Ethiopian Journal of Medical and Health Sciences
2023, Volume 3, Issue 2
https://journals.hu.edu.et/hu-journals/index.php/ejmhs

Open Access
ISSN (online): 2789-7087

Original Article

Prevalence of primary dysmenorrhea and associated factors among high school students in Hawassa, Sidama Region, Ethiopia

Mesud Hassen[2], Miftah Hussen[2], Samrawit Fantaw[1], Mihiretu Kayro[2], Samuel Kusse[2], Seud Worku[2], Ayantu Melke[1*]

[1]School of Public Health, College of Medicine and Health Sciences, Hawassa University, Ethiopia;
[2]School of Medicine, College of Medicine and Health Sciences, Hawassa University, Ethiopia

*Correspondence: Ayantu Melke; Email: ayantumelke@gmail.com

Abstract

Background: A crampy pain in the lower abdomen that occurs prior to or throughout the period of menstruation without any pelvic pathology is known as primary dysmenorrhea. Although primary dysmenorrhea is the most common reproductive health issue globally, there is no information on the prevalence of dysmenorrhea in this particular study population, where the study area is located. The study's objectives were to determine the prevalence of primary dysmenorrhea and its associated factors among high school students in Hawassa from March to April 2022.

Methods: A total of 373 high school students were participated in this cross-sectional study conducted from March to April 2022. Participants were selected using a stratified random sampling technique. Data entry and analysis were performed using SPSS version 25. Binary and multivariable logistic regression analyses were employed to identify associated factors.

Results: Among female students recruited for the current study, the response rate was 96.9%. The prevalence of primary dysmenorrhea was 67.6%. Around 30.3% reported mild-intensity menstrual pain and 63.3 complained about lower abdominal pain. 69.7% of study participants reported trouble concentrating at school as the impact of menstrual pain. Female students under the age of eighteen were fifteen times more likely to experience primary dysmenorrhea (AOR: 13.65; 95% confidence interval [CI]: 7.09, 26.303) than those age eighteen and greater. Female students whose menarche stared at the age of twelve or below were nearly eight times more likely to develop primary dysmenorrhea {AOR : 8.55; 95% CI: 4.34,16.82). Having an irregular menstrual cycle was also a determinant factor of primary dysmenorrhea (AOR: 2.56; 95% CI: 1.36, 4.83).

Conclusions: The prevalence of primary dysmenorrhea was found to be high. Age, age at menarche, and irregular menstrual cycle were determinants of primary dysmenorrhea.

Keywords: primary dysmenorrhea, prevalence, high school students, Ethiopia

Introduction

One of the most frequent gynecological issues among adolescent girls and women of reproductive age is dysmenorrhea, which can be either primary or secondary in nature. Without a clear intrinsic pathology, primary dysmenorrhea (PD) is characterized by painful menses or cramps in the lower abdomen before, during, or after the menstrual cycle (1). Systemic symptoms such as nausea, vomiting, diarrhea, headaches, and exhaustion may also be present. In most cases, symptoms begin with the onset of menstrual flow or happen a few hours before or after, and they remain for the first 24 to 48 hours (2). One of the most prevalent issues facing women is dysmenorrhea, a gynecological disorder with high morbidity (3). According to estimates, up to 90% of adolescents and 25% of women are affected. Globally, the prevalence of dysmenorrhea ranges from 16 to 91 per cent, and 10 to 20 percent of those affected, have severe dysmenorrhea (4). Most women first experience dysmenorrhea throughout adolescence, often 4-5 years after their first menstrual period (5). When adolescents reach their ovulatory cycles, primary dysmenorrhea typically starts, and its prevalence is highest during the years of adolescence and decreases with age after adolescence (6). Teenage girls' activity limitations and school absences are frequently brought on by dysmenorrhea. The illness is typically overlooked since it is frequently viewed as physiological pain (7). Menstrual issues are seen as minor health issues and are therefore unimportant to the public health agenda (8), especially for women in underdeveloped nations who may confront life-threatening illnesses. PD is a significant health burden for women and one of the global public health issues; it causes 140 million hours of missed school or work each year (9). Many elements, including behavioral and psychological ones, are thought to be connected to PD. Risk factors for dysmenorrhea include age, nulliparity, excessive menstrual flow, smoking, high socioeconomic position, attempts to lose weight, physical activity, disruption of social networks, sadness, and anxiety (10,11). Even though it frequently occurs and has a big impact on daily activities, many women don't mention their discomfort or go to the doctor, thus it goes undiagnosed and untreated (12). The fact that only 14.2% of women seek medical attention or guidance highlights the significance of screening all adolescent girls for menstrual cramps.

