

# Prevalence of dysmenorrhea, associated factors, pain intensity, and its effect on daily academic activities among female undergraduate students of Hawassa University College of medicine and health sciences, Hawassa, Ethiopia

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## Research Article

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# Abstract

**Background:** Painful menstruation, known as dysmenorrhea, is a common gynecologic incident that affects mainly reproductive-age females with significant social, academic, and psychological negative impacts. Young females are one of the productive age who become future leaders and hope for the country as well as the community. Any problem which affects this age group will have a tremendous economic and psychological burden on the country and community. This study aims to assess the prevalence, associated risk factors of dysmenorrhea, pain intensity, and its effects on academic activities among Hawassa university students from April 1–30/2021

**Methods:** A cross-sectional study was employed among Hawassa University students. Standardized self-administered questionnaires were used to get 348 individuals selected by systematic random sampling technique. A verbal multidimensional scoring system and Numerical Pain Rating Scale (NPRS) tools were used to the assessment of dysmenorrhea and the extent of pain severity. Data entered into Epi info version 7 and exported to SPSS version 21 for analysis. Pearson chi-square test was used to check the presence of an association between independent and outcome variables. Bivariate analysis and multivariate logistic regression were used for further assessment of the strength. The significance level was obtained using an odds ratio of 95% and CI with p-value < 0.05.

**Results:** The prevalence of dysmenorrhea was 80% (277). Of these, 39.7% (110) have reported that daily activity was affected; analgesics were required and gave sufficient relief, and 12.6% (35) reported that analgesia has no effect and their daily activities are inhibited. It hurt academic activities such as loss of class concentration, study time, sleep disturbances, personal relationships, and absenteeism. Factors associated are being sexually active, family history of dysmenorrhea, and presence of depression

**Conclusion:** Dysmenorrhea is prevalent in this study and has a significant impact on academic activities. Family history of dysmenorrhea, being sexually active, and presence of depression are associated factors.

## 1. Introduction

Dysmenorrhea is a lower abdominal pain during menstrual flow which can be classified as primary and secondary dysmenorrhea based on the pathology. Primary dysmenorrhea is pain during menstrual flow without identified cause whereas secondary dysmenorrhea is when secondary pathology is identified. The pain starts during the first 24–36 h of menstruation and lasts till 2–3 days post menses. Primary dysmenorrhea is usually encountered during the earlier years of menstrual flow. The pathophysiology of pain is associated with increased prostaglandin production and abnormal uterine sensitivity to prostaglandins. (1–4).

Since the reporting of pain is influenced by different sociocultural factors, the prevalence has wide variation across the globe. The report indicated that the prevalence ranges from 16.8–95% throughout the world according to the works of literature reviewed. (1, 2, 5–7) The Ethiopian prevalence is

64.7%-85.4% (8–10). The severity of dysmenorrhea varies across different age reproductive and different countries in the world. This disparity is possible because dysmenorrhea varies according to the age of women included in the study samples. (11)

There are multiple factors are associated with dysmenorrhea. Those factors like age, alcohol use, family history, low BMI, the extent of menstrual flow, and duration of flow are associated with the prevalence of dysmenorrhea. (9, 10, 12–16).

Dysmenorrhea has a significant impact on the quality of life, academic performance as well as personal relationships. This impact depends on the extent of the pain experienced. The effect on academic performance was in the following ways mainly study time, concentration, participation in group activities, examination performance, and class attendance. There is also social withdrawal, poor personal activities, sleep disturbances, and limited daily activities. (1, 8, 9, 15, 17).

In Ethiopia, despite the negative sociocultural belief in women empowerment, there has been significant progress in women's participation in organizational and political leadership, and the economy as well as enrollment in higher education since the adoption of the women's empowerment plan in the past two decades. The positive effect of women empowerment showed by having 50% of the Ethiopian cabinet be females in 2021, the current president of the country is female and according to the ministry of education report in 2019, 35.7% of university students were female and the number of female employees at public universities has increased to 12.6% (2017) but still low so anything which hinders the academic performance of young females in university will make the struggle hard to achieve the goal. (18, 19).

Considering the valueless role of women in the country and these young female university students are one of the productive age who become future leaders and hope for the country as well as the community. Any problem which affects this age group will have a tremendous economic and psychological burden on the country and community. Furthermore, there is limited evidence on the prevalence, associated factors, and effects of dysmenorrhea on academic activities among university female students.

