Menarche, Menstruation related Problems and Practices among Adolescent High School Girls in Addis Ababa, 2003/04.

Research Thesis Submitted to the School of Graduate Studies of Addis Ababa University in Partial Fulfillment of the Requirement for the degree of Master of Public health.

By

Yared Abera,MD.

July 2004.
Addis Ababa

Declaration

I, undersigned that this thesis is my original work, has never been presented in any other University and that all resources of materials have been duely acknowledged.

Yared Abera

Signature _____

Place Addis Ababa, Ethiopia

Date of submission July 2004.

This thesis has been submitted for examination with my approval as University advisor.

Dr. Fikru Tesfaye

Signature _____

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List of Abbreviation

AAU	Addis Ababa University
ARH	Adolescent Reproductive Health
DHS	Demographic and Health Survey
FGD	Focus Group Discussion
FLE	Family Life Education
HIV/AIDS	Human/Acquired Immuno Deficiency Syndrome
MOH	Ministry of Health
MOE	Ministry of Education
NGO	Non Governmental Organization
SES	Socio Economic Status
STD	Sexually Transmitted Disease
WHO	World Health Organization

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Abstract

This is a school-based cross-sectional study conducted among female adolescents who were enrolled for 2003/04 academic year in Addis Ababa Secondary Schools. It was done as part of the curriculum for partial fulfillment of master degree in public health. Pathfinder International and Packard Foundation sponsored it.

The study was conducted on randomly selected 863 students. The study looked at research questions such as age at menarche and its correlates; role of parents, schools and friends in the process of maturation; how they are prepared and dealt with menarche, and the current practices; and menstrual hygiene and suitability of school environment during menstruation with its effect on learning process. To reach at the desired objectives, different instruments were used. These were Pre-tested self administered questionnaire; Key informant interview, checklist for observation and focus group discussion.

The study revealed that the mean age at menarche was (13.72±1.31) years. The dominant sources of information and advice on menstruation and how to deal with were teachers, mothers, elder sisters and friends. Fathers and brothers were the least consulted. Almost all girls hadn't expected their menstruation when it happened for the first time. Seventy seven percent of them believed that menstruation was not a female matter which should be kept for oneself, not to talk of it openly to others; 54% of them hadn't told any body. Girls preferred to get information on menstrual matters from female teachers, mothers, female health personnel friends and elder sisters in their descending order. The most felt needs during early days of menarche were menstrual soak ups and information. Sixty one percent of the girls used rag made soak ups during menarche while the current practice showed that only 52% of them used rag made.

Seventy four percent of girls reported to have health problems related to menstruation where abdominal/backache and mood change were the most reported. Absenteeism due to menstruation related health problems was 51%, majority of them for one day when the occurrence of menstruation coincided with week days.

In Addis Ababa adolescent girls reach at menarche while they are still in elementary schools, before they get sufficient information and counseling on menstruation or how to deal with it. Though most of the girls apparently had classes or obtained information on menstruation related facts that focused more on biologic and hygienic aspect, basically they didn't address the psychosocial factors. This directly or indirectly may contribute to absenteeism. Besides this, the poor school facilities that couldn't respond well to the needs of menstruating girls and lack of concern for its management at school are the areas that need attention.

Hence, schools should provide the minimum acceptable, desirable and affordable standardized menstrual hygiene for girls. Health education or any education related to ARH, maturation process, should focus and complete the parent-student-teacher circle. Intervention programs focusing on school health should work in line with improving this situation as well as take this advantage as a good entry point to addressing other ARH problems including HIV/AIDS.

Key words: Age at menarche, Menstrual Hygiene, Absenteeism due menstruation related health problems and Sexuality

I. Introduction

Early adolescence is a time of physical, intellectual, emotional, and social development during which young people confront the questions. Here, physical maturation and particularly sexual maturation, has significant effects on self-concept and social relationships during this period. This period is influenced by peer, parents and teachers (counselors if available). (1,6,11)

When a healthy child is somewhere between 9 and 16 years old, he or she will enter puberty. Puberty refers to the onset of sexual maturation. It is the period under the influence of hormones when the child experiences physical and sexual changes. Adolescence is the period of transition between puberty and adulthood. The onset of menstruation (menarche) is one of the most visible signs that a girl is entering puberty.(2)

There are many challenges during this transition period such as the challenge of understanding self, the challenges of family relationship and counseling, the challenges of peer pressure, and the challenges of physical and sexual maturation. Among these challenges the maturation process with parental counseling capacity and devotion can take the lion share in shaping the maturing individual (3,6,11).

Maturing girls seek advice and support from their parents as well as someone who is closer to them. As menarche is a powerful signifier of entry into sexual and reproductive maturity, it should be dealt with in different perspectives. Normal body maturity should be viewed, in the perspective of the maturing girls, parents, society and the governing socio-cultural norms. Many mothers try to protect their daughters from a knowledge characterized as shameful, if not tragic, by concealing or ignoring the upcoming event their daughters would experience until absolutely necessary, which is usually after they began menstruating.

For most girls menarche is a negative, frightening experience, or, at best, a non-event. Among young girls, menstruation is seen as a nuisance, or is something to fear or to be ashamed of. Clinical studies demonstrated that both pre- and post-menarcheal girls regard menarche as a hygienic crisis than as a maturational event. The role of parents in preparing girls for maturation is often complex and challenging. The explanations they provide to girls as they prepare their daughters for menstruation may be unsuitable and misdirected, infact be partly inadequate to represent all the realities of menstruation, such as the emotional and cognitive changes that arrive with menarche. The other challenge to mothers is the social prohibition that causes parents to avoid discussing menstruation with their daughters, leaving the girls feeling unprepared for menarche (1,2,3,11).

There are different misconceptions and misunderstanding of the subject because of the deep rooted culturally and religiously influenced established and accepted perceived facts related to menstruation. Mothers often times are the closest ones to their daughters when it comes to females' matters especially related to sexuality and its accompany. Nonetheless it is hardly a common scene in most male dominated societies to have daughters talking about female things like menstruation with parents. The subject is strangely and intriguingly a taboo. This is not only a case in developing, culturally, religiously and male dominated society, Africa—Ethiopia; however, even in the developed western countries the problem is seen not uncommonly (4). Menstruation has long history as a taboo topic. According to Delaney, Lupton and Toth(1988), the word 'taboo' has possible roots in the Polynesian word 'tupua,' which means menstruation. The connection between menstruation and taboo was based on the idea that menstruating women are dangerous. They could contaminate crops, bring bad luck to hunters, and spoil the fish. As such, during menstruation women were considered as a threat to the economy of farming societies and needed to be secluded from social and sexual activities as to reduce the danger (45).

The most striking event in the whole process of female puberty is undoubtedly the onset of menstruation, i.e. MENARCHE. It is a different point, marking the borderline

between man and woman. It is an emotionally packed moment with fear, anxiety and feminine hood contentment packed with untold emotional attachment to it, which thereafter creates discomfort and some anxiety when it doesn't occur, as it would be expected.

Many women in developing countries, if asked, will state they have menstrual problems and that their general well being is thereby affected (5). Due to the non-salient, unspoken but ironically understandable taboo about menstruation, females of all age groups don't talk of or seek early preparatory advice before menarche, and even treatment to health problems from concerned bodies related to menstruation. If they dare seek advice, many of them discuss the problem with component of embarrassment or hesitancy. In different countries people give different nicknames and an adage by Shirley "the problem with no name"(4). Many girls use different slang terms and euphemism in an attempt to disguise the actual topic of their conversation. Another tactic girls use is the use of circumlocutions and omissions to avoid naming menstruation itself. Unlike euphemisms, however, they do not replace the word menstruation, rather omit it altogether. One example of this is the omission of the object for the verb "start," referring both to starting menstruation and starting a cycle. These girls use this tactic by saying, "I haven't started yet or I will start next week". Euphemistic deixis is another strategy girls use. Deixis is a linguistic term for the indexical or pointing function of certain words, especially demonstratives, such as *that* and *those,* and pronouns such as *she, it* and *them*. The belief among these girls is that by using these terms, adults and boys will not understand what they are discussing. Hence, it is rarely that both adolescents and adults discuss menstrual matters related to sexual maturation freely with parents and their siblings respectively which has got a real negative impact.

Women will most likely try to ignore their symptoms or take painkillers (if she has got some education) and some with dubious herbal medicine. The reason is probably that menstruation is a female concern, and deeply personal issues. Females during their

menstrual periods don't even wash their sanitary materials, the usual rag made, in public; however, hiding even from their parents and married ones form husbands. In several African societies menstruating women make known their unavailability for the bed (Malawi) or going to bed fully clothed (Nigeria.) (16). In general menstruation is not a subject for public discussion nor is often talked about in private, often regarded as shameful.

In many European and African countries the contemporary teenagers about one in eight girls reach menarche while they are still at primary schools (7,9,12,13,14). Addressing the issue of age at menarche, and awareness on how to deal with menstrual problems can be useful starting point for linking them with adolescent programs providing sexual and reproductive health information and education as well as clinical management. This is relevant for all girls, whether sexually experienced or not, and is a logical step to helping them through their years of sexual maturity.

To mitigate the problems associated with maturity process, the reproductive health issues of adolescence, different small and large scale inconsistent and un sustained programs and projects had been and being implemented by MOH, Regional Health Bureau and other non-Governmental organization without marked appreciable out comes. Moreover studies and intervention programs toward menstruation related problems such as inadequate knowledge about it before the onset, information around menses, sanitary facilities at homes, out of home and at schools, sanitary materials used, effect of these problems in learning process of girls and managements of minor and major menstruation related problems are lacking.

II. Review of Literature

i. Menarche

Menarche is the period at which menstruation begins. Menstruation is the discharge of blood and tissues from the lining of uterus each month. It is often called the menstrual period and is a function of the female body.

The age at onset differ form race-to-race; and depending on geographic location. However, the average age has come declining since the dawn of the 20th century in many countries of the world. This age has leveled to 12.5 years in most European and North American countries (12,14).

The onset of menstruation, MENARCHE, is influenced by different factors like genetic factors, environmental conditions, body stature, socio-economic status, nutritional and health status, family size, level of education and psychological well being (7, 9, 13, 14, and 19). It is typically occurs about 2 years after initial pubescent changes are noted. It may occur as early as 10 years, or as late as 15 years, with the average in the United States being about 12.5 years. A concurrent rapid growth in height and accumulation of fat in girls occur between ages of about 9.5 and 14.5 years, peak at around 12 years (21). A closed cohort done in Taipei city, in 1993, in eight elementary schools showed that 45% of school girls had their first menstruation before graduating from elementary schools (29).

Besides early menarche's association with higher risk for breast and other reproductive tract cancers, those menstruate earlier, i.e. 11years of age (early maturer, by Brook-Gunn) have a poorer attitude toward menstruation; more likely to report severe menstrual symptoms; have a poorer preparation for menarche; have a poor body image; may have poorer self-esteem especially if changing school and earlier onset of dating, smoking, drinking and sex.

Different Studies have tried to show the relationship between age at menarche and possible determinants. Most previous researches have been logically unable to disentangle the genetic and environmental influences on age at menarche. A data on 1338 kinship pairs from the National Longitudinal Survey of youth in behavioral genetic analysis in USA partitioning variability in menarcheal age into genetic and environmental sources showed that about half the variability in menarcheal age was related to genetic influences. Father absence was associated with a younger age at menarche, and residing with two parents under extreme living conditions may delay age at menarche (22). Though this study didn't come up with effect of family size, birth order, personality, income or parental education; study done in London (19) family size had effect on age at menarche.

Studies in most settings, showed strong association between age at menarche and premenarchial weight gain with fat accumulation. Study done in Shiraz, Iran showed that BMI was significantly correlated with age at menarche and under weightedness delayed menarche by about 15 weeks, while over-weighted ness and obesity promote it by 13, and 19 weeks, respectively as compared to the girls with normal weight. This study has shown also that menarche happened to occur during the seasons the schoolgirls took vacation supporting the fact that stress associated with school activities could have an inhibitory effect on the onset of puberty (14).

