



Prevalence and Associated Factors of Primary Dysmenorrhea Among Debre Tabor University Students, North Central Ethiopia

Awoke Gilete^{1,*}, Workaferahu Bekele²

¹Department of Public Health, College of Health Science, Debre Tabor University, Debre Tabor, Ethiopia

²Department of Midwifery, College of Health Science, Debre Tabor University, Debre Tabor, Ethiopia

Email address:

awokegilete@yahoo.com (A. Gilete), workaferahubekele@gmail.com (W. Bekele)

*Corresponding author

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Abstract: Primary dysmenorrhea is a painful menstrual cramp without any evident pathology to account for them. It is the most common gynecologic disorders and frequently observed cause of anxiety and discomfort among female adolescents. The aim of this study was to determine the prevalence of primary dysmenorrhea, its effect on academic performance and factors associated among Debre Tabor University students. An Institution based cross-sectional study was conducted between March and June, 2017. A total of 183 regular students from all departments at Debre Tabor University were included. Structured and pretested self-administrated questionnaires were used. Descriptive statistics and logistic regression analyses were employed. The result indicated the prevalence of primary dysmenorrhea was 62.3%. Among them students with primary dysmenorrhea 67 (58.7%) had negative effect on their daily activities. Family history of dysmenorrhea (AOR=2.930 95%CI: 1.505, 5.707), early age of menarche 12-15 (AOR=4.072, 95% CI: 2.039) and menstrual cycle irregularity (AOR=2.262, 95% CI: 1.102, 4.643) were factors that significantly contributed to the presence of primary dysmenorrhea. Prevalence of primary dysmenorrhea among Debre Tabor University student was high. It has negative effect on daily activities and academic performances of the students. Family history of dysmenorrhea, early age of menarche and menstrual cycle irregularity are factors that significantly contributed to the presence of primary dysmenorrhea among students of Debre Tabor University. Thus appropriate medical management and counseling should be considered to engage students in physical activity.

Keywords: Primary Dysmenorrhea, Menstruation, Age at Menarche, Ethiopia

1. Introduction

Dysmenorrhea is pain full menstruation characterized by crampy pelvic pain accompanied by other symptoms, such as sweating, headaches, nausea, vomiting and diarrhea beginning shortly before or at the onset of menses [1]. There are two types of dysmenorrhea: Primary dysmenorrhea refers to pain with no obvious pathological pelvic disease or painful menses with normal pelvic anatomy, usually beginning during adolescence after their ovulatory cycles become established. Secondary dysmenorrhea is menstrual pain associated with underlying pathology, and its onset may be years after menarche or it is more common in women older than 20 years [1, 2].

A range of risk factors for dysmenorrhea have been identified and no one single cause is attributable for primary dysmenorrhea. So that a combination of factors including increase of synthesis and secretion of prostaglandin f2a, increased vasopressin and oxytocin that subsequently enhance the type c pain fibers, are postulated to be the contributing agents [3].

Primary dysmenorrhea is a key woman health burden and is also one of the public problems in the world. It affects millions of women during their reproductive year which is more prevalent than the other 2 common types of chronic pelvic pain, namely, dyspareunia and noncyclical chronic pelvic pain. The problem affects female adolescent's performance through absenteeism and disturbance of their

daily activates, particularly the academic ones. Dysmenorrhea is considered the most common symptom of all menstrual complaints and poses a greater burden of disease than any other gynecological complaint in developing countries [4, 5].

The prevalence of dysmenorrhea reported in the literature varies substantially. A greater prevalence was generally observed in young women, with estimates ranging from 67% to 90% for those aged 17–24 years. The studies in adult women are less consistent in reporting prevalence of dysmenorrhea and often focus on a specific group, with rates varying from 15% to 75% [6, 7]. Severe pain sufficient to limit daily activities among adolescents and young adults aged 26 years or less reported that 41% of the participants had limitations in their daily activities due to dysmenorrhea [8].

Studies on the prevalence of primary dysmenorrhea have shown that many factors are related to this disorder. These factors include a younger age, smoking, early menarche, prolonged menstrual flow; premenstrual complaints, null parity, high socio economic status, attempt to lose weight, behavioral and psychological aspect, genetic influence, physical activity, disruption of social networks, depression and anxiety [9].

