ADDIS ABABA UNIVERSITY, COLLEGE OF HEALTH SCIENCES

SCHOOL OF MEDICINE

DEPARTMENT OF ANATOMY

Assessment of age at menarche and menstrual cycle pattern among adolescent school girls in GamoGofa Zone, Southwest Ethiopia

By: Mengistu Boshe

A thesis submitted to the school of graduate studies of Addis Ababa University in partial fulfillment of the requirements for the degree of Master of Science in human anatomy

November,2018

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November, 2018

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Declaration

This is to certify that the thesis prepared by Mengistu Boshe, entitled: Age at menarche and menstrual pattern among adolescent school girls in GamoGofa Zone, Southern Ethiopia.It is submitted to Addis Ababa University on the year 2018 in partial fulfilment of the requirements for the Degree of Masters of Science in Human Anatomy complies with the regulations of the university and meets the accepted standards with respect to originality and quality. This thesis has not been presented for a degree in any other university, and that all sources of materials used for the thesis have been duly acknowledged.

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ACKNOWLEDGMENT

I am very appreciative to Almighty God for His protection, strength and abundant provision.My special appreciation goes to my advisor; Abay Mulu (Assistant Professor of Anatomy) for his kind support and assistance; unreserved advice and continuous follow up he provided from the very beginning of the title selection and proposal development. I also extend my deepest gratitude for my co-advisor; Dr. Desalegn

Tigabufor his inspiration and valuable advice in the title selection and proposal development and his willingness to support me in the thesis work.

I would also like to acknowledge Chencha high school staffs and Arbaminch Chamo high school staffs fortheir unreserved effort during data collection. I am indebted to all study participants for their willingnessto participate in the study.

I extend my deepest gratitude to all staff members in the department of Anatomy for their support throughout my study.

Also, I would like to acknowledge AMU for sponsoring my study and AAU for funding the thesis work.

Finally, I would like to acknowledge my wife and three children of me for their support by everything.

LIST OF ABBREVIATIONS

AAM – Age at menarche

AAU – Addis Ababa University

AMU– ArbaMinch University

AOR – Adjusted odds ratio

BMI – Body mass index

FDRCSA –Federal Democratic Republic of Ethiopia Central Statistical Agency
HPO – Hypothalamus Pituitary Ovarian Axis

NGOs – Non Governmental Organizations

PMS – Premenstrual Symptom

SES – Socioeconomic Status

SPSS –Statistical Package for the Social Sciences

SNNPR –Southern Nations Nationalities and Peoples Region

UNICEF–United Nations International Children's Emergency Fund

WHO – World health organization

Summary

Background: The onset of menstruation is part of the maturation process. However, variability in age at menarche, menstrual cycle characteristics, factors that affect onset of menstruation and related disorders are common.Knowledge on this variability is necessary for patient education and to guide clinical evaluation.

Objective: To assess the age at menarche and menstrual cycle patterns among adolescent school girls in GamoGofa zone, Southwest Ethiopia.

Methodology: Across-sectional study design was conducted in two towns called Chencha and A/Minch between May–June 2017 in Southwest Ethiopia.Systematic samplingtechnique was used to select 613 school girls from two secondary schools. Data were collected using a self-administered structured questionnaire.Data was entered and cleaned to Epi-data software version 3.1 and exported to SPSS version 22 for analysis. Descriptive data analysis was done first using frequency, percentage, cross tabulation, median and mean. Table and graphs were used for data presentation.

Result

The ages of the study subjects range between 13 and 19 years with a mean of 16.02 ± 1 year and median of 16.00. The average age at menarche by recall method was 14.17±1 years. The mean age at menarche was 0.5 years younger for urban (13.98 ± 0.9) females compared with rural(14.48 ± 1.2) ones. The mean menarcheal age difference between A/Minch town (13.97 ±1) and Chencha town (14.36 ± 1) school student girls was 0.39 with p-value < 0.001.The menstrual cycles were irregular in 112 (18.3 %) of the subjects. A cycle length between 21 and 35 days was observed in 52.1% of the girls. The mean duration of flow was 3.74 ± 1.2 days with a range of 1-9 days. The overall prevalence of dysmenorrhoea was 75.5% among the participants. Premenstrual symptoms were present in 428 of the females (69.8%). In the adjusted odds ratio, adolescents who were living in urban areas were 2.42 times earlier probability to see menarche as compare to adolescent school girls who living in rural areas(AOR= 2.42, 95% CI: 1.59, 3.69). In the adjusted odds ratio, adolescents who were living in ArbaMinch town were 2.08 times earlier probability to see menarche as compare to adolescent school girls who living in Chencha town (AOR= 2.08, 95% CI: 1.36, 3.18).

Conclusion: In this study age of menarche was found to be earlier than the study conducted in the same country with the different region, but higher than in the same region in different population and time in Ethiopia. A significant number of students complain of the abnormal menstrual cycle, dysmenorrhoea and premenstrual symptoms which call for appropriate counseling and management.

Keywords: Age at menarche, menstrualcycle pattern, altitude, Ethiopia.

1. Introduction

1.1. Back ground

Adolescence is a transition period between childhood and adulthood marked by development in secondary sexual characteristics and sexual maturation (Sharma *et al*., 2016). According to the World Health Organization (WHO) 'adolescence' is a period between 10 and 19 years (Adams *et al*., 2008). During this period, maturation of the endocrinological system involved in hypothalamus, pituitary and ovary axis occurs in female adolescence. Normal reproductive function indicates the health of components of the axis(Jahromi, 2016).One of normal reproduction function indication is menstruation.Menstruation is a cyclical bleeding occurring in women during the reproductive stage of the female adolescent; caused by endometrial shedding at regular intervals and it is present when ovum fertilization does not take place in the uterine tube(Gomez, 2007). Menarche is the first menstrual period or first menstrual bleeding and it is one of the most significant milestones in a woman's life and the transition periodat which a female exits childhood and enters into adulthood (Zegeye *et al*.,2009; Walvoord, 2010). It is indicated that the body has developed to a point at which it is becoming sexually mature (Sterling &Samara R, 2013). Many studies showed that the mean age at menarche varies from population to population, from year to year and from place to place (Chumlea *et al., 2003*; Zegeye*et al*., 2009; Al-Agha *et al., 2015*). This variation of AAM asseveral studies from various countries worldwide showed that influenced by various factors, including genetics, ethnicity, nutrition, socioeconomic status, urbanization, physical activity andbody mass index (BMI) (Samira et al., 2016). The normal range of menstrual cycle is between 21 and 35 days, the duration of menstrual flow normally ranges from 2 to 7 days while most periods last from 3 to 5 days. For the first few years after menarche, irregular and longer cycles are common. Knowledge of variation of the menstrual cycle is necessary for patient education and for identifying deviations from normal to guide clinical evaluation (Zegeye*et al*., 2009).

In Ethiopia, very few researchers have tried to look at adolescent's health in relation to their menstruation and AAM. Studies in different areas and different period showed that the mean age of menarche varies from 15.8 years by recall analysis in Northern Ethiopia and 13.9 years in Southern Ethiopia from 2009 to 2013 respectively(Zegeye *et al*., 2009; Israel*et al*., 2013). Because age at menarchedepending on the different factors. The menstrual pattern or characteristics in terms of menstrual cycle length, duration, regularity and the amount of blood flow per each bleeding were studied in few areas of Ethiopia (Zegeye*et al*, 2009; Getachew*et al*., 2013).

1.2. Statement of the problem

In the adolescent periodchallenges ofthe menarche and menstrual cycle in girls are inevitable (Koo *et al*., 2002; Smith *et al*., 1983). Studies showed thatthe effects of early menarche (before age 12) include short stature, obesity, breast cancer, endometrial and ovarian cancers and increase mental and behavioral disorders (such as depression, eating disorders, alcohol use, smoking, unsafe sex, and early pregnancy in adolescence) (Berkey *et al*., 2000; Onland *et al*., 2004; Golub *et al*.,2008;Karapanou, 2010) and compared with other women, those who had early menarche (8–11 yr) had a higher risk of hypertension, diabetes, cardiovascular diseases, and all-cause mortality (Rajalakshmi *et al*., 2009). Also, late menarche (after 16 years) may lead to osteoporosis, depression, and social anxiety disorder in the coming years of life (Karapanou *et al*., 2010). A number of taboos and social and cultural restrictions still exists concerning menstruation (Therese & Maria 2010),which intimidate the girls and make their life difficult (Anant&Kamiya, 2011). In most African communities limited information is provided regarding physiologic issues at the expense of social and cultural factors (Ramathuba, 2015).During menstruation, adolescent girls are faced with challenges related to the management of menstrual hygiene in public places and students absent from their class. The most frequent menstrual disorders in female adolescents are dysmenorrheal (painful cramps), heavy bleeding (menorrhagia), oligomenorrhea (Light or infrequent menstruation) in addition to premenstrual syndrome and menstrual symptoms (Adams, 2002; Diaz*et al*., 2006). The medical and social consequences of premenstrual and disorders of menstruation influence not only the individual but also her family and society(Deo *et al*., 2007).

In Africa, many girls have little or no information about normal and abnormal menstruation (Sharma *et al*., 2003). Study in Vhembe district, South Africa showed that adolescent girls tend to receive information about menstruation from a variety of sources, but they complain that education about it was less (Ramathuba, 2015).The prevalence of dysmenorrhea varies widely between different populations and among different age groups within the same population. Such variation may be due to different etiologies, cultural differences in pain perception and variability in pain threshold (Karout *et al*., 2012).

In Ethiopia, some studies showed that due to the levels of exercise/physical activity, use of vegetables, the amount of calorie and protein content, eating habits, BMI, sleep habits of the adolescents and people living in different residency have significant association with AAM(Israel*et al*., 2013;Zegeye *et al*., 2009).Studies have shown that adolescence schoolgirls suffer fromthe menstrual disorder in Ethiopia, among those disorder dysmenorrhea was highest prevalence and reason for school absenteeism(Muluken *et al*., 2014; Zegeye *et al*., 2009).In addition to dysmenorrheal, the premenstrual symptoms are also reason for school

absenteeism (Zegeye et al., 2009; Muluken *et al.,* 2014). Even though numerous health problems related to early and late age at menarche and menstruation, the study of age at menarche and menstruation in Ethiopia is limited, mainly in Southern Ethiopia. Only a few published studies show age at menarcheand problems related to menstrual cycle pattern in the Northern part of a country (Zegeye *et al*., 2009; Ayele et al., 2013). As a result age at menarche,some factors contributing for age at menarche and associated with the menstrual pattern and the magnitude of menstrual disorders remain unknown in my study areas. Therefore, to fulfill these gaps present study aims to assess the age at menarche and menstrual cycle pattern among adolescent school girls and search its variation across altitude difference, socioeconomic, BMI and demographic factors in the GamoGofa zone.

1.3. Significance of study

The finding of this study will be helpful in the different setting. It may serve as a reference for the policymakers to develop evidence-based interventions in order to overwhelm the impact of the menstrualrelated problem to an adolescent girl in the country. In addition, it can be used not only to prevent school absenteeism but also to mitigate the physical, social and psychological impact of menstruation on adolescent school girls. Thus, it will benefit the public at large by identifying the most important factors that contribute to the difference in age at menarche, which will help the family and health care professionals to provide reproductive health counseling timely. Moreover, it will be used as a baseline data for researchers who are interested to conduct further studies on the same or related title, especially for those in the area of reproductive health, obstetrics, physiology, anatomy, public health, and other related disciplines.

2. Literature review

2.1. Menarche

Menarche is the first menstrual period and it is one of the most significant milestones in a woman's life. The age of onset of menstruation varies from 9 to 18 years in the world(Chumlea *et al., 2003)*. Several studies showed that the mean AAM varies with time, place and population. The average age of menarche dropped from 12.75 to 12.54 years in the United States, a difference of 2½ months (Anderson *et al., 2003*). Other developed countries, such as those in Northern Europe, have also documented this trend. It is estimated that the average age of menarche in Northern Europe has declined up to 3 years over the last century (Bellis *et al., 2006*). Also, the average age of menarche in the UK fell from 16.5 years in 1840 to 12.8 years in 2008 (Garden *et al., 2008*). In India, the average age at menarche was reported as 15.4 years in 1998 and 13.76 years in 2014(Pathak *et al.,2014).* In Africa, the studies showed that the mean menarcheal age for Blacks 14.9 years in 1956, 12.4 years in 2009, but for Whites 13.1 years in 1977,and 12.5 years in 2009 in South Africa study(Jones LL *et al., 2009*).In another study in Egypt Mean age at menarche was 12.49 years (Abdelmoty *et al., 2015*), in South-Western Nigeria the AAM was 13.6 years(Adebimpe*, et al.,* 2016),and the mean recall age at menarche was 13.66 years in Northern Ghana(Ameade E *et al.,* 2016).In Ethiopia study carried among nursing students in 1967 showed that the mean age of menarche was 15 years (Teclewold *et al*., 1972). Arecent study also showed that the median age at menarche was found to 14.8 years by using probit analysis and 15.8 ± 1.0 years by recall analysis in Gonder, Northwest Ethiopia, (Zegeye*et al*., 2009). In another school-based cross-sectional study in Mehal Meda secondary school, Mehal Meda town, Amhara region the mean age at menarche was a 14.1±1.4 year(Gultie *et al*, 2014).The study on Government and Private High-School Students in Mekelle City, Northern Ethiopia showed that the mean age of menarche was 14.24 year (Gebremariam *et al*., 2015). In southern Ethiopia in sawla town also the study showed that the mean age of menarche was 13.9 ± 1.2 years (Esrael*et al*., 2013).Several studies from various countries worldwide have shown that menarcheal age is influenced by various factors including genetics, ethnicity, nutrition, socioeconomic status, physical activity, body mass index (BMI), and demographics (Samira *et al.,* 2016).The effect of urbanization on menarcheal age has also been widely reported that urban girls mature earlier, on average than rural girls (Samira *et al.,* 2016).The effects of environmental influences on the timing of menarche can be explained, from an evolutionary-development perspective,in terms of life history theories.Among the life history theories the energetic theories suggest that energy availability during childhood influences the timing of menarche. It hypothesizes that girls who were

