Assessment of Menstrual Hygiene Management and Its Determinants among Adolescent Girls: A Cross-Sectional Study in School Adolescent Girls in Addis Ababa, Ethiopia.

BY: Ephrem Biruk (BSC)

Advisors: -Mr. Worku Tefera

A research paper submitted to Addis Ababa University, college of health science; school of public health in partial fulfillment of the requirement for the degree of Public Health (MPH).

June, 2017

Addis Ababa, Ethiopia

Approved by the Board of Examiners

As thesis research advisor, I hereby certify that I have read and evaluated this thesis prepared under my guidance by Ephrem Biruk entitled Assessment of Menstrual Hygiene Management and Its Determinants among Adolescent Girls: A Cross-Sectional Study in School Adolescent Girls in Addis Ababa, Ethiopia recommends that it be submitted as fulfilling the thesis requirement.

Advisor

_____	_____	_____
Name	Signature	Date

Approved by Examining Board

_____	_____	_____
Name	Signature	Date

Chair person, Department of graduate committee

_____	_____	_____
Name	Signature	Date

Acknowledgment

It gives me pleasure to express my heartfelt gratitude to Addis Ababa University, School of Public Health librarians for providing me the necessary references. I would like to thank to my advisor Mr Worku Tefera for his unrestricted guidance, envisioning and supporting from the period of instigation to this project.

I am also grateful to thank Addis Ababa education bureau, sub city education offices, school staffs, my office staffs for their cooperation and assistance in giving important information.

I am pleased to extend my thanks to my brother, Mehary Biruk, for his devotion to support me through the academic years.

I would also like to thank all the participants of the study for their patience and collaboration during data collection.

I am exclusively thankful to my friends Ashagre Sisay, Ermias Woldie, Tasew Denbi, Nardos Tadesse and Sintayehu Tadesse for their vital contribution for success of this work.

Table of Contents pages

List of Tables

List of Figures

Acronyms

AIDS	Acquired Immuno-Deficiency Syndrome
BV	Bacterial Vaginosis
CDC	Centers for Disease Control and Prevention
FGD	Focus Group Discussion
HIV	Human Immune Deficiency Virus
ICPD	International Conference on Population and Development
JMP	Joint Monitoring Programme
MHM	Menstrual Hygiene Management
MOH	Ministry of Health
NGO	Non-Governmental Organization
RTI	Reproductive Tract Infections
SPSS	Statistical Package for Social Studies
UNICEF	United Nations International Children's Emergency Fund
UTI	Urethral Tract Infection
VVC	Vulvovaginal Candidiasis
WASH	Water, Sanitation and Hygiene
WHO	World Health Organization

Abstract

Introduction: Menstrual hygiene management is essentially dealing with menstrual flow and also in continuing regular activities like going to school, working etc. However, menstruation can place significant obstacles in girls' access to health, education and future prospects if they are not equipped for effective menstrual hygiene management.

Objective: To assess the menstrual hygiene management and its determinant among adolescent girls in Addis Ababa, Ethiopia.

Methods: Cross-sectional study design with quantitative method was carried out among 770 systematically selected adolescent school girls of Addis Ababa from April 1 to May 5, 2017. A self-administered pre-test close ended Amharic questionnaire at school setting was used for data collection. The coding was done using the original English version and entered to EPI-7 software. The quantitative file exported to statistical package for social science (SPSS) version 25.0 software for analysis. Total mean score was used to categorize individuals as good and poor while AOR; 95% CI with $p < 0.05$ was used to determine factors of menstrual hygiene management practice.

Result: This study had 98% response rate. Five hundred thirty (70.1%) and 388(51.3%) respondents had good knowledge and practice of menstrual hygiene respectively. The findings also showed a significant positive association between good knowledge of menstrual hygiene management and girls from mother's whose education were secondary (AOR = 10.012, 95 % CI = 3.628-27.629). Fifth wealth index quantile (AOR = 9.038, 95 % CI = 3.728-21.909) revealed significant positive association with good practice of menstrual hygiene.

Conclusion and recommendation

Majority of participants had good knowledge of menstrual hygiene and majority of them were from private school. Although knowledge was better than practice, girls should be educated about the process, use of proper pads or absorbents and its proper disposal.

Key Words: practices of menstrual hygiene, Menstrual knowledge, adolescent girl, Sanitary napkins, Menarche, school health.

1 Introduction

1.1 Background

Menarche is an important milestone in a girl's transition to womanhood (1). Around the world women have developed their own personal strategies to cope with menstruation, which vary from country to country and depend on economic status, the individual's personal preferences, local traditions and cultural beliefs and education status. The onset of menstruation presents multiple challenges for school girls. Many girls lack the knowledge, support and resources to manage menstruation in school (2).

Managing menstruation is essentially dealing with menstrual flow and also in continuing regular activities like going to school, working etc (3). However, menstruation can place significant obstacles in the way of girls' access to health, education and future prospects if they are not equipped for effective menstrual hygiene management (MHM). Good MHM requires access to necessary resources (menstrual materials to absorb or collect menstrual blood, soap and water), facilities (private place to wash, change and dry re-usable menstrual materials, in addition to an adequate disposal system for menstrual materials), and education about MHM (1).