Socio-economic status is another determinant on age at menarche. A study done in India showed that in general daughters of hamals (loaders), housemaids, day laborers experienced menarche later than the girls of the middle and higher economic groups. The difference was about 12 months (23).

In contrary to the study done on contemporary British teenagers which the study found out no difference on median age at menarche by social class or ethnic group, the study on Iranian School girls showed that nearly one-fourth of girls who were from poor

families had higher age at menarche than girls of the middle and higher classes (13,14,19,24).

Nutritional status and dietary habits are also influencing factors on age at menarche. Foods containing high calories and proteins are associated with early onset of menstruation (8,23,24). Shastree et al (1974) conducted a study on Maharashtrian girls and found that non-vegetarian girls would menstruate about 6 months earlier than a vegetarian. This was seen on recent study on the same ethnic group that maximum numbers of girls experiencing early menarche were reported in the non-vegetarian group (23).

A western style diet of refined grain products and high fat dairy foods, diet with a very low in take of fruits, vegetables, free nuts, and fatty fish is associated with early onset of menarche. However, girls with high fiber intake have significantly lower risk for early onset of menarche (8). A study done in rural Senegal (1995) showed that puberty assessed by age at menarche was delayed by about 3 years with probable explanation due to malnutrition (25).

Though the difference between the exercising and the non-exercising group were statistically non significant, in previous study (Valsik et al, 1973) girls who had to do more physical work, or had a long, tiresome way to school and spent greater expenditure of calories delay the process of puberty (23).

Besides, the different influencing factors on age at menarche, the declining trend has great impact on sexuality of the contemporary adolescents; and the other big concern for both parent as well as health care professional is the implication that early puberty may have negative effect on girls' mental health and their quality of life (15).

This earlier age at menarche than before with concomitant younger age at birth, at first marriage and at first sexual intercourse has attained different pictures. Premarital sexual activity parallel with delay age at marriage is rising faster. In Africa, among

Kenyan students surveyed in the late 1980s, 17% of girls in primary and secondary schools were sexually active. In Latin America, average age at first intercourse for girls ranges from 16 to 18 years that has decreased in decades time (7,10). Early age at child bearing has a detrimental effect on health of both mother and child. More than 50% of women age 30 and above (DHS 2001, Ethiopia) have had their first birth in teenage, even among the cohort age 20 - 24 sizeable proportion 44% have had their birth before age 20 in most sub- Saharan countries. The prevalence of HIV/AIDS is high in the age range 15 to 24 years. So, using and dealing with age at menarche as a point of entry to addressing the problem of adolescent health as early in primary school is a best alternative strategy(10).

ii. Menstruation Related health problems

Menstrual problems account for much of the morbidity that occurs in women of reproductive age, being one of the four most common reasons for consulting general practitioners (33).

Menstrual complaints typically present a complex combination of psychological symptoms, including irritability, aggression, tension, anxiety and depression, and weight gain (31,32). According to a population survey in Glasgow and Edinburgh among women of reproductive age found that 24% reported a recent painful period and 20% heavy period with about half experiencing both. Fifty six percent of those with heavy periods and 44% of those with pain reported mood changes around the time to a period (33). Women are affected irrespective of socio-economic status, race or cultural background, and family clusters are well documented. The causes of the premenstrual syndrome have not been clearly elucidated but have been attributed to hormonal change, neurotransmitters prostaglandin, diet, drugs and lifestyle (32).

A study done in SE Nigeria on rural adolescent girls showed that 26.9% of girls complained severe pain(dysmenorrhoea) in every menses and 31% suffered from either menorrhagia i.e. excessive blood loss or moderate/severe menstrual pain. Fourteen percent of girls were frequently absent form school. Around 47% took palliative drugs - mostly bought from patent medicine seller (34,35).

Though dysmenorrhoea in adolescents usually begins 2 to 3 years following the onset of menses, it can also be experienced even in the annovolutory period soon after onset. It is characterized by crampy lower abdominal pain that begins prior to the onset of a menstrual period and lasts for 1 more days in to the period and subsides. Pain may be mild to severe, and associated with nausea and vomiting and changes in bowel habits either constipation or diarrhea (29,30).

Most females experience some degree of pain and discomfort during menstural period, which can impact on their daily activities, and disturb their productivity at home or at their workplace. Some studies report the prevalence of dysmenorrhoea as high as 50% during the reproductive life of women. In the same studies showed that nearly 10% of females with dysmenorrhoea experienced an absence rate of 1 to 3 days per month from work or were unable to perform their regular daily tasks due to severe pain (18,29,34,35).

The Iranian Study on adolescent school girls showed that the prevalence of dysmenorrhoea was 71%, of these 15% it had interfered with their daily life activities and caused them to be absent form school for 1 to 7 days a month. Over 67% of the girls reported taking palliative medicine without consulting a doctor (30).

iii. Menstrual Hygiene

Menstruation is a natural phenomenon where healthy matured females experiencing it every month for one to seven days. Women lose between 4 to12 teaspoons of

menstrual blood each month. The bleeding is not with bad odor or unhealthy. However, it should be carefully dealt with. There are many different means of soaking up the flow, using home made –reusable, washable rag, cloth; or commercially made.

In a study published in winter 1995 issues of the Journal Adolescence, researchers asked 157 ninth-grade girls about the best ways to prepare for menarche. Thirty- five percent of the girls asked adults to offer "support and reassurance" and 34% asked for "knowledge about menstrual hygiene" (11).

In different settings and circumstances one can notice how poorly girls are prepared and advised to attend menarche. This is not a case only for societies dominated by traditional and cultural beliefs as well as practices where menstruation considered as taboo to be discussed among family members or others. A good example is the one taken from a mother and a researcher around menstruation, Shirley. (4) She asked her girl friends how they learned about menstruation. One woman told her that her mother was just "not the kind who would explain anything," so her older brother told her how to put in a tampon by reading the little booklet that comes in the box - through the bathroom door! Another told her that she got her period the first time the day of a very important swimmeet and that her mother spent two hours trying to get a tampon into her so she "would not let the family down." Others remembered that their mothers had left pamphlets lying around the house, or had their older sisters explain "things." Many said they had never really thought about it. She told to her self ‘It was sad!’

In the past few decades there has been concern about the existing wide gender gap in

educational systems in sub-Saharan countries, Ethiopia included, with girls lagging behind
boys in enrollment, persistence and academic achievement. Other than the different factors that can be mentioned in the process of sexual maturation in girls that plays role in influencing this gender disparity have not been adequately examined ; however , key influences on girls' learning associated with sexual maturity include the following:

- Lack of knowledge of human growth and development
- Attitudes of teachers and other pupils towards girls as they mature,
- Parental protection due to concerns about safety,
- Girls potential sexual activity as they mature, and
- The management of menstruation outside the home.

In most African and developing countries schools are not with adequate toilet facilities which girls can use to change menstrual hygiene materials with adequate privacy and sanitation. Further, there is usually no proper site for the disposal of used materials. Though this is true for most of the rural schools, it is also applicable in the urban areas. It is practical and reassuring ideally to have sanitary towels ready in the bathroom or bedroom to prepare for a first period. When a period begins, a sanitary pad is simply placed in the underwear to absorb the blood. It is always a good idea to have sanitary towel in a school bag, just in case a period begins while she is in school. However, if a girl has not brought a sanitary pad to school and her period begins, she should be able to get them from school nurse or from a teacher.

There are different menstrual flow catching or absorbing materials ranging from rag made to very costly industrial products. There are increased innovations providing women with myriad options in choosing feminine hygiene products that will best suit their needs. Among the factors that determine quality of products:

- Leak protectiveness
- Absorbency capacity

- Dryness
- Comfort and size of the product, thinness
- Allergy to the product
- Biodegradability

The feminine hygiene product is a multi-million dollar business and very competitive one where there is continuous improvement and challenges from different companies with improved market attractiveness to the comfort of consumers (37). The first commercial tampon in USA was marketed in 1930s. This start had had a support from the then renowned Gynecologist, Dr. Richard Dickson who published a paper on JAMA in 1945 'Tampons as menstrual guard', that claimed the added importance of using tampons than the usual home made or commercial pads. He stressed that using the pads as menstrual guard for 'The Curse'-he named menstruation, is very unhygienic as it may foster fecal contamination of vagina and also acts continuously as arousal rubbing the vulva during each walk. (12)

The different menstrual flow catching materials are:

- Rag made
- Pad
- Tampon
- Cups and disposable or reusable
- Panty liner
- Reusable panty

Though there are no documented data on the prevalence of tampon users or if at all there are, it is associated with the risk of developing toxic shock syndrome (TSS). It is a bacterial induced reproductive tract infection at times could be lethal to end the victim in death. In 1980, 38 women died in America of TSS related to tampons use. It is associated to dioxin bleaching, organochlorine bleaching as well as chemicals to aid in

absorbency. It is estimated that an average woman may use up to 15,000 tampons in her life time. 'That is a lot of waste for the environment.' (12)

Hygiene related practices of women during menstruation are of considerable importance especially for young girls who don't have experience. Especially during the onset, at MENARCHE, menstrual flow could occur accidentally while they are still in class or out of home. Water, privacy in school to change products and dispose used materials at schools have got psychological impact and disruption of academic performance. A study in Iran showed that only 32% of study subjects have practiced personal hygiene during menstruation such as taking bath, used hygienic protective gears, changed it every 6-8 hour etc. (29). Out of randomly selected 344 primary schools in United Kingdom although sanitary towels could be obtained in 90% of them, they were generally only available from an adult (teacher, secretary, or school nurse). Only 1.4% of school had a machine in the girl's toilets where sanitary towels could be obtained unobtrusively. Disposal facilities were available within an individual cubicle in only 34% of girl's toilet (13).

A study in kerala (Anuradha) showed that 60% of women dealt with menstruation un hygienically. A statistically significant association was seen between menstrual hygiene maintenance and education, SES, knowledge prior to menarche, type of protection, access to water, bathroom facilities and menstrual disorders. It showed also unhygienic menses and reproductive tract and skin infection (17). The schools because of facilities (toilets, water supplies) were in adequate for coping with menses.

III. Problem Statement

Young adults do face serious health risks as they mature and become sexually active. Most face these risks with too little factual information, too little guidance about sexual

responsibility and too little access to health care (6,7). Meeting young adults' diverse needs challenge parents, communities, health care providers, teachers and educators.

The beginning of early sexual intercourse without sufficient awareness of the consequences and how to prevent it, has very devastating effect with the long term back firing. Besides, girls who started menarche earlier tend to begin dating and having sexual intercourse younger than their classmates (14). The poor intra family openness and communication around sexual maturity on top of peer pressure and the 'I can handle it' sentiment of young adolescent make the declining age at menarche very critical turning point in the life of young adolescents.

The availability and quality of sanitation facilities will obviously influence the attendance of girls in school. The lack of adequate toilets and washing facilities contribute for school absenteeism and school performance of girls. The lack of privacy to change protective gear, the inability to having affordable sanitary protective materials that force them to use unsanitary rag made for longer hours in not well ventilated jostled classrooms leading for development of bad odor and at extreme RTI as well as skin problems. This creates young girls to be anxious restless and absent from school. There fore this study ventured on this undermined over looked but humiliating situations. The study focused on to investigating the real problem around menstruation focusing and tried to get answers for the following research question:

- Age of menarche and its correlates
- Role of parents, schools and friends in the process of maturation
- How they were prepared and dealt with menarche, and the current practices
- Menstrual hygiene and suitability of school environment during menstruation.

IV. Objective

4.1 General objective

To assess awareness and behavior towards menarche and menstruation related problems among high school adolescent girls.

4.2 Specific Objective:

1. To determine the age at menarche and its correlates among female adolescent in secondary schools,

2. To examine the psychosocial preparedness and reaction of adolescent girls towards menarche and sexuality,

3. To assess the role of parents and schools in counseling adolescent girls about handling menstruation and menstrual hygiene,

4. To assess the knowledge and practices of adolescent girls about menstrual hygiene,

5. To estimate the prevalence of medical and academic problems associated with menstruation.

V. Methods

5.1. Study area

The study was conducted in Addis Ababa on randomly selected secondary schools. The population of Addis Ababa is close to 3 million with annual growth rate of 2.9% (26). According to the current education policy schools are divided in to primary (grades1-8) and high school- 1st cycle (grades 9-10), and 2nd cycle Technical and vocational education training and preparatory (11-12). There are 46 high schools with grades 9 & 10. More than half of these, i.e. 26 are non-governmental and 20 are government owned, enrolling about 5721 and 42911 students (girls), respectively (27).