exposed to a chronically poor nutritional environment will grow more slowly, experience later pubertal development (relative to their genetic potential), and reach relatively small adult size compared with those children who were exposed to greater food availability (Frisch, 1990).The psychosocial acceleration theory hypothesizes that the experience of high levels of emotional stress in and around a girl's family leads to earlier menarche (Belsky, 1991).Based on the same logic, the parental investment theory hypothesizes a special role for the father and other men in influencing the timing of menarche. The stress-suppression theory proposes that early adversity, whether it is by adverse physical or social conditions or psychosocial stress, causes a delay in pubertal development until better times (MacDonald, 1999). Ellis describes the child-development theory as reconceptualizing 'the age at menarche as the end point of a developmental strategy that conditionally alters the length of childhood in response to the composition and quality of family environments(Samira *et al.,* 2016).Studies performed, especially in the USA, have shown ethnic-racial differences in pubertal maturation and menarche. Black girls were younger than white girls at the same stage of breast development, pubic hair development and menarche. According to the Bogalusa Heart Study, black girls experienced menarche, on average, 3 months earlier than white girls (12.3 vs 12.6 years) (Freedman*et al.,* 2002).Socioeconomic status, often measured by parental educational attainment or occupation, has also been hypothesized to influence menarcheal age. Girls from families with higher socioeconomic class tend to reach menarche earlier than those from families with lower socioeconomic status(Bielicki*et al.,*2009;Goon *et al.,* 2010). Altitude variation also affects the age at menarche according to the study conducted in Peru and India, but this was not similar finding with a study conducted in North Ethiopia (Kapoor *et al.,* 1986;Gustavo *et al.,* 1994; Zegeye*et al.,* 2009).Research Hypothesis that there is a negative correlation between BMI percentile and the age of menarche; adolescent girls who have higher BMI values will experience menarche earlier ages than girls with lower BMI values(Oh *et al.,* 2012).Early menarche is commonly accepted to be before 12 years of age (Mumby*et al*., 2011). The Third National Health Examination Survey of 2002 found that only 10% of U.S. girls begin menstruating before age 11, and 90% of all U.S. girls are menstruating by 13.75 years of age (Chumlea*et al*., 2003). It has been determined that this wide range concerning AAM can be explained by a variety of factors, including altitude, BMI, Ethnicity, physical activity/exercise, and socioeconomic factors.

2.1.1. Menarche and altitude difference

Median age at menarche differs among populations due to genetic, nutritional, ethnic, socioeconomic and environmental factors. Among environmental factors, it has been suggested that life at high altitude may delay menarche.This phenomenon may be related to the stress of high altitude hypoxia (Gonzales *et al.,* 1993). Otherprevious studies showed that all females from high altitude had late menarche as compared to healthy females living at sea level (Kapoor*et al*., 1986). Also other cross-sectional study conducted in Peru showed that the median AAM was earlier (13.08years) in girls living at sea level (150 meter above sea level) than the girls living at high altitude(4340 meter above sea level) when the BMI was kept constant and the study showed that the median AAM significantly higher (14.33 years) at high altitude than at sea level (Gonzales *et al*., 1996). However, study conducted recently in Northwest Ethiopia said that there was no significant difference in the mean age at menarche of the two areas of different altitudes of Dabat (2754 metersabove sea level) (15.9 ± 1) versus Koladiba (2000 meters below sea level) (15.7 ± 1)(Zegeye*et al*., 2009).

2.1.2. Menarche andBody mass index

Body Mass Index is a measurement of a person's body mass relative to their weight and is calculated by dividing weight in kilograms by the square of the height(kg/m^2). It has always been considered that weight & height arethe major influencing factor in the pubertal growth period. Generally, height is considered to primarily reflect skeletal growth, weight is considered to primarily reflect tissue growth (Frisch and R. Revelle, 1991).The Frisch-Revelle hypothesis essentially states that an increase of BMI in childhood and adolescence is the most reasonable explanation of early AAM(Epplein *et al., 2010*; Frisch and R. Revelle, 1991).The study in Southern Ethiopia found that age at menarche was inversely associated with BMI as other similar studies. The underlying mechanism for such an association was stated as unclear. Some authors speculated that high BMI during childhood (especially 9-11 years) is directly associated with high BMI later in their lives, and can reflect the changes in growth and body composition in the prepubertal period. As a result, it has been suggested that childhood high BMI drives the age at onset of sexual maturation and hence the age at menarche (Ayele *et al*., 2010; Power *et al*., 1997; Esrael*et al.,* 2013).

2.1.3. Menarche andEthnicity

In 2002, the Bogalusa Heart Study conducted in Louisiana using cross-sectional and longitudinal analyses to compare the average age at menarche in between black and white girls. According to the study the black girl's age at menarche was 3 months earlier than the white girls did (12.3 years vs. 12.6 years) (Clayton *et*

al., 2005). During a 20 year study period, the median menarcheal age decreased by approximately 9.5 months among black girls. The secular trend among white girls was smaller and less consistent since a 2-month decrease was recorded(Karapanou and Papadimitriou, 2010). Females from the Southern European populations attain menarche slightly earlier than those from the northern part of the continent (Rigon, 2010). According to the US Census Bureau, Hispanics are considered as Caucasians (U.S.Census Bureau, 1999). Several studies reported that females of Hispanics ethnicity have lower AAM than whites and blacks (Dowell *et al*., 2007).In Africa, the studies showed that the mean menarcheal age for Blacks decreased from 14.9 years in 1956 to 12.4 years in 2009 and for Whites from 13.1 years in 1977 to 12.5 years in 2009 in South Africa study(Jones *et al.,* 2009).

2.1.4. Menarche andPhysical Activity/Exercise

AAM delay is well documented for females exposed to regular high-intensity physical exercises in childhood and adolescence (Warren *et al.,* 2001). A cross-sectional study performed in a group of Colombian university women demonstrated that age at menarche was positively associated with the practice of at least two hours daily of physical activity (Chavarro*et al*., 2004).Menarche, on average, occurs later in athletes, including ballet dancers, then in the general population, with the exception of swimmers, suggesting that intense exercise delays puberty (Malina*et al*., 1983).

2.1.5. Menarche andSocioeconomic status

Socioeconomic factors have a significant impact on nutritional and psychosocial status during childhood and adolescence and may influence AAM (Yermachenko*et al.,* 2014). These factors include the type of residency, parental educational and occupational level, family size, household income, and maternal marital status. The majority of studies reporting the association between AAM and socioeconomic status (SES) were conducted in developing countries (Kapoor *et al*., 1986; Gonzales *et al*., 1996). Another cross-sectional study carried out on female students in different schools of Karachi showed that the lower class had the highest mean age of menarche while the upper class had the lower age at menarche *(*Ahmad *et al*., 2016). These findings were inconsistent with those in a study conducted in Turkey, which found the menarcheal age to be lowest in the low socioeconomic group and highest in the middle socioeconomic group (Yermachenko*et al*., 2014). A similar study done in Contemporary British teenagers said that no difference on median age at menarche by social class. Also, the study on Iranian School girls showed that nearly one-fourth of girls who were from poor families had the higher age at menarche than girls of the

middle and higher classes(Whincup*et al*., 2001;Bagga*et al*., 2000).It has been suggested that diet can affect the onset of menarche through the alteration of hormone levels(Sterling *et al*., 2013).

Several studies explain that nutritional status and dietary habits are affecting age at menarche.Food containing high calories and proteins are associated with early onset of menstruation (Bagga*et al*., 2000; Khan *et al*., 1996). Astudy conducted on Maharashtrian girls found that non-vegetarian girls would menstruate about 6 months earlier than a vegetarian(Shastree *et al*., 1974). This was seen again in recent study Sawla, Southern Ethiopia, that maximum numbers of girls experiencing early menarche were reported in the non-vegetarian group (Ayele*et al*., 2013; Bagga*et al*., 2000). The studies in Northwest Ethiopia, Nigeria and Morocco showed the mean age at menarche for rural female adolescents was significantly higher than for urban ones (Zegeye*et al*., 2009; Montero *et al.,* 1999; Ikaraoha*et al*., 2005).This can be explained by the better socioeconomic status for urban girls than rural ones. However, the study conducted in Nigeria did not show significant differences between AAM in rural and urban areas probably due to similar living conditions in the rural areas and the cities(Tunau*et al*., 2012).

Maternal contributions can affect a girl's physical development. A mother's age at menarche influences the age at which her daughter attains menarche and maternal (and subsequently fetal) exposure to tobacco or other toxins can also determine the age at which her daughter will attain menarche (Sterling *et al*., 2013;Ersoy *et al*., 2005).

The presence or absence of the father, either physically or emotionally, has also been shown to affect a girl's age at menarche. The physical development of young girl's ages 11-14, as observed by the onset of menarche was assessed inrelation to whether or not their biological fathers were present in their lives. Girls of fathers who were absent were morelikely to attain menarche at earlier ages than girls who had fathers who were present (Maestripieri *et al*., 2004). However, a longitudinal study done on twin mothers and their female offspring indicated that a more accurate predictor of early menarche was the presence of a stepfather, even more than the absence of the child's biological father (Mendle*et al*., 2006).

2.2. Menstruation Related health problems

Menstrual problems can be symptoms of certain conditions like polycystic ovarian syndrome and endometriosis, which if undiagnosed and untreated may have a profound long-term sequel in adult life(Emans*et al*., 1998). Common menstrual disorders reported among young women include irregular frequency of menstruation, abnormal duration of flow, dysmenorrhea, premenstrual syndrome, polymenorrhea, and oligomenorrhea. Globally, little attention has been paid to menstrual disorders and many of such presentations go unnoticed (Harlow *et al*., 2000; Walraven *et al*., 2002; Karout *et al*.,

2012).The problems are the major cause of school absenteeism and business establishment (Pandit *et al*., 2014). Menstrual cycle irregularity is common in several studies (34% in Maharashtra India, (24%) in Hyderabad, Pakistan and 30% in North Ethiopia). The minor difference among the various studies was mainly due to environmental, racial, nutritional and lifestyle factors (Zegeye*et al*., 2009; Pandit *et al*., 2014;*Dars et al*., 2014). Dysmenorrhoea and premenstrual symptoms are the common disorder that affects more than 50% of the menstruating women (ACOG, 1983; Dangal, 2004). The proposed cause of pain is an excess production of prostaglandins (PG) in the endometrium during the ovulatory cycle. It was shown that women with dysmenorrhea have higher levels of PG in their plasma and menstrual discharge than women without dysmenorrhea (Sun *et al*., 2005).The Iranian Study on adolescent school girls showed that the prevalence of dysmenorrhoea was 71%, of this 15% had interfered with their daily life activities and caused them to be absent from school for 1 to 7 days a month. Over 67% of the girls reported taking palliative medicine without consulting a doctor (Poureslami*et al*., 2003).Study in India showed that the prevalence of dysmenorrhea was 76%, ranged from mild to moderate degree in 46% and of the severe degree in 30% of the participants. Out of 76% students, who experienced dysmenorrhoea, 24% revealed the occasional use of analgesics and antispasmodic drugs and 40% had to depend on these drugs to alleviate pain (Nirmala *et al*., 2014). A similar study in North Ethiopia showed that dysmenorrhoea was reported by 72% of study subjects of which about 28.5% were having moderate to severe dysmenorrhea. In North Ethiopia study dysmenorrhea was more common among those who had irregular cycles, longer duration of flow, rural residents, from Koladiba district and about 48.8% of those suffering from dysmenorrhea had reported being absent from school merely due to the pain (Zegeye*et al*; 2009).

Premenstrual syndrome (PMS) is the name given to a collection of physical and psychological symptoms that some women experience during the late luteal phase of each menstrual cycle (7 to 10 days prior to menstruation) due to changes in blood levels of estrogen as well as progesterone (Dangal, 2004; Henderson, 2000). A cross-sectional survey was conducted in Eastern province in Saudi Arabia showed that 95.6% of the participants had at least 3 symptoms among common PMS (Headache, fatigue, feeling of gaining weight, abdominal bloating, backache, breast heaviness and joint pain), in which 46.2% of the participants the symptoms do not disappear by the onset of menstruation and 52.7% disappear by the onset of menstruation. Also, PMS interfere with hobbies or social activities among 51.2% of the participants. A study conducted in Bahir Dar University, Ethiopia showed that the prevalence of PMS (at least one symptom 1-7 days prior to menstruation in the last 12 months) was 72.80%.The most common five psycho-behavioral premenstrual symptoms reported by the respondents were irritability, fatigue, depression,

anxiety/tension, and social isolation/withdrawal. The five most common physical premenstrual symptoms reported by the respondents were breast tenderness, bloating, acne, headache, and joint or muscle pain. The most common PMS reported from psycho-behavioral and physical are irritability and breast tenderness respectively (Shiferaw *et al*., 2014).Another study in Gonder, Northwest Ethiopia showed that about 75.4% percent of adolescent female students suffered from PMS. In addition to dysmenorrhea also PMS is the cause of school absenteeism (Zegeye *et al*; 2009).

3. OBJECTIVES

3.1. General Objective

- To assess the age at menarche and menstrual cycle pattern among adolescence school girls in selected towns of GamoGofa Zone, Southwest Ethiopia.

3.2. Specific Objectives

- To assess age at menarche of adolescent school girls in selected towns of GamoGofa Zone, Southwest Ethiopia.
- To describe the menstrual cycle pattern of adolescence school girls in selected towns of GamoGofa Zone, Southwest Ethiopia.
- To assess the prevalence of menstrual problems among adolescents in selected towns of GamoGofa zone, SouthwestEthiopia.
- To determinefactors associated with age at menarcheamong adolescents in GamoGofa zone, Southwest Ethiopia.

