



WOLKITE UNIVERSITY

**COLLEGE OF MEDICINE AND HEALTH SCIENCES DEPARTMENT
OF NURSING**

**PREVALENCE AND ASSOCIATED FACTORS OF PRIMARY
DYSMENORRHEA AMONG WOLKITE UNIVERSITY FEMALE
STUDENT, SOUTHERN ETHIOPIA, 2023**

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ABBREVIATION AND ACRONYMS

BMI	Body Mass Index
ETB	Ethiopian Birr
NSAID	Non-steroidal anti-inflammatory drugs
PD	Primary dysmenorrhea
QoL	Quality of Life
SD	Secondary Dysmenorrhea
SPSS	Statically Package for the Social Science
WKU	Wolkite University
VAS	Visual Analogue Scale
AOR	Adjusted Odd Ratio
COR	Crude Odd Ratio
CI	Confidence Interval

ABSTRACT

Introduction: Primary dysmenorrhea is the most common gynecologic complaint among adolescent females, there is a wide variation in the estimate of prevalence of Primary dysmenorrhea.

Objectives: The aim of the study was to determine the prevalence of primary dysmenorrhea, and associated factors among Wolkite university female students 2023.

Methods: institution based cross sectional study design was conducted. The study was conducted from June -July 2023. A total of 508 female students were selected by systematic random sampling method. The data was collected with self-administered questionnaire. The data was entered into Epi data 3.1 versions and bivariable and multivariable analysis was carried out in SPSS version 23. Binary logistic regression models were used to assess the association between dependent and independent variables. Variables with the p value < 0.25 in bivariable logistic regression analysis were entered to multivariable logistic regression analysis. Finally, variables with p value <0.05 with 95 % CI in multivariable logistic regression was taken as independent predictors. COR and AOR was used to show the strength of association between dependent and independent variable.

Results: A total of 508 female students who had in undergraduate program were participated in the study, making the overall response rates 96.6 %. The prevalence of primary dysmenorrhea was 42.4% 95% CI; 38.1%, 46.4% Age of Menarche(AOR=17.759,95%CI;7.469,42.228), Amountoftea(AOR=0.287,95%CI;0.133,0.619),Chocolateconsumption(AOR=4.142,95%CI;2.15 0,7.978), and physical exercise (AOR=0.373,95%CI;0.203,0.686) had significantly associated with primary dysmenorrhea.

Conclusions: In Wolkite university primary dysmenorrhea affect 2 from 5 students. Age of menarche, amount of tea consumed, chocolate consumption and physical exercise were significantly associated to the occurrence of primary dysmenorrhea. Wolkite University should provide accessible and appropriate medical treatment and counseling service for primary dysmenorrhea affected female students. Physical exercise was protective against primary dysmenorrhea.

Keywords: Female, Prevalence, Primary dysmenorrhea, Age of menarche

1. INTRODUCTION

1.1. Background

Dysmenorrhea is a type of abdominal pain that can be felt in the lower back, legs, and inner thighs. There are two types of dysmenorrhea, primary dysmenorrhea (PD) and secondary dysmenorrhea (SD)[1]. In primary dysmenorrhea there is no obvious pathology for menstrual pain. It usually begins within the first two years after menarche. Affected females experience a spasm of pain in the supra pubic area which can be felt from the back of the legs. Within hours of the start of the menstruation, pain peaks as the flow becomes heavier during the first day or two of the cycle [2]. Secondary dysmenorrhea is the menstrual pain associated with underlying pelvic pathology such as endometriosis and chronic Pelvic inflammatory disease, adenomyosis, and contraceptive device related issues. A key differentiating factor in SD is the onset and the presence of symptoms of pain that persist beyond the normal menstrual period .SD occurs any time after menarche and can arise as a new symptom in their 30s or 40s[3].

The etiology of PD is not precisely understood, but most widely accepted explanation for its pathogenesis is overproduction of uterine prostaglandin s (PGs), particularly Prostaglandin F_{2α} (PGF_{2α}). Patients with primary dysmenorrhea have higher PG levels in the endometrial and menstrual blood [4].

Health is not only the absence of disease and infirmity but also the presence of physical, mental, and social well-being according to the World Health Organization. Quality of life (QoL) is defined as a subjective phenomenon based on individual perception, experiences, beliefs, and expectations. Nowadays, Quality of life has become an issue in many clinical studies [5]. Primary dysmenorrhea have a negative impact on health related quality of life, daily activities, work productivity and academic performance. The most common gynecological and menstrual disorder is primary dysmenorrhea. It affects a lot of women. Millions of women are affected by it during their reproductive year [6].

Despite this most women don't seek medical treatment because they think it's normal to experience pain during menstruation. For example, 85.8% of females don't seek medical care. Screening all adolescent girls for primary dysmenorrhea is important because 85.8% of females

don't seek medical care. The health impact of dysmenorrhea among adolescent girls can be reduced with appropriate management and preventive strategies [7].

1.2. Statement of the problem

The prevalence of dysmenorrhea varies from 20% to 90%, where 2–29% experience severe pain. The prevalence of dysmenorrhea has been reported in Europe and America to range from 52.4% to 85.7%. In Asia, the prevalence of dysmenorrhea is between 58.8% and 84.9% [7]. The prevalence ranged from 42% to 85.4% in various studies in Africa [9]. The prevalence of primary dysmenorrhea in Sub Saharan Africa varies from 51.1% to 88.1%. The prevalence of primary dysmenorrhea in Ethiopia is between 62.3% and 85.4% [6].

According to several studies, primary dysmenorrhea can affect relationships, functioning, and productivity. It also contributes to absenteeism in class/work and reduces day-to-day life activities. 42% of young women reported limitation in their daily activities, and 17% reported missing 1-2 days of work or school [1]. 5% to 20% of the women are adversely affected by participation in usual activities [10]. The disorder interfered with the academic performance of in Debre Birhan University 88.3% of the students in the study. and more than half of the respondents had encountered social withdrawal and decrease in academic performance [11].

Many factors are related to the prevalence of primary dysmenorrhea. 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 [12].

In addition to this many girls reported low body mass index (underweight) 1.45 times more likely experience primary dysmenorrhea than other girls being overweight may not associated with the development of PD [13]. In study conducted female student at high school of Wolaita zone younger participant whose age 14-17 were 2.55 times more likely experience primary dysmenorrhea than those aged > 18 years. In addition to this women's who have positive family history for PD are 3.49 more likely develop PD than who have not [3].