During the 2002/3 academic year there were 125, 237 students in secondary schools and preparatory schools. The pupil to section ratio was 92:1, which is almost similar with the national figure 80 students to one section. On the other hand, the national figure for pupil to teacher ratio in 2002/03 was 49 to 1; the figure is smaller for Addis Ababa, 42:1. This ratio is considerably smaller among non-governmental schools (27,28).

Facilities within the countries' schools though vary from region to regions most of them share
relatively similar drawback. Of all schools 47% reported to have water facilities while only
3% have clinic with in the schools compound, and 78% do have latrines.

5.2 Study design

This is a school-based, descriptive, cross-sectional study.

5.3 Source Population

All female secondary schools students in Addis Ababa who were enrolled in grades 9 & 10 during the academic year 2003/04 are considered as the source population.

5.4 Study Population

The study population was female adolescents in grades 9 & 10 who were attending the regular (daytime) in the randomly selected schools during the 2003/04 academic year.

5.5 Sample Size

The sample size was determined using the formula for single population proportion.

$$\mathbf{n} = \frac{Z^2_{\alpha/2}\ p(1-p)}{d2}$$

Where: $Z\ \alpha/2$ = The Z- score corresponding to the 95% confidence level which is 1.96.

P is the proportion of girls who are absent from school due to menstruation related problems.

d is the degree of precision

Assumption for calculating the sample size:

- Confidence level = 95%
- 5% degree of precision
- It was not possible to get previous studies for estimation of proportion on the prevalence of absenteeism during menstruation. Besides, for the sake of having larger sample size it was considered taking 50% as appropriate.

Taking the above assumption 'n' becomes 384. With the design effect of 2 and 10% non- response rate, the final sample size became 845.

5.6 Sampling procedure and selection of study subjects

The sampling procedure started by stratifying the schools into two categories, governmental and non-governmental. There were 20 governmental and 26 non governmental schools. For selection of representative numbers of students, the ratio of students in the respective types was considered i.e., 1:8. It was needed to have 94-96

students from nongovernmental schools. This could be obtained by selecting two schools. The selection of these schools was done randomly. The assumption was applied to select six schools from the governmental schools. Initially this was done with an intention of selecting 845 female students. However, this number increased to 863 because of some of the selected classes had more than expected number of students, this variation seen in the governmental schools. Considering the overall 1:8 ratio of students between non-government and government owned schools, 96(11%) were from non-government and 767(89%) were from governmental. The 96 students were 48 from each school, and 23 from each grade that was selected randomly from the total sections of grades 9th and 10th. This was done first by randomly selecting a class from the available grades 9th and 10th. The 767 students were 128 from each school, 64 from grade 9 and 64 from grade 10 selected randomly. Since it was not possible to get 64 female students in a class, and as there are two shifts in governmental schools, 32 students per shift from the same grades were selected randomly.

5.7 Recruitment and training

Two data collectors, twelve grade complete with past experience on data collection, and one supervisor with respective qualification of Nurse and Sociology and experience of counseling were recruited. The supervisor was additionally entitled to facilitate and mediate the FGD. One-day training on how to guide and direct students during questionnaire completion was given. The training included ethical issues like confidentiality and the right of students, the focus area of the FGD where to give emphasis and how to encourage girls talk theirs and their friends' experiences before and after menarche, as well as, how to take information. There was discussion on the content of the questionnaire in detail.

5.8 Data collection

The study employed both qualitative and quantitative methods for data collection. A structured pre-tested closed-end questionnaire; and an interview guide for key-informant interview and focus group discussion, and checklist for observation were the instruments.

The students completed a structured, **self-administered questionnaire** after brief introduction by principal investigator, supervisor and data collectors about the study and how to fill in. They were informed about the confidentiality of all information they give and their right each of them not to answer a particular question if they don't want to. Before the start of data collection was launched the questionnaire was pre-tested on 60 students, selected randomly from 9^{th} and 10^{th} grades, at Tikur Anbessa Secondary School. The questionnaire was mainly composed of 'closed-end' questions covering socio-demography, menstruation related information, sexuality, and menstrual hygiene.

A checklist was used to make an inventory on sanitary facilities available in the schools. The list contained questions on availability and accessibility of water near and in latrines, privacy and adequacy of latrines, availability of disposal sites for menstrual hygiene material, and the presence of clinic or clinic srvices to the students for consultation and counseling during menstruation within the school premises.

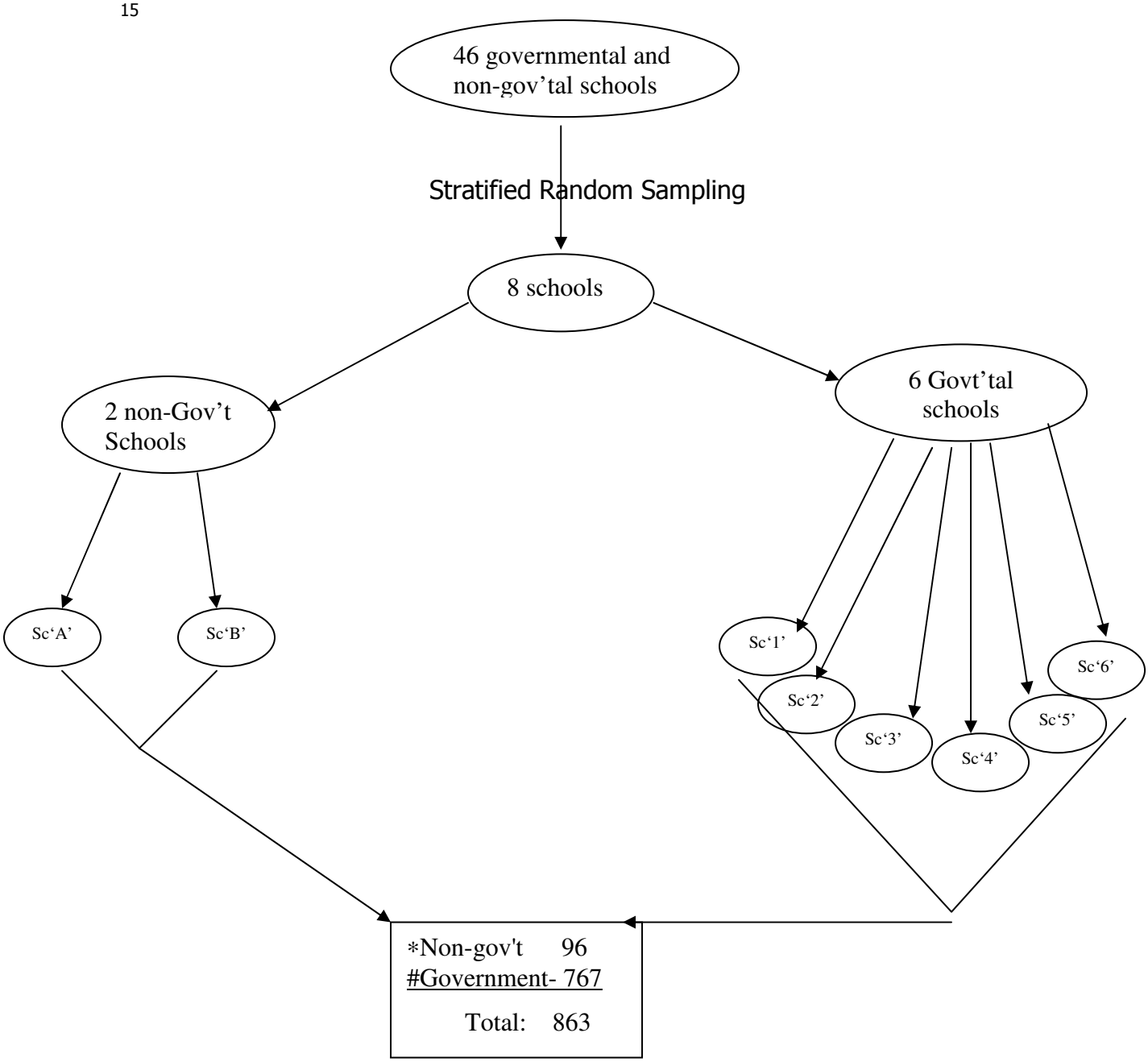
Interview was also made with key-informants of the respective school authorities, Region-14 Education Bureau Planning Department officials, Ministry of Education and Ministry of Health Environmental and Hygiene departments, on issues related to menstruation currently and in the future. A semi-structured guide was used for this purpose.

Focus Group Discussions, a total of four FGDs, each involving a group of 8 students were conducted at three governmental and one group from non-government schools were conducted under a female Nurse-sociologist facilitator, using a semi- structured interview guide. The discussion was made within the school compound in the quietest

corner appropriated by school officials. The girls for the FGD were selected from Girls' and anti AIDS clubs, and among other volunteers. The discussion focused mainly on personal experiences shared among the FGD participants, friends, and families during menarche, and quotes were recorded too. The FGDs were recorded using tape recorder.

fig 1 - Schematic Representation of the sampling procedure

15



*Random selection of grades9&10 from the selected two school, from each class consisting of 23 students. This will make 47 students/non-governmental school total of 94 students #From each selected governmental school 32 students /shift i.e. 64/class-9th and 62/class-10th, this will make 128 per school and a total of 863 students.

The atmosphere of the discussion was also recorded, including their reactions toward each question. The FGD attempted to uncover some untold experiences among them from one to other discussions.

5.9 Data Quality Assurances

The data quality was maintained through careful design of questionnaire by standardizing, translation from English to Amharic and back to English, as well as, pre-testing for relevant amendment. The data collectors and supervisors provided the necessary introduction and instruction to the students and clarified problems that were raised during data collection. The questionnaires were checked for the completeness immediately after data collection. During the completion of questionnaire the students were given the chance to ask about what was not clear or difficult to understand. The principal investigator and the supervisor closely monitored the data collection process.

5.10 Variables of interest

The study focused on socio-demographic variables including family size, religion, ethnicity, Socio-economic status, and educational level of parents. The other variables were mean age at menarche, family role during maturation, source and preference of information on menstruation and related practices. Variables that could show effects of menstruation on girls' school attendance were also studied, these included;

- Age at menarche
- Educational level of parents
- Season of menarche
- School absenteeism during menses
- Psychological and physical reaction during menarche
- The role of families, teachers and friends in the preparation of girls to sexual maturation
- Knowledge and use of menstrual soak ups or menstrual hygiene

- Health problems related to menstruation
- School environment suitability during menses: classrooms, latrines and availability of clinics.

5.11 Data entry and analysis

Questionnaires were coded after cleaning was done so that all the variables in the questionnaire could be followed by end coding. This was pre-tested by entering 50 questionnaires. After this validation data entry technicians entered the data using EPI Info version-6. Data analysis was made using both EPI INFO and SPSS version-10 statistical soft ware package, for testing association and other statistical computations. Frequencies, proportion, measure of central tendencies and variation were determined. A scoring system was applied to produce composite measure for socioeconomic status. Chi-square test, correlation and regression for measuring strength of association; and OR for measuring strength of association were used.

The data collected from the FGD were transcribed and the other information gathered through key informant interview and checklist observation was discussed.

5.12 Ethical Considerations

The study was conducted after ethical clearance from Addis Ababa University, Medical Faculty was obtained. Schools' director and directress were briefed on the objectives of the study. Verbal informed consent was obtained from the participants. Confidentiality was maintained by omitting their names and addresses on the questionnaires. Students were informed of their full right to skip or ignore any questions or terminate their participation at any stage.

5.13 Operational definition

Menarche – onset of menstruation for the first time.
Severe menstrual problem is menstrual problem that keeps student away from class or school for one or more days.
Mild menstrual problem- when the problem doesn't interfere with normal class attendance on using or without medication.

