



Impact of Dysmenorrhea on Academic Performance Among Haramaya University Undergraduate Regular Students, Eastern Ethiopia

Tiruye Tilahun Mesele^{1*}, Hiwotie Getaneh Ayalew², Asmra Tesfahun Syoum¹ and Tazeb Alemu Antehneh¹

¹ Department of Midwifery, School of Midwifery, College of Medicine and Health Science, University of Gondar, Gondar, Ethiopia, ² Department of Midwifery, School of Nursing and Midwifery, College of Medicine and Health Science, Wollo University, Dessie, Ethiopia

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*Correspondence:

Tiruye Tilahun Mesele
tiruyetlahun18@gmail.com

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Background: Dysmenorrhea is the most common gynecological problem among students. The disease affects students' academic performance, although studies carried out in Ethiopia primarily focused on the prevalence aspects rather than the impacts of dysmenorrhea on academic performance and its associated factors. Therefore, this study focused on the prevalence of the impact of dysmenorrhea on academic performance and its associated factors among undergraduate female students of Haramaya University in eastern Ethiopia.

Methods: A cross-sectional study design was conducted from February to March 2020. A multistage random sampling technique was applied and a total of 356 students were included in the study. To select students, simple random sampling was used and the sample size was proportionally allocated with respect to the total number of each selected department. A semi-structured and a pre-tested self-administered questionnaire were used. The descriptive result was presented as a proportion whereas the analytic part was presented with an adjusted odds ratio.

Result: The prevalence of the impact of dysmenorrhea on academic performance was 266 [(74.7%):95%CI (70.0, 79.5%)]. Premenstrual syndrome [AOR = 4.86:95%CI (2.13, 11.06)], early menarche [AOR = 4.89:95%CI (2.03, 11.77)], moderate/severe dysmenorrhea pain intensity [AOR = 8.53:95%CI (4.45, 16.39)], and students monthly pocket money <150ETB [AOR = 3.91:95%CI (1.48, 10.29)] were significantly associated with the occurrence of the impact of dysmenorrhea on academic performance. The most common impacts were difficulty in studying followed by loss of concentration in the class.

Conclusion and Recommendation: There was a high prevalence of impact of dysmenorrhea on academic performance among undergraduate female students of the Haramaya University. Awareness should be created among Haramaya university authorities and teachers about the academic performance impact of premenstrual syndrome and dysmenorrhea pain intensity to provide psychological and academic guidance, and managing mechanisms for the affected students. Haramaya University should also establish medical care for the affected students.

Keywords: dysmenorrhea, Ethiopia, academic performance, absenteeism, impact

BACKGROUND

Dysmenorrhea is painful menstruation which is a common gynecologic problem that significantly affects the routine life and academic performance of most of the affected female students (1–3). Dysmenorrhea is often accompanied by sweating, tachycardia, headache, nausea, vomiting, diarrhea, breast tenderness, and mood changes, which were the most common causes of class absenteeism and difficulty in studying (4–6).

Dysmenorrhea is the most common gynecological problem which has an impact on most of the students in their academic performance and daily activities (1, 3, 6–8). Globally, the prevalence of dysmenorrhea ranges from 16 to 91%, and 10–20% of them suffer from severe dysmenorrhea, which is the leading cause of recurrent school absenteeism (80%), loss of class concentration (66.8%), no active participation (47.4%), inability to do homework (21%), fail in an exam (15.4%), and limited activity (29.9%) (5, 6, 9–13). The overall prevalence of impact of dysmenorrhea on academic performance in Ethiopia ranges from 20 to 88.3% (5, 6, 10).

The major associated factors with dysmenorrhea are early menarche, age <20, family history of dysmenorrhea, premenstrual syndrome, anxiety, smoking, and lack of physical exercise (5, 6, 9, 11, 13–15). However, studies carried out in Ethiopia (16) primarily focused on the prevalence aspects rather than the impacts of dysmenorrhea on academic performance and associated factors. Therefore, this study focused on the prevalence of the impact of dysmenorrhea on academic performance and its associated factors among undergraduate female students of Haramaya University in eastern Ethiopia.