Schools, particularly those in developing countries, often completely lack drinking-water and sanitation and hand washing facilities; even, where such facilities exist they are often inadequate in both quality and quantity. Girls are likely to be affected in different ways from inadequate water, sanitation and hygiene conditions in schools, because the lack of such facilities they cannot attend school during menstruation (4). Girls are particularly vulnerable to dropping out of school, partly because when toilet and washing facilities are not private, not safe or simply not available in schools. Girls who reached puberty and female school staff need gender-related privacy; otherwise they may not use the facilities. This may result in absenteeism rates that can reach 10–20 per cent of school time (5).

Menstrual hygiene and management has not received adequate attention in the health and water, sanitation and hygiene (WASH) sectors in developing countries including Ethiopia and its relationship with and impact on achieving agenda of the sustainable development goal that

access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in Vulnerable situations (6).

Public investment in institutional sanitation, especially in schools and health facilities in urban areas is limited. The available sanitation facilities in most secondary schools, are poor in construction design; not convenient for sick, disabled, elderly and MHM. This in turn, results in significant unwanted impacts on health, economic activity and education (7).

According to the WHO/UNICEF Joint Monitoring Programme (JMP, 2014), the estimated coverage of urban sanitation indicated as improved, shared and other unimproved facilities have reached 27%, 40% and 26% respectively in 2015 compared to 20%, 30% and 12% respectively in 1990 (7). As a matter of fact, the existing sanitation condition for many of the school in Ethiopia is horrendous. Most school latrines are filthy and unclean, and the poor condition is contributing to high level disease prevalence, creates poor learning environments and especially impacting on girls' education (8).

However, much attention is not given to this problem and studies on menstruation and its hygienic management as well as its influence on girls' education are limited in Ethiopia. This study therefore, will be conducted with the aim of assessing menstrual hygiene management among primary and secondary school girls at both private and public schools.

1.2 Statement of the problem

During menstruation, adolescent girls face with challenges related to the management of menstrual hygiene in schools. Many school girls throughout the world, especially those in developing countries, do not have the resources, knowledge, or ability to handle their monthly cycles. Not providing adolescent girls with an opportunity to manage their menstrual cycle well has been shown to negatively affect their educational attainment and health, in addition to their overall well-being (6,9,10).

Studies in Africa have found out menstrual-related absenteeism prevalence to be 61.7% school at least one day per month. Sixty-three percent of the respondents connected their absenteeism with lack of private place to change menstrual materials for washing (1). The use of sanitary pads as low as amongst Tanzanian women with the remainder using cloth or toilet paper. (11).

A study conducted in Ethiopia showed large number of students used sanitary napkins and the rest of them used homemade cloth and underwear as menstrual soak-up during their last menstrual period. Most girls in Ethiopia are at risk of getting genitourinary tract infections due to their unhygienic practices during their menstruation period which may lead to further complication if left untreated (11). Challenges girls face managing menstruation at school are determined by factors that are largely preventable. The availability of WASH facilities and resources in schools greatly impacted girls' practices and their ability to manage menstruation. Personal hygiene, and a are basic problems at school setting. often discussed. The inability to practice personal hygiene effectively in the school setting is mainly due to need to have a clean space, water, soap, absorbent materials and places to change, disposal facilities(11–13).

School based studies conducted in Ethiopia showed schoolgirls described many challenges faced in managing their menstrual cycles. Some of the challenges included a code of silence that did not allow them to feel comfortable asking teachers for assistance, especially in the company of schoolboys. Schoolgirls described not feeling comfortable using toilet facilities and not having sanitary supplies to use throughout the school day. They identified a lack of soap, clean toilets, clean water, privacy, and sanitary supplies as the main challenges at school (11–13).

Girls who have adequate water, sanitation and hygiene conditions at school are able to integrate hygiene education into their daily lives, and can be effective messengers and agents for change in

their families and the wider community. Conversely, communities in which school girls are exposed to disease risk because of inadequate water supply, sanitation and hygiene at school are themselves more at risk. Families bear the burden of their children's illness due to bad conditions at school (14–16).

Correct use and maintenance of water and sanitation facilities is ensured through sustained menstrual hygiene behaviours at school (4,17,18). Appropriate facilities should be provided for menstrual hygiene for female teachers and secondary school girls. Depending on the type of sanitary facility used and the prevailing cultural practices, facilities could include such things as a private place to wash and dry cloth, waste baskets to throw away sanitary pads, and water inside toilet cubicles for cleaning. This is most important to encourage girls to attend school, even when they are not menstruating(4,14,18).

1.3 Significance of the study

Access to water and sanitation in Ethiopia is among the lowest in the world and needs greater effort and resource to access these basic rights for the society. Since much attention is not given to this problem and studies on menstruation and its hygienic management as well as its influence on girls' education are limited and scarce in Ethiopia. This study is therefore conducted with the aim of assessing the prevailing knowledge about menstruation and its hygienic management, identifying factors that affect hygienic management of menstruation among adolescent school girls and most critical measures would be taken by policy makers, program planners, managers, donors, field workers and beneficiaries to counter act the cruel impact on day to day health, education, and dignity of adolescent school girls.