Menstrual Sanitary hygienic materials - materials used for absorbing or catching menstrual flow.
Menstrual hygiene is healthy practice during menstruation to frequently change menstrual soak ups (every eight hours) and under wears; and minimum twice a day washing.

Absenteeism - not to be in class and/or in school for regular attendance because of menstruation related problems.

Socio-economic score is a composite score given for six variables selected. These are parent/guardians' job, permanent pocket money, ownership of Television, ownership status of house, ownership of vehicle and the means for body washing at home.
Low income lies below 25th percentile, middle income lies between 25-95th percentiles and high income lies above 95th percentile.

Regular menstrual cycle is menstruation that occurs uniformly and in orderly intervals through out a given period of girls'/women's life, 21-35 days of interval.
Irregular menstrual cycle is menstruation that occurs in disorderly interval from one cycle to another.

Knowledge on menstruation is the awareness of girls before and after menarche that menstruation is a natural and normal physiological maturation process.

Psychosocial preparedness is the readiness of a girl before menarche with knowledge and attitude that menstruation is a normal process and should not be ashamed or afraid of.

VI. Results

i. Socio-demographic background

There were two non-governmental and six governmental schools selected for the study. Eight hundred and sixty three girl students participated. The majority, 767(89%) were from governmental and the remaining 96(11%) were from the non-governmental schools. The (mean ± SD) age of the girls was 16.13± 1.57 years, ranging from 13-22 years. Nearly all the girls except three were unmarried. Most of the students were from Amhara ethnic group 441(51%) and Christian-Orthodox denomination 680(79%). *(Table 1)* Five hundred and thirty six (62%) of the girls live with both their father and mothers. Seventy six percent of girls live in houses that have got television sets. Sixty six (7.7%) of the girls earn money working out of school while, 231 (30%) of them get pocket money from parents or family members.

ii. Menarche and its correlates

Of the 863 female students, enrolled into the study, 821(95%) had experienced menstruation*. (Table 2)* Twenty eight from government and three from the non-government schools reported that they hadn't started menstruating i.e., 3.6%. The rest 11(1.3%) couldn't remember the age at menarche. The mean age at menarche was 13.72 ± 1.31 years with median age of 14 years. The mean age for governmental schools was 13.78 ± 1.32 while for the non-governmental schools it was 13.18 ± 1.13 with mean age difference of 0.61 year. The mean age of girls who hadn't started menstruation was 14.36 ± 0.92 with minimum 12.75 and maximum of 16.58 years of age. Association between age at menarche and other supposed predicting variables:

ethnicity, religion, family size, whom they live with, parents' education and SES was examined. It was found that there is significant relationship with SES at $p<0.05$.

Table 1: Socio-demographic characteristics of girl students, Addis Ababa, 2003/04

Variables	n=863	Frequency	Percent
Grades			
	9^{th}	461	53.4
	10^{th}	402	46.6
Age			
	13-15	347	40.2
	16-18	439	50.9
	19-21	74	8.6
	>21	3	0.3
Ethnicity			
	Amhara	441	51.1
	Oromo	168	19.5
	Ghuraghe	126	14.6
	Tigire	102	11.8
	Silte/Kembata/Hadiya/Hadere	26	3.0
Religion			
	Orthodox-Christian	680	78.9
	Protestant-Christian	86	10.0
	Moslem	82	9.5
	Catholic	15	1.6
With whom girls live			
	Mother and father	536	62.3
	Mother only	146	17.3
	Relatives	95	11
	Mother and step father	42	4.9
	Friends/husband/sister/brother	38	4.3
Fathers' education status (n=740)			
	Can't read and write	61	8.2
	Only read and write	243	32.8
	6-8 grade	73	9.9
	9-12grade	226	30.5
	Diploma	67	9.1
	Degree and above	70	9.5

Contd. Table 1

Variables	Frequency	Percent
Mothers' educational status (n=821)		
Can't read and write	149	18.1
Only read and write	301	36.7
6-8 grade	75	9.1
9-12 grade	203	24.7
Diploma	73	8.9
Degree	20	2.4
Parents' job status n=834		
Only father works	330	39.6
Both parents work outside of home	275	33.0
Only mother works	113	13.5
Both not working	60	7.2
Father on pension	29	3.5
Mother on pension	27	3.2
Transportation to school		
Walking	565	65.8
Taxi	162	18.8
Public bus	96	11.2
Private car	36	4.2

In average a girl had menstruated for 2.67 years with minimum 0.08 (one month) and maximum of 8.75 years. The seasons of onset of menstruation vary through out the academic calendar. Most of them had started their menstruation in academic seasons of vacation, 315(38%). (Table 2)

At the very early days following menarche they encountered different physical and psychological symptoms. Over half of the girls, 450(54%) in this study reported having had abdominal/back pain. Besides, 369 (44.4%) of them had irregular menstrual cycles which in most of the cases became regular after six months 88(22%) or after one year 108(26.7%). The rest of the study group had regular cycles that extend from 21 to 35 days.

Majority of the girls 708(85%) knew about menstruation before they had menarche. Six hundred and eighty nine (82.8%) of them had at least one person who had told/advise them about menstruation. The dominant source of information and advice for the girls were teachers, mothers and sisters. In the majority of the circumstances fathers were the least consulted one. Only 74 (10%) of girls found it easy to communicate with their fathers on this issue.

Girls in the study reported the different places where they experienced their first menstruation; 630 (76%) at home, 132 (15.9%) at school and 67(8.1%) at different places out side of their homes. Almost all students hadn't expected their menstruation when it happened for the first time. These girls had protean reactions towards menarche. Most of them 448 (54%) reported that they didn't tell any body. Few of them either they had told their mothers, sisters or relatives. However, 636 (77%) believed that menstruation was not a female matter which should be kept for oneself.

Girls' knowledge about average age at menarche, regular cycle interval, duration of flow and their personal experiences were also assessed. Seventy percent of girls answered that the average age at menarche in healthy girls was 12-14 years of age. Similarly the average cycle interval was every 28-30 days with flow duration of 3-4 days. About 60% of the girls had 3-4 days menstrual flow, with cycles lasting 28-30 days. (Table 2)

Ninety percent of the students reported that they have had class session on menstruation in one of their educational subjects about menstruation. The subjects were Biology, Science, Physical Education or Environmental Science. The girls expressed their preferred source of information on menstrual matter. Thus, most of them preferred to get from female teachers 297(37%), friends 254(32%), health personnel 258(32%), and their elder sisters 190 (24%). (Table 2)

The girls also expressed their most felt need during menarche from their parents or some one who was close to them. Nineteen percent (143) of them were in need of reassurance and comfort. The majority of them were in need of lesson on what menstruation was and the precaution they had to take, and provision of protective materials. During the first days of menarche, 226 (27%) and 170(21%) of the girls obtained protective gears from their mothers and elder sisters, respectively. At the time of menarche 503 (61%) of girls had used rag made menstrual soak ups, 37% of which were made by the girls.

iii. Menstrual health problems

Students were asked for different health related problems associated with menstruation and their practices, as well as, its effect on their school attendance and performances. Of the 832 students who responded whether they had any health related problem during menstruation, 618(74%) had experienced such problems for one or more occasions. Most of these girls reported abdominal/back pain as the most frequently encountered problem 337(54.5%) followed by mood change/swing 218(35%) like irritability and depression. (Table 3)

Table 2: Awareness and behavior towards Menarche, in high school girls. Addis Ababa, 2003/04.

Variables	Frequency	Percent
Academic season when menarche started n=830		
1st semester	298	35.9
End of academic year's vac.	222	26.7
2nd semester	217	26.2
Between semester's vacation	93	11.2
Physical symptoms girls had during menarche		
Abdominal/back pain	450	54.2
Weakness	143	17.2
Heavy bleeding	109	13.1
Sleeplessness	91	11.0
Don't remember	4	0.5
None	124	14.9

Contd. Table 2

Variable	Frequency	percent
Menstruation regularity during menarche (n=822)		
Yes	405	49.3
No	417	50.7
Irregularity reverted to normal		
Two months later	17	4.1
Three months later	96	23.0
Six months later	94	22.5
One year later	114	27.3
Still not regular	96	23.0
Menstrual knowledge before menarche (n=832)		
Yes	708	85.1
No	124	14.9
Informed on menstruation before menarche?		
Yes	689	82.8
No	143	17.2
Sources of information before menarche		
Teacher	347	42.0
Mother	332	40.0
Friends	171	20.7
Sister	169	20.5
Reading	156	19.0
Father/brother	60	7.3
None	143	17.0
Post menarche advice on how to deal with it from family members		
Yes	516	62.3
No	312	37.3
Preferred source of information		
Female teacher	297	37
Mother	283	35
Health personnel	258	32
Friends	254	32
Sister	190	24
Books/magazine	154	19
Male teacher	67	8.4
Father/Brother	39	5
Video/movie	44	5.5

Contd. Table 2

Variable	Frequency	Percent
The girls' most felt need during menarche (n=790)		
Provision of soak ups	273	35.0
Lesson about menses and precaution	187	24.0
Comfort/reassurance	143	19.0
Advise on how to make soak ups	7	0.9
None	226	29.0
Girls' feeling of their preparedness at menarche		
Not at all	355	43.0
Not well prepared	196	23.7
Prepared well	156	18.9
Don't remember	119	14.4
Menstrual soak ups at menarche		
Rag made pad	503	61.0
Commercially made pad	293	35.0
Napkin/soft paper	33	4.0
Source of soak ups at menarche		
Self made	309	37.3
Mother	226	27.3
Elder sister	170	20.5
Girls bought it	94	11.3
Father/friend /brother/relative	30	3.6

During such occasions girls consulted family members 332(47.6%) for any kind of help like acquiring drugs or comfort/assurance. The other majority 113(16.2%) bought medication/or took without consultation of health personnel or anyone. Girls reported to take medication like panadol, dipyrone, advil, tynalon, prudence/choice-brands of contraceptives either bought or acquired it from family members.

Thirty nine percent, 325 students reported to perceive that menstruation could affect or interfere with school performance. Moreover, 313(37.8%) of the students reported that they had difficulty of attending classes attentively as non menstruation days. Absenteeism due to menstruation related health problems was found in 313(50.7%) of

the students ranging from one day to four days every time when the occurrence of menstruation coincided with week days. (Table 3)

It was examined whether there was any association between school types, governmental versus non-governmental schools, and school absenteeism due to health problems related to menstruation. Here it should be noted that both schools had nearly 74% of students with health problems. But, it was found out that 8(11.8%) of non governmental and 305(55.45%) of governmental school girls were absent from schools. This was tested for association and turned out to be statistically significant at $p< 0.05$. The likely hood of being absent from schools 'cause of menstruation related health problem was 35.96 times higher for students with menstruation related health problems at $p<0.05$, and OR=35.96, 95% CI (11.6-110.9).

iv. Menstruation and menstrual hygiene

The study has also examined knowledge, attitude and practices related to menstruation and menstrual hygiene. Out of the 831 girls who were menstruating 545 (65.6%) reported feeling discomfort during menstruation while in school. Their attitude towards menstrual blood flow, 546(66%) thought that there could be foul odor and 406 (49%) the blood unhygienic.

Table 3: Health problems related to menstruation in high school girls. Addis Ababa, 2003/04.