MATERIALS AND METHODS

Study Period, Area, and Design

The study was conducted from February 24 to March 24 /2020 at the Haramaya University. It is one of the oldest public universities in Ethiopia which was established in 1954. The university is located between Dire Dawa and Harar town, 510 kilometers away from the east of Addis Ababa. A university-based cross-sectional study design was applied.

All the female undergraduate regular students at Haramaya University were the source population during the study period, whereas all the female undergraduate regular students in selected departments of the three colleges at Haramaya University during the data collection period were the study population.

Any regular undergraduate dysmenorrheic female student in the selected departments had the chance to be included in this study whereas students who were ill and could not give a response during the data collection period were excluded from this study.

Sample Size and Sampling Procedure

In this study, 356 female Haramaya university dysmenorrheic undergraduate students participated.

Abbreviations: CMHS, college of health and medical sciences; CSSH, college of social sciences and humanities; CNCS, college of natural and computational sciences; SPSS, statistical packages for social sciences; AOR, adjusted odds ratio; ETB, ethiopian birr; ID, identification card.

A multistage sampling technique was used. From 11 colleges and one school of directorate, which coordinates only freshman students of Haramaya University and is considered as one college for this study, 3 colleges were selected namely: College of Social Sciences and Humanities, College of Natural and Computational Sciences, and College of Health and Medical Science were selected using simple random sampling methods. From these 3 colleges, 13 departments were selected based on the number of departments in each college. The total sample size was proportionally allocated based on the total female students in each selected college and department and stratified by the year of study. Finally, the study participants were selected by simple random sampling.

Data Collection Tools, Procedures, and Quality Assurance

Data collection questionnaires were an adaptation from previous similar studies (6, 9, 16–22). Data was collected by using a pre-tested and self-administered questionnaire design in English. The tool includes four sections, such as socio-demographic characteristics of students, the menstrual pattern of students, dysmenorrhea characteristics of students, and impacts of dysmenorrhea on students' academic performance. The data were collected by a 6-degree midwife clinical staff and supervised by 2 master midwives. Data collectors have explained the aims of this study to the students and taken consent from students and then continued it. The questionnaire was pre-tested by Dire Dawa university students. One day of training for data collectors and supervisors was given to understand the objective of the study, methods of data collection, handling of data, and ways of approaching the students. The supervisors were checking the activities of each data collector and all the filled questionnaires for their completion, clarity, and proper identification of the students.

Operational Definitions

A student was considered to have dysmenorrhea if she said “Yes” about menstrual pain and had one or more of the following complaints: abdominal pain, groin pain, pelvic pain, back pain, or thigh pain before and/or during her menstrual periods (22).

Impact on academic performance: students said “Yes” about menstrual pain affects academic performance (6, 10, 12).

Methods of Data Processing and Analysis

After data collection, data were cleaned and coded before data entry. After cleaning and coding, it was to be entered into Epi-Data version 3.1 and exported to STATA 14 for analysis. A descriptive summary was used to describe the characteristics of students in terms of frequencies and proportion and then the information was presented by text and tables.

Both bivariate and multivariable analysis logistic regression models were used to identify factors associated with the outcome variable. Those variables in a bivariate analysis whose $p < 0.25$ were taken as a candidate for multivariable analysis. Multi-collinearity was checked and model fitness was tested by the Hosmer Lemeshow test. Finally, variables whose $p < 0.05$ in the

multivariable analysis were considered as a statistically significant association and the result was reported as the adjusted odds ratio.