4. Materials and Methodology

4.1. Study areasand study period

GamoGofa zone is found in Southern Nation's Nationalities and Peoples Regional State (SNNPR) of Ethiopia.It has the total of fifteen woredas and two administrative towns with anestimated total population of 2,043,668 (male – 1,013,531 and female – 1,030,137) according to FDRCSA;2013 with grade 9 and 10female student's number of 22,382.Gamogofa zone was classified based on altitude difference, namely kola, and Dega. From kola woreda towns; ArbaMinch town was randomly selected whereas from Dega towns Chencha town was randomly selected. So, the study was conducted in ArbaMinch and Chencha towns. The study sites had been also presented another comparative advantage, each representing a highland and a lowland area.ArbaMinch town is the capital city of GamoGofa zone of the Southern Nation's Nationalities and Peoples Regional State (SNNPR). It has an estimated total populationof 113,297.The town is located at a distance of 275 Km and 505 km from the regional city, Hawassa and the country capital city, Addis Ababa respectively. The towndivided into four sub-city (kifle ketema) and 11 kebeles (the lowest administrative level in Ethiopia). There are three private and three public high schoolsfound in the town.The average altitude of the ArbaMinch town is 1285 meters above sea level with an annual temperature ranging from 28 to 43 °C and annual rainfall of 818mm. On the other hand, Chencha town found in the Gamo Gofa zone located at a distance of 37 km capital city of Gamo Gofa zone (ArbmaMinch). It has an estimated population of 146,976.The town divided into 5 kebeles andone Government secondary and preparatory school and 4 Governmentelementary schools are found in the town. The average altitude of Chencha town is 2732 meters above sea level and the minimum air temperature ranges from 11 to 13 °C, whereas the maximum ranges from 18 to 24 °C and the average annual rainfall are 1172 mm with a peak in April followed by a second peak in September. The study period was from May – June 2017.

4.2. Study design

The institutional based descriptive cross-sectional study design was applied to assess age at menarche and menstrual cycle pattern among adolescents in selected towns of GamoGofa Zone, Southwest Ethiopia**.**

4.3. Source Population

All adolescent female studentsregistered during the academic year of 2016/2017 and following their secondary school education in grade 9 and 10 during the study period and found in Gamogofa zone, Southwest Ethiopiawasconsidered as the source population.

4.4. Study Population

All adolescent female students registered during the academic year of 2016/2017 and attending their secondary school education during the study period and found in selected towns of Gamogofa zone, Southwest Ethiopia was considered as the study population.

4.5. Sample Size determination and sampling procedure

4.5.1. Sample Size determination

The sample size was determined a using single population proportion formula. According to the study conducted at Northwest Ethiopia by Zegeye et al., the proportion of girls who had dysmenorrhea was 72%. The level of confidence (α) is taken to be 0.05 (Z (1-α/2) = 1.96); the margin of error is taken to be 0.05. Accordingly; the calculated sample size using the following formula:

$$n=\frac{[Z\left(\frac{\alpha}{2}\right)]^2 xP(1-P)}{d^2}$$

Where; n = Minimum sample size for a statistically significant survey

Z = Normal deviant at the portion of 95% confidence interval two tailed test is; = 1.96

P = the proportion of girls who had dysmenorrhea in Northwest Ethiopia=72%

q= 1-p

d = margin of error taken as 5%= 0.05

Accordingly, n= 310

Sincethe later sample size was relatively large; it was taken as sufficient sample size for the study. In addition, since the multistage sampling procedure is going to be implemented, design effect was considered and the final sample size was; 310(2) = 620.

4.5.2. Sampling procedure and selection of study subjects

Multistage sampling technique was used to identify the study participants. Accordingly, the sampling procedure was started by stratifying the towns into two categories, high altitude, and low altitude.One town from each stratum was selected using a lottery method. Arbaminch town from the low altitude and Chencha from the high altitude were selected. Then, Chamo secondary and preparatory school was randomly selected using a lottery method from public schools found in the Arbaminch town, and the only public secondary and preparatory schoolfrom Chencha town was included. Then,to select the study subject from list of students name was accessed from the school's registrar, and separate male students name and using the female student name list, which was used as the sampling frame and selecting each section randomly by lottery method. Then, study subjects were selected by using systematic sampling technique every K^{th} interval, which means that the total number of adolescent female students fromselected sections of grade 9 and 10 of each school divided intocalculated sample size of their school.Then, the first student was randomly selected using a random number table from each section and the next student and the subsequent one were obtained based on the calculated sampling interval until the selected sectionsanddetermined sample size was attained.

4.6. Inclusion and Exclusion criteria

4.6.1. Inclusion criteria

Regular (daytime) adolescent female students who were present in the school on the day of the administration of the questionnaire were included.

4.6.2. Exclusion criteria

- Three students excluded from Chencha secondary and preparatory school due to higher age than the adolescents.
- One student was excluded from Chamo secondary and preparatory school because of serious illness.

4.7. Variables

4.7.1. Dependent variable

- Age at menarche
- Menstrual pattern
- Menstrual disorder

4.7.2. Independent Variables

- Socioeconomic status- Body mass index

- Type of residency - Altitude difference
- Parental educational level - Ethnicity
- Parental occupationalstatus- Physical Activity

- Religion
- Age

4.8. Data collection techniques and instrument

To collect data from an adolescent girl; the self-administered structured questionnaire was used.TheEnglish version structured questionnaire is adapted from the previous study with some modification. Then, English version questionnaire was translated into Amharic version in order to collect the data from the study participant.The questionnaire has both open and close-ended questions.The questionnaire included variables on socio-demographic characteristics, age at menarche, menstrual cycle patterns and menstrual disorders. First permission was taken from each school.Then the list of the student's name wastaken from the registrar and used as sampling frame after separating male student's name. Finally, degree holderdata collectors were informed study participants about the purpose of the study and written informed consent orassent was secured from each study participant.

4.9. Anthropometric measurement

Anthropometric measurement on participants was carried out by a well-trained female research assistant according to the following protocols. Height was measured to the nearest centimeter using a portable stadiometer. BMI was calculated with height and weight [weight (kg)/height (m^2)].

4.10. Data quality assurance

The adapted standard questionnaire was used for data collection to ensure maximum data quality. Data werecollected with well-trained data collectors and they were degree holders. Data collectors and supervisors were trained for two days by the principal investigator. Before the actual data

collection,thequestionnaire was pretested on the school in MirabAbaya town in the GamoGofa zone. After the pretest, some questions were eliminated,and then the questionnaire was amended before duplication as needed. The collected data was double entered into Epi data software version 3.1.with two data clerks independently and consistency between the two data sets was checked. Then mismatched data was cross-checked with the hard copy and corrected accordingly.

4.11. Data Processing and Analysis

Data were entered and cleaned in Epi-data software version 3.1 and exported to SPSS version 22 for analysis. Descriptive data analysis was done first using frequency, percentage, cross tabulation and mean media and Table and graphs were used for data presentation.To see the presence of association between the explanatory variable and outcome variable data were analyzed using $\chi 2$ test. Also multinomial logistic regression was used to determine the association between age at menarche and all independent variables, and binarylogistic regression was used to explore the relationship betweenmenstrual disorder and all independent variables.

4.12. Ethical Consideration

To adhere to ethical issues formal ethical approval letter was taken to the educational bureau of respective towns from Addis Ababa University, college of health sciences Institutional Health Research Ethics Review Committee (IHRERC). Schools were asked for a written permission to conduct the study in their respective compound. Before obtaining informed consent or assentfor participants, they were given a clear description of the study title, procedure, and duration of the study, possible risks and benefits of the study by their language. Their right during the data collection for either not to participate or to withdraw at the middle of data collection was guaranteed. Then, written and signed informed consent or assentwas asked from the respondents and taken before starting data collection. Thestudy ensured individual information was notdisclosed and kept confidential. A personal unique identifier such as the name of study participants was not asked. There was no any payment for study participants.

4.13. Dissemination plan

The findings of the study will present during final open thesis defence at Addis Ababa University, health Science College.At the end, the result of the study will be disseminated to the governmental and non-governmental organizations to provide information about age at menarche and pattern of menstrual cycle amongadolescent girls in selected towns of GamoGofa zone, Southwest Ethiopia. In addition, it will be

submitted to Addis Ababa University science library. Further efforts will be made to publish the findings on the national or international journal.

4.14. Operational definitions

- Absenteeism–According to World Bank statistics, it means not to be in class and/or in school for regular attendance (approximately 4 days every 4 weeks) because of menstruation related problems.

- Regular menstrual cycle - is menstruation that occurs uniformly and in orderly intervals throughout a given period of girls'/women's life.(Radivojevic UD et al., 2014)

- Irregular menstrual cycle - a range of varying of bleeding-free intervals>20 days in individual cycle lengthover aperiod of 1 year. (Fraser*et al.,*2011)

- Measurements of amount of menstrual blood flow per a day are: Little (4 pads/day), Moderate (5-7 pads/day), Heavy (8 pads/day) (Shiferaw *et al*., 2014)

5. Results

5.1.Socio-demographic characteristics

From the total 620 study subjects, 613 had completed the questionnaire. This makes the response rate 98.9%. Their current age rangesbetween 13 and 19 years with a mean ageand standard deviation of 16.02± 1 and median of 16.00 years. Half (50.4%) of the respondents were from ArbaMinch. Gamos compose 83.5% (512) of the participants and 47.8 % (293) were Orthodox Christians. About 63.1% (387) were from urban areas. The majority 94.8% (581) of participants were single.The majorities (68.5%) of the respondents BMI were normal range (18.5–24.99 kg/m^2). Most of participant's mothers and fathers achieved their educational status up to primary school and above. The occupational statusesof parents were considered in this study, both parents 235 (38.3%) of participants were employed, and only fathers 190 (31.0%) and only mothers 72(11.7%) employed in the family of participants and 102 (16.6%) parents of participants were not both employed.**(See Table 1 below)**

Table 1: Socio-demographic characteristics of female school adolescent's in southwest Ethiopia, 2017.

Variables		Number	Percent
Current age	13	1	.2
	14	34	5.5
	15	163	26.5
	16	233	37.8
	17	130	21.1
	18	41	6.6
	19	11	1.8
Towns	ArbaMinch	309	50.4
	Chencha	304	49.6
Residence	Urban	387	63.1
	Rural	226	36.9
Grade	9th	348	56.8
	10th	265	43.2
Religion	Protestant	277	45.2
	Orthodox	**293**	**47.8**
	Muslim	14	2.3
	Others	29	4.7
Ethnicity	Gamo	**512**	**83.5**
	Gofa	26	4.2
	Wolayita	10	1.6

	Amhara	41	6.7
	Konso	15	2.4
	Others	9	1.5
Marital status	Single	**581**	**94.8**
	Married	20	3.2
	Divorced	4	.7
	Widowed	8	1.3
BMI	< 18.5 kg/m^2	125	20.4
	18.5–24.99 kg/m^2	**420**	**68.5**
	$\geq$ 25 kg/m^2	68	11.1
The time spent during walking from and toschoolper day	< 30 min	**348**	**56.8**
	30 – 60 min	165	26.9
	> 60 min	79	12.9
	Others	21	3.4
Educational status of father	No education	112	18.3
	Able to read and write	105	17.1
	Primary school	117	19.1
	Secondary school	104	17.0
	Higher education	**175**	**28.5**
Educational status of mother	No education	**199**	**32.5**
	Able to read and write	84	13.7
	Primary school	137	22.3
	Secondary school	105	17.1
	Higher education	88	14.4
Occupational status of parents	Both employed	**235**	**38.3**
	Only father work	190	31.0
	Only mother work	72	11.7
	No work for both	102	16.6
	Others	14	2.3

Ethnicity = Others (Oromo - 2, Tigre – 1, others- 6)

5.2. Menarche

The range of age at menarche was 10 to18 years with mean AAM of 14.17±1 and median of 14.00. From all participants 28(4.6%) school student girls have an early menarche (≤ 12years), 363 (59.2%) girls had a medium menarche (13 and 14 years) and 222(36.2%) experienced a delayed menarche (≥ 15 years).

(See table 2 below)

Table 2: Distribution of AAMand current age ofadolescent school girls in southwest Ethiopia, 2017.

Menarcheal age	Current age							Total
	13	14	15	16	17	18	19	
10	0	0	0	0	1	0	1	2
11	0	1	0	3	1	0	0	5
12	1	3	5	4	7	2	0	21
13	0	10	40	37	24	4	3	118
14	0	19	77	101	37	10	0	245
15	0	0	40	72	49	13	2	177
16	0	0	0	16	6	6	2	31
17	0	0	0	0	5	4	1	10
18	0	0	0	0	0	2	2	4
Total	1	33	162	233	130	41	11	613

There is statistically significant differences (X^2= 8, p-value < 0.001) between mean menarcheal age of A/Minch (13.97 ±1) and Chencha (14.36 ±1) female students who took part in the study. The subjects living in the rural area revealed a mean age at menarche of 14.49 ±1. The mean age at menarche was 0.51 years younger for urban girls compared to rural girls which are statistically significant with p-value < 0.001.**(See table 3 below)0**

Table 3: Mean age at menarche of school adolescent girls in southwest Ethiopia, 2017.