Variable (n=832)	Frequency	Percent
Health problem during menstruation		
Yes	618	74.3
No	214	25.7
Health problems, recent		
Abdominal/back ache	337	54.5
Mood change/irritability depression	218	35.3
Irregularity	128	20.7
Headache	93	15.1
Excess flow	92	14.9
Sleep disorder	37	6.0
Perceived effects of menstruation on school performance		
Yes	327	39.3
No	505	60.7
Menstruation related absenteeism		
One day	276	44.7
Two days	21	3.4
Three days	11	1.8
Four days	5	0.8
None	305	49.5

Of the 770 girls who gave multiple answers about what menstrual hygiene was 657(85.3%) responded that frequent washing, 547(71%) frequent changing of protective gears and few of them 43(5.6%) responded frequent changing of pants. About 730(87.5%) of the girls reported that they changed their menstrual hygiene materials twice or thrice a day. Ninety four (11%) of them did change once a day. (Table 4)

Table 4: Current knowledge and behavior related to menstruation and menstrual hygiene in high school girls. Addis Ababa, 2003/04

Variables	Frequency	Percent
Comfort at school during menstruation n=831		
Disturbed	545	65.6
Not disturbed	286	34.4
Perceive menstrual blood to have bad odor		
Yes	546	66
No	281	34
Perceive menstrual blood as un hygienic		
Yes	406	49.1
No	421	50.9
Sitting beside male student during menstruation		
Feel no different	403	48.5
Don't sit	209	25.2
Feel discomfort	117	14.1
Ashamed	102	12.3
Attending class session during menstruation		
Difficult	314	37.8
Not difficult	517	62.2
Knowledge on menstrual hygiene		
Frequent washing	657	85.3
Frequent changing of soak ups	547	71.0
Frequent changing of under wears	43	5.3
Don't know	20	2.6
Menstrual soak-ups used		
Commercially made	395	47.6
Home made pad	434	52.4

Of the 831 students 403(48.5%) felt no inconvenience sitting beside male students during menstruation, while 117(14%) and 102(12%) felt discomfort and shame, respectively. The rest 209(25%) didn't sit beside male students. Contrary to what they

used in place of menstruation, 257(31%) very few number of students 35(4.2%) reported using euphemism for menstrual soak ups. Among these students 314 (37.8%) had faced difficulty of attending class sessions attentively during menstruation.

Among the different types of menstrual hygiene materials the girls commonly reported to know were home made and commercially prepared ones. No student mentioned types like tampon, panty liner, cups and reusable panty. Commercially made protective gears were used by 395(47.6%) and 434(52.4) of the girls reported using home made pad. The main source of money to buy these protective gears came from parents for 268(67.8%), other family members 99(25%), other minority either earned to buy 16(4%) or friends provide them 12(3%). Nearly 90% of the students reported that they never saw any motion picture, film or video on menstruation.

The multiple responses girls gave on their sources of information on how to use protective materials are family, friends, schools and mass media in descending order. About 648(78%) had seen/heard once or more times advertisement on menstruation hygiene materials. These advertisements were channeled through television, radio, magazines and news papers in descending frequency.

Only five students reported ever disposing their used sanitary materials into an open field. However, majority of them 630(75.8%) dispose it into latrines and few of them 78(9.4%) who are most in the non-governmental schools dispose into the available waste bins.

Experiencing menstruation related health problem has changed the perception (attitude) and practice towards school performances. There is statistically significant relationship between health related problems and attitude that menstruation related health problems could affect school performance. The odds of developing negative attitudes to such health problems is 2.48 times higher than those without, OR=2.48 at 95% CI (1.75, 3.52).

On the other hand there was significant association between these menstruation related health problems and difficulty of attending class sessions attentively unlike the other non-menstruation days. The likelihood of facing difficulty of pursuing class sessions during mensus is four times higher for those with menstruation related health problems, 0R=3.9 at 95% CI (2.65, 5.76).

V. Sexuality

The appropriate age for marriage in the majority of the cases was 23-27 years, 483(59%). While the appropriate age to start sex was 16-20years by 191(23%); 21-25 years by 211(26%); and coupled with marriage by 289(35%). Almost all in all supported and valued virginity even some who had already started sex before marriage. Eighty nine (11%) of the girls have already stated sex with the exception of three students who are married. Out of 739(89%) who didn't start sex 553(75%) reported that they would be using condom and/or contraceptives to prevent unwanted pregnancy and/or STI- including HIV/AIDS if in case they some how started sex before marriage. The rest 25% didn't respond rather wrote their stand: 'I don't want to start sex'; 'I never contemplated to start';' when I think of marriage I will ask my partner to check for HIV' and some don't know.

Places preferred by girls to get information on sexuality were schools 373 (46%) in the first place followed by home 244(30%) and health institutions / government 115 (14%) and non-government 145(18%)/. Mosque and churches were the least places preferred. Most students preferred to get information or messages on sexuality either through female health workers 316(40%) or female teachers 292(37%). Many of the students preferred to have free talk on sexuality with their sisters 313(40%), friends 232(29%) and their mothers 141(18%).

Table 5: Sexual maturity and related matters in high school girls. Addis Ababa, 2003/04.

Variable (n=828)	Frequency	Percent
Parental counseling on body changes during maturation?		
Yes	397	47.9
No	432	52.1
Shy to undress before family members?		
Yes	505	61.1
No	321	38.9
Free talk with parents on sex matters		
Yes	246	29.7
No	581	70.3
Initiation of sex (debut)		
Yes	89	11
No	739	89
Preferred places for information on sexuality		
School	373	46
Home	244	30
Private health institution	145	17.9
Gov't health institution	115	14.2
Church/Mosque	54	6.7
Preferred person for information on sexuality		
Female health worker	316	38.5
Female teacher	292	35.6
Male teacher	86	10.5
Male health worker	72	8.8
Family members/friends	44	5.4
None	10	1.2

Finally, association between parents' advice about maturation and embarrassment due to maturity physical changes was examined. It was found out that there was significant association between them at $P<0.05$.

vi. Result on qualitative study

The qualitative study used checklist to make an inventory on the schools' facilities, an interview guide for key informants interview and focus group discussion.

All the selected eight schools were visited. Two non-governmental schools, Nazareth School and Lideta Mariam (Nativity) Girls' School and six governmental schools located in five sub-cities, in Addis Ababa.

Using checklist, attached in the annex, the environment of the schools inspected and findings were recorded. It was found out that all schools had latrine and water facilities. It was also noted that there was a marked difference between the two types of schools in the ratio of number of latrines to students. The number of latrines designated for girls, the cleanliness and presence of water near and in the latrine and the privacy were checked.

The NG schools, both were girl-only schools, where it was found out that the number of latrines (though there is no guideline how many per school and to the number of students) were satisfactory and in good sanitary conditions. There is water facility in and out of the latrines, waste bins in and out of the latrines, and the latrines give full privacy for all users. The ratio of latrine to students is 1: 77. There were seven janitors assigned by different shifts to clean the in and out of the latrines. In both schools the latrines cleaned three to four times a day. There were two standardized functional incinerators each with in the schools compound. There were no clinics, health personnel and psychologist as counselor in both schools. Rather there were teachers who work as counselors in addition to their daily routine to counsel girls at times when they need help. The girls have access to menstruation protective gears from school with affordable price in case they didn't come prepared.

The class rooms of the governmental schools were crowded with students. Most of them were built long time ago. The rooms were flooded with students gathered and jostled on narrow benches, three students on single half a meter bench. Though the latrines were designed somehow considering gender they were not separated by location. The usual apportion gave the front half to boys and the back to girls or vice versa. Two thirds of these schools have got toilets half of which were not in satisfactory conditions that most were non functional. The toilets lack the basic quality of privacy where girls were forced to be engaged turn by turn in screening their girl friends off from male students or trespasser.

The toilets in the governmental schools share the shortfalls like absence of waste bins, water near and inside the toilets and waste disposal pits around the toilets. In some of the schools even if there were water points near the toilets they were out of use. There are no incinerators within the compound of the schools. If incinerators existed either they need repair or were not functional. The ratio of toilet to students is in the range of 1 to 140-180 per students/shift. Most of these latrines would be cleaned once or at time twice a day. There were no specific janitors assigned to clean the toilets and the surroundings rather they did as part of the class rooms once in a day. Two of the six schools had clinics which have not been visited by the girls for menstruation related health problems. There were two health personnel and two teachers who were working as counselor besides teaching.

Key informants were responsible officials from MOE, MOH, Region 14-education bureau and respective schools' director and directresses. They were asked on issues related to menstruation and its possible effect on school performance; and whether they consider it as an issue in planning.

Though the MOH Environmental Health and Hygiene Department claimed to launch a school health programs in two localities as a pilot project, at this moment there was no any program run to address the hygiene and sanitary problems related to menstruation in schools.

The interview with an official at MOE revealed that the ministry has realized the issue as one of the determinants of failure to stay at school and could contribute to poor performance especially in elementary schools. Hence, steps were made to ensure that all primary schools to be built and already existing ones should have gender designated latrines. Nonetheless, the planning department had no any policy or guideline regarding numbers and types of toilets in schools. The presence of water point in and/or near latrines was not given emphasis associating it with privacy and menstrual hygiene. The ministry was also, at this moment, not in a position to provide girls with menstrual hygiene materials under cost sharing schemes or free of charge.

The other interview was made with region-14 education bureau official which yielded similar response from the ministry. A little bit wider and deeper discussion was made rather with schools' unit leaders, director and directresses. They tried to disclose the felt problems both by the girls and the indirect burden due to menstruation on the school daily routine. Agreed on the deficiency of facilities to quench the girls' desires, the unit leaders complained how the girls used menstruation as a scapegoat or pretext to leave classes or the school compounds. One unit leader emphasized it, put his experience like this, "*A girl asked me a permission for she couldn't attend class as it happened without her knowledge of the date. When I knew she was not, she asked me if she could lower her dress and show her blood that I would be convinced with the psychology I wouldn't let her do. You know what I did I rebuked her not to and gave her permission knowing she was not on the day of flow."*

Moreover, there were many girls who used menstruation as a disguise against attending sport (physical education) class during physical exercises. However, the school officials didn't deny the real difficulty girls were facing during menses. The absence of clinics or health personnel or trained counselors in most of the schools made it not possible to help girls who really had problems so that they might be able stay in school and not miss classes. The other big issue raised by some of them especially female officials was the absence of menstrual hygiene material. This was considered as one of the important factors for most girls who had irregular menstrual cycles and for not ready ones. They, female officials also condemn the school environment for it is not suitable for menstruating girls. A teacher, counselor and organizer of Girls' club in one of the schools said, *"Look at the class rooms where the girls sat, three four girls on a single narrow and short desk. Imagine during a sunny hot day a menstruating girl sandwiched in between students, especially boys. Look again the latrines where no privacy they could provide. How then a menstruating girl could be comfortable in an environment where her confidence crumbled."*

The focus group was held in four of the eight schools. One from the non-governmental and the other three were from the governmental schools. The sessions were held in the respective schools' compound. Active girls who are daring and volunteer to speak on the topics of discussion were selected. The discussions were facilitated and mediated by a female sociologist. The discussion was recorded.

The discussion started by asking them what menstruation means to them and continued following the semi-structured guideline for the discussion with possible probing. In the quietest corners of the schools a group of eight students gathered voluntarily to freely talk on the topic told they would be discussing. Few of them were showing the expression of bashfulness on their faces that later disappeared after the discussion stared. Candidly expressed theirs and friends of them how they confronted the maturation changes.

Most of them believed to menstruate was healthy and natural phenomenon. However, at times they even didn't know what was wrong with it. There were ambivalence of mixed reactions towards it that is normality as well as the nothing to be frightened, and the unpleasantness and distressing. Mothers and family members don't talk freely. Mothers especially the closet ones to daughters were not free to them. Either they told them that it was normal, no more no less. So, girls took the event as some thing not a matter to talk of with any one, but kept silent. Even a matter not to think of it, just forgot it consciously. Boys, class mates, were not aware of this spectacular physiological change in girls' maturation process. Hence, they often mocked about or made fun of girls whom they thought menstruating. At home, fathers and brothers are the most feared and least consulted when it comes to menstruation, as most girls agreed up on. The girls stressed on the importance of emotional support and assurance. This is often seemed provided by, however, in reality they felt that they have not had it for they were still not confident during menstruation period. Most of them told that they had class sessions on what menstruation was and associated practices. Nonetheless, they considered them selves unprepared and clumsy to handle the practical aspects of menstruation.

The commencement of menstruation was an awkward moment mixed with surprise and fear, for most of them. Most had never expected it with appropriate preparation both in psychosocial or material wise. When it happened suddenly, for a moment they failed what necessary measures to take. They preferred to be left alone. Mesmerized by the often told and not told event, they meditated the circumstance in silence until they were clean. At times they felt as it was natural, next moment they hide or be cautious not to be messed up by letting no one knew. The puzzle around it! They also responded to the good side of menstruation. They said that it was an opportunity for females to clean their womb monthly; it was a guiding light to be on the safe side not to be pregnant and a sign of woman hood and fertility.