When we see the association between BMI and PD in the study conducted in rural girls in India show that from total girls having mild dysmenorrhea, (71.84%) had BMI < 16.5 whereas 27.18% were underweight and just 0.97% had normal BMI (13). Not only this women's who have low social support are 4.25 times more likely develop PD than who have good social support [14].

It is unclear the extent to which young girls are incapacitated each month due to its severity, especially PD in university is a real health issue which deserves more attention and requires having better knowledge of its prevalence and particularly its associated factors. To the best of our knowledge, local studies especially among Wolkite university female students studying primary dysmenorrhea and its associations are scarce and it will be interesting to see the prevalence and associated factors among students and we also add factor which is not study by other researcher's.

1.3 Significance of the study

This finding was provided useful information which can be supportive for university policy makers and school administrators for developing a plan that specifically give attention for female students who are suffering from primary dysmenorrhea. In addition, this study may provide a pathway and information for other researcher who wants to conduct their study on the same issue and findings would also help for future studies. And also, the study would pave the way for pleasant environment for teaching and learning process in such away by promoting the psychological as well as the physical well-being of girls attending in university.

2. LITERATURE REVIEW

2.1. Prevalence of primary dysmenorrhea

In a cross sectional study conducted in China,(2020) to assess the prevalence and risk factors associated with primary dysmenorrhea among Chinese female university students and found 41.7% out of 4606 participants [15].

In Saudi Arabia,(2020) conducted a cross-sectional study to assess the prevalence of primary dysmenorrhea among female medical students and found that 80.1% out of 376 respondents [16].

In Nigeria,(2020) conducted a cross sectional study to assess the prevalence and management practices for dysmenorrhea among adolescent school girls among 1680 participant's found 51.1% of them [17].

In Gondar,(2020) conducted A cross-sectional study to assess the prevalence of primary dysmenorrhea out of a total of 459 of female participants was found 64.7% of them [18].

In Haramaya university,(2022) conducted a cross-sectional study to assess the prevalence of dysmenorrhea and associated factor and found 64.7% out of a total of 569 participants [19].

In Hawassa university,(2022) a cross sectional study was conducted to assess Prevalence of dysmenorrhea, associated factors, pain intensity, and its effect on daily academic activities among 348 female undergraduate students was found 80% [20].

2.2. Associated factors of primary dysmenorrhea

2.2.1 Socio demographic factors

In Malaysia, (2020) conducted a cross sectional study to assess the effect of health education on knowledge and self-care among Arabic school girls with primary dysmenorrhea. Age of the participants were in between 18-27 years old girls by which it implies that age significantly associated with primary dysmenorrhea [21].

In Bangladeshi, (2022) a cross sectional study was conducted on the Menstruation of Adolescent Girls age were significantly associated with primary dysmenorrhea [22].

In Northern Uganda,(2023) a cross sectional study was conducted on to assess Primary dysmenorrhea among University students symptoms manifestation, and management, PD also was significantly associated with marital status[23].

In Addis Ababa, (2020) a cross section study was conducted on the prevalence of premenstrual syndrome and its effect on academic and social performance of female medical students in Addis Ababa university, PD was significantly associated with marital status [24].

In Wolaita, (2022) a cross sectional study was conducted on the Prevalence of Primary Dysmenorrhea, Its Intensity and Associated Factors among Female Students at High Schools. On this study place of residency is significantly determinant factor on primary dysmenorrhea [25].

2.2.2 Gynecological factor

In Palestine, (2018) a cross sectional study was conducted in Prevalence of dysmenorrhea and predictors of its pain intensity among 956 Palestinian female university students. Menstrual symptoms like fatigue, nervousness, diarrhea, vomiting, dizziness, headache, breast tenderness, insomnia, arthralgia were significantly associated with primary dysmenorrhea [26].

In Uganda, (2023) a cross sectional study conducted on the Prevalence and effects of menstrual disorders on quality of life of among 275 female undergraduate students in Makerere University College of health sciences Age at menarche(early and delayed menarche) were significantly associated with primary dysmenorrhea [27].

In Lebanon, Karout, S., et al., (2021) a cross sectional study was conducted on the Prevalence, risk factors, and management practices of primary dysmenorrhea among young females. On this

study family history of dysmenorrhea were significantly associated with primary dysmenorrhea [1].

In Wolaita, (2022) a cross sectional study was conducted on the Prevalence of Primary Dysmenorrhea, Its Intensity and Associated Factors Among Female Students at High Schools, family history of dysmenorrhea have been determining factor for primary dysmenorrhea [28].

2.2.3 Menstrual factor

In Bangladeshi, (2022) a cross sectional study was conducted on the Menstruation of Adolescent Girls. On this study a menstrual interval between, 21-35 day and an interval of more than 35 days were significantly associated with primary dysmenorrhea. And also the amount of menstrual flow (moderate, heavy and scanty respectively) significantly associated with primary dysmenorrhea [22].

In Palestine, (2018) a cross sectional study was conducted on the Prevalence of dysmenorrhea and predictors of its pain intensity among 956 Palestinian female university students. On this study the regularity of menstrual cycle were significantly associated with primary dysmenorrhea [26].

In Wolaita, (2022) a cross sectional study was conducted on Prevalence of Primary Dysmenorrhea, Its Intensity and Associated Factors among 733 Female Students. In this study regularity of menstrual cycle, the length of menstrual cycle and length of menstrual flow, amount of menstrual flow were significantly associated with primary dysmenorrhea[28].

In Indonesia, international journal of human and health science, (2022) an observational analytic study with cross sectional approach was conducted on the relationship between age of menarche with primary dysmenorrhea in adolescents. In this study age of menarche were significantly associated with primary dysmenorrhea [1].