Variables		Number	Mean AAM ± sd	Median	X^2	P - Value
Town	A/Minch	309	13.97 ± 0.9	14.00	8	< o.oo1*
	Chencha	304	14.36 ± 1.1	14.00		
Residence	Urban	387	13.98 ± 0.9	14.00	8	< o.oo1*
	Rural	226	14.49 ± 1.2	15.00		
BMI	Under weight	125	13.9±1	14.00	16	0.155
	Normal weight	419	14.24±1	14.00		
	Over weight	668	14.21±1.2	14.00		
Occupational status of parents	Both employed	235	14.2 ± 1	14.00	32	0.056
	Only father work	190	14.1 ± 1	14.00		
	Only mother work	72	13.9 ± 1	14.00		
	No work for both	102	14.5 ± 1	15.00		
	Others	14	14.1 ± 1	14.50		
Physical activity	Less than 30min	348	14.1 ± 1	14.00	24	0.123
	30 to 60min	165	14.2 ± 1	14.00		
	Greater than 60min	79	14.5 ± 1	15.00		
	Others	21	13.9 ± 1	14.00		

* P-value < 0.05

5.3. Menstrual Cycle Pattern

Out of the total study participants 501 (81.7%) school adolescent girls had regular menstrual cycle and 112(18.3%) of students had irregular menstrual cycle.The duration of menstruation was taken to the nearest whole day, as information about the hour at which menstruation began and ceased could not be obtained. The duration range of menstrual flow was 1-9 days and most (259, 51.7%) of subjects duration of menstruation were 2 - 3 days. The menstrual cycle length from all participants 261 (52.1%) had a cycle length between 21 and 35 days, 198(39.5%) adolescents had a menstrual cycle length shorter than 21 days, 42 (8.4%) longer than 35 days. The majority 413 (82.4%) of subjects use a sanitary pad during menstruation for sanitation and the rest 88 (17.6%) use pieces of clothes as a sanitary pad and it was impossible to determine the size and number of pieces of clothes used. General characteristics of menstrual pattern according to towns and residence are presented in table 4 below.

Table 4: Menstrual pattern of secondary school adolescents in Southwest Ethiopia, 2007.

Menstrual characteristics		**Total (%)**	**Towns**		**Residence**	
			A/Minch (n =309)	**Chencha (n=304)**	**Urban (n=387)**	**Rural (n=226)**
Cycle length	< 21 days	198 (39.5)	105	93	116	82
	21–35 days	261 (52.1)	134	127	170	91
	> 35 days	42 (8.4)	14	28	28	14
Duration	< 2 days	17 (3.4)	5	12	7	10
	2 - 3 days	259(51.7)	119	140	148	111
	4 - 5 days	200 (39.9)	119	81	142	58
	6 - 7 days	20 (4)	10	10	15	5
	8 - 9 days	5(1)	0	5	2	3
Regularity	Regular	501 (81.7)	253	248	314	187
	Irregular	112 (18.3)	56	56	73	39
Sanitary pads/cloths usedduring menses	Sanitary pads	413(82.4)	234	179	269	144
	Piece of cloth	88 (17.6)	19	69	45	43

From those who have regular menstrual cycle, the highest number 214 (42.7%) of students used sanitary pad two times per day. Among those who used sanitary padsas sanitary pad two times per day, more percent (25.3%) of urban girls were used sanitary pads as sanitary pads than rural girls (11.8%). The number of students from ArbaMinch town (22.75%) who used modes as sanitary pad two times per day was higher than the students from Chencha town (14.4%) andit was statistically significant with p-value 0.012.**(See table 5 below)**

Table 5: The number of pieces of Cloths & sanitary pads used per a day during menstruation in adolescent girls in southwestEthiopia, 2017.

Sanitary pads used per a day			1time	2times	3times	4times	5times	Others	$X^{2(df)}$	P-value
Towns	Arbaminch	Cloths	2	6	5	5	1	0	5	0.876
		Sanitary pads	14	114	73	28	5	0	5	0.012
	Chencha	Cloths	8	22	23	11	5	0		
		Sanitary pads	19	72	70	9	8	1		
	Total		43	214	171	53	19	1		
Residence	Urban	Cloths	6	17	12	8	2	0	5	0.578
		Sanitary pads	21	127	85	30	6	0	5	0.052
	Rural	Cloths	4	11	16	8	4	0		
		Sanitary pads	12	59	58	7	7	1		
	Total		43	214	171	53	19	1		

The majority 500 (81.6%) of the subjects had the source of information before starting menstruation. Among those the more 182(36.4%)wasinformed by teachers. **(See table 6 below)**

Table 6: The firstsource of information about menstruation in adolescent girls in southwestEthiopia, 2017.

Sources	Frequency	%
Mother	152	30.4
Father	8	1.6
Peers	130	26.0
Teacher	182	36.4
Health professionals	25	5.0
Media	3	0.6
Total	502	100.0

The menstrual cycle length of study subjects is shown in table 7 with respect to age of menarche, towns, place of residence, BMI, Occupational status of parentsand physical activity of participants. There is no statistically significant difference in menstrual cycle length by residence (rural vs urban), district and age of menarche, but has statistically significant difference between physical activity and occupational status of participants with p-value 0.006 and p-value 0.036 respectively. **(See table 7 below)**

Table 7: Menstrual cycle length of Secondary school adolescents in southwest Ethiopia, March, 2017.

Variables		Number	Less than 21 days	21 to 35 days	35 to42days	X^2	P - Value
Towns	A/Minch	253	105	134	14	4	0.187
	Chencha	248	93	127	28		
Residence	Urban	314	116	170	28	4	0.577
	Rural	187	82	91	14		
BMI	Under	110	45	60	5	8	0.121
	Normal	331	129	168	34		
	Over	59	23	33	3		
Occupational status of parents	Both employed	205	80	108	17	16	0.036*
	Onlyfather work	144	51	83	10		
	Onlymotherwork	64	28	28	8		
	Noworkfor both	78	36	36	6		
	Others	10	3	6	1		
Physical activity	L/than 30min	283	113	150	20	12	0.006
	30 to 60min	144	51	76	17		
	G/than60min	57	30	22	5		
	Others	17	4	13	0		
AAM	Early menarche	24	8	14	2	8	0.287
	Medium menarche	300	115	166	19		
	Late menarche	177	75	81	21		

* P-value < 0.05

The menstrual cycle regularity of study subjects is shown in table 8 with respect to age of menarche, towns, place of residence, BMI, Occupational status of parents and physical activity of participants. There are statistically significant differences between menstrual cycle regularity and occupational status of parentsoffemale students who took part in the study with p-value 0.006. Also there are statistically significant differences between menstrual cycle regularity and physical activityoffemale students with p-value of 0.040 and BMI with p-value of 0.038. There are no statistically significant difference in menstrual cycle regularity by residence (rural vs urban), district and age of menarche.**(See table 8 below)**

Table 8: Menstrual regularity of Secondary school adolescents in southwest Ethiopia, March, 2017.

Variables		Number	Regular	Irregular	X^2	P- Value
Towns	A/Minch	309	253	56	1	0.924
	Chencha	304	248	56		
Residence	Urban	387	314	73	1	0.620
	Rural	226	187	39		
BMI	Under	125	110	15	2	0.038
	Normal	420	332	88		
	Over	68	59	9		
Occupational status of parents	Both employed	235	205	30	4	0.006
	Only father work	190	144	46		
	Only mother work	72	64	8		
	No work for both	102	78	24		
	Others	14	10	4		
Physical activity	L/than 30min	348	283	65	12	0.040 *
	30 to 60min	165	144	21		
	G/than60min	79	57	22		
	Others	21	17	4		
AAM	Early menarche	28	24	4	2	0.578
	Medium menarche	363	300	63		
	Late menarche	222	177	45		

* P-value < 0.05

The duration of menstrual blood flow of subjects is shown in table 9 below with respect to age of menarche, town, place of residence and BMI. The mean duration of flow was 3.74 ± 1.2and median of 3.00 days. It is statistically significant (X^2 = 8, P-value < 0.001) difference between the duration of flow and age at menarche of female students who took part in the study. It is statistically significant (X^2 = 4, P-value < 0.005) difference between the duration of flow and residence (urban Vs rural) of adolescent student girls and also statistically significant (X^2 = 4, P-value < 0.002) difference between the duration of flow and district (A/Minch Vs Chencha) of participants and also statistically significant difference with BMI.

Table 9: The duration of menstrual blood flow of school adolescents in northwest Ethiopia, 2007.

Variables		**Number**	**Less than 2days**	**2 to 3days**	**4 to 5 days**	**6 to 7 days**	**8 to 9 days**	**X^2**	**P - Value**
Town	A/Minch	253	5	119	119	10	0	4	0.002*
	Chencha	248	12	140	81	10	5		
Residence	Urban	314	7	148	142	15	2	4	0.005*
	Rural	187	10	111	58	5	3		
BMI	Under	110	3	45	56	6	0	8	0.035*
	Normal	332	12	188	119	10	3		
	Over	59	2	26	25	4	2		
AAM	Early	24	1	13	8	0	2	8	<0.001*
	Medium	300	7	130	149	13	1		
	Late	177	9	116	43	7	2		

*p- value < 0.05

5.4. Menstruation related disorders

Premenstrual symptoms were present in majority 428 (69.8%) of participant girlsand the rest 185 (30.2%) had no any premenstrual symptoms. From those who had PMS common symptom was a lower abdominal pain, which was experienced by 255 (59.6%) of the participants and 229 (37.2%) of the participants had one symptom and 69 (11%) had two symptoms.There are statistically significant (X^2 = 8, P-value = 0.004) relation between menarcheal age and headache, and statistically significant relation between menarcheal age and lower abdominal pain(X^2 = 8, P-value = 0.031) and also statistically significant relation between menarcheal age and disappointment(X^2 = 8, P-value = 0.048).**(See table 10 below)**

Table 10: Premenstrual symptoms among Schooladolescent girls in southwestEthiopia, 2017.

PMS		Frequency (%)	Menarcheal age									X^2(df)	P-value
			10	11	12	13	14	15	16	17	18		
Headache	Yes	75(17.5)	0	0	6	22	17	20	5	3	2	8	0.004
	No	353(82.5)	2	3	10	61	156	94	20	5	2		
Lower abdominal Pain	Yes	255(59.6)	2	2	11	58	94	64	19	5	0	8	0.031
	No	173(40.4)	0	1	5	25	79	50	6	3	4		
Back pain	Yes	178(41.6)	1	2	10	34	71	41	14	3	2	8	0.479
	No	250(58.4)	1	1	6	49	102	73	11	5	2		
Vomiting	Yes	23(5.4)	0	0	0	4	10	3	5	1	0	8	0.068
	No	405(94.4)	2	3	16	79	163	111	20	7	4		
Disappointment	Yes	41(9.6)	0	1	0	9	15	9	7	0	0	8	0.048
	No	387(90.4)	2	2	16	74	158	105	18	8	4		
Mood change	Yes	124(29.0)	0	2	4	30	41	30	12	3	2	8	0.100
	No	304(71.0)	2	1	12	53	132	84	13	5	2		
Chill	Yes	30(7.0)	0	1	2	6	9	6	5	1	0	8	0.125
	No	398(93.0)	2	2	14	77	164	108	20	7	4		
Fatigue	Yes	76(17.7)	1	1	3	16	22	20	10	3	0	8	0.35
	No	352(82.3)	1	2	13	67	151	94	15	5	4		
Poor appetite	Yes	58(13.5)	0	1	3	13	21	10	9	1	0	8	0.44
	No	370(84.5)	2	2	13	70	152	104	16	7	4		
Breast tenderness	Yes	77(18)	0	2	3	21	26	18	7	2	0	8	0.142
	No	349(82)	2	1	13	62	147	96	18	6	4		
Acne	Yes	83(19.4)	0	0	2	17	29	26	6	3	0	8	0.608
	No	345(80.6)	2	3	14	66	144	88	19	5	4		

Challenges as a result ofpremenstrual symptoms were showed in this study.From participants those who had PMS 204 (47.7%) subjects were passed the time without any problem, the others 99 (23.1%) subjects were absent from school.**(See table 11 below)**

Table 11: Challenges that student faced due to premenstrual symptoms among School adolescent girls in southwestEthiopia, 2017.

Challenges due to PMS	**Yes N (%)**	**No N(%)**
No problem	204(47.7%)	224(52.3%)
Absent from school	99(23.1%)	379(76.9)
Loss of attention in the class	106(24.8%)	322(75.2%)
Decrease class participation	75(17.5%)	353(82.5%)
Absent from exam	36(8.4%)	392(91.6%)
Less grade	27(6.3%)	401(93.7%)
Decrease all activity in the society	55(12.9%)	373(373)
Other	5(1.2%)	423(98.8%)

The overall prevalence of dysmenorrheal (assumed to be primary dysmenorrheal, as secondary is rare at this age) was 75.5% (463), and among those subjects of the study, it was rated mild in 224(48.1%), moderate in 152(32.6%) and sever type in 90(19.3%). From participants those who had menstrual pain 267(57.7%) subjects were absent from school due to pain.From those 133(51.7%) participants were absent one day in every cycle from school, 67(23.8%) two days and 50(18.2%) three days absent in every cycle from school.**(See figure 1 below)**

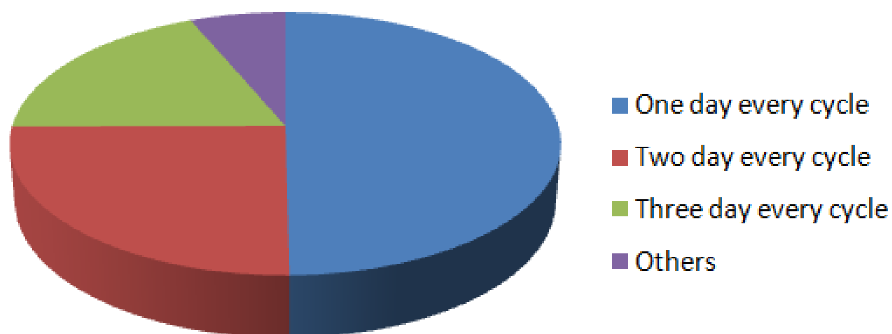

Fig.1: Adolescent school girls that absent from school in every cycle due to dysmenorrhoeain southwestEthiopia, 2017.

