, where it is involved in vasoconstriction and affects mood, it's suggested that serotonergic dysfunction results in PMDD.[3]

Mood swings, irritability, dysphoria, anxiety, and physical symptoms that go away around the onset of menstruation or shortly after are the hallmarks of PMDD, and a history of other mental disorders increases the likelihood of having PMDD.[4,5] Age 15–29 years is a turning point in life when social, emotional, intellectual, and physical development quicken. Women are more prone than males to experience depression, lack of confidence, low self-esteem, and diminished vitality, according to the World Health Organization.[6]

According to an epidemiology study, most young women have premenstrual difficulties to some extent, particularly during the first few years of their reproductive careers. Up to 80% of fertile women are thought to experience severe premenstrual symptoms.[7] PMDD, which is characterized by one or more physical, emotional, or behavioral symptoms in the days preceding menstruation, was present in 94.8% of reproductive-age women (15–49 years) worldwide.[8] The most prevalent symptoms in Iranian individuals who had been diagnosed with PMDD were breast pain (100%) and stomach pain (53%) as well as fatigue or lethargy (51.4%), backache (47.2%), and joint or muscle pain (38.7%).[9] According to research conducted in India, 37% of medical students had PMDD.[10] The prevalence of PMDD was found to be 31.3% in women attending postsecondary institutions in Kenya.[11] In Ethiopia, the prevalence of PMDD among university students is as high as 66.9%.[12]

Premenstrual symptoms can make it difficult for women in a number of ways, including by impairing their ability to function physically, psychologically, or severely disrupting their social or professional lives.[13] Symptoms in young teenagers may have a significant impact on social interactions and academic performance.[14]

Recent research on the burden of PMDD reveals a significant economic indirect cost, primarily from decreased productivity and effectiveness at work and from strained social interactions.[15] A number of variables were found to be determinants of PMDD. A history of substance use increased the chance of having PMDD.[16] The likelihood of developing PMDD is also increased by a variety of medical conditions (such as migraine, asthma, allergies, and seizure disorders) and other chronic conditions.[17]

Patients with PMDD frequently lament being away from school and performing poorly in class.[18] Premenstrual dysphoric condition in women of working age is upsetting to them personally, but it also puts a financial, social, and emotional strain on the affected women's friends and family.

Additionally, it indirectly affects a nation's economy and educational systems. The prevalence and associated factors of PMDD among female university students are little understood, despite the considerable burden.[19] Because of this, this study was essential in detecting this gap and supporting the scientific treatments needed to reduce further consequences. The primary goals of this study were to determine the prevalence of PMDD and associated factors among graduating class female students of Haramaya University, Eastern Ethiopia.

Materials and methods

Study area and period

The study was carried out at Haramaya University, which was established in 1954 according to the Ethiopian calendar. It is situated 510 km east of Addis Ababa and presently operates on two campuses: the main Haramaya campus and the Harar campus. The university is home to nine colleges, one sports academy, and one institute (the Institute of Technology). The College of Health and Medical Sciences is located on the Harar campus, which is about 23 km away from the main (Haramaya) campus. Eight colleges (the College of Agriculture and Environmental Science, the College of Business and Economics, the College of Computing and Informatics, the College of Education and Behavioral Science, the College of Veterinary Medicine, the College of Law, the College of Natural and Computational Science, and the College of Social Science and Humanities), one sports academy, and one institute (the Institute of Technology) make up the Haramaya campus. The study was conducted from 1 up to 30 November 2022.

Ethical consideration

The study was carried out under consideration of the Helsinki Declaration of medical research ethics. Ethical clearance was obtained from Haramaya University College of Health and Medical Science Institutional Health Research Ethics Review Committee (IHRERC) reference number (IHRERC/014/2022). Informed, voluntary, written, and signed consent was taken from each respondent. Study participants were also informed that if they did not want to answer any question, they had the right to do so. Filled out questionnaires were carefully handled and all access to results were kept strictly within the members of the group. Anonymity was maintained to ensure confidentiality of respondents.