A literature review of previous studies showed that dysmenorrhea negatively impacts the quality of life of affected women including their relationships with family members and friends, school or work performance in addition to social and recreational activities (21). It has been also reported that women with dysmenorrhea tend to have a higher sensitivity to pain in general even at the time when they have no menstrual pain (2). Affecting female students' academic performance, absenteeism from school and loss of work days are common in a woman with dysmenorrhea or PD, which result in significant economic consequences. The study gives insights into PD-associated risk factors, the severity of this disorder among groups of female students, and its effect on their academic performance. Thus, the study is aimed to assess the Prevalence of primary dysmenorrhea and associated factors among high school students in Hawassa, Sidama Region, Ethiopia

Methods and materials

Study area and setting

A Cross-sectional study was conducted from March to April 2022, in Hawassa high school and preparatory female students. Hawassa is the capital city of Sidama regional state, Ethiopia and is located 237 km South of Addis Ababa.

It contains 8 sub-cities and has a total population of 315,267. There are 16 private and 14 government high schools in the city with 38,450 students of which 18,654 are females and 19,796 are males.

Source and study population

All female high school students in Hawassa City were our source population. All female students at selected high schools were our study population.

Eligibility Criteria

Female students who undergo their education in the selected preparatory school at Hawassa town were included in the study. Those who had a known diagnosed medical history of pelvic pathology were excluded from the study.

Sample size

The sample size for the study was calculated using Epi Info™ version 7 Stat Calc function of sample size calculation for population survey at a 95% level of significance, a 5% margin of error, considering the prevalence of 65% from the related study in Gondar high school (13) and adding 10% non-response rate, a total of 385 study participants were included to this study (Figure 1).