2.2.4. Behavioral factors

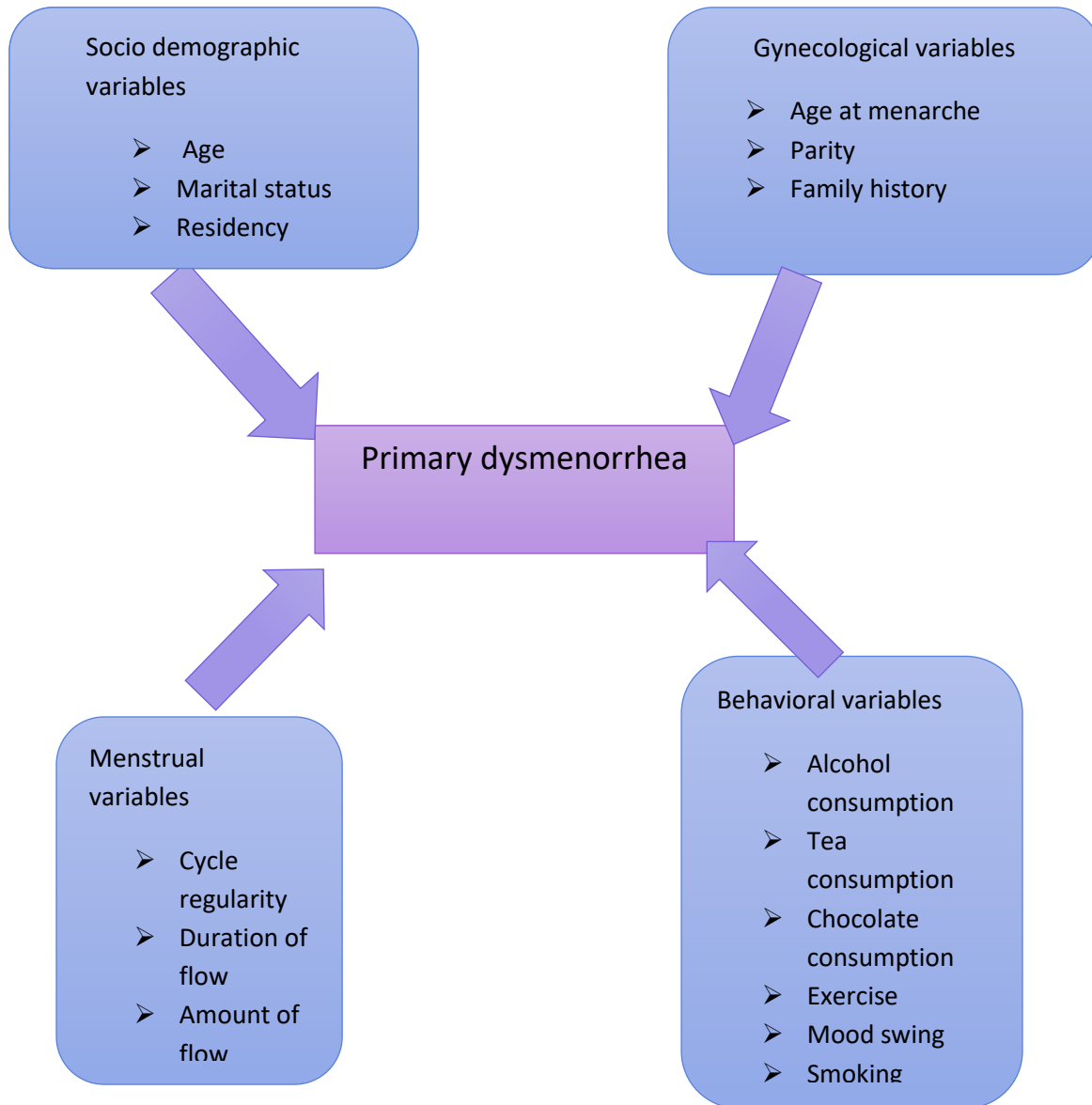
In Lebanon, (2021) a cross sectional study was conducted on the Prevalence, risk factors, and management practices of primary dysmenorrhea among 550 young females on this study physical exercises, smoking and alcohol consumption were significantly associated with primary dysmenorrhea [1].

In Indonesia,(2023) a cross sectional study was on Effect of Combination of Dark Chocolate and Herbal Ingredients for Dysmenorrhea in Late Adolescents on 30 respondents , in this study chocolate consumption and physical exercises were significantly associated with primary dysmenorrhea [29].

In North Uganda, (2023) across sectional study was conducted on among University students on the symptoms, manifestation, and management among 232 participants. In this study mood disturbance was significantly associated with primary dysmenorrhea [23].

In Wolaita, (2022) a cross sectional study was conducted on the Prevalence of Primary Dysmenorrhea, Its Intensity and Associated Factors Among 733 Female Students who performs physical activity, cigarette smokers ,alcohol consumers, chocolate users and takes tea were significantly associated with primary dysmenorrhea [28].

2.3 Conceptual Frame Work



Conceptual framework developed from different literatures [1, 18, 22,25].

Figure 1: conceptual framework for prevalence of primary dysmenorrhea and associated factors among Wolkite University female student, SNNP Region, South Ethiopia, 2023.

3. OBJECTIVES

3.1 General objectives

- To assess the prevalence of primary dysmenorrhea, and associated factors among Female Students at Wolkite University, Southern Ethiopia, June to July 2023

3.2 Specific objective

- To determine the prevalence of primary dysmenorrhea among Female Students at Wolkite University, Southern Ethiopia, June to July 2023
- To identify associated factors that affect primary dysmenorrhea among Female Students at Wolkite University, Southern Ethiopia, June to July 2023

4. METHODS AND MATERIALS

4.1 Study area

The study was conducted in Wolkite University, Gubre Campus, Southern region, Ethiopia. It is one of the 45 Universities in Ethiopia. Wolkite is capital city of Gurage zone. This is found around 167 km far from Addis Ababa (the capital city of the country), has a total number of 8 collages, 1 school, 47 departments and 2 remedial. It has 8072 total regular students from this 2563 are female. It has 2 campuses Gubre and Wolkite campus. Gubre campus has 8 colleges namely college of health science (350 regular female students), college of agriculture (214 regular female students), college of engineering and technology (267 regular female students), college of computing and informatics (74 regular female students) college of social science and humanity (181 regular female students), college of business and economics (308 regular female students), college of natural and computational science (111 regular female students), college of educational and behavioral sciences (119 regular female student), 1 school (school of law, 55 regular female students) and 2 Remedial (remedial natural science 528 and remedial social science 356 female students).

4.2. Study period

The study was conducted from June to July 2023.

4.3. Study design

An institution-based cross-sectional quantitative study design was implemented

4.4. Population

4.4.1. Source population

The source population was all regular female students currently learning at Wolkite university main campus.

4.4.2. Study population

- The study population was all female regular student who fulfill the inclusion criteria

4.4.3. Inclusion criteria

- All female regular students

4.4.4. Exclusion criteria

- Those women who are amenorrheic.
- Those women who have gynecologic follow up
- Those who are using Artificial contraceptive method
- Those who undergone major gynecologic surgery for the last 12 months
- Those women whose pain continues after menstruation
- Those women who has little or no response for NSAIDs (Diclofenac, ibuprofen and tramadol)

4.5. Sample size determination and sampling technique

The sample size for this particular study was calculated using formula for a single population proportion considering the following assumptions.