Study design and population

An institutional-based cross-sectional study was conducted. The source population was all graduating class female

students at Haramaya University in 2022 according to the Gregorian calendar (G.C). The study participants were graduating female students' at Haramaya University and available during the data collection period. Graduating female students who were attending weekend and night shifts were excluded from the study.

Sample size determination

The sample size was determined by using a single population proportion by taking the prevalence of PMDD among female students in Wollo University which is 66.9% (12), with 5% margin of error, 95% confidence interval as follows:

$$ n = \frac{Z\frac{\alpha^2}{2}p(1\text{-}p)}{d2} $$

$$ n = (1.96)^2 \, x0.669 \, (1\text{-}0.669) / \, (0.05)^2 = 340 $$

Thus, by applying the formula, a sample of 340 was calculated.

Since the source population is 1062, which is below 10,000, a correction formula was used as follows:
Where
nf = final sample size
n = minimum sample size required for the study
N = the total number of Haramaya university female students
N = 1062 students
nf = *n*/1 + *n*/*N*,
nf = 340/1 + 340/1062 = 256

The calculated sample size was 256 and by adding a 10% non-response rate, the final sample size was 282. Regarding the sampling procedure, the study population was divided into strata of characteristics based on their field of study, and then the total sample size was allocated proportionally based on number of graduating female students in each field of study. Finally, a simple random sampling technique was used to select study participants from each department. The student's identification number was used as the sampling frame and a computer-generated method was used to randomize the selection.

Data collection instruments and procedures

A self-administered, pretested structured questionnaire was used to obtain data from the study participants. The questionnaire was administered in English version with the assumption that participants could easily understand it. Cronbach's alpha was used to verify internal consistency and provide preliminary validation. The data collection tool has nine sections including socio-demographic characteristics, academic demand variables, psycho-social and health-related variables, obstetrics and gynecology factors, substance-related factors, behavioral factors, and The Diagnostic and Statistical

Manual of Mental Disorders, Fifth Edition, Text Revision (DSM-5-TR) criteria for premenstrual PMDD.

The DSM-5 was utilized to evaluate PMDD, and the diagnostic criteria for PMDD were taken from the Diagnostic and Statistical Manual of Mental Illness, Fifth Edition. The diagnostic tool was created by the American Psychiatric Association and is currently used in Ethiopia to identify clinical PMDD. The ideal cutoff point to identify PMDD requires the presence of at least five symptoms from 11.[20]

Data quality control

Before the actual data collection, data collectors received training on data gathering techniques, tools, and how to manage ethical dilemmas. Before 2 weeks of actual data collection, the questionnaire was pretested on 5% of the total sample size (14 female graduating students) at Dire Dawa University. Daily supervision was provided to the data collection process, and the lead investigator and supervisors verified the accuracy of the completed questionnaires each day.

Data processing and analysis

Data were cleared, coded, and entered into Epi-data 3.01 before being exported and examined in Statistical Package of Social Science 20 versions (SPSS 20). Descriptive statistics were used to study the respondents' socio-demographics and other factors. A bivariable logistic regression analysis was conducted to determine the association between each independent variable and the outcome variable. The multivariable logistic regression model includes all variables with a *p*-value of less than 0.25 in the bivariate logistic regression analysis. We needed enough candidate variables for multivariable logistic regression, and we also took clinical significance into account when choosing the variables for the multivariable logistic regression model, which is why the *p*-value was determined to be less than 0.25. The adjusted odds ratio (AOR) with a 95% confidence interval (CI) was computed when the *p*-value was less than 0.05, which was considered statistically significant. The model's fitness was assessed using the Hosmer-Lemeshow test, and the result was 0.54.