They often used euphemism to conceal and not to be over heard by the most feared class mates, boys. Some times as if a ghost overheard them they didn't mention its proper name. Some of these were," monthly ration, red terror, females' epistaxis, red cross, my red pen is overflowing, monthly wage-salary, red candy, the red king, red traffic light is on, it is raining, the push, joy of the month, the guest of the 28th, Lili, scorpy and ,etc." They also told what they used in place of menstrual soak ups. Though they didn't have long list as menstruation, there were few like," the red cloth, Mimi's rag, the hide, disaster preventive and Mimi's tear drier."

Girls talked on mishaps related to occurrence of menstruation. A girl said," *It was while we were in junior high when most us started menstruating, one of friends started bleeding on the way to home after a class. I still see how she was scared to death. It was her first time. Her eyes widened, dump and started shivering. Blood was trickling over her shins. Fortunately we were not out of the school compound. For I had already started, I stood beside her to calm and sooth her. I took her to the nearest shady corner and torn her T-shirt apart in to pieces, made a pad. Cleaned her bloody legs, put the pad inside and went home. She didn't appear for a week since then." She added, "You know what she was afraid she never knew what to menstruate and above all we were not in a position to have any protective material."*

The school environment to most of them is not a convenient place during menstruation. The class rooms are crowded with more than seventy students. The benches and desks they were using were not comfortable especially at that particular event. Even some complained that they were often anxious and feared of the presence of malodor during the hottest period of the day. The lack of lavish water supply in the latrine or near the latrines made worst the occasion. The number of properly functioning latrines were not sufficient foe the whole girls streaming to at the time of break. They had no shield or door to somehow keep their privacy. Some thing that should be stressed and deserve emphasis is the availability of menstrual hygiene materials with school compound. There was no trust worthy people, girls said, that they could go and shared their fear

and problems. There were no clinics to go and received services for problems related to menstruation. The physical education period was another the most feared accompany of menstruation. The girls, all in all, believed a menstruating girl shouldn't exercise for it might aggravate the bleeding. They divulged too, that some students used it as an excuse for absenteeism and leaving the school compound. The school curriculum, as to the students, was not uniform and directed to equip them with essential knowledge so that a girl would face the occasion promptly rather than bewildered. It should be given, they stressed, in separate class with other health related topics.

The girls responded well to the discussion topic what would they be doing if they were given the chance to prepare maturing girls for her menarche and there afterward. They told that they would be kind, sensitive and caring one. They would let them know that it is a natural, not a hurt, normal, healthy and part of growing. And they shouldn't be frightened or worried about or embarrassed. They also would like to tell them that there could be slight pain in the tummy that would disappear meanwhile. As to menstrual hygiene, they told that they would advised them to have frequent washing, changing protective materials and should always be ready incase it happened at school. They wanted to advice girls to wear trouser during their period so that they could minimize leakage.

The responses of girls to what advice they would give to their mothers and fathers, they said that mothers preferably have got responsibility to prepare and sustain girls to face the reality of menstruation. Mothers should be kind, caring and be free to let their daughters talk. They should always start conversation as maturing girls are too shy to ask. They shouldn't over indulge girls in heavy duty. They should be considerate always.

Often fathers not wanted to know the girls' maturing story. They all considered it that mothers could handle or take care of it. Mothers should provide with menstrual hygiene materials and how to make it. Besides, mother should share their daughters their past experiences showing the good and bad sides.

VII. Discussion

The study come by a wonderful result, revealed the prevailing situation around menstruation in high school adolescent girls. Menstruation is routine, always occurring, but unspoken. It is associated with psychological, physical, social and educational problems, but not well addressed or given due attention.

The study has estimated age at menarche in the contemporary adolescents in the region's high schools. The age at menarche in this study was 13.78(SD 1.32) years with median age of 14 years. When it is compared to many European countries and European descendents, the result is higher by not less than one year (12). In the contemporary British teenagers the median age at menarche was recorded at 13 years (13). In general age at menarche in the Western nations has dropped to an average of about 12.6 years (8). Compared to Africa and some developing Asian countries the result of this study can be approximated. A study from Khartoum showed the mean age to be 13.85 years, a Moroccan study that is relatively recent one showed the median age was13.04 years. The Zambian study reported a little bit higher than this study, 14.2(SD 1.4). A study from rural and urban Eastern China showed relatively lower, 13.2(SD 1.0) and 12.8(SD 0.9) respectively. Studies from India showed that a lower result, 12(SD 0.67) for better offs and seven month later for less. (18, 23, 38, 42, 43)

Different studies showed that age at menarche depends on the SES and body fat accumulation. Girls from better off families reach at lower age than poor ones. In this study there was difference in the mean ages at menarche between governmental and non governmental schools. The difference, here and compared to other countries, may be explained by the economic disparity between the two types of schools. Besides, majority of the students in non-governmental schools reported using either parent's cars or taxi as a means of transport to school while the others should walk long distance to their schools. Studies showed that girls who do more physical exercise, or have a long, tiresome way to school have a greater expenditure of calorie, at the same

time low amount of fatty tissues may delay menarche (8, 14, 23, 24). The high under nutrition prevalence of our country among the low SES partially could explain the comparative delay. The Dakar study showed that malnutrition could contribute to a delay in puberty when it is assessed by age at menarche (25).

Other studies showed association between age at menarche, and family size, parents' education level and whom the girls live with. Girls who live in small families menstruate earlier than girls from larger (5+) families (19, 40). In the present study, it was found an association between age at menarche and SES. This study is more consistent with the American Survey that showed that there was no relationship with birth order, family size and parental education status (22).

Most girls had started menstruation early at the first semester, after two months of vacation; or during the two seasons of vacation, in between semesters and end of academic year. This may be due to decreased stress related to school and rest from walking long distances to school (14).

It was found out more than half of the girls had abdominal/back ache at menarche which is similar to many studies (18, 30, 35, 36, 39). As it happened in the first two years to many girls, menstruation is irregular with anovulatory period that extends to 90 days at times. This is often not understood by many girls which made them anxious. Some times when annovulatory period is longer it needs professional advice (41). In this study 44% of the girls had irregular cycle, out of which became regular within six months to one year. So this is another issue girls should be informed that it could happen, however, when it is longer they should seek advice from health professional that is done rarely. Attention to menstrual irregularity and the earlier diagnosis of conditions causing it may lead to interventions that will benefit life long bone health, as hypoestrogenism leads to osteoporosis.

The mean duration girls had menstruated was 2.67 years. This indicates that almost all girls had started menstruating while they had been in elementary or junior high school.

The situation appears universal among in-school girls (7,11,13,30,39). More than 80% of the girls heard about menstruation before menarche, having at least one person told them about it. This is higher compared to 56% of the study subjects in the Riyadh who had had any information from their mothers, school, religious book and friends in the order as sources of information (44). The dominant source of information and advice in this study were teachers, mothers and elder sisters. The least consulted ones are fathers and brother. This trend was also seen in different studies including in the westerns that often considered the least to be affected by taboos (11,39,44,45,46).

Menarche can happen at any time and place. Almost none of girls in this study had expected its occurrence. In this study 75% of them, luckily enough, experienced it at home. Despite its places of occurrence, the information and kind of advice about menstruation they reported to have prior, more than 50% of them didn't tell any body. Though 77% of the girls believed menstruation was not," a female matter not to talk to any one," and about 90% of them had lesson in class related to menstruation, they preferred to keep silent. This may be due to the poor counseling power of mothers when it comes to menstruation that most mothers consider it as a matter of not much detail. This could be because of most of the information communicated to the girls focus on the immediate and obvious biological and hygienic aspects of menstruation. It is paradoxical to be told menstruation is normal and natural and something to be happy about while being instructed both to conceal its occurrence and to carry on as if nothing happened (11,45,46,47,48). Cultural critic, Kissling, told that the most fascinating thing about menstruation is its paradox. Women often feel joy in their ability to reproduce, but shame and sadness at living in a society that considers menstruation as a taboo and prohibits women from talking openly about normal bodily processes (46).

Most girls preferred to get information on menstrual matters from female teachers, friends, health personnel and elder sisters. This is almost universally true to many results produced (7,11,18,39,44,45). This observation is useful in the planning process to address the problems associated with menstruation in adolescent girls. Girls have

also expressed their most felt needs during menarche from their parents or someone who was close to them. Acquisition of menstrual protective materials was on the top of the list. Despite this 37% of the girls prepared the most widely used type of protective material, home made torn-cloth. Showing the economic disparity between the government and non-government schools, almost all students of the later were using commercially available protective materials obtaining them either from their mothers, family members or purchase by themselves. Here it should be given due attention to the majority of the girls who are using rag made pads. The cleanliness of the pad and re-usability should match the standard that the commercially made one provides otherwise they will be exposed to development of bad odor, fungal and other reproductive tract infection (17,37). Besides the need for regular cleaning and possible ironing, as well as 'cause of its coarse texture it creates discomfort.

About 67% of girls felt that they were not prepared during menarche, consistent with researches by Brooks-Gunn and Ruble. As others have observed, in this study too girls had access to a variety of sources of information, but tended to rely most heavily on their mothers, whom they perceived as helpful, and their female friends. However, the information they obtained either hadn't been sufficient or it didn't address the psychosocial component which is often not mentioned both by teachers and mothers. This can also be supported by the euphemism and slang used in place of menstruation and their highly felt and perceived disturbed comfort i.e., 65% of them during menstruation while they spent the day at school. This indirectly justify how girls are inadequately prepared. About 31% of girls used different words and phrases in place of it just to conceal both verbally and physically. This is similar to the situation in many parts of the world where studies identified over 128 expressions that are used to refer to menstruation (45). This magnifies the deep rooted socio-cultural myth and taboos inherited from generation to the next, led girls time to time developed words that replace and conceal menstruation. Boys, because of poor knowledge of menstrual process, often use it as a means to ridicule and embarrass girls. This directly or indirectly can and possibly robs the girls' confidence to stay cool in classes. Girls taking

this into consideration, give their opinion that their male school mates should have the family life education or health education sessions on menstruation (11, 39, 47).

Girls experienced health problems related to menstruation not only at the onset but also throughout till menopause. About 74% of the girls had experienced on one or more occasions such problems. The most frequently experienced one at menarche was abdominal and back pain 55%, followed by mood changes like irritability and depression 35%. This is a bit higher than the population survey of Glasgow and Nigeria (5,34) but lower than other study released from Nigeria that was 72% and Tehran 71%. Still it is lower than the report from Finland 79% and on Moroccan girls 69%. This could be explained in such a way that as abdominal pain is significantly more frequent in girls with early maturity and menarche (18,30,35).

Nearly 50% of the students who experienced such health problems consulted their mothers or other family members for comfort/assurance or drugs. The other 16% took palliative drugs without consulting health personnel or family members, either buying it or taking from home. This is consistent with the study done in Nigeria (33,34). Similarly, about 14% of them consulted health personnel. This one is consistent with the Tehran study where 18% of girls reported to having consulted Doctors. (30)

The absence of clinic, counselor and health personnel in the school compound make menstruation related health problems a good reason or excuse for absenteeism. The schools' toilets during the observation were found out to be, especially in governmental schools, not suitable for a menstruating girl to keep a minimum desired hygiene. Lack of privacy, absence of water in and near the latrines as well as the long waiting time to have the service due to inadequate number of cubicles in the toilets were factors that made the study areas very uncomfortable for girls during menstruation. Schools should be able to accommodate the needs of girls so that drop out, poor performance and all other possible inconveniences due to menstruation have less negative impact on the teaching and learning process.

Different studies showed that menstruation related health problems, especially dysmenorrhea of any degree, could result in interference of daily routine and class attendance (18, 30, 34, 35, 46). In this study menstruation related absenteeism was very high, where 50% of those who got health problems were absent for one or more days every time when their menstruation coincided with week days. The absenteeism was higher to girls in government schools about 55% while it was only 8% for non governmental. A recent study from Jimma University done on girls studying in different departments showed that 27% of absenteeism from class or daily routines due to menstruation related health problems (51).