The treatments that the participants received during menstrual pain were showed in this study. From those184 (39.7%) subjects were took rest, the others treat their pain by using drug 63(13.6%) and drinking coffee 187 (40.4%) and others 29(6.3%. From drug (medicine) users the majority were used Asprin 31(49.2%), diclofenac 19 (30.1%), paracetamol 10 (15.9%) and other3(4.8%).**(See fig. 2 below)**

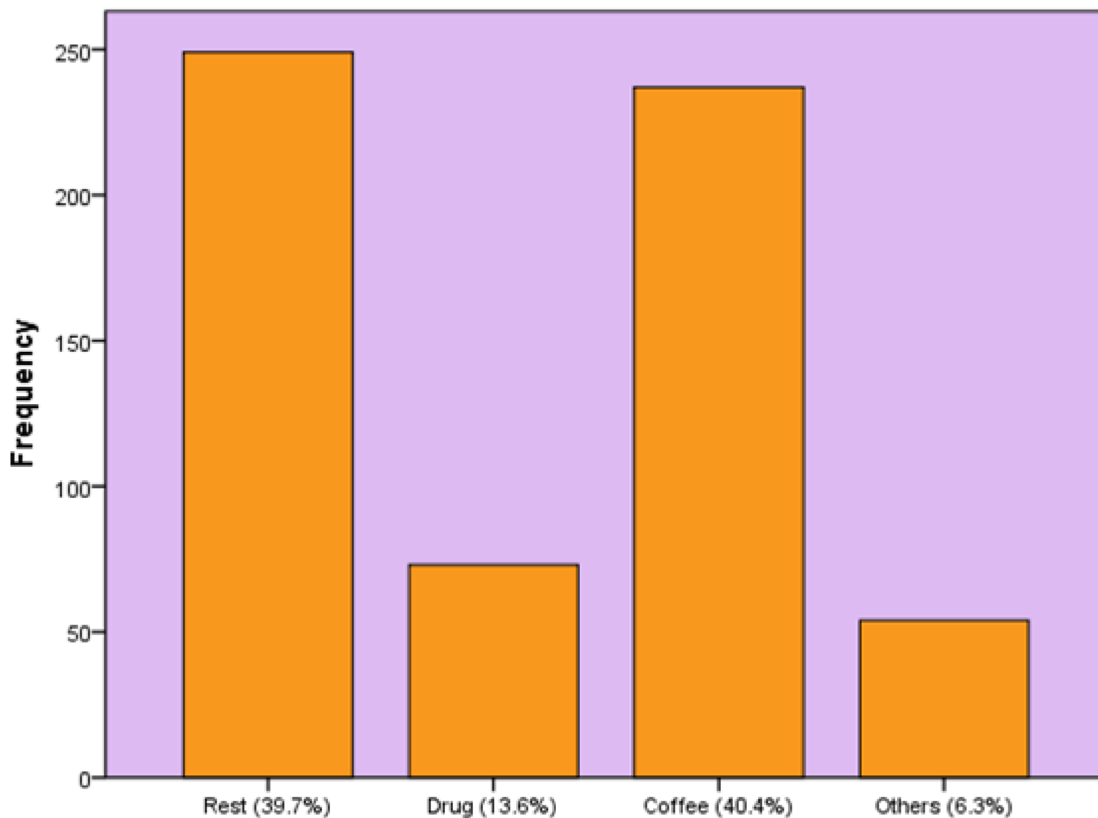

Fig. 2: The treatment that participants received during menstrual pain among adolescent school girls in southwest Ethiopia, 2017.

The participant's communication with others on menstruation problemswere showed in this study.From those the highest number 301 (49.1%) of adolescent school girls were communicate with their friends about menstrual problems. **(See table 12 below)**

Table 12: The practice thatadolescent school girls were sharing about their menstrual problems to others in SouthwestEthiopia, 2017.

Variable		Frequency	%
Mother	Yes	251	40.9
	No	362	59.1
Father	Yes	25	4.1
	No	588	95.9
Brother	Yes	29	4.7
	No	584	95.3
Sister	Yes	183	29.9
	No	430	70.1
Friend	Yes	301	49.1
	No	312	50.8
Teacher	Yes	27	4.4
	No	586	95.6
Other	Yes	17	2.8
	No	596	97.2

The majority 524 (85.1%) of participants had not ask forhealth workers counsel about menstrual pain in this study, but the rest 92(14.9%) subjects were ask forhealth workers counsel about their menstrual pain during menstruation period.

(See table 13 below)

Table 13: Adolescent school girls that ask for health workers adviceabout menstrual pain in SouthwestEthiopia, 2017.

Variables	Frequency	Percent
Yes	92	15.0
No	521	85.0
Total	613	100.0

Out of the total study population,39 (6.4%) adolescents used contraceptives, from those 16 (41.0%) of subjects used injectable, 14(35.9%) pills, and 6 (15.4%) Norplant. From all study subjects, 68 (11%) of school girls were started sexual intercourse, 8 of them married and the rest 546(89%) were not started sexual intercourse. Dysmenorrhoea was significantly related with BMI (p-value < 0.036).Thoseliving in urban areas more frequent than rural. The results of the study (Table 15 below) indicated that there was a significant association between dysmenorrhoea and the educational status of mothers (P <0.023) and educational status of fathers (P< 0.001) of the participants. Dysmenorrhoea was not significantly associated with age at menarche.There werestatistically significant association between the presence of premenstrual symptoms and BMI andeducational status of fathers. PMS was not significantly associated with age at menarche and duration of menses.**(See table 14 below)**

Table 14: Dysmenorrhoea and Premenstrual syndrome among School adolescents in northwest Ethiopia, March 2017.

Variables		**PMS**			**Dysmenorrhoea**		
		Yes	**X^2**	**P- Value**	**Yes**	**X^2**	**P- Value**
District	A/Minch	225	1	0.103	242	1	0.106
	Chencha	203			221		
Residence	Urban	260	1	0.063	290	1	0.654
	Rural	168			173		
BMI	Under	93	2	0.042*	99	2	0.036*
	Normal	295			320		
	Over	39			43		
Educational status of your mother	No education	149	4	0.077	165	4	0.023
	Read and write	61			65		
	Primary school	98			100		
	Secondary school	64			74		
	Higher education	56			59		
Educational status offather	No education	84	4	0.003*	99	4	< 0.001*
	Read and write	78			81		
	Primary school	93			98		
	Secondary school	67			74		
	Higher education	106			112		
Occupationa	Both employed	151	4	0.141	168	4	0.194

l status of parents	Only father work	138			145		
	Onlymother work	54			59		
	No work for both	73			78		
	Others	12			13		
Marital status of mothers of participants	Single	57	20.60	< 0.001*	73	1.87	0.598
	married	337			352		
	Divorced	7			15		
	Widowed	27			24		
Physical activity	Less than 30min	241	3	0.872	249	3	0.057
	30 to 60min	114			130		
	Greaterthan 60min	57			67		
	Others	16			17		
Onset of menarche	Early menarche	21	2	0.676	21	2	0.643
	Medium menarche	256			279		
	Late menarche	151			163		
Cycle length	< 20 days	137	9.50	0.050	155	4.65	0.324
	21 to 35 days	172			189		
	35 to 42 days	30			34		
	Not regular	89			86		
Duration	< 2 days	10	4	0.890	12	4	0.266
	2 to 3 days	180			206		
	4 to 5 days	132			140		
	6 to 7 days	14			16		
	8 to 9 days	3			4		

* P-value < 0.05

The results of the study indicated that there is significantdifference between the severities of dysmenorrhoea and the residence of the participants (p<0.012).There were no relation between severity of dysmenorrhoea and length of menstrual cycle, duration of menses and age of menarche.

(See table 15 below)

Table 15: Factors associated with severity of dysmenorrhoea among school adolescents girls in southwest, Ethiopia, 2017.

Characteristics		Dysmenorrhoea			X^2(df)	P- Value
		Mild	Moderate	Sever		
Residence	Urban	146	103	43	3	< 0.012*
	Rural	78	49	47		
Towns	ArbaMinch	124	80	39	3	0.289
	Chencha	100	72	51		
Menstrual cycle length	< 21 days	75	54	27	12	0.157
	21to35days	97	58	34		
	35to42days	16	13	5		
	Notregular	36	27	24		
Duration	< 2 days	8	2	2	12	0.104
	2 to 3 days	105	69	32		
	4 to 5 days	69	45	28		
	6 to 7 days	4	9	3		
	8 to 9 days	2	1	1		
Menarcheal age	Early menarche	8	8	5	6	0.62
	Medium menarche	141	89	53		
	Late menarche	75	56	32		

In order to determine factors associated with age at menarche multinomial logistic regression was done with assumptions. After adjusting for potential confounders, adolescent school girls who were living in urban areas and Arbaminch town (low altitude) hadstatistically significant association with age at menarche.In the adjusted odds ratio, adolescents who were living in urban areas were 2.42 times earlier probability to see menarche as compare to adolescent school girls who living in rural areas(AOR= 2.42, 95% CI: 1.59, 3.69). In the adjusted odds ratio, adolescents who were living in ArbaMinch town was2.08 times earlier probability to see menarcheas compare to adolescent school girls who living in Chencha town (AOR= 2.08, 95% CI: 1.36, 3.18).**(See table 16 below)**

Table 16: Factors associated with menarcheal age of adolescent school girlsin GamoGofa Zone,Southwest Ethiopia, 2017.

Variables		Menarcheal age			(95% CI)	
		≤ 12years	13 &14	≥ 15	Crude OR	Adjusted OR
Residence	Urban	16 (4.1%)	268 (69.3%)	103 (26.6%)	3.25 (2.29, 4.63)*	2.42 (1.59, 3.69) *
	Rural	12 (5.3%)	95 (42.0%)	119 (52.7%)	1	1
Towns	ArbaMinch	12 (3.9%)	217(70.2%)	80(25.9%)	2.63(1.86, 3.72)*	2.08 (1.36, 3.18) *
	Chencha	16 (5.2%)	146(80.0%)	142(46.7%)	1	1
BMI	Under Weight	6 (4.8%)	88 (70.4%)	31 (24.8%)	1.86(0.97, 3.57)	0.94 (0.45, 1.97)
	Normal Weight	17(4.1%)	237(56.6%)	165(39.4%)	0.94(0.54, 1.62)	0.80 (0.44, 1.45)
	Over Weight	5 (7.4%)	38 (55.9%)	25(36.8%)	1	1
Educational status of mother	No education	9 (4.5%)	111(55.8%)	79(39.7%)	0.60(0.34, 1.05)	1.05 (0.49, 2.25)
	Read and write	1 (1.2%)	45(53.6%)	38(45.2%)	0.51(0.27, 0.96)*	0.61(0.27, 1.38)
	Primary school	7(5.1%)	87 (63.5%)	43(31.6%)	0.87(0.48, 1.58)	1.12(0.54, 2.32)
	Secondary school	6 (5.7%)	62 (59.0%)	37(35.2%)	0.72(0.38, 1.34)	0.88(0.43, 1.79)
	Higher education	5 (5.7%)	58 (65.9%)	25(28.4%)	1	1
Educational status of father	No education	6 (5.4%)	61(54.5%)	45(40.2%)	0.68(0.41, 1.12)	1.20 (0.61, 2.38)
	Read and write	5(4.8%)	55(52.4%)	45(42.9%)	0.61(0.37, 1.02)	0.99(0.51, 1.89)
	Primary school	5(4.3%)	68(58.1%)	44(37.6%)	0.78(0.47, 1.28)	1.27(0.67, 2.39)
	Secondary school	4 (3.8%)	68 (65.4%)	32(30.8%)	1.07(0.63, 1.81)	1.21(0.66, 2.22)
	Higher education	8 (4.6%)	111(63.4%)	56(32.0%)	1	1
Occupational status of parents	Both employed	10(4.3%)	138(58.7%)	87(37.0%)	1.85(0.60, 5.68)	0.79 (0.24, 2.58)
	Only father work	5(2.6%)	128(67.4%)	57(30.0%)	2.62(0.84, 8.14)	1.32 (0.40, 4.32)
	Only mother work	7(9.7%)	47(65.3%)	18(25.0%)	3.04(0.90, 10.3)	1.54 (0.43, 5.50)
	No work for both	5(4.9%)	44(43.1%)	53(52.0%)	0.96(0.30, 3.09)	0.61(0.18, 2.04)
	Others	1(7.1%)	6(42.9%)	7(50.0%)	1	1
Physical activity	Less than 30min	14(4.0%)	216(61.1%)	118(33.9%)	0.61(0.21, 1.72)	0.54 (0.17, 1.66)
	30 to 60min	11(6.7%)	97(58.8%)	57(34.5%)	0.56(0.19, 1.64)	0.68 (0.21, 2.16)
	Greater than 60min	2(2.5%)	35(44.3%)	42(53.2%)	0.27(0.09, 0.84)*	0.44 (0.13, 1.48)
	Others	1(4.8%)	15(71.4%)	5(23.8%)	1	1

In order to determine factors associated with PMSbinary logistic regression was done with assumptions. After adjusting for potential confounders, adolescent school girls who were living in Arbaminch town anddaughters of primary school educated parents had statistically significant association with PMS. The adjusted odds ratio, adolescents who were living in Arbaminch town were 0.62 times more likelyto develop PMS as compare to adolescent school girls who living in Chencha town (AOR= 0.62, 95% CI: 0.41,

0.96).As compared to daughters of parents who took higher education, daughters of primary school educated parents were 0.43 times more likely to develop PMS(AOR = 0.43; 95% CI, 0.23 - 0.83).

(See table 17 below)

Table 17: Factors associated with PMS of adolescent school girlsin GamoGofa Zone,Southwest Ethiopia, 2017.