Operational definition

PMDD: Those women experiencing at least five symptoms from diagnostic criteria of DSM-5-TR in the majority of menstrual cycles were considered as having PMDD.[20] It was must for these symptoms to be present in the final week before the onset of menses, start to improve within a few days after the onset of menses, and become minimal or absent in the week of post menses; symptoms are present for at least 2 symptomatic cycles and are associated with clinically significant distress or interfere with work, school, usual social activities or relationships with others.[20]

Table 1. Distribution of socio-demographic variables of graduating female students at Haramaya University Harar, Eastern Ethiopia, 2022.

Variables	Categories	Frequency	Percentage
Age (mean ± SD)			23.27 ± 2.51
Religion	Orthodox	108	39.4
	Muslim	92	33.6
	Protestant	63	23
	Other*	11	4
Ethnicity	Oromo	139	50.7
	Amhara	102	37.2
	Somali	10	3.6
	Hadere	13	4.7
	Other**	10	3.6
Relationship status	Single	140	51.1
	Married	45	16.4
	Divorced	3	1.1
	Separated	6	2.2
	Has boyfriend	80	29.2
Distance from a place where family lives (km)	<500	119	43.4
	≥500	155	56.6
Residence before joining university	Urban	128	46.7
	Rural	146	53.3
Current residence	Lives in dormitory	211	77
	In rent house	43	15.7
	Lives with family	20	7.3
Mother's educational level	Has no formal education	45	16.4
	Primary	83	30.3
	Secondary	77	28.1
	Diploma	26	9.5
	Degree and above	43	15.7
Average monthly pocket money in birr	<500 (<10$)	57	20.8
	500–1000 (10–20$)	103	37.6
	>1000 (20$)	114	41.6
Family's average monthly income	<5000 (100$)	45	16.4
	5000–10,000 (100–200$)	122	44.5
	10,000–15,000 (200–300$)	65	23.7
	>15,000 (>300$)	42	15.3

$: USD; *: Catholic, wakefata; **: Tigre, Gurage, Wolayita.

Regularity of menstruation: Those women whose menses flows every 28 days/4 weeks.[12]

Severe dysmenorrhea: Subjective response of severe pain felt during menstruation.[12]

Moderate dysmenorrhea: Subjective response of moderate pain felt during menstruation.[12]

Mild dysmenorrhea: Subjective response of mild pain felt during menstruation.[12]

Results

Socio-demographic characteristics of respondents

Out of a total sample of 282 participants, 274 participants agreed and participated in the study, giving a response rate of 97.2%. The mean age of the respondents was 23.27 (±2.51 SD). Regarding relationship status 140 (51.1%) participants were single. In terms of the distance from where their family lives, for 155 (56.6%) participants it was greater than or equal to 500 km. Regarding their residence before joining the University, 146 (53.3%) of them live in rural areas. Regarding their current residence, 211 (77%) of them live in a dormitory. In the present study, the average monthly pocket money for 114 (41.6%) of them is above 1000 Ethiopian birr (ETB) (20 USD). The families' average monthly income for 122 (44.5%) is 5000–10,000 ETB (100–200 USD) (Table 1).

Academic demand variables of respondents

Among study participants, 89 (32.46) of them were from the College of Health and Medical Science, 80 (29.2%) were from the College of Computing and Informatics and 38 (12.7%) were from the College of Natural and Computational Science, and the rest 67 (25.6%) of them were from the

College of Business and Economics. The majority of the respondents, 212 (77.37%) respondents, have an interest in their field of study and the remaining, 62 (22.63%) respondents, have no interest. Regarding students' CGPA, 118 (43.1%) of them have between 3 and 3.5 and 39 respondents have a CGPA greater than 3.5 out of 4.00.

Psychosocial and health-related variables

In this study, out of 274 total respondents, 131(47.8%) rated it as having strong social support; while 114 (41.6%) rated it as medium and the rest 29 (10.6%) rated it as having low social support. Regarding perceived academic stress, 114 (41.6%) responded as having low academic stress, 66 (24.1%) as a medium, 42 (15.3%) perceived it as having strong academic stress, and the rest 52 (19%) had no perceived stress.