A 95% confidence level, margin of error (0.05), p (= 0.647) prevalence of primary dysmenorrhea in the study conducted at University of Haramaya [18] is substituted in the following single population proportion .

So, $n = z^2 p(1 - p) / w^2$ where, n= required sample size

Z= critical value for normal distribution at 95% confidence interval which is equal to 1.96(at alpha 0.05)

P= the proportion of primary dysmenorrhea (0.647).

W= Margin of error which is 5%Margin

$$n = \frac{z^2 p(1-p)}{w^2}$$

$$n = \frac{(1.96)^2 0.647(1-0.647)}{0.05^2} = 351$$

Since the total number of our study population less than 10,000, i.e. 2563 we need correction formula. Where, n = initial sample size

nf = corrected sample size

N = total number of regular female student

$$nf = \frac{n}{1+n}$$

$$N$$

$$N = 2563$$

$$= 351 / (1 + 351/2563)$$

$$nf = 308$$

Considering design effect, i.e. $308 * 1.5 = 462$

Then finally we consider 10% non-respondents from the participant.

$$\text{i.e. } nf = n + 10/100(n)$$

$$nf = 462 + \frac{10 * 462}{100}, nf = 508$$

Therefore, our sample size was including 508 students.

4.5.1. Sampling technique

A multi stage sampling technique was used by taking the colleges as primary sampling unit, the department as secondary sampling unit and student as tertiary sampling unit then we selected three colleges randomly by lottery method from 8 colleges, 1 remedial and 1 school of law WKU. Then we selected our study participant (students) by systematic random sampling by using sample interval "k" from selected department with proper allocation by using list of name of students as a sample frame.

$$K = N/n$$

Where: n=Sample size of female students

N=Total number of female students

$$K = 2563/508 = 5.04 \approx 5$$

Number of the first female to be included in the sample was chosen randomly by picking one out of the five pieces of paper numbered 1&5 through lottery method, and then the study included 508 students.

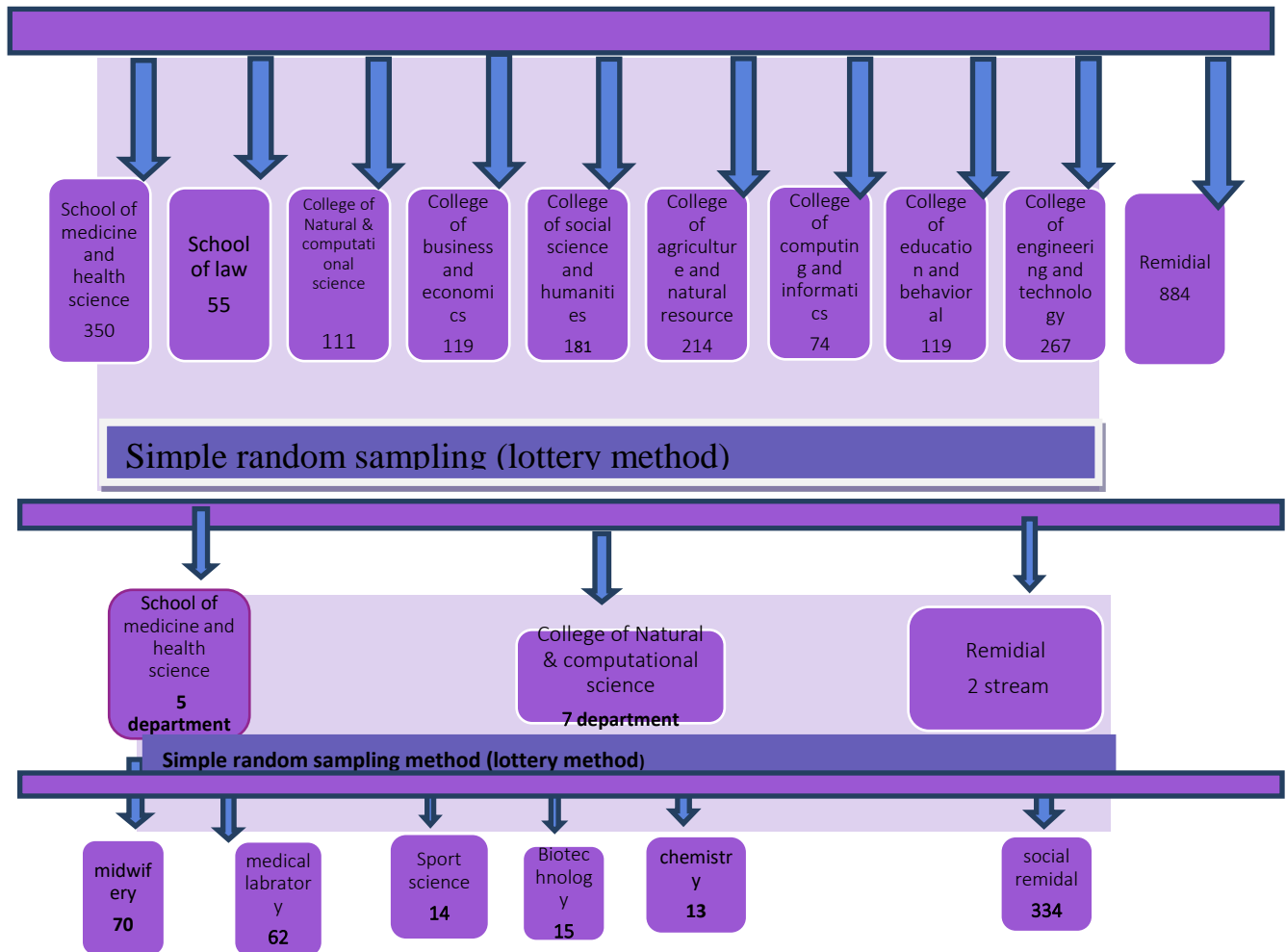


Figure 2: Schematic presentation of sampling procedure in selected 3 colleges 6 departments from June-July, 2023

4.6. Study variables

4.6.1. Dependent variable

- ❖ Primary dysmenorrhea

4.6.2. Independent variables

- ❖ **Socio-demographic:** Age, marital status, residency.
- ❖ **Gynecologic factors:** age at menarche, parity, family history.
- ❖ **Menstrual factors:** cycle regularity, duration of flow, flow amount.
- ❖ **Behavioral factors:** Alcohol consumption, Tea consumption, Chocolate consumption, Smoking, Exercise, Mood swing

4.7 Operational definition

Primary dysmenorrhea: it is determined by recurrent, lower abdominal or back pain before or during menstruation with Wallid score ≥ 5 in the last 12 months.