RESULTS

Socio-Demographic Characteristics of Students

Students' age ranges from 18 to 26 years. The majority, 237 (66.57%), of the students were categorized under the age group of 21–24 years. Most of the students, 242 (67.98%), were in the 3rd year and above. The majority of the students, 211 (59.27%), were in the College of Health and Medical Science and 202 (56.74%) had more than 300ETB monthly pocket money. Half, 226 (63.48%), of the student's mothers were not formally educated. Most of the students, 276 (77.53%), did not participate in physical exercise. The majority of the students, 274 (76.97.5%), had a history of anxiety (Table 1).

The Menstrual Pattern of Students

About 156 (43.82%) students experienced menarche at the age of 13–14 years. About 168 (47.19%) students had a regular menstrual cycle and most of the students, 165 (46.35%), had menses within 21–35 days intervals. About 192 (53.93%) students had a duration of menstrual flow of fewer than 3 days and 217 (60.96%) had used less than three pads per day (Table 2).

Prevalence of Dysmenorrhea Pain Intensity

Dysmenorrhea that hindered academic performance and required medication during each menstrual cycle was classified as moderate to severe in 245 (68.8%) and mild pain in 111 (31.2%). Most of the students, 239 (67.1%), had dysmenorrhea pain starting the same day of the menstruation flow. The majority of the students, 209 (58.7%), had pain onset after menarche from 6 up to 12 months. In about 184 (51.7%), the pain was relieved after 8 h of its onset. The majority of the students 302 (84.83%) had premenstrual syndrome (Table 3).

Prevalence of Impact of Dysmenorrhea on Academic Performance

Among students who suffered from dysmenorrhea, 266 (74.7%) reported that the pain adversely affected their academic performance. Difficult to study 245 (92.1%) and difficult to concentrate in class 229 (86.1%) were the most common reported academic impact of students (Table 4).

Multivariable Analysis of Factors Associated With the Impact of Dysmenorrhea on Academic Performance

In multivariable analysis, four variables, namely pain intensity, age at menarche, premenstrual syndrome, and pocket money of students were statically significant factors associated with the impact of dysmenorrhea on academic performance. Students who had premenstrual syndromes had an impact of 4.86 times on academic performance than those who had no premenstrual syndromes [AOR = 4.86:95%CI (2.13, 11.06)]. Students who had moderate to severe dysmenorrhea pain intensity had 8.53 times an impact on academic performance [AOR = 8.53:95%CI (4.45, 16.39)] compared with students who had mild pain intensity. Age of menarche ≤ 12 years had an impact of 4.89 times on academic performance compared with the age of menarche ≥ 15 [AOR = 4.89:95%CI (2.03, 11.77)]. Students who had monthly pocket money <150ETB had an impact of 3.91 times on academic performance than students who had monthly pocket money of 300–6000ETB [AOR = 3.91:95%CI (1.48, 10.29)] (Table 5).

DISCUSSION

In this study, prevalence and the associated factors of impact of dysmenorrhea on academic performance among undergraduate regular students of Haramaya University were assessed.

This study showed that among students with dysmenorrhea, 74.7% [95%CI: (70.0–79.5%)] reported that dysmenorrhea had

TABLE 1 | Socio-demographic characteristics of female undergraduate students, at Haramaya University, Ethiopia, 2020.

Variables		Frequency	Percent
Age of the students (in years) (<i>n</i> = 356)	18–20	101	28.37
	21–24	237	66.57
	≥ 25	18	5.06
Monthly pocket money of the student's (<i>n</i> = 356)	<150 ETB	69	19.38
	150–300ETB	85	23.88
	>300 ETB	202	56.74
The academic year of the students (<i>n</i> = 356)	2 nd year	114	32.02
	3 rd year and above	242	67.98
College of the students (<i>n</i> = 356)	CHMS	211	59.27
	CSSH	78	21.91
	CNCS	18.82	18.82
Educational status of student's mother (<i>n</i> = 356)	No formal education	226	63.48
	Formal education	130	36.52
Doing physical exercise (<i>n</i> = 356)	Yes	80	22.47
	No	276	77.53
History of anxiety (<i>n</i> = 356)	Yes	274	76.97
	No	82	23.03

TABLE 2 | Reproductive characteristics and menstrual pattern of female undergraduate students, at Haramaya University, Ethiopia, 2020.

