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

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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 gynecologic 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 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.
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 enrolled 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%), 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 (n = 356) |                                                      |
| 18–20                      | 101        | 28.37  |
| 21–24                      | 237        | 66.57  |
| ≥25                        | 18         | 5.06   |
| Monthly pocket money of the student’s (n = 356) |                                                      |
| <150 ETB                  | 69         | 19.38  |
| 150–300 ETB               | 85         | 23.88  |
| >300 ETB                  | 202        | 56.74  |
| The academic year of the students (n = 356) |                                                      |
| 2nd year                  | 114        | 32.02  |
| 3rd year and above        | 242        | 67.98  |
| College of the students (n = 356) |                                                      |
| CHMS                      | 211        | 59.27  |
| CSSH                      | 78         | 21.91  |
| CNCS                      | 18.82      | 18.82  |
| Educational status of student’s mother (n = 356) |                                                      |
| No formal education       | 226        | 63.46  |
| Formal education          | 130        | 36.54  |
| Doing physical exercise (n = 356) |                                                      |
| Yes                       | 80         | 22.47  |
| No                        | 276        | 77.53  |
| History of anxiety (n = 356) |                                                      |
| Yes                       | 274        | 76.97  |
| No                        | 82         | 23.03  |
Impact of Dysmenorrhea on Academic Performance

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

| Variables                              | Frequency | Percent |
|----------------------------------------|-----------|---------|
| Age at menarche (n = 356)              |           |         |
| ≤12 years                              | 125       | 35.11   |
| 13–14 years                            | 156       | 43.82   |
| ≥15 years                              | 75        | 21.07   |
| History of sexual intercourse (n = 356) |           |         |
| Yes                                    | 20        | 5.62    |
| No                                     | 336       | 94.38   |
| Menstrual regularity (n = 356)         |           |         |
| Yes                                    | 168       | 47.19   |
| No                                     | 188       | 52.81   |
| Menstrual interval in days (n = 356)   |           |         |
| <21 days                               | 156       | 43.82   |
| 21–35 days                             | 165       | 46.35   |
| >35 days                               | 35        | 9.83    |
| Duration of menstrual flow (n = 356)   |           |         |
| <3 days                                | 192       | 53.93   |
| 3–7 days                               | 124       | 34.83   |
| >7 days                                | 40        | 11.24   |
| Number of pads changed per day (n = 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 (n = 356)                     |           |         |
| Mild                                         | 111       | 31.2    |
| Moderate-severe                              | 245       | 68.8    |
| Location of the pain (n = 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 (n = 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     |
| Pain started after menarche (n = 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 (n = 356)     |           |         |
| 8 h after                                    | 184       | 51.7    |
| 8–72 h after                                 | 133       | 37.3    |
| 3 days after and other                       | 39        | 11.0    |
| Premenstrual syndrome (n = 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
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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