Among girls in the study, 545(66%) reported that they were uncomfortable during menstruation at school. This is a big figure though it was not possible to compare with other studies. The girls expressed their feeling during the FGD that in general the environment is not conducive for a menstruating girl. Most of them (66%) believe that during menstruation there is foul odor which boys in the class or someone who sits beside could feel. The other half thinks that the blood itself is unhygienic though more than 80% reported to have a lesson in class on menstruation. The rooms are overcrowded and at times not well ventilated. Boys and even some male teachers don't have an integrated knowledge. Girls are afraid of leaks for they are not using standardized or locally modified rag-made pad. Lack of supply of any menstrual protective gears in any of the government schools is another challenge for the girls' comfort. This is very contrary to situation in England where 90% of schools have sanitary towels in the school premises either in toilets or at schools' clinics (13).

When it comes to the knowledge of menstrual hygiene 70-85% of them know that frequent washing and changing of menstrual soak ups are necessary; except the two types of soak ups, home made and commercial ones none of them know any other types of female hygienic materials. However, in school where there are no good and well protected toilets, and there is no adequate water provision to manage the personal

hygiene of a menstruating girl, knowing the principle will not do much other than making the girls anxious.

Most girls changed their soak ups two or three times a day, which is not often done at school. Here also, not as high as for menstruation, girls use words that replace menstrual soak ups contrary to other studies (45, 46, 47, 48). This may be due to the fact that most girls use english word which might have given the girls a confidence that no one use or hear or understand the meaning. One such oftentimes used term is "pad". More than 90% of the students had never had educational motion pictures that explain how menstruation occurs, or how to use menstrual protective materials appropriately.

The sources of information available to the girls on this regard are family members mostly elder sisters and mothers; and friends. Nearly 80% of them had seen/ heard once or more times advertisement on feminine hygiene materials. This may be regarded high for Ethiopia, capital city, but less when compared to many countries with 98% TV ownership in major cities. The purpose of these advertisements is more on business promotion than public health significance. And at times they may exaggerate the sense of insecurity on the majority who are using the home made type.

The disposal system of used menstrual hygiene materials while girls are at home and school doesn't have difference. Most of them use pit latrines for disposal. In this regard, it may be noted that most of the girls use rag made or Cotton-made cloth which are bio-degradable. However, using latrines with narrow passage to septic tank could end up with blockage by the plug of used sanitary pads. A related concern is that the commercially made pads, due to the cheap price of imported materials mightn't be environmentally friendly (37). In such circumstances the appropriate means of disposal should be promoted by creating awareness on possible consequences of inappropriate disposal.

Most students who faced menstruation related health problems had a tendency to develop negative attitude towards it. The odds of developing negative attitudes to such problems that it could affect school performance is 2.5 times higher among those with than those with out such problems. This is because girls who experienced health problems due to menstruation have had absenteeism and/or poor attention in classes.

Examining menstruation alone without assessing sexuality makes the study incomplete. Hence, few points like knowledge of students on appropriate age for sex initiation and marriage; information source and preference on sexuality; and parents' role in the process of maturation were entertained.

The appropriate age for marriage was 23-27 years according to the majority of girls 483 (59%). Almost all students irrespective of their commencement of sex reported that they value virginity, and 35% of them preferred and considered that initiation of sex should be coupled with marriage. This is a trend seen in most countries that age at menarche came down, age at first marriage is rising and age at first sex is decreasing (7, 10, 49). The prevalence of sexually active (those who had at least one penetrating sexual intercourse in the past) was 11%. Though this figure is lower than the study done in Zway 31% for both sexes, and 12-72% in Europe and America adolescent girls; it is consistent with DHS 2000 report and the Butajira study, 8.8% on high school girls (6, 10, 55)

The prevalence of HIV/AIDS is very high in this segment of population, adolescent. When we consider the attitude of the girls how they value virginity irrespective of their status of sexual activeness will hopefully contain the contagious nature of starting sex under peer influence. More over, among the girls who haven't started sex 75% of them reported that they would be using condom and/or contraceptives to prevent unwanted pregnancy and/or STD including HIV/AIDS if in case they started sex before marriage. This is encouraging; however, the rest 25% are at risk 'cause all these girls preferred not to say their opinion as they considered it (using condom and contraceptive, and

also talking of starting sex) disreputable, not-religious. In this group there were girls who don't know at all what they would be doing, hence, they responded,' I will never have sex/ never contemplated to start'. Besides this a glance at the prevalence rate of HIV/AIDS in all affected countries, this age group bore the brunt of the pandemic (UNICEF, 2004).

The study has also examined the role of families in simple terms such as, how they address the issue of sexual maturity with their daughters. Nearly 50% of girls reported that their parents told them about bodily changes during maturity; however, 60% of them were shy or afraid to change cloth before any members of their families. This discordance can explicitly depict the poor communication between parents and daughters. Girls preferred to get information on sexuality through female health workers and female teachers. Girls also preferred to talk with their sisters and friends on sexuality than their mothers or fathers. This shows the poor communication link between parents and their daughters needs change or improvement.

VIII. Limitation and Generalizability

The presence of some sensitive and personal questions could be considered as limitation. The data collected using self administered questionnaire might also be cited.

The generalizabilty of the study was not compromised due to the aforementioned facts. The study population selected randomly after schools stratified into Governmental and Non-governmental ones. Representation considered a ratio of 1:8 taking the size of each stratum. A random stratified sample can be kept small in size without losing its accuracy; hence, the small size of Non-governmental schools will not affect it.

Though the study used self administered questionnaire as means for the girls to tell taboo related issues, the confidentiality and their right not to respond to questions to the extent to quit participation made the girls to respond candidly. The study was supported by key informant interviews and FGDs. Besides, this was compensated by increasing the sample size by 10% for the non response rate.

Keeping in mind the sensitiveness of the study variables, the cultural and the religious misunderstandings and misconceptions towards menstruation; the school environment which could be a bit worse than Addis in terms of availability and quality of facilities share the same drawbacks in the management of menstruation at home and at schools. In light of this, with some restriction the study can be generalized to most major cities. The age at menarche as it is influenced by SES and most cities are not well comparable to Addis Ababa it is difficult to generalize.

IX. Conclusion

The observation that age at menarche in many parts of the world is declining has become a widely accepted fact. Economic growth with good nutritional status and health outcomes has led to early onset of menstruation. The age at menarche of the Addis Ababa's high school girls showed partially this fact. Late compared to the affluent western and even to some African countries, not extensive previous study to compare but perceived to be earlier, could be the high prevalence of chronic malnutrition that affect the fat accumulation and body weight of maturing girls. This can be further investigated by a comparative longitudinal or cross sectional studies with the objective to see the nutritional status of maturing girls.

In Addis Ababa adolescent girls encounter their first menstruation while they are still in elementary schools, before they get sufficient information and counseling about menstruation or how to deal with it. Though most of the girls apparently had classes or obtained information on menstruation related facts that focused more on biologic and hygienic aspect, basically they weren't address the cultural taboo related to menstruation that has got negative psychosocial effect on the girls. This directly or indirectly contributes to absenteeism and lead to poor performance at school.

The high ratio of section to student and toilet cubicle to student; the lack of privacy and absence of private individual cubicle in the latrine; lack or absence of washing facility or water sources near and/or in the latrines are important contributing factor for girls' absenteeism and discomfort at school. Moreover the situation contributes to the development of low self esteem. The absence of counselor or health personnel with accessible health facilities will exacerbate the situation.

In the maturity process of young girls more involvement is needed from parents and schools. Well designed health education and free intra-family communication on sexuality with possible emphasis on the HIV/AIDS epidemic has important contribution to save and give futurity to the young generation.

X. Recommendations

The occurrence of menarche while the girls are in the elementary schools indicates where future interventions should be targeted. Girls might not be expecting when their menarche would occur. In society where cultural and religious taboos around menstruation are common, parents and schools, as well as, public health professionals in the ARH should work hand in hand to create conducive school environment for maturing girls so that they could pursue their education without embarrassment and fear. The health education or any education related to ARH, sexual and reproductive maturation, should encompass and complete the circle," parent-student-teacher".

Schools should provide the basic required sanitary facilities for girls' acceptable menstrual hygiene. Schools shouldn't be menacing and uncomfortable arenas for menstruating girls that rob and shatter their confidence. The latrines should be clean, provide privacy and have water in and near them. Non-governmental organizations that are working in school health should put more efforts to improve the class room condition in accordance with improving the comfort of girls during menstruation so that the high prevalence of school absenteeism could be averted. Besides this they should create an environment where girls could get menstrual hygiene materials with subsidized price within school premises.

Though there are class sessions on FLE and menstruation related topics incorporated in the existing subjects, girls and boys should have a better, well organized health education class delivered by trained health education instructors. Even if this may seem a bit difficult both in respect to finance and skilled personnel, it can be tackled strategically by introducing the theme as a subject," Health education".

The school environment is the best place to promote healthy adolescence. Menarche is a special event and period for all girls a point that mark womanhood and fertility. This is a good point of entry for many different interventions related to adolescent health. At this historical moment where the majority of victims and vulnerable segment of the

society who bore the brunt of the HIV/AIDS epidemic are young people, addressing menstruation related issues in adolescents is a very pragmatic approach to enter and win the confidence of young people so that it could be possible to entertain other related health risk behaviors.

The key organizations and Ministries concerned with the health and educational improvement of girls both in elementary as well as in high schools should work in an integrated manner. In this regard the MOE, MOH, the Water authorities and Non-governmental organization have responsibility.

XI. References

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Annex 2

Age at menarche, menstruation related problems and practices among secondary school female adolescents in Addis Ababa, 2003.

Code number _____

School code_____

General instruction: You will not write your name on this questionnaire. Hence, there is no chance to know who filled in this questionnaire. There are various questions that appear to be more sensitive and personal. However, we solemnly request you to give us true and right answer. The study revolves around the onset of menstruation and associated problems. The related problems i.e untold but need bold and prompt response from respective bodies. So, this study is the chance to speak out your problems for it will make a difference at the end of the day by giving an overall view to take an initiative for a change. Thank you for your kind cooperation.

Section 1: Background characteristics (Socio-demographic)

No	Questions and filters	Coding categories	Skip to	code
101	In what month and year were you born?	Month -------- Year ----------		
102	How old were you at your last birth	_____ year		
103	Grade level?	_____Grade		
104	Marital status?	1.Unmarried 4.Separeted 2.Married 5.Widowed 3.Divorced		
105	Ethnicity?	1.Amhara 4.Guarage 2.Oromo 5.other,specify_____ 3.Tigre		
106	Religion?	1.Orthodox 4. Catholic 2. Muslim 5.Other, specify _____ 3.Protestant		
107	Whom do you live with at present?	1.With my mother and father 2.With my mother only 3.With my father only 4.with step mother and my father 5.With step father and my mother 6.With relatives 7.With friends 8.Alone 9.Other,specify		
108	How many people live together in your family?	1.Three 4.Six 2.Four 5.Seven 3.Five 6.Eight 7.Other, specify _____		

109	What is your father's educational level?	1.Can't read and write 2.Read and write 3. Last grade completed_____		
110	What is your mother's educational level?	1.Can't read & write 2.Read and write only 3. Last grade completed_____		
111	Parents' job status?	1. Both don't work 2. Only my father works 3. Only my mother works 4. Both parents work outside of home 5. Mother is on pension 6. Father is on pension		
112	Do you get permanent pocket money from your parents?	1. Yes 2. No		
113	Do you earn money for yourself?	1. Yes 2.No		
114	Is the house you live in --	1. Owned by your family 2. Rented from government 3. Rented from private owners 4. Other, specify		
115	How many living rooms does your house have?	_____ rooms		
116	Does your family have a TV set?	1.Yes 2.No		
117	What is the ceiling of your family's house or the place you are living at currently?	_____		
118	What is the floor of your family house or the place where you are currently live made of?	_____		
119	Do your parents own a vehicle?	1. Yes 2. No		
120	How do you go to school?	1.Walk 2.Taxi 3.Private car 4.Public bus		
121	Source of drinking water?	1. Public 2. Private		
122	How do you wash your body?	1.In the house using shower 2.In the house using bath 3.In the house using bucket 4. Other, specify		