Variables		PMS		(95% CI)	
		No	Yes	Crude OR	Adjusted OR
Residence	Urban	127 (20.7%)	260(42.4%)	1.41(0.98, 2.04)	1.43(0.92, 2.23)
	Rural	58(9.5%)	168 (27.4%)	1	1
Towns	ArbaMinch	84 (13.7%)	225 (36.7%)	0.75(0.53, 1.06)	0.62(0.41, 0.96) *
	Chencha	101(16.1%)	203(33.1%)	1	1
BMI	Under Weight	32 (5.2%)	93 (15.2%)	0.46(0.24, 0.86)*	0.50(0.25, 1.00)
	Normal Weight	124(20.2%)	295(48.1%)	0.56(0.33, 0.95)*	0.58(0.33, 1.01)
	Over Weight	29(4.7%)	39 (6.4%)	1	1
Educational status of your mother	No education	50 (8.1%)	149(24.3%)	0.59(0.34, 1.00)	0.98(0.47, 2.03)
	Read and write	23(3.7%)	61(9.9%)	0.66(0.34, 1.26)	1.15(0.52, 2.50)
	Primary school	39(6.4%)	98(16.0%)	0.69(0.39, 1.23)	0.98(0.49, 1.9)
	Secondary school	41(6.7%)	64(10.4%)	1.1(0.62, 2.01)	1.34(0.69, 2.58)
	Higher education	32(5.2%)	56(9.1%)	1	1
Educational status of father	No education	28(4.6%)	84 (13.7%)	0.51(0.3, 0.86)*	0.55(0.27, 1.08)
	Read and write	27(4.4%)	78(12.7%)	0.53(0.31, 0.90)*	0.56(0.29, 1.07)
	Primary school	24(3.9%)	93(15.2%)	0.39(0.23, 0.68)*	0.43(0.23, 0.82)*
	Secondary school	37(6.0%)	67(10.9%)	0.84(0.51, 1.40)	0.89(0.50, 1.55)
	Higher education	69(11.25%)	106(17.3%)	1	1
Occupational status of parents	Both employed	84(13.7%)	151(24.6%)	3.33(0.73, 15.2)	2.97(0.62, 14.31)
	Only father work	52(8.5%)	138(22.5%)	2.26(0.0.48, 10.4)	1.9(0.40, 9.37)
	Only mother work	18(2.9%)	54(8.8%)	2.0(0.40, 9.7)	2.15(0.42, 11.06)
	No work for both	29(4.7%)	73(11.9%)	2.38(0.50, 11.3)	2.49(0.51, 12.21)
	Others	2(0.33%)	12(1.9%)	1	1
Physical activity	Less than 30min	107(17.4%)	241(39.3%)	1.42(0.51, 3.9)	1.75(0.60, 5.11)
	30 to 60min	51(8.3%)	114(23.5%)	1.43(0.49, 4.1)	1.94(0.64, 5.85)
	Greater than 60min	22(3.6%)	57(9.3%)	1.23(0.40, 3.77)	2.05(0.63, 6.70)
	Others	5(0.8%)	16(2.6%)	1	1

In order to determine factors associated with dysmenorrhoeabinary logistic regression was done with assumptions. After adjusting for potential confounders, adolescent school girls who were living in Arbaminch town and daughters of uneducated, able to read and write and primary school educated

parentshad statistically significant association withdysmenorrhoea.The adjusted odds ratio, adolescents who were living in Arbaminch town were 0.61 times more likelyto develop dysmenorrhoea as compare to adolescent school girls who living in Chencha town (AOR= 0.61, 95% CI: 0.39, 0.96).As compared to daughters of parents who took higher education, daughters of primary school educated parents were 0.32 times more likely to developdysmenorrhoea (AOR = 0.32; 95% CI, 0.16 - 0.64).As compared to daughters of parents who took higher education, daughters of able to read and write parents were 0.48 times more likely to developdysmenorrhoea (AOR = 0.48; 95% CI, 0.25, 0.94).

(See table 18 below)

Table 18: Factors associated with dysmenorrhoea of adolescent school girlsin GamoGofa Zone,Southern Ethiopia, 2017.

Variables		Dysmenorrhoea		(95% CI)	
		No	Yes	Crude OR	Adjusted OR
Residence	Urban	97(15.8%)	290(4.7%)	1.09 (0.74, 1.6)	0.77 (0.48, 1.24)
	Rural	53(8.4%)	173(28.2%)	1	1
Towns	ArbaMinch	67(10.9%)	242(39.5%)	0.73 (0.50, 1.06)	0.61 (0.39, 0.96) *
	Chencha	83(13.5%)	221(36.0%)	1	1
BMI	Under Weight	26(4.2%)	99(16.1%)	0.45(0.23, 0.8)*	0.60 (0.29, 1.25)
	Normal Weight	99(16.1%)	320(52.2%)	0.53(0.30, 0.9)*	0.66 (0.37, 1.18)
	Over Weight	25(4.1%)	43(7.0%)	1	1
Educational status of mother	No education	34(5.5%)	165(26.9%)	0.41(0.23, 0.7)*	0.98 (0.45, 2.14)
	Read and write	19(3.1%)	65(10.6%)	0.59 (0.30, 1.17)	1.08 (0.47, 2.44)
	Primary school	37(6.0%)	100(16.3%)	0.75 (0.42, 1.34)	1.19 (0.59, 2.40)
	Secondary school	31(5.0%)	74(12.1%)	0.85 (0.46, 1.57)	1.15 (0.58, 2.29)
	Higher education	29(4.7%)	59(9.6%)	1	1
Educational status of father	No education	13(2.1%)	99(16.1%)	0.22 (0.11, 0.4)*	0.20 (0.90, 0.46) *
	Read and write	24(3.9%)	81(13.2%)	0.51 (0.29, 0.8)*	0.48 (0.25, 0.94) *
	Primary school	19(3.1%)	98(16.0%)	0.33 (0.88, 0.6)*	0.32 (0.16, 0.64) *
	Secondary school	30(4.9%)	74(12.1%)	0.70(0.41, 1.18)	0.66 (0.37, 1.19)
	Higher education	64(10.4%)	111(18.1%)	1	1
Occupational status of parents	Both employed	67(10.9%)	168(27.4%)	5.18 (0.66, 40.4)	4.20 (0.51, 3.29)
	Only father work	45(7.3%)	145(23.6%)	4.03 (0.51, 31.6)	3.11 (0.38, 25.4)
	Only mother work	13(2.1%)	59(9.6%)	2.86 (0.34, 23.8)	3.24 (0.37, 27.98)
	No work for both	24(3.9%)	78(12.7%)	4.00 (0.49, 32.1)	4.41 (0.53, 36.48)
	Others	1(0.16%)	13(2.1%)	1	1
Physical activity	Less than 30min	99(16.1%)	249(40.6%)	1.69 (0.55, 5.14)	2.20 (0.69, 7.04)
	30 to 60min	35(5.7%)	130(21.2%)	1.14 (0.36, 3.61)	1.46 (0.43, 4.89)
	Greater than 60min	12(1.95%)	67(10.9%)	0.76 (0.21, 2.65)	1.10 (0.29, 4.10)
	Others	4(0.65%)	17(2.8%)	1	1

6. Discussion

Menarche is one of the most significant milestones in a woman's life. The mean age of onset of menstruation varies by time, place and population with a range of 9 to 18 years in the world(Anderson *et al*., 2003;Chumlea *et al.,* 2003). In the present study the mean age of menarche was 14.17±1 and median of 14.0years by recall method which is earlier than similar study in the same country by Zegeye (15.8 ± 1.0 years) in Gonder, Northwest Ethiopia (Zegeye *et al*., 2009) and approximately similar (14.1±1.4 years) mean AAM with another study which was conducted recently in Amhara region, Northern Ethiopia (Gultie *et al*, 2014) and 14.24 years in Mekelle City, Northern Ethiopia (Gebremariam *et al*., 2015). Which is even higher than similar study (13.9 ± 1.2 years) done in the same region by Esrael in sawla town, southern Ethiopia (Esrael *et al*., 2013). Another study conducted in Addis Ababa reported a lesser mean age of menarche as 13.72 ± 1.31 years (Abera *el al.,* 2004).The menarcheal age in our study was also found higher than many African countries, 12.5 years in South Africa (Jones LL *et al.,*2009),12.49 years in Egypt(Abdelmoty *et al.,* 2015), 13.6 years in South-Western Nigeria (Adebimpe, *et al.,* 2016),and13.66 years in Northern Ghana (Ameade E *et al.,* 2016).In this study also mean AAM higher than developed countries, 12.54 years in the United States (Anderson *et al.,* 2003), 12.8 years inthe UK (Garden *et al.,* 2008). There was significant difference in the mean age at menarche of the two areas of different altitudes in our study i.e. A/Minch (13.97 ± 1.9) versus Chencha (14.36 ± 1.1) and which is disagree with a study conducted in Gonder, Northern Ethiopia (Zegeye *et al*., 2009) which showed that there was no significant difference in the mean age at menarche of the two areas of different altitudes in their study,but this study similar with research conducted in PeruandIndia (Gustavo *et al.,* 1994; Kapoor *et al.,* 1986). This showed that an increase in the mean age of menarche with altitude. Also the adjusted odds ratio demonstrated that there is significant association between AAM and different altitude in this study.The reason may be altitude difference to significantly affect the age at menarche. The mean age of menarche for rural (14.49±1.2) female adolescents was significantly higher than urban (13.98± 0.9) ones, which is agree with the result found in Gonder, Northern Ethiopia (Zegeye*et al*., 2009) andNigeria (Ikaraoha *et al*., 2005)andalsothe adjusted odds ratio demonstrated that the association between AAM and residence.This can be explained by the better socioeconomic status for urban girls than rural ones and rural girls travel long distances to school every day than urban girls which may partially delay their menarche. The findings of this study wereinconsistent with previous research (Esrael *et al.,* 2013; Epplein *et al.,* 2010; Sterling *et al*., 2013)in showing a relationship between BMI and AAMby using logistic regression (AOR).The occupational status of parents and physical activity of participants was not associated with AAM in this study by Odds ratio

which is dissimilar with other studies conducted inSawla Ethiopia and Colombian(karaoha *et al*., 2005;Chavarro *et al*., 2004; Esrael *et al.,* 2013). This is because of the difference in occupational type and physical activity that done in different areas and the distance difference between the school and home.About 39.1% of the study subjects had experienced abnormal menstrual cycle length (<21 days or >35 days) which is higher than the study done in Gonder (Zegeye*et al*., 2009; Dambhare et al., 2012). This is a common phenomenon in the first two years after menarche (Adams *et al*., 2008). This could be because of changing trends in lifestyle, socioeconomic status, dietary habit, stress, physical activity, hormonal imbalance or some medical reasons which require gynecological assessment at the earliest year (Dhingra R *et al* 2009; Zegeye*et al*., 2009).The mean duration of menstrual flow was 3.74 days, which is almost similar with a study conducted in Gonder (Zegeye*et al*., 2009); whereas in the study conducted in Turkey the mean menstrual flow lasting more than 8 days (Sule ST *et al.,* 2007). This is because of difference in changing trends in lifestyle, district, residence, and age at menarche as shown in this study.

Dysmenorrhea (pain during menstruation) was reported in this study by 75.3% of the study subjects which is to some extent higher than the study conducted in Gonder, Ethiopia 72% (Zegeye*et al*., 2009) andin Iran 71% (Poureslami *et al*., 2003), and almost the same to study conductedin India 76% (Nirmala JL *et al*., 2014), but the percent less than the study conducted in Bahir Dar, Ethiopia 85.1% (Shiferaw *et al*., 2014). As demonstrated in this study by using AOR, might be the percent variations of dysmenorrhea within different areas were associated with the difference of altitude and socioeconomic status of parent's (educational status fathers). In this study, dysmenorrheal was more common among those who had lesser duration of flow, urban residents, this is not similar with study conducted in Gonder (Zegeye*et al*., 2009), however similar with study conducted in Dharan and Turkey (Houston *et al.,* 2006, Sharma *et al.,* 2003).It is common also from A/Minch town which is low land area and those who had normal body mass index and less physical activity. In present study about 57.7% of study subjects suffering from dysmenorrhea had reported to be absent from school merely due to the pain, which is higher percent than the study conducted in Gonder which was 48.8% (Zegeye*et al*., 2009) and 13.9% in central India (Dambhare *et al.,* 2011).

About 69.8% of adolescent female students had at least one symptom of PMS. It is lower percentage than that of a study conducted in Gonder (Zegeye*et al*., 2009), in Bahir Dar 72.80% (Shiferaw *et al*., 2014), in Malaysia 74.6% (Lee LK *et al*., 2006)and in India 63.1% (Sharma *et al*., 2010). However, it was higher than the prevalence found among university students of Saudi Arabia and college students of Japan which was 35.6% and 43.3% respectively (Balaha MH *et al.,* 2010; Fujiwara *et al.,*2007).This might be due to the

difference in the study population shown as in this study, because there is significant relationship between BMI and altitude differenceand PMS which is showed in AORin this study.

In this study, 82.4%of the girls reported that they use sanitary pads which is slightly higher than the finding shown in a study done in Gonder 67.4% (Zegeye *et al*., 2009) and Addis Ababa 47.8% (Abera*et al*., 2004). Attempts to measure menstrual blood loss on the basis of number of pads or tampons used per day or frequency of pad changes were not successful because of variations in individual care, type and brands of sanitation product used and individual estimation of the volume of flow (Zegeye *et al*., 2009). Teachers were found as potential sources of information in urban and rural girls. This does not agree with studies done in Gonder (Zegeye *et al*., 2009), in India (Tiwari *et al.,* 2005) and Malaysia (Lee LK *et al*., 2006). The difference in the source of information between study areas may be due to the difference in the knowledge of parents about menstruation which makes them refrain from advising their daughters about menstruation and related reproductive health issues.

Limitations of this study may related to the nature of cross-sectional study, that to assess the age at menarche retrospective self-reporting questions were used, which may risk for recall biasto remember the time of menarche tothose who were near to end of adolescent ages.Because of no private school in Chencha town those private school adolescent female students were not included in this study which is may limit the study in other way.

7. Conclusion

Menarche is one of the most significant milestones in a woman's life. This study showed that mean AAM was experienced as delayed, averageand early menarche. Altitude and residence were factors associated with variations in age at menarche. Adolescent school girls living in high altitude and rural areas were late to see menarche compared to adolescent girls living in low altitude and urban areas. Teachers were primary source of information on menarche for school girls in both urban and rural areas.Most of the school adolescent girls had a regular menstrual cycle and showed no difference with respect to altitude.The regularity of menses was associated with occupational status of parents, physical activity of adolescent school girls and their BMI. The mean value of the duration of menstruation was in the normal range and durations were associated with altitude difference, residence, BMI and AAM. Dysmenorrhea was a common problem in school adolescents and it was associated altitude. Adolescents living in low altitude suffered dysmenorrhea more than those living in high altitude. The daughters of fathers whom attended primary school education level or less suffered dysmenorrhea more compared to daughters of highly educated fathers.Altitude difference was associated with PMS. Adolescents living in low altitude areas suffered by morePMS than those in high altitude areas and daughters of primary school educated fathers suffered more PMS than those of higher educated fathers; but still there existed less practice of visiting health professionals for the problem.