Variables		Frequency	Percent
Age at menarche (<i>n</i> = 356)	≤12 years	125	35.11
	13–14 years	156	43.82
	≥15 years	75	21.07
History of sexual intercourse (<i>n</i> = 356)	Yes	20	5.62
	No	336	94.38
Menstrual regularity (<i>n</i> = 356)	Yes	168	47.19
	No	188	52.81
Menstrual interval in days (<i>n</i> = 356)	<21 days	156	43.82
	21–35 days	165	46.35
	>35 days	35	9.83
Duration of menstrual flow (<i>n</i> = 356)	<3 days	192	53.93
	3–7 days	124	34.83
	>7 days	40	11.24
Number of pads changed per day (<i>n</i> = 356)	<3 pads	217	60.96
	3–7 pads	126	35.39
	>7 pads	13	3.65

TABLE 3 | Dysmenorrhea pain intensity of female undergraduate students, at Haramaya University, Ethiopia, 2020.

Characteristics		Frequency	Percent
Pain intensity (<i>n</i> = 356)	Mild	111	31.2
	Moderate-severe	245	68.8
Location of the pain (<i>n</i> = 356)	Lower abdominal pain	266	74.7
	Pelvic pain	220	61.8
	Back pain	289	81.2
	Groin pain	45	12.6
	Thigh and leg pain	84	23.6
Pain onset (<i>n</i> = 356)	The same day to menstrual flow	239	67.1
	One day after menstrual flow	77	21.6
	Two days after menstrual flow	13	3.7
	1–2 weeks before flow and other	27	7.6
The pain started after menarche (<i>n</i> = 356)	6–12 month	209	58.7
	1–2 years	107	30.0
	6–2 years	22	6.2
	Not remember	18	5.1
Free from the pain after onset (<i>n</i> = 356)	8 h after	184	51.7
	8–72 h after	133	37.3
	3 days after and other	39	11.0
Premenstrual syndrome (<i>n</i> = 356)	Yes	302	84.83
	No	54	15.17

an impact on their academic performance. Some of its impacts were as follows: unable to study for an exam (92.1%), loss of class concentration (86.1%), inability to do homework (80.8%), loss of class participation (54.9%), class absence (27.1%), and limited sports participation (24.1%). This prevalence is in line with a previous study conducted in Gondar, Ethiopia, which was 74.1% (23). This prevalence is higher than those in previous studies conducted in Ethiopia 20–62.8% (5, 6, 21) and lower than previous studies conducted in Iraq 79.9% (22) and 88.3% in Ethiopia (10). This variation would be because of the self-reporting nature of the operational definition

of academic impacts, university students' various disciplines, and the difference in socio-demographic characteristics of the students.

In this study, those students who had a moderate to severe dysmenorrhea pain intensity were found to have a significant association with the occurrence of the impact of dysmenorrhea on academic performance, which was 8.53 times more likely compared to mild dysmenorrhea pain. This is consistent with reports from other studies (15, 16, 22, 24, 25). This could be due to the following: no standard measure used for dysmenorrhea pain intensity, hormonal change in the luteal phase resulting

TABLE 4 | Prevalence of impact of dysmenorrhea on academic performance of female undergraduate students, at Haramaya University, Ethiopia, 2020.

Characteristics		Frequency	Percent
Pain impact on academic performance (<i>n</i> = 356)	Yes	266	74.7
	No	90	25.3
Impacts on academic performance (<i>n</i> = 266)	Difficult to study	245	92.1
	Unable to do homework	215	80.8
	Difficult to concentrate in class	229	86.1
	Unable to active participation	146	54.9
	Unable to go to class	72	27.1
	Unable to do sport	64	24.1
	No change from other days	25	9.4

TABLE 5 | Multivariable analysis of factors associated with the impact of dysmenorrhea on academic performance among female undergraduate students, at Haramaya University, Ethiopia, 2020.