There are a limited number of studies conducted on university female students with the problem of dysmenorrhea in Ethiopia. These studies reported different prevalence; for instance, at Bahir Dar and Mekelle University the prevalence of dysmenorrhea was 85.1% and 34% respectively [10, 11]. Understanding the full range of factors of primary dysmenorrhea is a crucial point in developing appropriate interventions. However, studies on the magnitude and associated factors of primary dysmenorrhea a long with its effect on academic performance are scarce in Ethiopia. Hence, this study was aimed to determine the prevalence of dysmenorrhea with its severity and associated symptoms, and identifies associated factors among Debre Tabor University students in Debre Tabor town.

2. Material and Methods

2.1. Study Area

Debre Tabor University is one of the new universities in Ethiopia which was established in 2011 G. C and located in Amhara region 666 kilometer away from Addis Ababa. The university has 5 faculties with a total of 15,000 regular students during this study period. The study populations were all regular female students who were selected from different departments during specified study period.

2.2. Study Design and Period

An institution based cross-sectional study was conducted between March and June, 2017 at Debre Tabor University in Debre Tabor town, North Central Ethiopia.

2.3. Sample Size and Sampling Procedure

For this study, sample size was determined using single

population proportion formula by taking the proportion of dysmenorrhea 85% in Bahir Dar University [10] at 95% confidence interval (CI). Considering 10% none response rate, the total sample size was 216.

There are five faculties in the study area. Female students from all departments were included in the study. After having the list of all female students with their respective departments from each faculty, codes were assigned for each student, and a new sampling frame was constructed. Simple random sampling technique was used to select the study participants.

2.4. Data Collection

Pretested and self-administered structured questionnaires were used to collect the data. The questionnaires were first prepared in English and translated to Amharic (the local language) and then retranslate to English to check its consistency. One day training was given on data collection way, the ethical concern and data handling. Pretest was done at one government teachers training center similar with the study setting. The data were collected and checked for completeness and internal consistency, and then it were sorted, grouped and stored on the tally sheet by using computer.

2.5. Data Analysis

Processed data were analyzed using descriptive and analytical statistics. The association between some selected dependent and independent variables were determined using analyzed using statistical package for social sciences version. Variables that have p-value less than 0.2 in bivariate analysis were entered in to multivariate analysis. At the end p-value less than 0.05 was considered as a significant association.

2.6. Operational Definitions

Menstrual cycles were considered to be regular if ranged between 21 to 35 days. A family history of dysmenorrhea was defined as positive if a student's first degree relative (mother or sister) had a history of dysmenorrhea. Mild pain during menses refers to painful menses but not inhibits normal activity (class activities), moderate pain refers daily activity affected and required analgesics which give relief and severe pain refer activity clearly inhibited and poor effect of analgesics.

3. Results

In this study, a total of 183 individuals were included with response rate of 84.7%. Eighteen participants were not voluntary to participate and fifteen questionnaires were found incomplete and excluded from analysis.

3.1. Socio Demographic and Behavioral Characteristics

This study was conducted among 86 (47%) urban and 97 (53%) rural origin students before joining the university. Their age was between 19 and 30 years with a mean age of

22.63 \pm 1.47. The majority of the study participants were between 19 and 23 years old. From one hundred eighty three participants, majority belongs to Amhara ethnicity 132 (72.1%) and follower of Orthodox Christians 138 (75.4.0%). One hundred seventy four (94.0%) of respondents didn't involve in physical activity. One hundred seventy five (95.6%) and 140 (76.5%) respondents had no smoking history and chat use respectively (Table 1).

Table 1. Socio-demographic and behavioral characteristics of study participants in Debre Tabor University 2017 (n=183).

Variables		Frequency	Percentage
Age (in years)	19-23	139	76.0%
	24-28	42	23.0%
	29-33	2	49.2%
Residence	Urban	86	47.0%
	Rural	97	53.0%
Ethnic city	Amhara	132	75.4%
	Oromo	30	16.4%
	Tigre	9	4.9%
	SNNPRS	7	3.8%
	Others ^A	5	2.7%
	Muslim	13	44.7%
Religion	Orthodox Christian	138	51.0%
	Protestant	29	15.8%
	Other ^B	3	1.6%
	Single	147	80.3%
Marital status	Married	32	17.5%
	Others ^C	4	2.2%
Practiced physical exercise	Yes	11	6.0%
	No	172	94.0%
Ever smoking	Yes	8	4.4%
	No	175	95.6%
Ever taken alcohol	Yes	43	23.5%
	No	140	76.5%

A= Gambela, Somale and Afar, B= Catholic, Adventist, C= Separated, divorced

3.2. Menstrual Patterns and Reproductive Characteristics

About 101 (55.2%) of respondents experienced menarche in the age of greater than fifteen and the average age of menarche was 15 \pm 1.90. About 138 (75.4%) respondents had regular menstrual cycle and most of respondents 143 (78.14%) have menses within 21-35 days intervals. Majority of respondents 148 (81.8%) had normal duration of menstrual flow (3-5 days). Furthermore, thirty six (19.6%) students had no history of sexual intercourse of which 32 (17.5%) had history of contraceptive utilization (Table 2).