## **2. Methods**

### **2.1 Study Area and source population**

An institution-based cross-sectional study was conducted at Hawassa University College of Medicine and Health Sciences (HUCMHS) from April 1–30/2021. All randomly selected undergraduate females at HUCMHS Campus were the study population.

### **2.2 Sample size determination and sampling technique**

The single population proportion formula was used to determine the sample size required to conduct this study from the prevalence of dysmenorrhea occurrence among female students at Mekelle University College of Medicine and Health Science 71.8%, (9) at 95% certainty and 5% margin of error to get a total sample size of 348 female students after adding 10% of the non-response rate. Out of 720 female

students currently learning at CMHS Campus, 348 students were drawn by systematic random sampling technique. The departments were listed alphabetically from the department of anesthesia to Radiotechnology then female students in each department were listed. After taking that female Student list from the college registrar, we arranged the all-female students starting from anesthesia to radiotechnology then this final list of students was used as the sampling frame, sampling every other student was decided with the K value of 2 after choosing the first student randomly. Then considering absence from class and dropping out, when it happened the next student was taken as a sample. Before distributing the questionnaire, any students who were Amenorrhic, pregnant, delivered within the past six months, and currently lactating were excluded from the study by asking students so if any, the next student was taken.

### **Data Collection Tools and procedures**

The data collection tool (the Questionnaire) used in the study was adapted from the literature review and was prepared in English but translated to the local language (Amharic) by two different professionals and then again translated back to English by two different professionals. Finally, the consistency of language translation was checked then it came to effect. The questionnaire had three major parts which were focused on sociodemographic characteristics, menstruation characteristics and its severity, and its impacts on academic activities of dysmenorrhea. The study participants were screened for depression by using patient health question nine (PHQ-9) depression screening tools. (20, 21). And the pain score was made with a numeric pain rating (NPR) and verbal multidimensional pain score system (VMPS) (22). The data collection instrument was pretested on 20 students who were not included in the final analysis and relevant modifications were instituted before the commencement of actual data collection. Along with that, these collectors were trained for 3 days well before being involved in the collecting processes. The data was collected by three trained collectors (trained year two and year three residents) through standardized self-administered questionnaires, by explaining the questions to those who were unable to understand. The data collectors were contacted by supervisors on daily basis in case of any problems and difficulties. The completeness of the data was checked by the principal investigator.

### **Data Processing and Analysis**

Responses for PHQ-9 were summarized based on the mean section total score (by assigning 1 for yes response and 0 for no response; or 0 to 3 for PHQ-9). Then after it is reported as no depression (0–4) mild depression (5–9), moderate depression (10–14), moderately severe depression (15–19), and severe depression (20–27). The severity of pain was assessed by two methods one is by using NPRS which is a segmented numeric version of the visual analog scale (VAS) where the respondents mark from 0-to 10 according to their pain strength. The second one is by using the VMPS method which is by grading the severity of pain with the use of analgesia, having systemic symptoms, and affecting daily activities. Painful menses but seldom inhibits normal activity and analgesics are seldom required (grade I, mild pain), daily activity was affected; analgesics were required and gave sufficient relief (grade II, moderate pain) and daily activity was inhibited by dysmenorrhea, the effect of analgesics to give relief of the pain

was insignificant (grade III, severe pain). The collected data were checked, cleaned, and entered to Epi data version 7 and exported to SPSS version 21 for further data cleaning and analysis. The information is described in tables, graphs, means, and frequency including the effect of dysmenorrhea on daily academic activities. The presence of an association between independent and outcome variables was checked by the Pearson chi-square test. Additionally, each independent variable was fitted separately into bivariate logistic analysis to evaluate the degree of association with the outcome variable. Thus, multivariate logistic regression analysis was done on variables with p values less than 0.05. The significance level was obtained at an odds ratio of 95% CI and p-value < 0.05.