Concerning history of depression, 217 (79.2%) of the respondents have no history of depression and the rest 57 (20.8%) have a history of depression. With regard to having chronic medical illness, 227 (81.8%) have no chronic medical illness and the rest 47 (17.2%) have chronic medical illnesses. The 187 (68.2%) of the respondents have no history of chronic medical illness that runs within the family, and the remaining 87 (31.8%) of the respondents have a history of chronic medical illness within the family.

Obstetrics, gynecological, and menstrual characteristics of respondents

Of the study participants, 159 (58%) aged at first menses were between 11 and 13 years, while 111 (40.5%) were in the range of 14–16 years, and for the rest 4 (1.5%) were between 17 and 19 years of age. The average interval of menstrual cycle for 159 (58%) participants was irregular while for 115 (42%) was regular. The amount of bleeding (menstrual flow) during one cycle as graded by the respondents was minimal 55 (20.1%), moderate 165 (60.2%), and heavy 54 (19.7%). Among the study participants, 208 (74.9%) of them suffer from dysmenorrhea (pain during menstruation), whereas the remaining 66 (24.1%) do not. The 98 (35.8%) individuals who experienced dysmenorrhea rated it as light, 74 (27%) as moderate, and the remaining 36 (13.1%) rated it as severe.

Behavioral and substance-related variables

The majority of the study participants, 235 (85.8%) have not used alcohol in the past 3 months, while the remaining 39 (14.2%) have used alcohol and with regards to cigarette smoking, 23 (8.4%) of participants currently chew tobacco and 251 (91.6%) do not. The remaining 10 (3.6%) smokers make up the remaining 264 (96.4%) non-smokers. Out of 274 participants, 143 (52.2%) gave their sleep time a rating of higher than 7 h, 104 (38%) gave it a rating of between 5 and 7 h, 20 (7.3%) gave it a rating of between 4 and 2 h, and the remaining 7 (2.6%) gave it a rating of less than 2 h. In terms of using contraception, 209 respondents (76.3%) do so, while the remaining 63 respondents (23.7%) do not.

COVID-19 and related factors

Of the participants in this study, 242 (88.3%) have never had a COVID-19 test, whereas the remaining 32 (11.7%) had it. The 26 (9.4%) individuals who had Covid-19 testing were negative, and the remaining 6 were positive. The 266 (97.1%) participants said no student in their dorm tested positive for COVID-19, while the remaining 5 (1.8%) said there was a student who tested positive for COVID-19.

Prevalence and perceived impacts of symptoms of premenstrual dysphoric disorder

In this study, the prevalence of PMDD was 64.6% (95% CI: 50.5–70.4). PMDD symptoms were also tested using the DRSP tool. The analysis describes the psychological symptoms, physical symptoms, and impairment levels among university students with PMDD. The results revealed that 11.6% ($n = 32$) of the students with PMDDs reported having severe levels of depression before menstruation, with 32.8% ($n = 90$) reported having severe levels of anxiety before menstruation, 28.8% ($n = 79$) reported having severe level of mood swings before menstruation, 38.3% ($n = 105$) reported having severe levels of irritability before menstruation (Table 2).

Factors associated with PMDD

To identify associated factors for PMDD, bivariable and multivariable logistic regression analyses were conducted. In a multivariable logistic regression analysis, PMDD was statistically significantly associated with irregular menstrual cycles, severe menstrual pain (severe dysmenorrhea), a history of depression, and high and moderate menstrual flow at a p-value < 0.05. According to the findings, those who had irregular periods had a 2.34 times higher chance of getting PMDD than those who had regular periods (AOR = 2.34, 95% CI: 1.26–4.34). Students with excessive menstrual flow and those with moderate menstrual flow had 2.53 and 2.29 times the chance of having PMDD, respectively, compared to those with little menstrual flow (AOR = 2.53, 95% CI: 1.84–7.59) and (AOR = 2.29, 95% CI: 1.02–5.26). Students who experienced significant menstrual pain had a 5.69 times higher chance of having PMDD than those who did not (AOR = 5.69; 95% CI: 1.86–7.42). Those who have depressive symptoms are 2.45 times more likely to acquire PMDD than those who don't (AOR = 2.45, 95% CI: 1.06–5.68) (Table 3).