Table 2. Menstrual patterns and reproductive characteristics of respondents in Debre Tabor University, 2017.

Variables		Frequency	Percentage
Age at menarche	12-15	82	44.8%
	>15	101	55.2%
Regular menstrual cycle	Yes	138	75.4%
	No	45	24.6%
Menstrual intervals in days	<21	5	2.8%
	21-35	143	78.1%

Variables		Frequency	Percentage
Duration of menstrual flow in days	>35	35	19.1%
	1-2	7	3.9
	3-5	148	81.8%
	>5	15	12.2%
Family history of pain full menstruation	Yes	94	51.4%
	No	89	48.8%
Practiced sexual intercourse	Yes	36	19.6%
	No	147	80.32%
Used contraceptive	Yes	32	17.5%
	No	151	82.5%
History of abortion	Yes	141	27.5
	No	371	72.5

3.3. Prevalence of Dysmenorrhea and Its Severity

This study reported that 114 (62.3%) of students were suffering from primary dysmenorrhea. A dysmenorrhea that hindered daily activities and required medication during each menstrual cycle was classified as severe in 67 (58.7%), moderate pain in 36 (31.6%) and mild pain in 11 (9.6%).

Table 3. Prevalence of dysmenorrhea and its severity among Debre Tabor University students, 2017.

Variables	Frequency	Percentage
Primary dysmenorrhea		
Yes	114	62.3%
No	69	37.7%
Characterize your menstrual pain		
Sever	67	58.7%
Moderate	36	31.57%
Mild	11	9.64%
Effect on your academic performance		
Yes	67	58.7%
No	47	41.2
Effect on your academic performance		
Class absenteeism	20	29.8%
Difficult on concentration	30	44.7%
Both	17	22.3%
Symptoms related with dysmenorrhea		
Abdominal pain	60	52.6%
Vomiting	12	14.3%
Head ach	42	36.8%
Sleep disturbance	65	57.0%

3.4. Factors Associated with Primary Dysmenorrhea

The analysis showed that; students who had irregular menstrual cycle had the risk to develop dysmenorrhea was 2.49 times higher than as compared with who had regular menstrual cycle (COR 2.409; 95%CI [1.231-4.715] P=0.10 and (AOR 2.262; 95%CI [1.102-4.643]) P=0.026. Family history of dysmenorrhea had the risk to develop primary dysmenorrhea was 2.983 times higher than compared with who had no family history of primary dysmenorrhea (CO 2.983; 95%CI [1.601-5.559] P=0.001 and (AOR 2.930; 95%CI [1.505-5.707]) P=0.002. Age of menarche between 12-15 years had the risk to develop dysmenorrhea was 4.058 times higher than compared with age of menarche >15 (COR 4.058; 95%CI:[2.094-7.861]) P \leq 0.001 and (AOR 4.072;

95%CI: [2.039-8.132]) $P \leq 0.001$ (Table 4).

Table 4. Bivariate and multivariate logistic regression analysis of factors associated with primary dysmenorrhea, DTU.

Variables	COR (95%CI)	P value	AOR (95%CI)	P-value
Age of menarche				
12-15	4.058 (2.09-7.78)	0.000	4.072 (2.04 -8.13)	0.000
>15	0.246 (0.13-0.47)	0.000	0.246 (0.12-0.49)	0.000
Family history of pain full menstruation				
Yes	2.98 (1.60-5.56)	0.001	2.93 (1.50-5.71)	0.002
No	0.33 (0.18-0.62)	0.001	0.34 (0.17-0.66)	0.002
Regular menstrual cycle				
Yes	0.41 (0.21-0.81)	0.010	0.44 (0.21-0.91)	0.026
No	2.41 (1.23-4.71)	0.010	2.26 (1.10-4.64)	0.026