8. Recommendation

- Gamo Gofa zone Health department may use and analyze the findings of this studyin order to enhance wellbeing of female adolescents with regard to age at menarche, menstrual pattern and menstrual disorders in by enhancing family awareness.

- Parents and non-governmental agencies should also be focusing on the female adolescence to actively participate and openly discuss about menarche, menstrual issues, and reproductive health.

- Medical professionals should consider problems related to early and late menarcheduring diagnosis and interventions of reproductive health.

- During pre and menstrual instance problems of the adolescents should be communicating with health professionals, parents, teachersand friends, not being scared.

- Further, longitudinal studies regarding age at menarche should be conducted to in the future to avoid recall biases that might affect quality of such cross-sectional studies.

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ANNEX 1: Subject Information Sheet (English Version)

Dear participant!

Here, I the undersigned, at Addis Ababa University,School of Medicine and Health Sciences, Department of Anatomy, currently I will be undertaking research on a topic entitled as assessment of age at menarche and menstrual cycle pattern among adolescent school girls in GamoGofa zone Southwest Ethiopia. For this study, you will be selected as a participant and before getting your consent, you need to know all necessary information related to the study which will be detailed as follows.

Purpose of the study: the purpose of this study is to assess age at menarche and menstrual cycle pattern among adolescent school girls in GamoGofa zone Southwest Ethiopia.

Benefits: For your participation in the study no payment will be granted or has no any special privilege to you. Your responses to the following questions are beneficial to you, your family and other societies to overcome menstrual related problem and it will benefit the public at large by identifying the most important factors that contributes to difference in age at menarche.

Risks: There is no possible risk associated with participating in this study except the time spent for responding to the questionnaire.

Confidentiality: Your name will not be written in this form and any information you tell us will not be disclosed to third party. Your participation is voluntary and you are not obligated to answer any question you do not wish to answer. If you feel discomfort with the question, it is your right to drop it any time you want. If you have questions regarding this study or would like to be informed of the results after its completion, please feel free to contact the principal investigator.

Address of the principal investigator:

Mengistu Boshe, Cell phone: +251 0911759888, e-mail: boshemengistu@yahoo.com

Are you satisfied with the information provided so far?

1. Yes,   Signature ………………………….. Continue to the next page

2. No,Signature…………………………… I won't participate. Reason for not participate in the study...

ANNEX 2Consent form (English Version)

In undersigning this document, I am giving my consent to participate in the study entitled as "assessment of age at menarche and menstrual cycle pattern among adolescent school girls in GamoGofa zone Southwest, Ethiopia" I have been informed that the purpose of this study and I have understood that participation in this study is entirely voluntarily. I have been told that my answers to the questions will not be given to anyone else and no reports of this study ever identify me in any way. I have also been informed that my participation or non-participation or my refusal to answer questions will have no effect on me. I understood that participation in this study does not involve risks. I understood that Mengistu Boshe is the contact person if I have questions about the study or about my rights as a study participant.

Respondent signature_________________________________

Data collector Name_________________________Signature___________Date____________

ANNEX 3 Questionnaire (English Version)

Addis Ababa University, College of Health Sciences, School of medicine, anatomy department

Self administered structured questionnaire to assess the age at menarche and menstrual cycle pattern among adolescent school girls in Gamo Gofa zone, Southwest Ethiopia.

Questionnaire ID No---------------

Instruction for participant: Put (√) mark on the boxes in front of options provided.

Part I- Socio demographic characteristics

S .no.	Questions	Response	Remarks
Q 101	Age?	………….Years	
Q 102	Birth date?	…………..Day…………..month………….Year	
Q103	What is your grade	1. 9th □ 2. 10th□	
Q104	Where is your permanent resident address?	1. Urban □ 2. Rural □	
Q105	What is your religion?	1. Protestant □ 2. Orthodox □ 3. Muslim □ 4. Others (specify)…………	
Q106	What is your ethnicity?	1. Gamo □ 2. Gofa □ 3. Wolayita □ 4. Amhara □ 5. Konso □ 6. Oromo □ 7. Tigre □ 8. Others(specify)……	

Q107	What is your marital status?	1. Single □ 2. Married □ 3. Divorced □ 4. Widowed □	

Part II- Menarche and menstrual cycle pattern

S .no.	Questions	Response	Remarks
Q201.	Have you started menstruating?	1. Yes □ 2. No □	
Q202.	If yes, how old were you when you started menstruating?	______years	
Q203.	Have you ever had advice about menarche before you have started menstruation?	1. Yes □ 2. No □	
Q204.	If yes for Q203, Who are your first sources of information about menarche?	1. Mother □ 2. Father □ 3. Peers □ 4. Teacher □ 5. Health professionals □ 6. Media / Internet □ 7. Sister □	
Q205.	During the first year after you started menstruating your menstrual blood flow per cycle was in the same days?	1. Yes □ 2. No □	
Q206.	If no to Q205, when its flow was in the same days per a cycle?	1. After 3 months □ 2. After 6 months □ 3. After one year □ 4. Others --------------------	
Q207.	For the last 6 months, How long is the interval between the first days of each of your menses?	1. < 21 days □ 2. 21 to 35 days □ 3. 35 to 42 days □ 4. My cycles are not regular □	
Q208.	How many days does your menses last?	________ days	
Q209.	What was you used to absorb menstrual	1. Cloth/compress □	

	blood during menses?	2. Modes □	
Q210.	The number of Cloth/modes used in a day during menstruation?	1. One time □ 2. Two times □ 3. Three times □ 4. Four times □ 5. Five times □ 6. Other….......	

Part III –Socio demographic status of parents of participants

S .no.	Questions	Response	Remarks
Q 301.	What is the educational status of your mother?	1. No education□ 2. Able to read and write □ 3. Primary(1-8) school □ 4. Secondary school (9-12)□ 5. Higher education □	
Q 302.	What is the educational status of your father?	1. No education □ 2. Able to read and write □ 3. Primary(1-8) school □ 4. Secondary school □ 5. Higher education □	
Q303.	What is the occupational status of your Parents?	1. Both employed □ 2. Only father work □ 3. Only mother work □ 4. No work for both □	
Q304.	Estimate of hours that spent during walking to schooldaily is?	1. < 30 min□ 2. 30 – 60 min□ 3. >60 min□ 4. Others/Using vehicle □	

Part IV- menstruation related problems/disorders

S .no.	Questions	Response	Remarks
Q401.	Do you have pain (problems) 1 week or less before your menses in the last 6 month?	1. Yes □ 2. No □	
Q402.	If your answer is yes to Q401,from the following which are your problems?	1. Headache □ 2. Lower abdominal pain □ 3. Back pain □ 4. vomiting □ 5. Nausea □ 6. Disappointment □ 7. Mood change □ 8. Chill □ 9. Fatigue □ 10. Poor appetite □ 11. Breast tenderness □ 12. Acne □ 13. Others…… □	
Q403.	If your answer is yes to Q401, which problems you faced due to problems you have 1 week or less before your menses?	1. No problems □ 2. Absent from school□ 3. Loss of attention in the class □ 4.Decrease class participation□ 5.Absent from exam□ 6. Less grade □ 7. Decrease all activity in the society □ 8. Others (mention)………	
Q404.	Do you have pain during your menses?	1. Yes □ 2. No □	
Q405.	If yes for Q404, what type of pain you face?	1. Headache □ 2. Abdominal Cramp □ 3. Back pain □ 4. Vomiting □ 5. Nausea□ 6. Disappointment□ 7. Depression □	

		8. Chill□ 9. Fatigue□ 10. Poor appetite □ 11. Breast pain□ 12. Acne□ 13. Others………………	
Q406.	If yes to Q404, the pain is?	1. Mild □ 2. Moderate □ 3. Sever □ 4. Very sever □	
Q407.	Among the following problems which you face during menses?	1. No problem□ 2. Absent from school□ 3. No attention in the class □ 4. Decrease class activity□ 5. Absent from examination □ 6. Low grade achievement □ 7. Not participate in common social activity □ 8. Others……………	
Q408.	If yes to Q404, have you ever been absent from school because of menstrual pain?	1. Yes □ 2. No □	
Q409.	If yes to Q408, how often?	1. One day every cycle □ 2. Two days every cycle □ 3. Three days every cycle □ 4. Others (Specify) □	
Q410.	What treatment you receive during your menstrual pain?	1. Rest □ 2. drug □ 3. Coffee/tea □ 4. Others……………..	

Q411.	If 2 for Q410, what type of drug you used?	1. Paracetamol ◻ 2. Aspirin ◻ 3. Diclofenac ◻ 4. Others…………………	
Q412.	With whom you have communicated about menstrual problems you faced?	1. Mother ◻ 2. Father ◻ 3. Brother ◻ 4. Sister ◻ 5. Friend ◻ 6. Teacher ◻ 7. Others………………………..	
Q413.	Have you ever advise health worker because of menstrual pain?	1. Yes ◻ 2. No ◻	
Q414.	Do you take any form of contraceptives in the last one year?	1. Yes ◻ 2. No ◻	
Q415.	If yes to Q414, what form of contraceptive?	1. Pills ◻ 2. Injectable ◻ 3. Norplant ◻ 4. other (Specify)_____	
Q416.	Have you started sexual intercourse?	1. Yes ◻ 2. No ◻	

Part V: The anthropometric measurements of the participant

1. Weight (Kg)……………………….

2. Height (cm)…………………………

Thank you

ANNEX 4Information Sheet (Amharic Version)

የ ጥና ቱአጠቃላ ይምን ነ ትማዝራሪያ

የ ተከበሩየ ጥና ቱተሳ ታፊ!እኔ ከዚህበ ታችየ ማከፈርምዎትበአዲስአበባዩኒ ቨርሲቲህክምና ትምህርትቤትአና ቶሚትምህርትክፍልየ ደህረም ረ ቃሞር ሃ ግብርተማሪ ስሆን በአሁኑ ወቅትበደቡብምዕ ራፍበ ጋሞን ፋዞ ን በወጣትልጃገ ረድተማሪ ዎችላ ይየ ሙጀመሪ ያየ ወርአበባ ያየ ችበትን እድሜአና የ ወርአበባዑደትን ና ተጓዳኝነ ገ ሮችላ ይጥና ትእያ ካሄድኩእ ገ ኛለሁ፡ ፡ በማሆኑ ምክ ዚህ ጥና ትወስ ጥእርስዎእን ዲሳ ተፉየ ተማሪ ጠሁሆን ከማሳ ተፍዎበፊትግን የ ጥና ቱን ጠቅላ ላ ይዘ ትእና ዓላ ማአን ደሚከተለ ውአብራራለዎታለሁ፡ ፡

የ ጥና ቱዓላ ማ፡ የ ዚህ ጥና ትዓላ ማበደቡብምዕ ራፍበ ጋሞን ፋዞ ን በወጣትልጃገ ረድተማሪ ዎችላ ይየ ሙጀመሪ ያየ ወርአበባ ያየ ችበትንእድሜና የ ወርአበባዑደትንእና ለሎችተጓዳኝችግሮችን ማጥና ትነ ው፡ ፡

በማሳ ተፍዎየ ሚያገ ኙትጥቅም፡ በጥና ቱስለተሳ ተፉቀጥተኛየ ሆነ ገ ንዘ ብምሆነ ሌላ ክፍያአያገ ኙም፡ ፡ ነ ገ ርግን የ እርስዎድምጽለእርስዎ ፤ ለቤተሰቦዎእና ለህበረ ተሰቡከወርአበባ ጋርየ ተያ ያ ዙችግሮችን ለመፍታትእና የ ሙጀመሪ ያየ ወርአበባየ ሚታይበትን ዕ ድሜ ሚያ ለያ ዩተ ያ ያ ዝ ነ ገ ሮችን ለማለየ ትይጠቅማል፡ ፡

በማሳ ተፍዎየ ሚያ ጋጥምትጉዳት፡ በጥና ቱስለተሳ ተፉጥቅትደቂ ቃዎችከማሳ ጠትውጭምን ምአይነ ትየ አካልወያ ምዋ ስነ ልቦና ጉዳትአይደርስ ብዎትም፡ ፡

የ ሚረጃን ሚስጥር ማጠበቅ፡ የ እርስዎስምበማጠይቁወረ ቀትላ ይአይፃ ፍም፡ ፡ የ ሚሰጡን ሚረጃምን ምሚልኩለሶስተኛወገ ን አይታይም፡ ፡ በጥ ና ቱወስ ጥየ ማሳ ተፍምያ ለማሳ ተፍምእን ዲሁምበፈለግዎትጊዜየ ሚቋረ ጥመበትዎየ ተጠበቀነ ው፡ ፡ ስለጥና ቱማን ኛወምጫይነ ትጥያ ቄቢኖርዎ ትወይምስለጥና ቱየ ሚጨረሻወጤትማወቅቢያ ስፈልግዎትበሚከተለወየ ዋና ውተማሪ-ማሪ አድራሻማገ ኘትይችላሉ፡ ፡

የ ዋና ውተማሪ-ማሪ አድራሻ

ስልክ፡ 0911759888 ፣ ኢሜይል. boshemengistu@yahoo.com

Annex 5: Consent Form (Amharic Version)