Discussion

The current study revealed that the prevalence of PMDD among Haramaya University graduating class female students was 64.6%. This finding is similar with prevalence of

Table 2. Description of premenstrual dysphoric disorders symptoms using daily record of severity of problems (DRSP) (n = 274).

PMDD symptoms	Severity	Frequency	Percentage
Feeling self-deprecating (ideas of worthlessness) or guilty	Absent	32	11.6
	Moderate	178	65.0
	Severe	64	23.4
Feeling hopeless	Absent	82	30.0
	Moderate	123	44.9
	Severe	69	25.1
Feeling self-deprecating (ideas of worthlessness) or guilty	Absent	97	35.4
	Moderate	106	38.7
	Severe	71	25.9
Marked anxiety, tension and/or feelings of being tied up, nervous	Absent	52	19.0
	Moderate	132	48.2
	Severe	90	32.8
Moodiness (e.g., sudden feelings of sadness, desire to cry)	Absent	35	12.8
	Moderate	160	58.4
	Severe	79	28.8
Hypersensitivity to rejection, easily broken feelings	Absent	81	29.6
	Moderate	140	51.1
	Severe	53	19.3
Marked irritability or anger	Absent	41	15.0
	Moderate	128	46.7
	Severe	105	38.3
Increased interpersonal conflict	Absent	83	30.3
	Moderate	102	37.2
	Severe	89	32.5
Decreased interest in usual activities (e.g., work, school, friends, hobbies)	Absent	60	21.9
	Moderate	114	41.6
	Severe	100	36.5
Subjective difficulty concentrating	Absent	78	28.5
	Moderate	122	44.5
	Severe	74	27.0
Lethargy, excessive tiredness or marked loss of energy	Absent	30	10.9
	Moderate	135	49.3
	Severe	109	39.8
Marked changes in appetite, hyperphagia	Absent	57	20.8
	Moderate	136	49.6
	Severe	81	29.6
Cravings for some foods	Absent	71	25.9
	Moderate	124	45.3
	Severe	79	28.8
Hypersomnia	Absent	96	35.0
	Moderate	128	46.7
	Severe	50	18.3
Insomnia	Absent	89	32.5
	Moderate	142	51.8
	Severe	43	15.7
Feeling overwhelmed	Absent	41	15.0
	Moderate	130	47.4
	Severe	103	37.6
Feeling of losing control	Absent	107	39.1
	Moderate	139	50.7
	Severe	28	10.2
Breast pain	Absent	83	30.3
	Moderate	145	53.0
	Severe	46	16.7

(Continued)

Table 2. (Continued)

PMDD symptoms	Severity	Frequency	Percentage
Breasts swelling, impression of swelling, weight gain	Absent	89	32.5
	Moderate	108	39.4
	Severe	77	28.1
Headaches	Absent	95	34.7
	Moderate	118	43.1
	Severe	61	22.2
Muscle and/or Joint pain	Absent	64	23.4
	Moderate	119	43.4
	Severe	91	33.2
At work, at school, at home, or in daily routine, at least one of the problems noted above caused a reduction of productivity or inefficiency	Absent	56	20.4
	Moderate	134	49.0
	Severe	84	30.6
At least one of the problems noted above interfered with hobbies or social activities (e.g., avoid or do less)	Absent	47	17.2
	Moderate	148	54.0
	Severe	79	28.8
At least one of the problems noted above interfered with relationships with others	Absent	61	22.3
	Moderate	139	50.7
	Severe	74	27.0

Table 3. Factors associated with premenstrual dysphoric disorder among female health and medical science students at Haramaya University, Harar, Eastern Ethiopia, 2022.