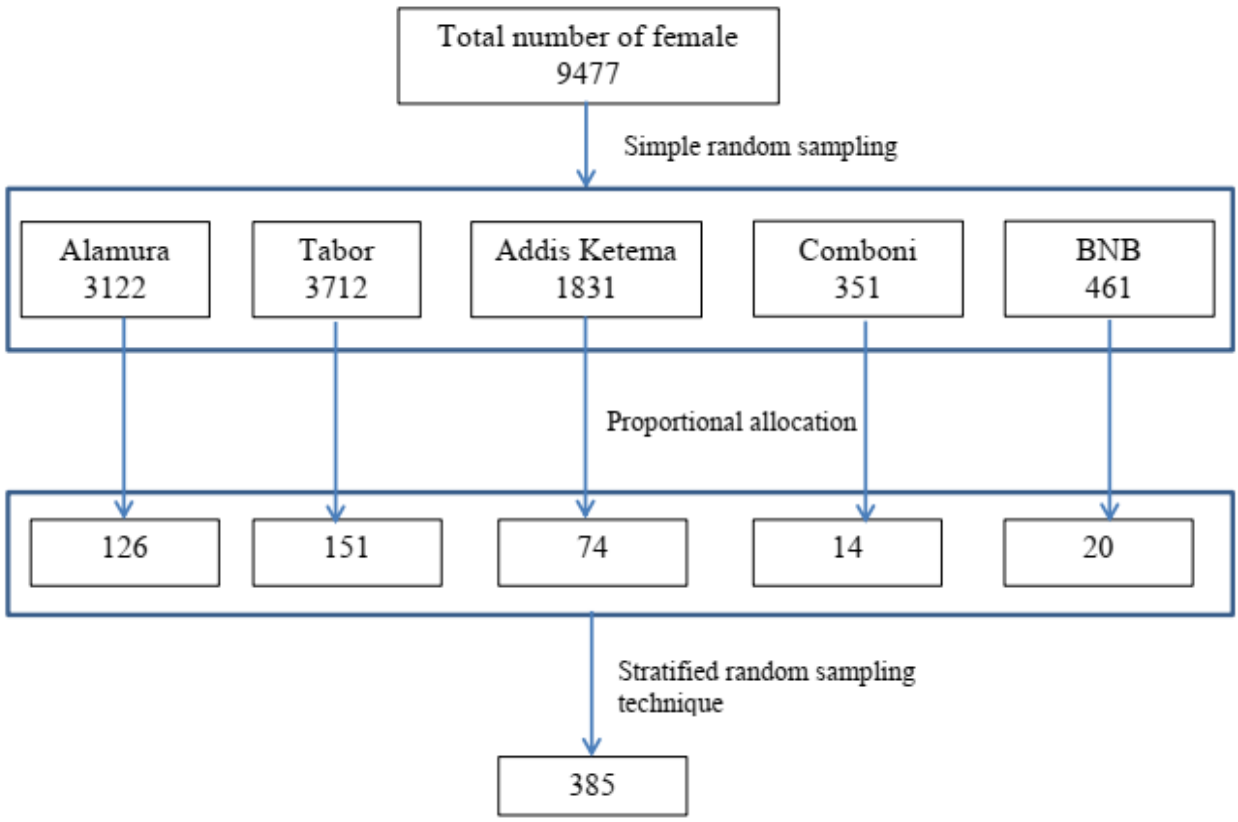

Figure 1: Sampling techniques, Hawassa, Southern Ethiopia, 2022

Sampling Methods and Subject Selection

Five high schools were selected by simple random sampling technique from all government and private high schools in the city. The selected schools were Hawassa Tabor Comprehensive and Preparatory School, Hawassa Addis Ketema

Secondary and Preparatory School, Alamura Secondary and Preparatory School, BNB School, and Combony School. The study participants were selected by stratified random sampling technique from the selected schools and the number of participants from each school was determined by proportional allocation.

Dependent Variable

Primary dysmenorrhea

Independent variables

- Socio-demographic characteristics of female students (Age in years, Marital Status, Origin of residence, Current residency)
- Obstetric and gynecological-related characteristics of female students (Age at menarche, menstrual cycle, menstrual bleeding duration (in days)**,** amount of menstrual flow by the **n**umber of pads, family history of dysmenorrhea

Operational Definition

Dysmenorrhea: for this study, a female student was considered to have dysmenorrhea if she had one or more abdominal pain, groin/pelvic pain, back pain or thigh pain before and/or during her menstrual periods for the last one year.

Menarche is the first menstrual cycle, or first menstrual bleeding, in female humans.

Irregular menses - a woman's periods are irregular if the gap between them is less than 21 days or more than 35 days.

Using a verbal report from the Numeric Rating Scale (NRS); the intensity of primary dysmenorrhea-related pain was considered as No pain (NRS = 0), Mild pain (NRS = 1–3), Moderate pain (NRS = 4–6), and Severe pain (NRS = 7–10)]

Data Collection Tools and Techniques

The data collection tool employed in this study was a self-administered questionnaire, which has been adopted from different literatures, structured, and pretested to ensure clarity and relevance (10, 11). The questionnaire consisted of four sections: informed consent, socio-demographic characteristics (10, 11), signs and symptoms of primary dysmenorrhea (3-6), and the associated impacts (13, 14). This structured approach enhances the validity and reliability of the data collected, allowing for comprehensive analysis of the subject matter.

Data Quality Management

To ensure quality, the questionnaire was initially drafted in the English language and then translated into Amharic language. Furthermore, before data collection, the questionnaire was back-translated into English to increase precision. The Questionnaire was pre-tested, data were checked for completeness, accuracy, clarity, and consistency before being entered into the software.

Data Analysis

The quantitative data were coded, cleaned, edited, entered, and analyzed by SPSS window version 25. Binary logistic regression was used to assess the association between each independent variable and the outcome variable. Model fitness tests were checked using Hosmer–Lemshow goodness-of-fit and Omnibus tests.

All variables with $p < 0.25$ in the bivariate analysis were included in the final model of multivariable analysis to control all possible confounders. A variance inflation factor > 10 and standard error > 2 were considered as suggesting the existence of multi-co-linearity. P-values less than 0.05 with a 95% confidence level were used to give out the statistical significance.