## **2. Results**

### **2.1 Socio-demographic characteristics of students**

In all, 99.4% of the respondents were involved in the study. The ages of respondents ranged from 18 to 36 years with a median of 21 years. The majority 89.6% (N = 310) came from urban whereas 10.4% (N = 36) from rural areas. (Table 1)

### **2.2 Medical and menstrual history of the study participants.**

Out of the total 346 respondents, they reported that: 31(9%) had a past medical illness, 17(4.9%) had a past surgical illness, 8(2.3%) had past abdominopelvic surgery, 16(4.6%) had past pelvic infection, 9(2.6%) had an ovarian cyst. The reported history of contraceptive use was 49(14.2%) and pregnancy was 18(5.2%). The age range for menarche was reported between 9 and 18 years. More than three fourth of the respondents (77.4%) reported menarche between 12 and 14 years. A large proportion of the study participants reported regular menses (78.3%). (Table 1)

Table 1  
Socio-demographic characteristics of students at HU, COMHS, 2021

Variable		Frequency	Percent
Age	less than 20	12	3.5
	20–24	304	87.9
	25–29	27	7.8
	greater than 30	3	.9
BMI	less than 18.5	76	22.0
	18.5 -24.99	246	71.1
	25 -29.99	22	6.4
	30 -39.99	2	.6
Place of origin	Rural	36	10.4
	Urban	310	89.6
Marital status	Married	30	8.7
	Single	316	91.3
Batch	2nd year	93	26.9
	3rd year	117	33.8
	4th year	65	18.8
	5th year	33	9.5
	medical intern	38	11.0
Previous pregnancy	Yes	18	5.2
	No	328	94.8
Age of menarche	9–11	20	5.8
	12–14	267	77.2
	15–17	58	16.8
	greater than 17	1	0.28
78.3Menses regularity	Regular	271	78.3
	Irregular	75	21.7
Menses interval length	21–35	266	76.9

Variable		Frequency	Percent
	greater than 35	21	6
	Irregular	59	17.1
Duration of menstrual flow	1–3 days	33	9.5
	4–5	220	63.5
	6–7	83	23.9
	greater than 7	10	2.9
Amount of menstrual bleeding	Normal	290	83.8
	Excess	56	16.2
Painful menses (dysmenorrhea)	yes, during every menses	98	28.3
	yes, but intermittently	179	51.7
	No	69	

## 2.3 Behavioral activities associated with participants.

Out of a total of 346 respondents, 135(39%) had a variable frequency of sports activities, 2(0.6%) smoke cigarettes, 131 (37.9%) had a variable frequency of alcohol drink, 66(19.1%) were sexually active (Table 2)

Table 2  
Behavioral activities of female students in HU, COMHS, 2021.

Categories	Frequency (346)	Percent
frequency Sport activity of female students		
Every day	4	1.2
A few times a week	46	13.3
Once a week	24	6.9
Once a month	8	2.3
Seasonally	25	7.2
Very rarely	38	11.0
I do not exercise	201	58.1
frequency Drinking alcohol of female students		
A few times a week	12	3.5
Several times a month	4	1.2
During celebrations, parties	56	16.2
very rarely	59	17.1
Never	215	62.1
Total	346	100.0

## 2.4 Common presentation during menstrual bleeding

Among the students in general, the most common symptoms associated with menses are: Back pain (67%); Dizziness, weakness, fatigue (65.3%); Bloating (55.5%); Breast pain (52.9%); Irritability, and mood swinging (59.8%); (Supplementary Table 1)

## 2.5 Prevalence of dysmenorrhea and its effect on students' academic performance

The prevalence of dysmenorrhea was found to be 80.1% (Table 3). Using the Numeric Pain Rating Scale out of 277 students with dysmenorrhea 21.7% (60), 33.2% (92), 37.5% (104), and 7.6% (21) of the respondents reported mild, moderate, severe, and very severe intensity of pain, respectively. According to the verbal multidimensional scoring system, out of 277 students, 47.6% (132) of students' menstruation was painful but seldom inhibits normal activity and analgesics are seldom required (mild pain). 39.7% (110) of students', daily activity was affected; analgesics were required and gave sufficient relief so that absence from school was unusual (moderate pain). Additionally, in 12.6% (35) of students, daily activity

was inhibited by dysmenorrhea, the effect of analgesics to give relief of the pain was insignificant (severe pain).