Variables		Dysmenorrhea impact on academic performance		AOR(95%CI)	P-value
		Yes	No		
Premenstrual syndrome	Yes	240	62	4.86 (2.13, 11.06)	0.000
	No	26	28	1.00	
Age at menarche	≤12 years	107	18	4.89 (2.03,11.77)	0.000
	13–14 years	116	40	2.49 (1.18,5.23)	
	≥15 years	43	32	1.00	
Student's monthly pocket money	<150 ETB	59	10	3.91 (1.48, 10.29)	0.006
	150–300 ETB	70	15	1.76 (0.76, 4.08)	
	>300 ETB	137	65	1.00	
Pain intensity	Moderate-Severe	212	33	8.53 (4.45, 16.39)	0.000
	Mild	54	57	1.00	

in mood changes, and other symptoms which interfere with students' daily academic activity. Furthermore, this study showed that early menarche (≤ 12 years) was 4.89 times more likely to cause an impact of dysmenorrhea on academic performance compared to late menarche ≥ 15 years, which is consistent with the findings of other studies in Nigeria (26). This might be due to early menarche reflecting longer exposure to uterine prostaglandins that play a major role in dysmenorrhea through increasing uterine contractility resulting in pain, and this pain interferes with the students' academic performance.

In this study, students having premenstrual syndrome were found to have a significant association with the occurrence of the impact of dysmenorrhea on academic performance, which was 4.86 times more likely compared to students who had no premenstrual syndromes. This is consistent with the report of another study in Egypt (27). The possible justification for this might be the hormonal changes that result from physical and psychological symptoms that interfere with students' academic activity. Students having monthly pocket money <150 ETB were found to have a significant association with the occurrence of the impact of dysmenorrhea on academic performance, which was 3.91 times more likely compared to students who had monthly pocket money 300–6,000 ETB (10). The possible justification would be those students who had not gotten enough money are exposed to

depression than students who have enough money, which results in aggravating painful menstruation that affects their academic performance.

LIMITATIONS OF THE STUDY

The cross-sectional nature of this study and dysmenorrhea academic impacts were reported looking-back. All students were from one university might raise the issue of generalization. However, this is a first approach, and based on these findings it would be interesting for future researchers to explore more in longitudinal studies to establish the causal effect of dysmenorrhea on academic performance.

CONCLUSIONS AND RECOMMENDATIONS

In this study, there was a high prevalence of the impact of dysmenorrhea on academic performance among undergraduate female students of Haramaya University. The most common impact was difficulty studying, unable to do homework, difficulty concentrating in class, unable to actively participate, unable to go to class, and unable to do sports activities. Dysmenorrhea pain intensity, age at menarche, premenstrual syndrome, and

students' monthly pocket money were found to be independent determining factors for the occurrence of the impact of dysmenorrhea on academic performance.

Awareness should be created among the authorities and teachers of Haramaya University about the impact of premenstrual syndrome and dysmenorrhea pain intensity on academic performance to provide psychological and academic guidance, and managing mechanisms for the affected students. Haramaya University has to establish medical care for the affected students.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/**Supplementary Materials**, further inquiries can be directed to the corresponding author.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Haramaya University College of Health and Medical Sciences Institutional Health Research Ethics Review Committee (HU-IHRERC). The patients/participants provided their written informed consent to participate in this study.

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AUTHOR CONTRIBUTIONS

TM, HA, AS, and TA were involved in title selection, design of the study, literature search, review, data collection and analysis, data interpretation, and report writing. All authors read and approved the final manuscript.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/frph.2022.939035/full#supplementary-material>

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