Results

Socio-demographic characteristics of respondents

In this study, out of the total interviewed sample of 385 students, 373 were included in the analysis and 12 encounters were excluded due to incompleteness and making the response rate 96.9%. The mean age of study respondents was 17 years (±1.28 SD). Among study participants, 214 (57.4%) were aged less than 17 years, 120 (32%) were grade eleven, majority were single 370 (98.9%), around 251 (68.1%) were protestant christian followers, and 331 (88.7%) live in their family home (Table 1).

Table 1: Socio-demographic characteristics of female students at Hawassa High Schools, Ethiopia, 2022 (n = 373)

Variables	Category	Frequency	Percent
Age	<18	214	57.4
	≥18	140	42.3
Student grade	9th	57	15.3
	10th	99	26.5
	11th	120	32.2
	12th	97	26.0
Religion	Orthodox	68	18.2
	Protestant	254	68.1
	Catholic	15	4.0
	Islam	30	8.0
	Other	6	1.6
Marital status	Married	3	0.8
	Unmarried	370	99.2
Origin of residence	Urban	315	84.5
	Rural	58	15.5
Current residency	At family home	331	88.7
	At a relative's home	40	10.7
	At rented dormitory	2	0.5

Obstetrics and gynecology-related characteristics

Among study participants, 252 (67.3%) experienced 1st menstruation at or below the age of 12 years. The minimum and maximum ages at menarche were 10 and 14 days respectively. Three-fourths (76.7%) of study participants had regular monthly menstrual cycle patterns and (54.4%) of study participants reported menstrual bleeding duration ≤7 days. Most of the study participants (91.7%) reported their menstrual frequency ranging from 26 to 30 days. 84.1% of study participants reported that they had a positive family history of dysmenorrhea (Table 2).

Table 2: Obstetric and gynecological related characteristics of female students at Hawassa High Schools, Ethiopia, 2022 (n = 373)

Variable	Category	Frequency	Percent
Age at menarche	≤12	252	67.6
	>12	121	32.4
Monthly menstrual cycle	Regular	86	23.1
	Irregular	287	76.9
Menstrual flow duration (in days)	1-3	203	54.4
	4-7	170	45.6
Number of pads	1-2	235	63.0
	3-4	138	37.0
Family history	Yes	333	89.3
	No	32	8.6
	I do not know	8	2.1

Prevalence of primary dysmenorrhea

The prevalence of primary dysmenorrhea was found to be 67.6% of which 63.3% of them complain about lower abdominal pain and 56.8% complain of back pain (Figure 2).