Variable	PMDD		COR (95% CI)	AOR (95% CI)
	Yes	No		
Age (in years)				
≤23 years	106	50	1.403 (1.852–2.33)	1.670 (0.881, 3.165)
>23 years	71	47	1.00	1.00
Current residence				
Lives in dormitory	129	82	1.18 (0.04–0.77)	0.18 (0.031, 1.058)
In rent house	30	13	1.26 (1.052–1.27)	0.22 (0.034, 1.478)
Lives with family	18	2	1.00	1.00
Sexual abuse				
Yes	34	6	3.606 (1.456–8.930)	3.31 (0.887, 12.319)
No	143	91	1.00	1.00
Emotional abuse				
Yes	21	6	2.04 (1.79–5.24)	0.61 (0.143, 2.57)
No	156	91	1.00	1.00
Depressive symptoms				
Yes	45	12	2.042 (1.795–5.244)	2.46 (1.06, 5.68)**
No	132	85	1.00	1.00
Regularity of menses				
Regular	79	62	1.00	1.00
Irregular	98	35	2.19 (1.32, 3.66)	2.34 (1.26, 4.34)**
Menstrual flow				
Minimal	28	44	1.00	1.00
Moderate	87	40	3.42 (1.87, 6.25)	2.29 (1.02, 5.26)*
Heavy	62	13	7.49 (3.49, 16.07)	2.53 (1.84, 7.59)*
Menstrual pain and its level (dysmenorrhea)				
No	27	45	1.00	1.00
Minimal	46	25	3.07 (1.55, 6.06)	2.24 (0.95, 5.29)
Moderate	41	17	4.02 (1.92–8.42)	2.31 (0.87, 6.15)
Severe	63	10	10.50 (4.62, 23.85)	5.69 (1.86, 7.42)*

1·00: reference group.
*$p < 0.05$, **$p < 0.001$.

PMDD among health science students in Wollo University which is 66.9%.[12] and other study done among 858 female university students in Jordan in which the prevalence of PMDD was 61.7%.[21] The possible reason of high prevalence of PMDD in our study might be due to higher substance abuse in especially stimulants like khat and alcohol in eastern part of Ethiopia.[22–25] Substance abuse can disrupt a woman's menstrual cycle by doing any of the following: Causing her to have a lighter or heavier period, increasing or decreasing the average length of her period, and inducing amenorrhea, or causing her to stop having a period. Misusing substances may be riskier for women with PMDD, because it worsens symptoms in two different ways: Directly triggering changes in mood and inducing other psychiatric symptoms and indirectly intensifying mental health symptoms through changes to the menstrual cycle. For women with PMDD, severe psychiatric symptoms like panic attacks, severely depressed mood, and suicidal thoughts are triggered by changes to their reproductive hormones and brain chemistry the week before menstruation begins.

A study conducted on Sistan and Baluchestan University (Iran) students found that the prevalence of PMDD was 36.3%, which is less than our study.[26] A cross-sectional study conducted on 448 female students across three universities in Karachi, Pakistan, found that the prevalence of PMDD, as determined by the American College of Obstetricians and Gynecologists criteria, was 23.9%. This figure is also lower than that of the current study.[27] This discrepancy may be explained by the different premenstrual symptom screening tool that was used to evaluate PMDD, the different sample size, or the different socio-demographic traits of the participants.