Pains: in VAS women who scored 1-3 is grouped as having mild pain, women who scored 4-6 grouped as moderate pain and women who scored of ≥ 7 grouped as severe pain.

Family history of dysmenorrhea: defined as positive if a student's first degree relative (mother or sister) had a history of dysmenorrhea

Regular physical exercise: means a woman who exercises two or more days per week for ≥ 30 minutes.

Mood swing: means experiencing a fluctuation of emotion for more than two weeks.

4.8. Data collection tools and procedure

Questionnaires was adapted from reviewed literature with modification and contextualized into local setting. The questionnaires consist three parts, in which the first part was used to assess socio-demographic characteristics, the second parts were used to assess gynecologic and menstrual factors and the third part were to assess behavioral factors. Under the gynecological factor there the visual analogue scale (VAS) and Wallid score, VAS is a 10cm horizontal line to estimate the degree of pain intensity from no pain to worst pain. VAS is a simple, validated method to record subjective estimates of pain intensity which has been used in the number of dysmenorrhea studies (1). Whereas Wallid score is a working ability, location, intensity, days of pain, dysmenorrhea score that was designed to diagnose dysmenorrhea and to predict medical

leave. Its scale-type survey, which integrated features of dysmenorrhea such as: 1) number of anatomical pain locations, 2) Wong–Baker pain range, 3) number of days of pain during menstruation, and 4) frequency of disabling pain to perform their activities. Each tool's variable provided a specific score between 0 and 3, and the final score ranged from 0 to 12 point[30].

4.9. Data quality control

Training was provided for data collectors and supervisors on objectives, benefits of the study, individual's right and informed consent for common understanding of the study in general and the questioner in particular. The data collectors and supervisors were undergraduate students. Pretest was done among 10% (51) of female students which are found in WKU Cluster campus in order to check reliability of the questioners. We used test- retest reliability method to assess the reliability of the question by doing the survey with a group of respondents in cluster campus and repeating the survey with same group after 2 days then we were compared the responses at the two time points. We also further considered the questions which are frequently asked from our respondents. During pre test all of our respondents were non smokers and non drinker(alcohol) then we out the questioners which asses this part, before the actual data collection time .Daily close supervision at the end of every data collection was made; the questionnaire was reviewed and checked for completeness, accuracy and consistency by supervisors and principal investigation.

4.10. Data processing and analysis

First the questionnaire was checked manually for completion and any misfiled questions. Before data entry code was given. Then data was entered in to Epidata info version 3.1 Software and exported to statistical package for social sciences (SPSS) version 23.0 software for analysis. Descriptive statistics was computed to determine frequencies and summary statistics (mean, median, standard deviation, and percentage) to describe the study population in relation to socio-demographic and other relevant variables. Data was presented using tables, graphs and figures. Initially, bivariate logistic regression will be carried out to see the association of each of the independent variables with the outcome variable. Then multivariable logistic regression was carried out for variables with p-value < 0.25 in bivariate logistic regression to determine significant relationships between the dependent (presence of PD) and independent variables. P-Value of <0.05 and 95% confidence level was used as a difference of statistical significance.

4.11 .Ethical consideration

All the ethical issues were considered and requested permission letter was obtained from Wolkite University, college of health science and medicine. At the time of data collection, a verbal consent was asked from the participant were given the right to do so. Confidentiality and privacy of responses was ensured (the names of respondents were not included and ensuring to participants that their identification was not be public. also clearly putting the objective of this study to respondents may help to keep the confidentiality of the respondents throughout the research process.

4.12. Dissemination of results

After the completion of the study, Results of the study will be presented to the college of health science department of nursing and other concerned bodies. The copy of the research will be submitted to Wolkite University specialized and Teaching Hospital in the form of soft copy and Wolkite university library through hard copy.

5. Results

In this survey from 508 Self-administered questionnaires, 491 female students responded to the questionnaires, yielding a response rate of 96.6%.

5.2. Socio Demographic Characteristics of the Participant

In residency 304(61.9%) of the respondent was from urban and 187(38.1) are from rural. Their age was in range of 18-35 years with the mean age of 22.39 years. From the total of respondent, 418(85.1%) were in the range of 18-24 years. regarding marital status, nearly three-fourth of respondent were unmarried (74.5%).

Table 1: Socio-Demographic Characteristics of female students at Wolkite university southern Ethiopia, 2023,(n=491)

Variables	Category	Frequency	Percent (%)
Age in years	18-24	418	85.1
	25-30	67	13.6
	>30	6	1.2
Marital status	Married	121	24.6
	Unmarried	366	74.5
	Widowed	1	0.2
	Divorced	3	0.6
Residency	Urban	304	61.9
	Rural	187	38.1

5.3. Obstetric and Gynecological Related Characteristics

Among study participant,205 (41.8%) experienced the first menstruation at the age less than 14. more than half 284(57.8%) reported menstrual duration of 3-7 days, and two hundred twenty-

eight (46.4%) of them usually use 3 pad per day. nearly half of them 249(50.7%) reported a normal amount of menstrual flow and, two hundred sixty-five (54%) have 21-35 days period gap between each menstruation. more over 266 (54.2%) of student reported family history of dysmenorrhea and, majority of respondent 387 (78.8%) didn't pregnant before.

Table 2: Obstetric and gynecological related characteristics of female student at Wolkite university Southern Ethiopia, 2023 (N=491)

Variables	Category	Frequency	Percent (%)
Age at menarche	<14 years	205	41.8
	14-17years	199	40.5
	>17 years	87	17.7
Menstrual bleeding duration (in days)	<3days	136	27.7
	3-7 days	284	57.8
	>7days	71	14.5
No pad used per day during menstruation	2 pads	210	42.8
	3 pads	228	46.4
	4 pads	53	10.8
Amount of menstrual flow	Normal	249	50.7
	Scanty	154	31.4
	Plenty	88	17.9
Period gap between menstruation	<21 days	139	28.3
	21-35 days	265	54

	>35 days	87	17.7
Family history of dysmenorrheal	Yes	266	54.2
	No	225	45.8
History of pregnancy	Yes	104	21.2
	No	387	78.8
The outcome of pregnancy	Delivered	70	67.3
	Aborted before 3 months	27	26.0
	Aborted after 3 months	7	6.7

5.4. Life style and Behavioral Characteristics:

More than half 342(69.7%) of the respondents were not involved in regular physical activity. Three hundred (61.1%), and three hundred forty-four (70.1%) of the participant took coffee and tea respectively. There were 211 (43.0%) participants consumed chocolate.