Table 3  
Dysmenorrhea prevalence and severity, Hawassa University, COMHS, 2021

Variable		Frequency	Percent (%)
Painful menses (dysmenorrhea)	No	69	19.9
	Yes	277	80.1
Dysmenorrhea was	During every menses	98	35.4
	yes, but intermittently	179	64.6
When did dysmenorrhea start about menarche	Started with my menarche	73	26.4
	one year after the onset of menarche	59	21.3
	2–5 years after the onset of menarche	90	32.5
	> 5 years after menarche	55	19.9
When does the pain start about menses flow	A day Before menses	85	30.7
	Day 1 of menses	176	63.5
	The second or third day of menses	16	5.8
When does the pain reach a peak	A day Before menses	30	10.8
	Day 1 of menses	202	72.9
	The second or third day of menses	41	14.8
	After cessation of menses	4	1.4
Duration of painful menses	Less than a full day	15	5.4
	1–2 days	210	75.8
	3–4 days	42	15.2
	greater than four days	10	3.6
Treated for dysmenorrhea	Yes	42	15.2
	No	235	84.8
Numeric pain scaling	Mild 0–3	60	21.7
	Moderate 4–6	92	33.2
	Severe 7–9	104	37.5

Variable		Frequency	Percent (%)
	Very severe 10	21	7.6
Severity grading	Grade 1 (mild):	132	47.7
	Grade 2 (moderate):	110	39.7
	Grade 3 (severe):	35	12.6

### The impact of dysmenorrhea on academic performances

Among the students with dysmenorrhea, the most common symptoms associated are Back pain (71.8%); Dizziness, weakness, and fatigue (75.1%); Bloating (62.8%); Breast pain (58.1%). Of the respondents with dysmenorrhea, 83% (194) reported that the disorder interferes with their academic performance; of these were mildly affected in 48%, moderately affected in 25.6%, and severely affected in 9%. Dysmenorrhea interferes with their concentration of 86.6% (N = 240), of these mildly affected in 46.2%, moderately affected in 26.7%, and severely affected in 13.7%. (Table 4)

Table 4

Effects of dysmenorrhea on academic activities among dysmenorrhea and based on the grade of pain severity, at HU, COMHS, 2021

Variable	Categories	Dysmenorrhea	Grade I pain	Grade II pain	Grade III pain
		Frequency (Percent)	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)
Academic performance	Not affected	47 (17.0)	43 (32.6)	4 (3.6)	0
	Mildly affected	134 (48.4)	74 (56.1)	52 (47.3)	8 (22.9)
	Moderately affected	71 (25.6)	12 (9.1)	51 (46.4)	8 (22.9)
	Severely affected	25 (9.0)	3 (2.3)	3 (2.7)	19 (54.3)
Concentration	Not affected	37 (13.4)	31 (23.5)	6 (5.5)	0
	Mildly affected	128 (46.2)	75 (56.8)	49 (44.5)	4 (11.54)
	Moderately affected	74 (26.7)	20 (15.2)	45 (40.9)	9 (25.7)
	Severely affected	38 (13.7)	6 (4.5)	10 (9.1)	22 (62.9)
Study	Not affected	36 (13.0)	31 (23.5)	4 (3.6)	1 (2.9)
	Mildly affected	108 (39.0)	72 (54.5)	34 (30.9)	2 (5.7)
	Moderately affected	86 (31.0)	21 (15.9)	55 (50.0)	10 (28.6)
	Severely affected	47 (17.0)	8 (6.1)	17 (15.5)	22 (62.9)
Sleep	Not affected	76 (27.4)	57 (43.2)	15 (13.6)	4 (11.4)
	Mildly affected	93 (33.6)	45 (34.1)	44 (40.0)	4 (11.4)
	Moderately affected	76 (27.4)	24 (18.2)	43 (39.1)	9 (25.7)
	Severely affected	11.6(32)	6 (4.5)	8 (7.3)	18 (51.4)
Personal relationship	Not affected	76 (27.4)	56 (42.4)	19 (17.3)	1 (2.9)
	Mildly affected	109 (39.4)	58 (43.9)	46 (41.8)	5 (14.3)

Variable	Categories	Dysmenorrhea	Grade I pain	Grade II pain	Grade III pain
		Frequency (Percent)	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)
	Moderately affected	71 (25.6)	15 (11.4)	41 (37.3)	15 (42.9)
	Severely affected	21 (7.6)	3 (2.3)	4 (3.6)	14 (40.0)
Class absence (days)	Yes	49.1	36 (27.3)	71 (64.5)	29 (82.9)
	No	50.9	96 (72.7)	39 (35.5)	6 (17.1)
Class absence (days)	0 day	141 (50.9)	96 (72.7)	39 (35.5)	6 (17.1)
	1 day	101 (36.5)	29 (22.0)	56 (50.9)	16 (45.7)
	2 days	30 (10.8)	6 (4.5)	15 (13.6)	9 (25.7)
	3 days	5 (1.8)	1 (.8)	0	4 (11.4)
Reason for absence	Lack of concentration	17 (12.5)	9 (25)	6 (8.5)	2 (6.9)
	Pain intensity	109 (80.1)	20 (55.6)	63 (88.7)	26 (89.7)
	Lack of interest	10 (7.4)	7 (19.4)	2 (2.8)	1 (3.5)
	<b>Total</b>	<b>277</b>	<b>132 (100.0)</b>	<b>110 (100.0)</b>	<b>35 (100)</b>