4. Discussion

This study reported that 114 (62.3%) of students were suffering from primary dysmenorrhea which is less than 85.1% in Bahir Dar University [10], 71.8% in Mekelle University [11] and 72% among secondary school adolescents in Dabat and Koladiba, northwest Ethiopia [12]. It was also comparable with 65.4, 69.8 and 72.7% reported among university students in Egypt [13], Nigeria [14] and Turkey [15, 16] respectively. However, it was higher than 45% among young college nursing students in India [17] and 61.27% in Rural South Africa [18]. The difference among these studies could be due to dissimilarity in selected groups of students, age variation, and absences of universal accepted method to defining primary dysmenorrhea. The variation in socio cultural, ethnic and life style factors among university students could also be other pertinent reason.

The mean age of this study was 22.63 which are similar to a study done among Nigeria college students [14] and students from Turkey 21.47 years [15, 16]. This study shows the mean age at menarche was 15 ± 1.9 which is concurrent with the study done Nigeria college student which is 14.2 years [14] but slightly higher than study done at Turkey University (13.08) [15, 16]. The possible justification for this variation could be the difference between the study groups in socio economic status and the studies were carried out among different age groups.

This study showed that primary dysmenorrhea had pain sever in 67 (58.7%), moderate pain in 36 (31.6%) and mild pain in 11 (9.6%) which is less than that of (66.2%) had moderate and sever dysmenorrheal in another study [19]. The possible explanation for these variation could be the study participant varies in menstrual pain characterization with difference of social, life style or cultural back ground of students despite of the observed percentage variation among studies, over all, PD in female students from different areas sever or moderate pain which would impair their quality of life and have negative effect on the academic performance.

This study showed that among participant with primary dysmenorrhea 58.7% reported that effect on daily activities and a study done among North West, Ethiopia secondary school adolescent revealed that 48.8% of students had

suffered with primary dysmenorrhea reported that effect on daily activity [12]. This variation could because of difference in operational definition of terms, severity of dysmenorrheal pain, and socio demographic variables.

In this study, those students with family history of dysmenorrheal had higher risk of developing primary dysmenorrhea. It was found that respondent who had family history of dysmenorrhea were 2.9 times more likely exposed to dysmenorrhea than female students who had no family history of dysmenorrhea (AOR=2.903, 95% CI: 1.505-5.707). This finding also confirmed studies from Turkish university [15, 16]. Based on this research finding there are gynecologic factors which had significant associations with primary dysmenorrhea.

This study showed that among participants with primary dysmenorrhea 52.6% reported that it has an effect on academic performance. Some of its effect were class absent seem (29.8%), loss of concentration 44.7%, and both absentees from class and loss in concentration were 22% which are somehow different from with studies done among Spanish female students in which there was loss of concentration 59% lass absenteeism 50%. The findings from this study also different from study done in Khonkaen, Thailand, which indicated poor class concentration, 73.9% and absence from class 18.2% [20, 21]. In one of the effects, absence from class, study done among North West Ethiopia secondary school adolescents revealed that 48.8%, of student suffered with primary dysmenorrhea, which is also high compared with result of this study [12]. This variation could be because of difference in operational definition and socio demographic variables. Nevertheless, in all the studies we can understand that primary dysmenorrhea interferes with their academic performance due to intensity of symptoms instead of stigma related to it.

Limitation of the Study

Since the study design was cross-sectional, temporal relations could not be established between dysmenorrhea and factors associated. In addition there could be a memory problem that leads to recall bias and over-reporting of the condition because students were asked for conditions within the last years prior to the study.

5. Conclusion

The aim of this study was to estimate the prevalence of primary dysmenorrhea and to assess factors that are associated with primary dysmenorrhea. From the findings of this study, the prevalence of primary dysmenorrhea among Debre Tabor University student was found to be high and negatively affected thier daily activities and academic performance. Factors that significantly contributed to the presence of primary dysmenorrhea were family history of dysmenorrhea, early age of menarche and menstrual cycle irregularity. Therefore, the government should enhance wellbeing of female students and health professionals should consider problems related with family history of dysmenorrhea, early age of menarche and menstrual cycle

irregularity during diagnosis and interventions of reproductive health problems. Debre Tabor University should provide accessible and appropriate medical treatment and counseling service, and recreational facilities for students. Further country wide studies should be conducted to identify other risk factors for primary dysmenorrhea to alleviate its effect on students' academic performance.

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Conflict of Interest

All the authors do not have any possible conflicts of interest.

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