Table 3: -life style and behavioral characteristics of female students in Wolkite university South Ethiopia, 2023.

Variables	Category	Frequency	Percent (%) (%)
Coffee intake	Yes	300	61.1
	No	191	38.9
Cup of coffee	1cup	111	37
	2cup	119	39.7

	>2cup	70	23.3
Tea drinking	Yes	344	70.1
	No	147	29.9
Cup of tea	1cup	121	35.2
	2cup	145	42.2
	>2cup	78	22.7
Chocolate consumption	Yes	211	43.0
	No	280	57.0
Bars of chocolate	1bar	74	35.1
	2bar	87	41.2
	>2bar	50	23.7
Physical activity	Yes	149	69.7
	No	342	30.3
Physical activity days per week	2days	62	41.6
	3days	74	49.7
	More than 3 days	13	8.7

5.1. Prevalence of primary dysmenorrhea

The prevalence of primary dysmenorrhea was found to be 208(42.4%) 95%CI; 38.1%, 46.4%.from this 27(13%) said never, 46(22.1%) said almost never, 87(41.8%) said almost always and 48(23.1%) said always the pain disabled them to perform their daily activities. The intensity of pain during menstruation was 58(27.9%) mild, 88(42.3%) moderate, and 62(29.8%) sever.

Prevalence of Primary Dysmenorrhea Among wolkitte university Female students

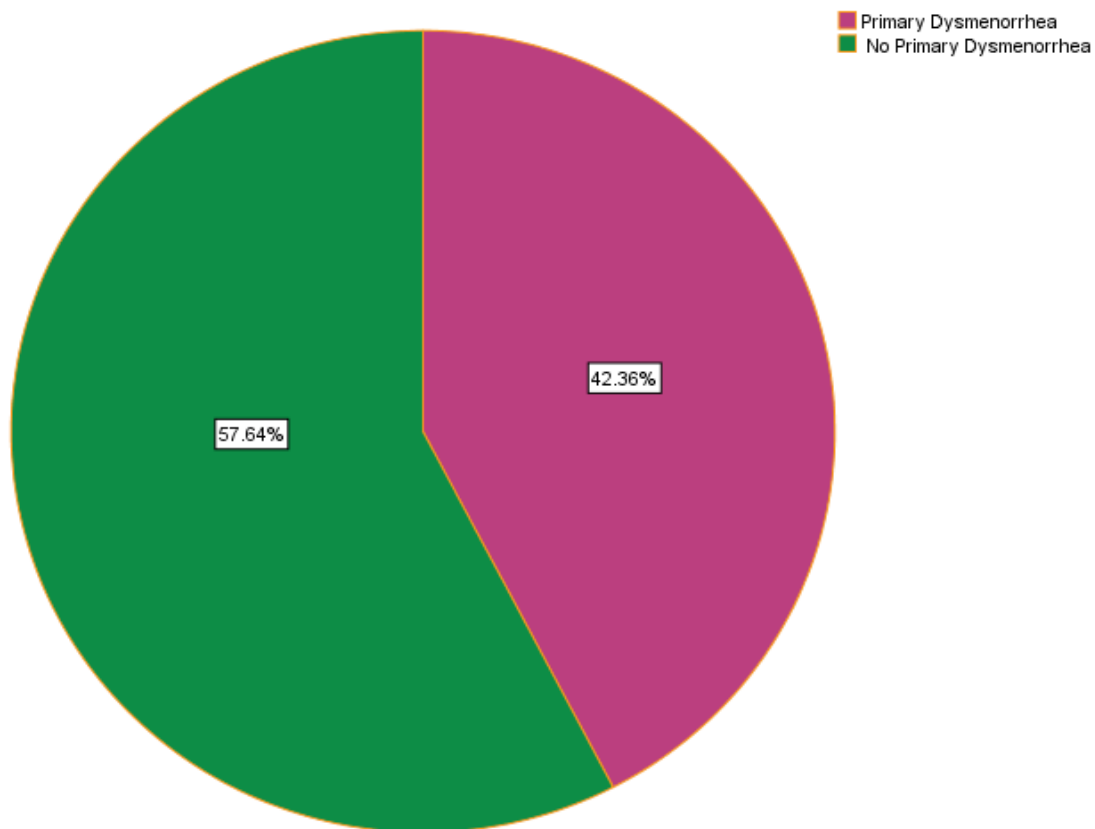


Figure 3:- Prevalence of primary dysmenorrhea among wolkitte university female students South Ethiopia , 2023

5.5. Factors Associated with Primary Dysmenorrhea

The numbers of days usually spot during menstruation, amount of menstrual flow ,the number of pad usually used during menstruation ,age of menarche ,family history, pregnancy history , tea consumption, cup of tea consumed , chocolate consumption and physical exercising were significantly associated with primary dysmenorrhea in Bivariate logistic regression analysis(table 4) .All this variables with p-value of <0.25 in Bivariate analysis were entered to multivariable logistic regression analysis .

In multivariable analysis; age of menarche, amount of tea, chocolate consumption, and physical exercise were the factors independently associated with primary dysmenorrhea. students who have seen their first menses(menarche) at age less than 14 had 17.759 times more likely primary dysmenorrhea as compared with age of menarche 14-17 years (AOR=17.759:95%CI 7.469,42.228). primary dysmenorrhea was 28.7% less likely in participants who consume one cup of tea per day compared with participant who consume two cups of tea (AOR=0.287:95%CI 0.133,0.619). Participant who consumed chocolate had 4.142 more likely primary dysmenorrhea than who didn't consume (AOR=4.412:95%CI .2.142, 7.978). Primary dysmenorrhea was 37.3% less likely in participant who did physical exercise as compared to those who didn't do physical exercise (AOR=0.373:95%CI 0.203, 0,686).