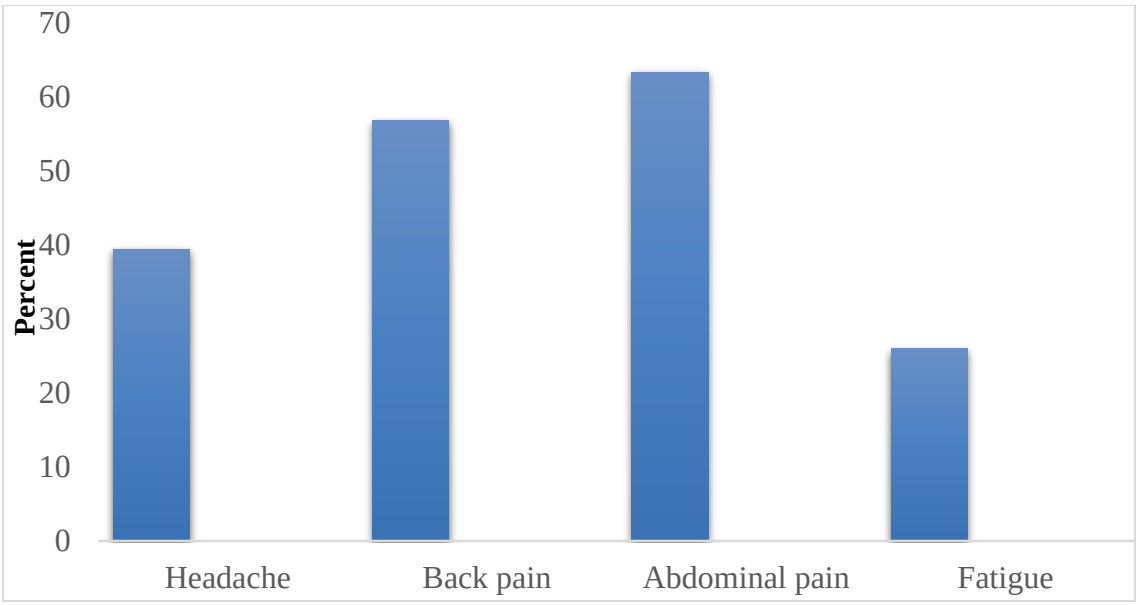

Figure 2: Common complaining symptoms associated with primary dysmenorrhea among female students at Hawassa High Schools, Ethiopia, 2022

Factors associated with primary dysmenorrhea

All variables with p-value ≤ 0.25 in the bivariate logistic regression were taken into multivariate analysis. Age, having an irregular monthly menstrual cycle and age at menarche were significantly associated with primary dysmenorrhea in multivariable logistic regression analysis (Table 3).

Discussion

The finding of the current study shows 67.6% of female students have a history of primary dysmenorrhea. This finding shows that lower abdominal pain 63.3% and back pain 56.8% were the most common symptoms. The intensity of pain during menstruation was 32.4%, 30.3%, 22.5%, and 14.5% reported having no, mild, moderate, and severe menstrual pain respectively. Absenteeism from school (60.6%), trouble with concentrating at school (69.7%) feeling less capable of taking exams (61%) and stopping exercising (69.7%) were some of the impacts of menstrual pain reported by study participants.

The finding of this study is in line with a study conducted at Debre Markos, 69.3% (10), Gondar, 64.7% (13), and Haramaya University, 64.7% (14). The finding of the current study was higher than the study done at Debre Tabor University, 62.3% (15), India, 61.33% (16), and Japan, 46,5% (17) and lower than studies done in Northern Ethiopia, 71.8% (18), Wolaita zone, 70% (19), and A systematic review and meta-analysis study conducted in another part of Ethiopia, 71.69% (66.82%–76.56%) (20). This variation may be associated with the study setting, sample size, age of study participants, method of data collection, geographical location and most of the studies did not differentiate whether the dysmenorrhea is primary or secondary.

Table 3: Factors associated with primary dysmenorrhea among female students at Hawassa High Schools, Ethiopia, 2022 (n = 373)

Variables		Primary dysmenorrhea		Odds ratio	
		Yes	No	COR (95% CI)	AOR (95% CI)
Age	<18	116	98	4.996(3.687, 6.768)	13.65(7.09, 26.303) *
	≥ 18	136	23	1	1
Family history	Yes	230	103	1.827 (0.940,3.552)	5.286(2.373,11,773)
	No	22	18	1	1
Age at menarche	≤12	147	105	4.687 (3.330,6.598)	8.55 (4.34,16.82) *
	>12	105	16	1	1
Monthly menstrual cycle regular	Yes	53	33	0.71 (0.529,0.953)	2.56 (1.36,4.83) *
	No	199	88	1	1
Current area of residence	Family house	219	112	1	1
	Relative house	32	8	0.511(0.32, 8.253)	0.418(0.13,13.585)
	Rented dormitory	1	1	0.250(0.14,4.445)	0.084(0.002,3.026)

CI, confidence interval; COR, crude odds ratio; AOR, adjusted odds ratio; * Significant at 95% CI

In this particular study Age, Age at menarche, and irregular menstrual cycle are the determinant factors of primary dysmenorrhea. A woman whose age less than eighteen was fifteen times more likely to experience primary dysmenorrhea [AOR =15.805, 95% CI: 0.037, 0.142] than age greater and equal to eighteen. This finding is consistent with a study conducted at High Schools of Wolaita Zone (19). The study revealed that females who start seeing menstruation at the age of twelve and below were nearly eight times more likely to develop primary dysmenorrhea [AOR =8.55, 95% CI: 4.34,16.82] compared to those who start to see menstruation at the age of greater than twelve-year-old. This is supported by a study conducted in different parts of Ethiopia such that Debre Markos (10), Debre Tabor University (15) and Wolaita Sodo (19) which report about the significant association between age at monarchy and primary dysmenorrhea. This could be the case because primary dysmenorrhea is less

common as women age increases and is more common in young, unmarried girls and in those who have not given birth.