## 2.6 Logistic regression analysis of significant variables related to dysmenorrhea

The potential association of factors was sought through chi-square then further strength of association regression analysis was done (Supplementary Table 2). In bivariate logistic analysis the following factors such as marital status, use of contraception, pregnancy, sexually active, maternal dysmenorrhea, sister's dysmenorrhea, and clot in menses Whereas in Multivariate logistic regression analysis only factors like being sexually active, maternal history of dysmenorrhea, Sister with history of dysmenorrhea, and presence of depression were significantly associated with dysmenorrhea.

Being sexually active was the determinant factor of dysmenorrhea. Sexually active female students are more than three times more likely to develop dysmenorrhea compared to those who were not sexually active [AOR = 3.260 (1.00-10.647)]. Family history is a strong risk factor for dysmenorrhea: having a mother and sister with dysmenorrhea was AOR = 8.481(95% CI, 3.608–19.934) and AOR = 4.012(95% CI, 1.929–8.346) times higher than without a family history of dysmenorrhea, respectively. Students who had a history of positive screening for depression have a 5.7 times higher risk as compared with those

who had no history of depression (AOR = 5.683, (95% CI, 1.762–18.329). (Table 5) Supplementary Table 2)

Table 5

Shows the results of the multivariate analysis using significant bivariate variables, of students at HU, COMHS 2021

Variables		Dysmenorrhea		COR (95%CI)	AOR (95%CI)
		Yes	No		
		N (%)	N (%)		
Married	Yes	16(53.3)	14(46.7)	0.241(0.111–0.522) ***	
	No	261(82.6)	55(13.4)	1	
Sexually active	Yes	42(39.4)	24(60.6)	0.335(0.185–0.607) ***	0.307(0.094–1.001) *
	No	235(83.4)	45(16.6)	1	
Using contraception	Yes	33(67.3)	16(32.7)	0.448(0.230–0.873) *	
	No	244(82.2)	53(17.8)	1	
Pregnancy history	Yes	8(44.4)	10(55.6)	0.175(0.066–0.464) ***	
	No	269(82)	59(18)	1	
Maternal has dysmenorrhea	Yes	170(94.4)	10(5.6)	9.374(4.597–19.115) ***	8.481(3.608–19.934) ***
	No	107(64.4)	59(35.5)	1	1
Sister has dysmenorrhea	Yes	197(90)	22(10)	5.261 (2.978–9.294) ***	4.012(1.929–8.346) ***
	No	80(63)	47 (37)	1	1
Chewing chat	Yes	5(55.6)	4(44.4)	0.299(0.078–1.143)	
	No	272(80.7)	65(19.3)	1	
Alcohol drink	Yes	167(77.7)	48(22.3)	1.506(0.854–2.653)	
	No	110(84)	21(16)	1	
clot presence in menses	Yes	71(89.9)	8(10.1)	2.628(1.199–5.761) *	
	No	206(77.2)	61(28.2)		
Having anxiety and worry	Yes	187(74.5)	64(25.5)	6.160 (2.396–15.837) ***	
	No				

Variables		Dysmenorrhea		COR (95%CI)	AOR (95%CI)
		Yes	No		
		N (%)	N (%)		
	No	90(94.7)	5(5.3)	1	
Positive screening for depression	Yes	195(76.8)	59(23.2)	2.481(1.210–5.088) *	5.683 (1.762–18.329) *
	No	82(89.1)	10(10.9)	1	
Irritable Mood Swinging	Yes	178(86)	29 (14)	2.480(1.449–4.245) **	
	No	99(71.2)	40 (28.8)	1	
Age	≤ 20	9	3	1	
	21–24	248	56	0.167(0.11–2.56)	
	25–29	19	8	0.113(0.10–1.34)	
	≥ 30	1	2	0.211(0.17–167)	
BMI	18.5	66	10	1	
	18.5–24.99	190	56	0.152(0.009–2.62)	
	25–29.99	20	2	0.295(0.018–2.98)	
	30–39.99	1	1	0.100(0.004–2.287)	
Batch	2nd year	67	26	1	
	3rd year	97	20	2.56(0.902–7.25)	
	4th year	53	12	1.36(0.49–3.95)	
	5th year	27	6	1.494(0.485–4.63)	
	medical intern	33	5	1.46(0.47–6-35)	
residency	Rural	27	9	1.389(0.631–3.12)	