Table 4: - Bivariate and Multivariable analysis for factor associated with primary dysmenorrhea among Wolkite University female students South Ethiopia, 2023

Variables	Category	Primary Dysmenorrhea		Crude OR (95%CI)	AOR (95%CI)	P
		Yes (%)	No (%)			
Days of menses	< 3 days	56(41.2)	80(58.8)	1.044(0.689,1.582)	1.374(0.554,3.406)	0.493
	> 7 days	38(53.5)	33(46.5)	1.717(1.018,2.898)	1.366(0.597,3.124)	0.460
	3-7 days	114(40)	170(60)	1	1	0.739
Amount of	Normal	92(37)	157(63)	0.601(0.400,0.904)	1.914(0.731,5.008)	0.186

menstrual flow	Plenty	40(45.6)	48(54.4)	0.855(0.506,1.446)	0.793(0.303,2.072)	0.636
	Scanty	76(49.3)	78(50.7)	1	1	0.026
Number of menstrual pads used	2 Pads	70(33.3)	140(66.7)	0.442(0.300,0.651)	1.459(0.474,4.494)	0.510
	4 Pads	17(32)	36(68)	0.418(0.222,0.786)	0.493(0.164,1.485)	0.209
	3 Pads	121(53)	107(47)	1	1	0.001
Age of menarche	<14 years	49(24)	156(76)	0.330(0.216,0.505)	17.759(7.469,42.228)**	0.000
	>17 years	62(71.2)	25(28.8)	2.608(1.158,4.480)	4.909(2.076,11.605)	0.000
	14-17years	97(48.7)	102(51.3)	1	1	0.000
Family history	Yes	133(50)	133(50)	2(1.386,2.886)	0.716(0.400,1.282)	0.261
	No	75 (33,3)	150(66.7)	1	1	
Pregnancy history	No	158(40.8)	229(59.2)	0.745(0.482,1.151)	1.758(0.884,3.497)	0.108
	Yes	50(48.1)	54(51.9)	1	1	
Tea consumption	Yes	163(47.4)	181(52.6)	2.041(1.355,3.075)	0.968(0.081,11.499)	0.979
	No	45(30.6)	102(69.4)	1	1	
Cup of tea	1 Cup	71(58.7)	50(41.3)	2.130(1.303,3.481)	0.287(0.133,0.619)*	0.001
	>2 Cup	34(43.6)	44(56.4)	1.159(0.664,2.024)	0.669(0.324,1.381)	0.271
	2 Cup	58(40)	87(60)	1	1	0.004
Chocolate	Yes	110(52.1)	101(47.9)	2.023(1,404.2.914)	4.142(2.150,7.978)*	0.002

consumption	No	98(35)	182(65)	1	1	
Physical exercise	Yes	51(34.2)	98(65.8)	0.613(0.411,0.915)	0.373(0.203,0.686)**	0.000
	No	157(46)	185(54)	1	1	

*=p <0.05; **=p < 0.001

6. Discussion

In this study, prevalence and associated factors of primary dysmenorrhea among Wolkite University undergraduate regular female students was assessed. According to the result, the prevalence of primary dysmenorrhea was found to be 42.4%, 95%CI, (37.9%, 46.8%) and age of menarche, amount of tea consumed, chocolate consumption, and physical exercise were significantly associated with primary dysmenorrhea.

This prevalence was in line with the previous study conducted in China with the prevalence of primary dysmenorrhea 41.7% [15]. But It was lower than the findings of previous studies in Ethiopia (Hawassa(80%), Haramaya(64.7%), Gonder(64.7%), [18],[19],[20]. The possible reason for the discrepancies of the estimated prevalence might be due to the absence of universally accepted definition of primary dysmenorrhea. It also lowers than the findings of previous studies in Nigeria (51.1%), Malaysia (54.6%), and Saudi Arabia (80.1%)[11],[16],[17]. The possible reason for the discrepancies might be due to the difference in lifestyle.

In this study, primary dysmenorrhea was 17.8 times more likely in women with age of menarche at age less than 14 years as compared to those age menarches 14-17. This is consistent to report in other study in Indonesia. this might be due to the longer exposure of prostaglandin, leading higher incidence of uterine dysmenorrhea in female with early menarche[29].

Drinking 1 cup of tea per day associated with 28.7% times decreased the odds primary dysmenorrhea than those who did take 2 cups of tea, which is consistent with previous study conducted in Hawassa. The relationship between might due to its effect that vitamins and mineral absorption and metabolism are compromised by sugar intake .it then leads to muscle spasm, which can be manifested by menstrual pain [2].

Different studies have reported consistent result regarding the relationship between chocolate consumption and primary dysmenorrhea [3],[29]. In present study, there was also direct association between chocolate consumption and primary dysmenorrhea, in which female student who consumes chocolate had 4.14 more likely develop primary dysmenorrhea than who didn't consume. This may due to chocolate, particularly milk chocolate, contain a lot of sugar,

including lactose, milk protein and fat – all of which can cause symptoms in susceptible person [29].

Furthermore , female student who do physical exercise had 37.3% less likely develop primary dysmenorrhea than who didn't do physical exercise, which is consistent with previous studies in Ethiopia ,Indonesia and Lebanon ([1],[3],[29]). The possible explanation for this physical exercise plays an important role in reducing stress and helps improve blood circulation and increases level of endorphins and nerve transducers [31].

5. Limitations and Strength of the study

There are several limitations in this study, including all of our respondents are nonsmokers and drinker, this lead us difficult to obtain the association between primary dysmenorrhea with alcohol drinker and cigarette smokers. The study strength is that it used primary data.

8. Conclusions and Recommendation

8.1 Conclusion

In Wolkite university primary dysmenorrhea affect 2 from 5 female students. Even if the overall prevalence of it wasn't high compare to different literatures, it negatively affected the students daily activates. Age of menarche, amount of tea consumed, chocolate consumption and physical exercise were significantly associated to the occurrence of primary dysmenorrhea. Physical exercise is protective against primary dysmenorrhea.

8.2. Recommendation

To Wolkite university

- Wolkite University should provide accessible and appropriate medical treatment and counseling service for primary dysmenorrhea affected female students

To teachers

- Teachers should provide academic support for affected females.

To researchers

- In this study we have got doing physical exercise is protective against primary dysmenorrhea. Similar University longitudinal studies are advantages to establish causal relationship of factors.

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Annexes

Annex I: Information Sheet

Identification Number _____

Dear Respondent:

Introduction: Good morning/Afternoon!

My name is _____ I am working as a facilitator in the study conducted by BSC graduate student in the field of nursing from Wolkite University. This questionnaire is prepared to conduct the study on **The Prevalence of Primary Dysmenorrhea, And Associated Factors among Students at Wolkite University**, you are selected and included in the study as part of the sample population to complete the questionnaire designed by the researcher. Your honest response is vital to assess the prevalence, associated factors and effect of Primary dysmenorrhea among Wolkite University female students.

Purpose of the study: this study aimed to assess the prevalence of primary dysmenorrhea, and associated factors among Wolkite University female students.

Procedure: To assess the prevalence of primary dysmenorrhea, and associated factors among students at Wolkite University, you are invited to include in this project. If you are willing to participate, we need you to clearly understand the aim of this study and show your agreement. Finally, you are kindly requested to give your genuine response in the questionnaire. All your responses and the results obtained will be kept confidential whereby no one will have access to your response.