In our study, the prevalence of PMDD was 64.6%, which is less than the 88.7% found in a study conducted at the Isra University Hospital in Hyderabad, Sindh, Pakistan.[28] The study carried out at Hawler Medical University's nursing college in Iraq revealed a greater prevalence of severe premenstrual symptoms, at 81.3%,[26] and another study from Pakistan's National University of Sciences and Technology and Islamabad Army Medical College revealed a 92.4% prevalence of PMDD.[29] This discrepancy could be caused by variations in the participant's socio-demographic characteristics, the study period, the sample size, and the study design. For example, Pakistan's study employed an analytic study design with convenience sampling, and the data collection instruments were different.[30]

PMDD was reported to be 81.3% prevalent in a facility-based cross-sectional research of female secondary and preparatory students at Debre-Markos, which included 496 students. This is a higher result than ours; the discrepancy may be due to a different tool used to screen for premenstrual symptoms and a difference in sample size.[31]

In our study, severe dysmenorrhea was strongly associated with PMDD, showing that students who had severe pain during their periods were higher odds to have the disorder than those who did not (AOR=5.69, 95% CI: 1.86–7.42).

This finding is consistent with a study conducted at Assosa Technical and Vocational School, which likewise found a substantial relationship between the presence of PMDD and severe dysmenorrhea.[28] The possible explanation for this association might be menstrual pain can cause distress and aggravate the emotional and behavioral response to menstrual symptoms and it can lead to the likelihood to develop PMDD.

Our study found a significant association between irregular menstruation and the development of PMDD. Students who experienced irregular menses were 2.34 times higher odds to develop PMDD than those who experienced regular menstruation (AOR=2.34, 95% CI: 1.26–4.34), which is supported by a study on female health science students at Wollo University.[12] This can be the result of a menstrual cycle that is irregular. Distress can heighten anxiety, tension, and irritability, which can exacerbate PMDD symptoms.

In our study, there is a strong correlation between heavy menstrual bleeding and the development of PMDD; students with heavy menstrual bleeding were 2.53 times higher odds to have PMDD than those with minimum bleeding (AOR=2.53, 95% CI: 1.84–7.59). This result is similar with the research conducted among university students at Jimma.[32] The probable cause could be severe bleeding, which can be quite uncomfortable and interfere with daily tasks, make people less interested in daily activities, and make them more susceptible to mood disorders like PMDD.

In our current study, history of depression is found to have a significant association with the dependent variable PMDD which is consistent with the study done on Mekele high School students.[33] On the other hand use of contraception methods has an association with PMDD which is similar to the study done on Assosa Vocational and Technical school.[28] This might be due to the reason that having depressive symptoms may decrease coping mechanisms for live events, and this leads to worsening of anxiety, irritability, and other mood symptoms, and with stressful live events the level of cortisol increases which in turn worsens premenstrual symptoms.

Limitation of the study

It is important to recognize the study's limitations. First of all, because self-reported measures may introduce recall bias or response into the data, this could potentially affect the accuracy of the responses. Second, because of the study's cross-sectional design, it is impossible to determine causal relationships or comprehend how things change over time. In this situation, a prospective or longitudinal study will be beneficial.

Conclusion and recommendation

PMDD was more common than in prior studies conducted in Ethiopia and other nations in the current study. Severe

dysmenorrhea, an irregular menstrual cycle, heavy and moderate menstrual flow, and depression were significantly associated with PMDD among the covariates evaluated in this study. The majority of students with PMDD failed to bring up menstrual symptoms to medical experts or sought medical attention. It will be better if higher education officials create and put into practice strategies to test for and treat PMDD in students.

Ethical approval

The study was carried out under consideration of the Helsinki Declaration of medical research ethics. Ethical clearance was obtained from Haramaya University College of Health and Medical Science Institutional Health Research Ethics Review Committee (IHRERC) reference number (IHRERC/014/2022).

Informed consent

Each respondent provided informed, voluntary, written, and signed consent. Participants in the study were also informed that they had the option not to answer any questions. Completed questionnaires were handled with care, and all access to results was restricted to group members only. To protect responders' confidentially, anonymity was maintained. Prior to participating in the study, all individuals received written consent in Amharic and Afan Oromo and signed it.

Trial registration

Not applicable.

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Supplemental material

Supplemental material for this article is available online.

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