Variables		Dysmenorrhea		COR (95%CI)	AOR (95%CI)
		Yes	No		
		N (%)	N (%)		
	Urban	250	60	1	
Age of menarche	9–11	16	4	1	
	12–14	218	49	13(0.123–11.56)	
	15–17	42	16	2.45 (0.98–9.13)	
	greater than 17	1	0	4.45(0.56–5.34)	
Menses interval length	21–35	210(78.9)	56(21.1)	1	
	≥ 35	20(95.2)	1(4.8)	1.045(0.519–2.101)	
	Irregular	47(79.7)	12(20.3)	0.196(0.24–2.67)	
Duration of menstrual flow	1–3 days	26(78.8)	7(21.2)	1	
	4–5	169(76.8)	51(23.2)	2.4(0.261–22.45)	
	6–7	73(88)	10(12)	2.76(0.336–21.97)	
	≥ 7	9(90)	1(10)	1.233(0.141–10.78)	
Amount of menstrual bleeding	Normal	231(79.1)	59(20.1)	1	
	Excess	46(82.1)	10(17.9)	1.175(0.56–2.56)	
Tea	No	64(80)	16(20)	1	
	1 cup	154(79.8)	39(20.2)	0.15(0.11–1.45)	
	2 cups	48(81.4)	11(18.6)	0.127(0.11–1.76)	
	3 cups	10(90.9)	1(9.1)	0.115(0.10–1.4)	
	4 cups	1(33.3)	2(66.7)	0.05(0.01–1.117)	

Variables	Dysmenorrhea		COR (95%CI)	AOR (95%CI)
	Yes	No		
	N (%)	N (%)		
Note: Asterisks show the level of significance at $p \leq 0.05^*$ , $p \leq 0.01^{**}$ , and $p \leq 0.001^{***}$ 1.0 = Reference category				

### 3. Discussion

This study shows a prevalence of dysmenorrhea at 80.1%, which is comparable to studies done in northern Ethiopia, Nigeria (7, 10), and Morocco(2, 7, 10) whereas the finding of this study was higher than those of the study done in eastern Ethiopia; 69.3%(23). Mekelle University; 71.8% (9) and Kenyan 68.1% (17). The finding of this study was lower than the finding of Kuwait University (24), Lithuania Vilnius University (13), and a study done in Turkey. (1). the variation is due to the assessment tool, method of data collection, and socio-cultural, ethnic, and lifestyle factors among females. Moreover, menstruation is considered a private issue in many cultures hence its associated complaints might be kept silently by most females

In this study, the prevalence of dysmenorrhea was 80% (277), using the Numeric Pain Rating Scale out of 277 students with dysmenorrhea 21.7% (60), 33.2% (92), 37.5%, (104), and 7.6% (26) of the respondents reporting the mild, moderate, severe and very severe intensity of pain, respectively. It is similar to one study where 47.4% of unmarried women reported severe and worst pain. (27).

According to the verbal multidimensional scoring system, 132 (38.1%) students had grade I, mild pain, and 110 (32.1%) females had grade II, moderate pain. Additionally, in 10.1% (35) of students, daily activity was inhibited by dysmenorrhea, and the effect of analgesics to give relief to the pain was insignificant (grade III, severe pain). This matches with the other findings in Ethiopia, In an Indian study, 55.26% of unmarried women reported that they use anti-pain on the second of menses(10, 27). So irrespective of the pain scoring methods, near to half of the female students were suffering from severe pain during menstruation.

Of the respondents with dysmenorrhea, 83% reported that the disorder interferes with their academic performance which was in line with the findings in northern Ethiopia and slightly lower than the study at Debre Brehan. (9, 10) but higher than finding Ghana and Turkey (1, 17). It may be due to socio-cultural differences, differences in pain tolerance between the populations as well as methodological differences. Additionally, this might be due to the questionnaire design on part of academic activities: ours had options (no affected, mildly affected, moderately affected, and severely affected), whereas the above Turkey and Ghana studies had Yes/No options. The student with mild negative effects might have chosen No in the Yes/No options.