Having an irregular monthly menstrual cycle is the determinant factor of primary dysmenorrhea. Female students who have irregular monthly menstrual cycles are nearly three times more likely to develop primary dysmenorrhea compared to those having regular monthly menstrual cycles [AOR = 2.56, 95% CI:1.36,4.83]. This is supported by the study conducted by Debre Tabor university (15), Wolaita Sodo (19) and Gondar High School (13). This may be associated with prostaglandin hormone secretion (23, 24)

Conclusion

The prevalence of primary dysmenorrhea among female students was found to be high. Age, Age at menarche, and irregular menstrual cycle are determinant factors of primary dysmenorrhea. Trouble with concentrating at school, absenteeism from school, feeling less capable of taking exams and stopping exercising were the main impacts of primary dysmenorrhea. Using the educational system and the media to spread knowledge about the causes and treatments of dysmenorrhea is crucial. Promoting health professional consultation is necessary to assist students experiencing dysmenorrhea.

We identified primary dysmenorrhea with clinical signs and symptoms; we suggest conducting further studies including laboratory investigations. Further studies should be also conducted to identify other determinant factors that were not identified in this study.

Acknowledgement

Firstly we would like to forward our deepest gratitude to Hawassa University Medicine and Health Science, School of Public Health for their support. Next, our thanks go to Hawassa City Education Bureau for providing the necessary information. Moreover, we extend our thanks to the data collectors for their contribution to this study.

Ethical considerations

Ethical clearance for the research was obtained from ethical review board of Hawassa University College of Medicine and Health Sciences. Additionally, a support letter was acquired from the School of Public health and an informed written consent was received from respondents before providing the questionnaire. They were also ensured that the information provided was used only for research purposes and therefore remained completely anonymous, and was treated confidentially.

Data availability statement

Data is not available for online access, however, readers who wish to gain access to the data can write to the corresponding author Ayantu Melke at ayantumelke@gmail.com

Conflicts of interest

The authors declare that they have no competing interests.

Funding statement

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

References

1. Abd El-Mawgod MM, Alshaibany AS, Al-Anazi AM. Epidemiology of dysmenorrhea among secondary-school students in Northern Saudi Arabia. J Egypt Public Health Assoc. 2016;91(3):115–9.
2. Durain D. Primary dysmenorrhea:

Assessment and management update. J Midwifery Women's Heal. 2004;49(6):520–8.
3. Zegeye DT, Megabiaw B, Mulu A. Age at menarche and the menstrual pattern of secondary school adolescents in northwest Ethiopia. BMC Womens Health. 2009;9:29.
4. Hailemeskel S, Demissie A, Assefa N. Primary dysmenorrhea magnitude, associated risk factors, and its effect on academic performance: Evidence from female university students in Ethiopia. Int J Womens Health. 2016;8:489–96.
5. Aziem A, Ali A, Rayis DA, Mamoun M, Adam I. Age at menarche and menstrual cycle pattern among schoolgirls in Kassala in eastern Sudan. J Public Heal Epidemiol [Internet]. 2011;3(3):111–4. Available from: http://www.academicjournals.org/jphe.
6. Hillen TIJ, Grbavac SL, Johnston PJ, Straton JAY, Keogh JMF. Primary dysmenorrhea in young Western Australian women: Prevalence, impact, and knowledge of treatment. J Adolesc Heal. 1999;25(1):40–5.
7. Omidvar S, Begum K. Menstrual pattern among unmarried women from south India. J Nat Sci Biol Med. 2011;2(2):174–9.
8. Harlow SD, Campbell OMR. Menstrual dysfunction: A missed opportunity for improving reproductive health in developing countries. Reprod Health Matters. 2000;8(15):142–7.
9. Ozerdogan N, Sayiner D, Ayranci U, Unsal A, Giray S. Prevalence and predictors of dysmenorrhea among students at a university in Turkey. Int J Gynecol Obstet [Internet]. 2009;107(1):39–43. Available from: http://dx.doi.org/10.1016/j.ijgo.2009.05.010
10. Muluneh AA, Nigussie T, Gebreslasie KZ, Anteneh KT, Kassa ZY. Prevalencia y factores asociados de la dismenorrea entre estudiantes de secundaria y preparatoria en la ciudad de Debremarkos, noroeste de Etiopía. Salud la mujer BMC. 2018;5(3):1–8.
11. Omidvar S, Bakouei F, Amiri FN, Begum K. Primary Dysmenorrhea and Menstrual Symptoms in Indian Female Students: Prevalence, Impact and Management. Glob J Health Sci. 2015;8(8):135.
12. De Sanctis V, Soliman A, Bernasconi S, Bianchin L, Bona G, Bozzola M, Buzi F, De Sanctis C, Tonini G, Rigon F, Perissinotto E. Definition and self-reported pain intensity in adolescents with dysmenorrhea: A debate report. Riv Ital di Med dell'Adolescenza. 2016;14(2):41–7.
13. Azagew AW, Kassie DG, Walle TA. Prevalence of primary dysmenorrhea , its intensity , impact and associated factors among female students ' at Gondar town preparatory school , Northwest Ethiopia. 2020;1–7.
14. Mesele TT, Dheresa M, Oljira L, Wakwoya EB, Gemeda GM. Prevalence of Dysmenorrhea and Associated Factors Among Haramaya University Students, Eastern Ethiopia. Int J Womens Health. 2022;14(March):517–27.
15. Giletew A, Bekele W. Prevalence and Associated Factors of Primary Dysmenorrhea Among Debre Tabor University Students, North Central Ethiopia. Http://WwwSciencepublishinggroupCom [Internet]. 2019;4(4):70. Available from: http://www.sciencepublishinggroup.com/j/ijbecs
16. Ahuja A. Impact of Dysmenorrhea on Quality of Life of Adolescent Girls of Chandigarh. J Child Adolesc Behav. 2016;4(3):1–5.
17. Akiyama S, Tanaka E, Cristeau O, Onishi Y, Osuga Y. Evaluation of the treatment patterns and economic burden of dysmenorrhea in japanese women, using a claims database. Clin Outcomes Res. 2017;9:295–306.
18. Yesuf TA, Eshete NA, Sisay EA. Dysmenorrhea among University Health Science Students, Northern Ethiopia: Impact

and Associated Factors. Int J Reprod Med. 2018;2018:1–5.
19. Mammo M, Alemayehu M, Ambaw G. Prevalence of Primary Dysmenorrhea, Its Intensity and Associated Factors Among Female Students at High Schools of Wolaita Zone, Southern Ethiopia: Cross-Sectional Study Design. Int J Womens Health. 2022;14(November):1569–77.
20. Molla A, Duko B, Girma B, Madoro D, Nigussie J, Belayneh Z, Mengistu N, Mekuriaw B. Prevalence of dysmenorrhea and associated factors among students in Ethiopia: A systematic review and meta-analysis. Women's Heal. 2022;18.
21. Matouq S, Al-Mutairi H, Al-Mutairi O, Abdulaziz F, Al-Basri D, Al-Enzi M, et al. Dysmenorrhea among high-school students and its associated factors in Kuwait. BMC pediatrics. 2019;19(1):80.
22. MacGregor B, Allaire C, Bedaiwy MA, Yong PJ, Bougie O. Disease Burden of Dysmenorrhea: Impact on Life Course Potential. International journal of women's health. 2023;15:499-509.
23. Inês Guimarães , Ana Margarida Póvoa. Primary Dysmenorrhea: Assessment and Treatment. Rev Bras Ginecol Obstet. 2020; 42(8):501–507 ; doi: 10.1055/s-0040-1712131
24. Samar Karout, Lama Soubra, Deema Rahme, Lina Karout, Hani M J Khojah and Rania Itani. Prevalence, risk factors, and management practices of primary dysmenorrhea among young females. BMC Women's Health . 2021; 21:392; https://doi.org/10.1186/s12905-021-01532-w

.