Section2: During and after the onset of menstruation-MENARCHE

No	Question and filter	Coding categories	Skip to	code
201	When did you start menstruating?	Month-------- Year----------		
202	In which season did you start menstruating?	1.During first semester 2.During second semester 3.Between semesters' vacation 4.During vacation at the end of academ		
203	What were your physical symptoms when the first time you had menstruation?	1.Abdominal and back pain 2.Sleplessness 3.Weakness 4.Heavy bleeding 5.Other,specify_____		
204	In how many days' interval was your menses occurring, when you started menstruating?	_____ days		
205	Was your menstruation regular at the time menarche?	1. Yes 2. No	If yes, to 207	
206	If not regular at the start, when did it start becoming regular?	1.After first month of commencement 2.After three months of commencemen 3.After six months of commencement 4.After one year of commencement 5.Other,specify		
207	Did you know about menstruation before you started menstruating?	1. Yes 2. No		
208	Did anyone tell you about menstruation before you started menstruating?	1.Yes 2.No	If no, to210	
209	Who told (advised) you about menstruation?(More than one answer is possible)	1.Mother 5.Friends 2.Father 6.Teachers 3.Sister 7.Reading 4.Brother 8.Other,specify		
210	If you are living with your mother, how do you find to communicate with her about menstruation?	1.Very easy 2.Easy 3.Average 4.Difficult 5.Very difficult 6.Don't see him		
211	If you are living with your father, how do You find to communicate with him about menstruation?	1.Very easy 2. Easy 3. Average 4. Difficult 5.Very difficult 6. Don't see him		

212	Where were you when your first menstruation occurred?	1. At home 2. At school 3. Out of home 4. Other, specify		
213	Were you expecting it when you experienced menstruation for the first time?	1. Yes 2.No		
214	What was your first reaction when you experienced for the first time?	1.Cried 2.Embarressed 3.Excited and joyful 4.Run to mom 5.Run to dad 6.Run to sister 7.Run to brother 8.Din't tell anyone 9.Other, specify		
215	Do you think menstruation is a female matter, to be kept for oneself only, not to talk it openly?	1. Yes 2. No		
216	Were any of your parents told you openly what menstruation is and how to deal with it? Describe in short	1.Yes 2.No If yes, _____ _____		
217	At what age, do you think most girls usually get their first period?	_____ years		
218	How long does the bleeding usually take place during menstruation, in normal person?	_____ days		
219	What is the average cycle interval?			
220	What is the average duration of your menstruation flow?	_____ days		
221	What do you think is the average cycle of menstruation in healthy girl (how long is it one menstrual cycle to the next)?	every _____ day		
222	From whom, or where from, would you prefer to have received more information on menstrual matter? (more than one answer is possible)	1.School teacher 7.Friends 2.Mother 8.Doctors 3.Father 9. Books/magazine 4.Brother 10.Films/videos 5.Sister 6.Other family member, _____		
223	Before the onset of menstruation, have you had any class session related to it in your school? If yes, what was the subject you learnt on?	1.Yes 2.No Subject: _____ _____		
224	What were you really wanted from your Parents during menstruation? Write in short	_____		

225	At this point in your life when you look back at those early days of onset , do you think you were prepared enough?	1.Not at all 2.Not well prepared 3.Prepared well 4.I don't remember		
226	What protective material did you used during your first days at menarche?	1. Napkin (soft paper) 2. Rag made pad 3. Commercially made sanitary pad 4. Other, specify		
227	Do you have or know any name (alternative) for menstruation? If yes, please state what you call it.	1.Yes 2.No _____		
228	Who provided you with the above material?	1. Mother made it for me 2. My older sister 3. My dad 4. I made it myself 5. I bought my 6. Other, specify		

Section 3:Related to menstrual health problems

No.	Question filter	Coding categories	Skip to	code
301	Have you ever experienced health problems during menstruation?	1.Yes 2.No	If no skip Q306	
302	If yes, (you can circle more than one)	1. Irregularity 2. Excess flow 3. Pain-back pain or abdominal pain 4. Head ache 5. Mood change-irritability, depression 6. Sleeplessness 7. Other, specify		
303	If pain, how severe?	1. Doesn't interfere with class activities 2. With vomiting and diarrhea 3. Interferes with class activties leading to absenteeism 4. Relief on using medication		
304	What do you do when you have menstrual problems?	1. Go to family members 2. Go to doctors, health personnel 3. Go to clinics 4. Buy medication from drug stores without consultation of health personnel 5. Use traditional medicine 6. Other, specify		

305	If you use medication without consultation of health personnel, what is medication you often use?	_____		
306	If your menstrual problem interferes with attendance, how often does it do so?	1. One day every cycle 2. Two days every cycle 3. Three days every cycle 4. Four days every cycle		
307	Do you think menstrual problems interfere with school performance?	1.Yes 2. No		

Section 4: Related to current menstrual hygiene

No.	Question and filter	Coding categories	Skip to	code
401	Do you feel comfortable in school during menstruation? If no, why? (answer in short)	1.Yes 2. No _____		
402	What do you know about menstrual hygiene? (Write in two lines)	_____ _____		
403	Do you think there is foul odor during menstruation?	1.Yes 2.No		
404	Do you think menstrual blood is unhygienic?	1.Yes 2. No		
405	W hat kind of menstrual flow catching materials or soak ups do you know?	1. Rag made 2. Pad 3. Tampon 4. Cups : disposable/reusable 5. Panty liner 6. Reusable panty 7. Other, specify		
406	What kind of menstrual protective hygienic materials do you use?	1. Commercially prepared 2. Home made 3. Other, specify _____		
	If commercially prepared, how much money do you spend per cycle? (In Birr) Where do you get the money?	_____birr 1. Parents 2. Family members 3. Earn it 4. Other, specify		
	If home made, what material do you use to make it?	_____		

407	Have you seen any video/motion pictures on menstruation?	1.Yes 2.No		
408	How frequently do you change your menstrual protective materials?	1. Once a day 2. Twice a day 3. Thrice a day 4. Other, specify		
409	Do you feel uncomfortable sitting beside male students during mensus?	1. Yes 2. No		
410	Have you had difficulty of pursuing Class sessions during menstruation	1.Yes 2.No		
411	Do you use another (alternative) name for the menstrual protective materials at home with family members or friends? If, yes, please write the alternative name.	1.Yes 2.No _____		
412	Have you come across any advertisement on menstruation? If yes, what was the source?	1.Yes 2.No 1. Television 2. Radio 3. Newspaper 4. Other,specify _____		
413	Where do you get the information to use protective gear?	1. Parents-who? –mom or dad 2. Friends 3. Mass media-(choose)-TV, Radio Newspapers 4. School 5. Other, specify		
414	Where do you dispose of these Used protective gears while you are at school?	1. Open field 2. In the latrines 3. In waste bins 4. Other, specify		

Section 5:Related to sexuality

No.	Question and filter	Coding categories	Skipto	code
501	What is the appropriate age for marriage?			
502	Appropriate age to start sex?	_____years		
503	Do you value virginity?	1.Yes 2.No		
504	Have you ever involved in sexual intercourse?	1.Yes 2.No		
	If you have not, what would you do if in case you started in the future to prevent unwanted pregnancy, STDs and HIV/AIDS?	1. contraceptive pills 2. condom 3. other, specify		
505	Where do you like the best place to get information on sexuality?	1.Home 2.School 3.Governmental-clinic 4.Private clinic 5.Church 6.Mosque 7.Other,specify		
506	Who do you prefer to provide you with information on sexuality and sex education?	1. Male teacher 2. Female teacher 3. Mass media 4. Female health personnel 5. Male health personnel 6. Other, specify		
507	Have your parents told you about body change during maturation?	1.Yes 2.No		
508	Was it embarrassing to change clothes in front of your parent at the time when you started having body change like growing breast bud?	1.Yes 2.No		
509	Do you freely talk on sex matters withyour parents? If yes, whom do you prefer to have the discussion with?	1.Yes 2.No. 1. Mother 2. Father 3. Sister 4. Brother 5. Other, specify		

Annex 3

Interview Guide for Health Related Policy maker, Ministry of Health

1. Position----------
2. Immediate responsibilities----------
3. What responsibilities does your office have on public health in schools? ----------
   ----
4. Do you make school visits? How frequently? ----------
5. What aspects of public health do you inspect?
6. Is your office consulted regarding planning on new schools in your area; what are the main areas of consultation?
7. In connection with schools what public health requirements must be satisfied before a school is permitted to operate?
8. Is there any set ratio of the number of pupils to a toilet facility? What is it?
9. Are there any public health concerns that related to the management of menstruation in schools? If there are any, what are these?
10. In which way are the health needs of girls addressed particularly with regard to the disposal of protective materials during menstruation?
11. What facilities are recommended for safe disposal?

Annex 4

Interview Guide for Ministry of Education & Region 14 Education Bureau

1. Sex----------
2. Office/Department----------
3. Position/Designation----------
4. Immediate Responsibilities ----------
5. Do you think menstruation can affect teaching-learning process?
6. In which way(s) do you think menstruation of girls may affect their acquisition of learning competencies?
7. In which way(s) does planning of schools and educational facilities take into consideration menstruation of students?
8. Is there any policy governing issues related to water and sanitation in schools, what does it state?
9. With regard to sanitation, does the MoE have guidelines regarding numbers and types of toilets in schools? Is there any gender designation?
10. Is there a set ratio of pupils to a toilet? If "yes" state
11. In developing these guidelines (if yes above), is there reference to the requirements of consultation with the MoH?

Annex 5

Checklist for observation of schools

1. Name of school ----------
2. Type of school (Gov't/ non-Gov't)
3. Sub- city ----------
4. Number of students----------
5. Number of girls ----------
6. Number of toilets- (all types)----------
7. No. of water closets (WC)----------
8. No. of pit latrines----------
9. No. of latrines designated for girls---------
10. Tap water, availability near and in the latrines 1.Yes 2.No
11. Waste disposal: 1.Bins 2.No bins
12. Waste disposal pit: 1. Yes 2.No
13. Incinerator? 1.Yes 2. No

    If yes, is it functional?_____
14. Cleanliness of grounds in and near the latrines ----------
15. Number of janitors assigned to clean the latrines_____
16. The daily schedule for cleaning
    1. Once a day
    2. Twice a day
    3.Three times a day
    4. Every other day
17. Clinic in the school compound----------
18. Health personnel within the school----------
19. Psychologist, or any counselor in the school----------

Annex 6

Interview Guide for Focus Group Discussion.

The discussion will try to unveil some experience of students in terms of preparation, initial response, parent's roles and source of information. It will look into their emotional response, what it feels like to menstruate? What the family reaction was to body changes of their daughters? What the negative aspect of having menstruation? What the positive aspect of menstruation is?

Q1. What would make the first menstrual period easier for a girl? Probe-----

Q2. What are the expectations for menstrual symptoms that girls hold prior to menstruation?

Q3.How do expectation for menstrual symptoms and beliefs related to the actual experience of menarche?

Q4.If you were given the opportunity to prepare a girl for her menstruation, what would you tell her?

Q5. What advice would you give to mothers, and to fathers so that they could better help their daughters deal with maturation and menarche?

Q6. What is ideal expectation of girls from schools in preparation of girls for menstruation and how to deal it?.....teachers, class rooms, latrines and other…….probe

Annex 7

Summary of economic scoring:

Variables	Label	Score
1. Television	yes	1
	no	0
2. Parent/guardian's job status	both don't work	0
	Only father works	1
	Only mother works	0.5
	Both work	2
	Mother on pension	0.5
	Father on pension	0.5
3. Pocket money	yes	1
	no	0
4. Owner ship of house	Owned by family	2
	rented from government	0.5
	rented from private owners	1
5. Ownership of car by guardians	yes	3
	no	0
6. Means of body washing	use shower	1
	use bath	2
	use bucket	0

Total score: Above 95 percentile – High income

Between 25 – 95 percentiles – middle income

Below 25 percentile - low income