Our finding was higher than the finding of the largest study so far to look into the impact of dysmenorrhea; 38% of all women reported dysmenorrhea interfering with their regular daily activities. (6). the difference may be due to the difference in the source population. Dysmenorrhea interfered with the concentration of 86.6% of females which was higher than the finding at Debre Brehan, Ghana, Australia (10, 17, 25). More than two-thirds 72.6%, reported dysmenorrhea had interfered with their relationship (mild in 39.4% and moderate to severe in 33.2%). Which was higher than the finding of the study at Debre Brehan, at Mekelle, Ghana Australia (9, 10, 17, 25).as well as lower than in Turkey where 92% reported personal relationship was negatively affected by dysmenorrhea. (1). this might be due to the questionnaire design on part of academic activities and differences in the study population. So due to the effect of dysmenorrhea personal relationships and concentration are significantly affected.

Almost half of the students with dysmenorrhea, 49.1% absent from class during the time of menses for 1–2 days. The common reason for class absence was pain intensity, reported at 80.1%. Our finding was higher than the finding of the study at Mekelle, Ghana, and Australia (9, 17, 25) as well as lower than the study at Debre Brehan and Gondar (8, 10).

Being sexually active was the determinant factor of dysmenorrhea. Sexually active female students are 70% less likely to develop dysmenorrhea compared to those who were not sexually active. This may be due to sexually active women being more likely to use hormonal contraception options, which are protective for dysmenorrhea.

A student whose mother and sister have a history of dysmenorrhea has an eight- and four-times increased risk to have dysmenorrhea compared to those whose mother had no dysmenorrhea. Most studies revealed that females who had a positive family history of dysmenorrhea were more likely to develop dysmenorrhea(8, 9) (16),(15). This study showed the presence of positive screening for depression were significantly associated with dysmenorrhea, participant with positive screening for depression were at a 5.7 times higher risk to have dysmenorrhea compared with those who had no history of depression. Mood disorders were associated with dysmenorrhea as this group has hypersensitivity to pain (11). Having depression was associated with a higher risk of dysmenorrhea (10). Furthermore, the strong effect of being depressed most of the time is associated with the risk of menstrual pain with an odds ratio of 13.3(26)

## **Strength**

The study tried to assess the factors and impacts of dysmenorrhea in young females,

The study used two different scoring methods especially numerical pain scoring have not been used widely in the literature.

## **Limitation of the study**

The other possible cause for secondary dysmenorrhea like endometriosis, PCOS (polycystic ovarian syndrome), and so on were not excluded since they need investigations

The cross-sectional study lacks cause and effect association

## **Conclusion**

Dysmenorrhea is found to be relatively high among female students attending university. It has a significant negative impact on students' academic performance. The study showed that being sexually active is protective against dysmenorrhea. Maternal history of dysmenorrhea, Sister with a history of dysmenorrhea, and presence of depression were significantly associated with dysmenorrhea.

## **Declarations**

### **Ethical Clearance and Consent**

Ethical clearance was obtained from the Institutional Review Board (IRB) of the college of medicine and health sciences, Hawassa University, Ethiopia with ethical clearance letter no. RPGe/76/2021. The IRB has given ethical clearance for written informed consent. After getting ethical clearance from the institutional review board of Hawassa University. Informed consent was taken from the study participants after informing them of the aim of the study. They have been told as they can withdraw from the study at any step if they feel so as well as confidentiality was granted. All methods were performed by relevant guidelines and regulations.

### **Consent for publication**

Not applicable

### **Author's contribution**

WB: proposal development, data collection, data analysis, manuscript preparation,

ZK: proposal development, data collection, data analysis, manuscript preparation,

NA: proposal development, data collection, data analysis, manuscript preparation,

MG: proposal development, data collection, data analysis, manuscript preparation,

AH: proposal development, data collection, data analysis, manuscript preparation,

BM: proposal development, data collection, data analysis, manuscript preparation,

TA: proposal development, data collection, data analysis, manuscript preparation, manuscript finalization

### **Acknowledgment**

Not applicable

## Availability of data and material

All data generated or analyzed during this study are included in this published article [and its supplementary information files].

## Conflict of interest

The authors declare that they have no competing interests.

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