Benefits / Risk/ Discomfort: When you participate in this research project you may feel some discomfort by wasting your time only it takes (15-20 minutes). However, your participation is definitely important and we are hopeful that this research was beneficial in improvement of students' health and school. We are sure there is no risk in participating in this research project.

Confidentiality: The information collected from you was kept strictly confidential and stored in a file without your name by assigning a code number to it. The information obtained in this study will be used only for research purposes.

Right to refuse or withdraw: You have the full right to refuse from participating in this research. You have also the full right to with draw from this study at any time you wish. You can choose not to respond to some or all questions if you do not want to give your responses

Annex II-tools

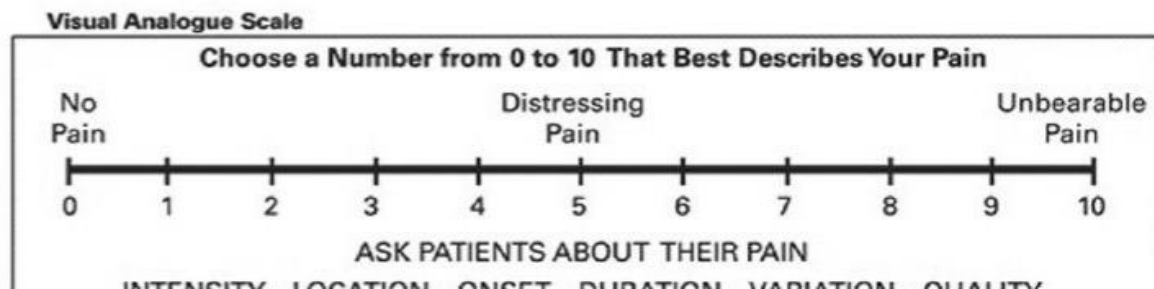
Tool 1; Wallid score tool

Table 5: Wallid score variables and their scores

Score	Daily working ability affects	Location the pain	Intensity of the pain	Days of pain
0	None	None	Does not hurt	0
1	Almost never	1 site	Hurts a little bit	1-2
2	Almost always	2-3 sites	Hurts little more	3-4
3	Always	4	Hurts worst	≥5

Tool 2; visual analogue scale

Figures: Tools Commonly Used to Rate Pain



Annex III-questionnaire

Part 1: socio-demographics related factors

1, Age in years-----?

2, Marital status-----?

1, Married 2, Unmarried

3, Widowed 4, Divorced

3, Residency -----?

1, Urban 2, Rural

Part 2: menstrual related factors

1, what is the period of gap between your menstruations-----?

1, < 21 day 2, 21_35 days 3, > 35 days

2, How many days do you usually spot during menstruation (in spotting days per cycle) -----?

1, < 3 day 2, 3-7 days 3, > 7 days

3, how much is your menstrual flow -----?

1, Normal 2, Scanty 3, plenty

4, How many menstrual pads do you usually use per day -----?

1, 2 Pads 2,3 Pads 3, 4 pads

Part 3: Gynecologic related factors

1, At what age did you saw your first menstruation-----?

1, <14 years 2,14-17years 3,> 17 years

2, in how many parts of your body usually feel the pain during menstruation?

1, no part of body 2, 1 part 3, 2-3 part 4, \geq 4 part

3, in what part of your body usually feel pain during menstruation for the last 12 months-----?

1, Lower abdomen 2, lumbar region 3, lower limbs

4, inguinal region 5 others, specify-----

4, Which associated symptoms you felt usually related to the pain -----?

1, Nausea 2, Vomiting

3, Diarrhea 4, Other, specify_____

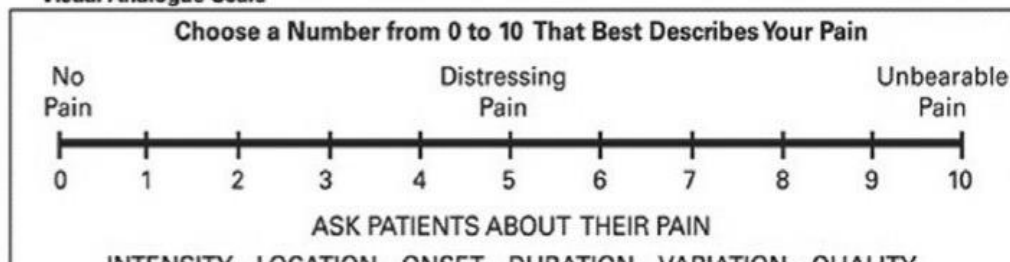
5, how many days your menstrual pain lasts -----?

1, 1-2 Days 2, 3-4 Days 3, \geq 5 Days

6, How severe (intense) is your pain-----?

Figures: Tools Commonly Used to Rate Pain

Visual Analogue Scale



7, what is the frequency of disabling pain to perform your daily activities?

1, never 2, almost never 3, almost always 4, always

8, Do you have Family history of menstrual pain (sister or mother) -----?

1, Yes 2, No

9, Have you been pregnant before-----?

1, Yes 2, No

10, if yes what was the outcome of your pregnancy-----?

1, Delivered 2, Aborted before 3 months

3, Aborted after 3 months

Part4: Behavioral related factors

1, Which psychological disturbances do you encountered during menstruation ____ --
-----?

1, Anger 2, irritation,
3, Insomnia
4, depression 5, other, specify-----

2, How much do you suffer those problems -----?

1, Always (if you suffer in 100% of the time)
2, usually (if you suffer in 90% of the time)
3, Frequently (if you suffer in 70% of the time)
4, Occasionally (if you suffer in 30% of the time)

5, seldom Frequently (if you suffer in 10% of the time

3. Do you take coffee-----?

1. Yes 2. no

4. If yes how many cups of coffee per day do you take -----?

1, 1 Cup 2. 2cups 3,> 2cups

5 Do you take tea-----?

1. Yes 2. No

6.If yes how many cups of tea per day do you take -----

1, 1 Cup 2. 2cups 3,> 2cups

7. Do you take chocolate-----?

1. yes 2.no

8. If yes how many bars of chocolate you take per week-----?

1, 1 bar 2. 2bars 3,> 2bars 4, None

9. Do you do physical exercises-----?

1, yes 2 no

10, How many Days per week do you do physical exercises -----?

1, 2Days per week 2, 3 Days per week

3, More than 3 Days 4, None

11, Do you smoke-----

1, Yes 2 No

12. If yes how many per day you smoke -----?

13. Do you drink alcohol_-----?

1, Yes 2, No

14, If yes, how much you drink alcohol -----?