የ ስምምነ ትቅጽ

እኔ ከዚህ በታች የ ምፈርመው ግለሰብ በደቡብ ምዕራፍ በጋሞ ፋዞን በወጣት ልጃገረድ ተማሪዎች ላይ የ መጀመሪያ የ ወር አበባ የ የ ችበትን እድመ እና የ ወር አበባ ዑደትን ና ተጓዳኝ ችግሮች ለ ማወቅ በሚጠና ወጥና ት ወስጥ ተሳታፊ እንድሆን ማስማማቴን እየ ገለጽኩ ጥናቱ በፈቃደኝነ ት ላይ የ ተማሰረተ መሆኑን ምተረድቻለሁ፡ ፡ ከዚህ ቀጥሎ ብማ ኘወ መጠይቅ የ ምስጠወ ሚጃ ምስጢር ነ ቱ የ ተጠበቀ እንደሚሆን ም በሚ ባ ተነ ግሮኛል ፡ ፡ በጥና ቱ ወስጥ ተሳታፊ መሆኔ ምአለ መሆኔ ምበ ግሌ ሕይወት ወስጥ ችግር እንደማያ መጣ በኝ ምተነ ግሮኛል፡ ፡ በመጨረሻ ምስ ለ ጥና ቱ እና የ ጥና ቱ ተሳታፊ እንደ መሆኔ ባለኝ መብት ዙሪያ ጥያ ቄ ቢኖረኝ ማ ን ግሥቱ ቦሼ የ ተባለ ወን የ ጥና ቱ ዋና ባለቤት ማ ጋገ ር እንደምችል ምተረድቻለሁ፡ ፡

የ ተሳታፊ ወፊር ማ------------------------------------የ ሚጃ ሰብሳቢ ወፊር ማ-------------------------------

Annex 6: Questionnaire (Amharic Version)

መለያ ቁጥር ---------------------------

በአዲስ አበባ ዩኒቨርሲቲ ህክምና ትምህርት ቤት አና ቶሚ ትምህርት ክፍል የ ድህረ ምረቃ ፕሮግራም መጠይቅ (ከእንግሊዘኛ የ ተተሮጎመ)

ይህ መጠይቅ በደቡብ ምዕራፍ በጋሞ ፋዞን በወጣት ልጃገረድ ተማሪዎች ላይ የ መጀመሪያ የ ወር አበባ የ የ ችበትን እድሜ እና የ ወር አበባ ዑደትን ና ተጓዳኝ ነ ገ ሮችን አጥን ተን አስፈላ ግወን መፍትሄ ለሚ ፈላለግ ስለ ምያ ስችለን ትክክለኛና የ ገ ጠሞችሁን ነ ገ ር ብቻ እንድትሞሉ እን ጠይቃለን፡ ፡

ለሚጃ ሰጭዎች መመሪያ ፡ ምርጫዎትን በጥያ ቄዎቹ ፊት ለፊት በተዘ ጋጀ ወሳጥን የ “√ “ ምልክት ያ ድርጉ፡ ፡

ክፍልአንድ -ማህበራዊእናስነ ህዝብመረጃማጠይቅ

ተ.ቁ	ማጠይቅ	ምላሽ	አስተያየት
101.	እድሜ	………………ዓመት	
102.	የትወልደዘመን?	…………ቀን…………ወር…………ዓ/ም	
103.	የትምህርትደረጃ?	1. 9ኛክፍል □ 2. 10ኛክፍል □	
104.	ያደግሽበትቋምዋ መኖሪያአድራሻ?	1. ከተማ □ 2. ገጠር □	
105.	ሐይማኖት ?	1. ፕሮቴስታን □ 4.ሌላ (ይገለፅ)… 2. ኦርቶዶክስ □ 3. ሙስሊም □	
106.	ብሔረሰብ?	1. ጋሞ □ 2. ጎፋ□ 3. ወላይታ □ 4. አማራ□ 5. ኦሮሞ □ 6.ኮንሶ□7. ትግሬ□ 8. ሌላ (ይገለፅ)…………………..	
107.	የጋብቻሁኔታ?	1. ያገባች □ 2. ያላገባች□ 3. የፈታች □ 4. የሞተባት□	

ክፍልሁለት፡ መጀመሪያየወርአበባየታየበትዕድሜእናየወርአበባዑደትመረጃማጠይቅ

ተ.ቁ	ማጠይቅ	ምላሽ	አስተያየት
201.	የወርአበባሞ ትጀምሪሻል?	1. አዎ □ 2. የለም □	
202.	ለጥያቄቁጥር 201. መልስሽአዎከሆነ በስንትዓመቱሽነበርየወርአበባሞ ትየጀመርሽው?	_______ዓመት	

203.	የወርአበባከመጀመሪያህበፊትስለወርአበባየምክርአገልግሎትአግኝተሽታውቂነበር ወይ?	1. አዎ □ 2. የለም □	
204.	ለጥያቄቁጥር 203 መልስሽአዎከሆነ ስለወርአበባለመጀመሪያጊዜመረጃያገኘሽውከማነው?	1. ከእናቴ □ 2. ከአባቴ □ 3. ከጓደኛዬ □ 4. ከመምህሬ □ 4. ከእህቴ □5. ከወንድሜ □ 5. ከጤናባለሞያ □ 6. ከሌላ(ይገለፅ)………………	
205.	የወርአበባመምጣትእንደጀመርሽአካባቢያወርአበባሽቀኑንጠብቆይመጣነበርወይ?	1. አዎ □ 2. የለም □	
206.	ለጥያቄቁጥር 205 መልስሽየለምከሆነ ቀኑንጠብቆመምጣትየጀመረውመቼነው?	1. ከ 3 ወርበኋላ □ 2. ከ 6 ወርበኋላ□ 3. ከአንድአመትበኋላ □ 4. ሌላካለይጠቀስ-----------------	
207.	ላለፉት6ወራትየወርአበባሽበአማካይበየስንትቀኑይመጣል?	1. በየ21 ቀኑናከዚያበታች□ 2. ከ22 – 35 ባሉትቀናት □ 3. ከ36 – 42 ቀናት □ 4.በየወሩቀኑንጠብቆአይመጣም □	
208.	የወርአበባሽለስንትቀናትእየፈሰሰይቆያል?	ለ--------------ቀናት	
209.	የወርአበባሽበሚፈስበትወቅትለወርአበባመቀበያምንትጠቀሚያለሽ?	1. ጨርቅ □ 2. ሞዴስ □	
210.	በወርአበባጊዜበቀንየወርአበባጨርቅ/ሞዴስስንትጊዜትቀይሪያለሽ?	1. አንድጊዜ□ 2. ሁለትጊዜ □ 3. ሦስትጊዜ□ 4. አራትጊዜ □ 5. አምስትጊዜ □ 6.ሌላካለይጠቀስ………	

ክፍልሶስት፡ የጥናቱተሳታፍዎችቤተሰብሁኔታ

ተ.ቁ	ማጠይቅ	ምላሽ	አስተያየት
301.	የወላጅ/የአሳዳጊእናትየትምህሪትደረጃ?	1. ያልተማሮች□ 2. ማንበብናመጻፍ□ 3. አንደኛደረጃንያጠናቀቀ(1-8) □ 4. ሁለተኛደረጃት/ቤትያጠናቀቀ□ 5. ከ12ኛበላይ□	
Q 302.	የወላጅ/የአሳዳጊአባትየትምህሪትደረጃ?	1.ያልተማሮ□ 2.ማንበብናመጻፍ□ 3. አንደኛደረጃንያጠናቀቀ(ከ1ኛ-8ኛ) □ 4. ሁለተኛደረጃት/ቤትያጠናቀቀ(9-12)□ 5.ከ12ኛበላይ □	
Q303.	የወላጆችሽየስራሁኔታ?	1. ሁለቱምሰራተኛናቸው□ 2. አባትብቻሰራተኛ□ 3. እናትብቻሰራተኛ□ 4. ሁለቱምስራየላቸውም□ 5. ለላ (ይገለፅ)………………….	
Q304.	በግምትወደትምህሪትቤትየሚራመጂበትሰዓትበቀን ?	1. ከ 30 ደቂቃበታች□ 2. 30 – 60 ደቂቃ□ 3. ከ60 ደቂቃበላይ□ 4. ለላ/ተሽከርካሪ□	

ክፍልአራት፡ የወርአበባጋርየተያያዙችግሮች/የጤፅክሎች

ተ.ቁ	ማጠይቅ	ምላሽ	አስተያየት

Q4 01.	የወርአበባሽከመምጣቱከአንድቀንእስከአንድሳምንትቀደምብለየሚያጋጥምሽችግር (ህመም) አለ?	1.አዎ□ 2. የለም □	
Q4 02.	ለጥያቄቁጥር401መልስሽአዎከሆነ ከሚከተሉትወስጥየ ትኛውነ ወያጋጠምሽ? (ከአንድበላይመምረጥይቻላል)	1. ከእምበርትበታችህመም□ 2.የወገብህመም□ 3. የጠትህመም□ 4.ተቅማጥ□ 5.ትኩሳት□ 6. የምግብፍላጎትመጨመር □ 7. ድብርት□ 8.ለላ (ይገለፅ)……………………………	
Q4 03.	በወርአበባሽከአንድእስከአንድሳምንትቀናትቀደምብለየሚያጋጥምሽችግርምክንያት ከሚከተሉትችግሮችመካከልየ ትኛወነ ወያጋጠምሽ? (ከአንድበላይመምረጥይቻላል)	1. ምንምችግርአላጋጠመኝም□ 2.ትምህርትቤትመቅረት□ 3.ክፍልወስጥትኩረትማጣት□ 4. የክፍልወስጥተሳትፎመቀነስ□ 5. ከፈተናመቅረት□ 6. ዝቅተኛነ ጥብማምጣት□ 7. የተለመደወነ ማህበራዊእንቅስቃሴአለማከናወን□ 8. ሌላ (ይጠቀስ)……	
Q4 04.	የወርአበባሽበሚፈስባቸውቀናትየ ሚያጋጥምሽህመምአለ?	1. አዎ □ 2. የለም □	
Q4 05.	ለጥያቄቁጥር 404 መልስሽአዎከሆነ ምንዓይነ ትችግር (ህመም)ያጋጥምሻል? (ከአንድበላይ) መምረጥይቻላል)	1. ራስምታት □ 2. ሆድቁርጠት □ 3. የጀርባህመም □ 4. ትዉኪያ□ 5. መቅለሽለሽ□ 6. ብስጭት □ 7. ድብርት □ 8. ብርድብርድማለት□ 9. ድካም□ 10. የምግብፍላጎትማጣት □ 11. የጠትህመም□	

		12. ፊትላይብሩር □ 13. ሌላ (ይጠቀስ)------------------	
Q406.	ለጥያቄቁጥር 404 መልስሽአዎከሆነ የህመሙ ማጠን?	1. ማጠነኛህመም □ 2. መካከለኛህመም □ 3. ከፍተኛህመም □ 4. በጣምከፍተኛ □	
Q407.	የወርአበባሽበሚፈስባቸውቀናትከሚከተሉትችግሮችመካከልየትኛዉን ወያጋጠመሽ? (ከአንደበላይመምረጥይቻላል)	1.ምንምችግርአላጋጠመኝም □ 2. ትምህርትቤትመቅረት □ 3.ክፍልዉስጥትኩረትማጣት □ 4.የክፍልዉስጥተሳትፎመቀነስ□ 5. ከፈተናመቅረት □ 6. ዝቅተኛነጥበማግኘት □ 7.የተለመደዉንማህበራዊእንቅስቃሴአለማከናወን□ 8. ሌላ (ይጠቀስ) ---------------	
Q408.	የወርአበባሽበሚፈስባቸውቀናትበሚያጋጥምሽህመምምክንያትከት/ቤትቀረተሽታዉቂያለሽ?	1. አዎ □ 2. የለም□	
Q409.	ለጥያቄቁጥር 408 መልስሽአዎከሆነ በአንድየወርአበባዑደትስንትቀንትቀሪያለሽ?	1. አንድቀን□ 2. ሁለትቀን□ 3. ሦስትቀን□ 4. ከሦስትቀንበላይ □	
Q410.	የወርአበባሽበሚፈስባቸውቀናትለሚያጋጥምሽህመምምንዓይነትእርምጃትወስጃያለሽ?	1. ዕረፍትማድረግ □ 2. መድሀኒትመዉሰድ □ 3. ሻይ (ቡና) ማጠጣት □	

		4. ሌላ (ይጠቀስ) ---------------------	
Q4 11.	ለጥያቄቁጥር 410 መልስሽመድሀኒትመዉሰድከሆነ ምንዓይነ ትመድሀኒትትጠቀሚያለሽ?	1. ፓራሲታሞል □ 2. አስፕሪን □ 3. ዳይክሎፌናክ □ 4. ሌላ (ይጠቀስ) ---------------------	
Q4 12.	በወርአበባምክንያትየ ሚያጋጥምሽንህመምከማንጋርተነ ጋግረሽታዉቂያለሽ? (ከአንደበላይመምረጥይቻላል)	1. ከእናቴ□ 2. ከአባቴ□ 3. ከወንድሜ□ 4. ከእህቴ □ 5. ከጓደኛዬ □ 6. ከመምህሬ□ 7. ሌላ (ይጠቀስ) -----------	
Q4 13.	በወርአበባምክንያትላጋጠመሽችግርሐኪምጋሄደሽታዉቂያለሽ?	1. አዎ □ 2. የለም □	
Q4 14.	ባለፈዉአንድዓመትየ ወሊድመከላከያዘዴተጠቅመሽታዉቂያለሽ?	1. አዎ □ 2. የለም □	
Q4 15.	ለጥያቀቁጥር 414መልስሽአዎከሆነ ከወሊድመከላከያዘዴዎችየ ትኞቹንተጠቅመሽታዉቂያለሽ?	1. የ ወሊድመቆጣጠሪያክኒን□ 2.የ ወሊድመቆጣጠሪያመርፌ □ 3. በክንድዉስጥየ ሚቀበርመከላከያ □4. ሌላ (ይጠቀስ) --	
Q4 16.	ከወንድጋርግብረስጋግንኙነ ትአድርገሽታዉቂያለሽ?	ሀ. አዎ □ ለ. የለም □	

ክፍልአራት: የ ተሳታፊዎችቁመትናክብደትመጠን

1. ክብደትበኪሎግራም(Kg)……………………….

2. ቁመትበሰንትሜትር (cm)…………………………

እናመሰግናለን