1. Literature Review

According to UNICEF Water, Sanitation and Hygiene (WASH) in Schools manual needs of adolescent girls increasingly, evidence has shown that the absence of toilets or separate toilets in schools for girls is a major reason parents keep their daughters from attending school. Menstruation is a phenomenon unique to the females. The onset of menstruation is one of the most important changes occurring among the girls during the adolescent years. The first menstruation (menarche) occurs between 11 and 15 years with a mean of 13 years. Among all the developmental milestones associated with the adolescent years, menarche may be the most important. The onset of the first menstrual period is a qualitative event of major significance in a woman's life, denoting the achievement of a major functional state. The bodily changes associated with puberty will have an impact in the girl's physical, psychological and social development(19–21). Globally women and girls have developed their own personal strategies to cope with menstruation. These vary greatly from country to country, and within countries, dependent on an individual's personal preferences, available resources, economic status, local traditions and cultural beliefs and knowledge or education. Due to these restrictions women often manage menstruation with methods that could be unhygienic or inconvenient, particularly in poorer settings(20,22).

The burden of reproductive tract infections (RTI) is a major public health concern worldwide and RTI are particularly widespread in low income settings. The proportion of this burden that can be attributed to poor menstrual hygiene management (MHM), as opposed to sexually transmitted infections; iatrogenic infections; or endogenous infections caused by agents other than those introduced through poor menstrual management is unknown. Confusing any attempt to investigate this is the fact that concurrent infection from multiple sources is possible. RTIs thought to be of most relevance to MHM are the endogenous infections bacterial vaginosis (BV) and vulvovaginal candidiasis (VVC)(6,8,22).

Across the globe menstruation and its management also have important social and cultural implications which may in turn impact women and girls' lives. Estimates of the prevalence of methods of management vary greatly across contexts but studies report widespread use of unsanitary absorbents, and inadequate washing and drying of reused absorbents across Africa, South East Asia and the Middle East(22).

2.1 Adolescent school girl's knowledge about menstruation and its hygienic management

A studies on adolescent school girl's knowledge about menstruation and its hygienic management those conducted in Ethiopia and other developing countries, are mostly shows an overview of key girls' awareness and personal hygiene followed by adolescents during menstruation awareness gabs in detail(11,12,20,23).

In India and Nepal studies shows that large of majority of 99.6% and 92% of the students had heard of menstruation and 57.9% had acquired this knowledge before attaining menarche. In India a large proportion, the knowledge was imparted to them by the mother, followed by friends and sister. In Lebanon, most girls 95.4% reported receiving information regarding menstruation from a number of sources simultaneously. The preferred provider of information was the mother, followed by school and health care professionals(6,19,23).

A mixed-method research combining quantitative and qualitative methods conducted in Northeast Ethiopia shows adolescent school girls' knowledge about menstruation and its hygienic management that the majority of the girls, 86.75% had heard about menstruation before they had menarche; where the leading sources of information were sisters, followed by mothers, friends and teachers respectively (13). The results of West Ethiopia study in 2015 revealed that, 67.8 % of the respondents got information about menstruation from their friends, followed by mass media, teachers, from their mothers and books. Girls whose mother's education status secondary school and above were 1.51 times more likely had good knowledge about menstruation and menstrual hygiene than their counterparts. Girls from families with radio and/or TV were more likely to have good knowledge about menstruation and menstrual hygiene when compared to those who had no radio/ TV (12). School based cross sectional study in Amhara region also shows that the main source of information about menstrual hygiene was teachers followed by mother. 38.4% adolescents reported that they had ever discussed with their friends about menstrual hygiene. 25.8% didn't learn about menstrual hygiene in their class and 33.9% reported they never discussed about menstrual hygiene with anyone (11).

In India and North East Ethiopia 73.7% and 57.89% of them knew correctly that menstruation is a physiologic process respectively(14,24). In India about 13.4% felt it was due to the curse of

god. Even though most of the girls had heard about menstruation, only 28.7% had knowledge on the exact process during menstruation (14). And most of the girls 89.1% large majority knew that menstruation was a phenomenon unique only to females. 50.8% felt that the menstrual cycles have an important physiological role in females while the rest of them were undecided. In North East Ethiopia 51.36%, had good knowledge about menstruation, but there is a knowledge gap in specific areas, i.e. only 8.35% and 23.05% of them knew exactly as menstruation is due to hormones and the menstrual bleeding is from the uterus, respectively (13,19).

A large proportion of the students I India thought that menstruation was a lifelong process 46.5% while 31.8% said that it was not a lifelong process and the remaining were undecided (19). West Ethiopia a 2015study shows that Knowledge about menstruation and its hygiene according to the data obtained from the participants, 60.9 % of the respondents had good knowledge about menstruation and its hygiene and 76.9 % of girls knew that menstruation was a physiological process, 9.7 % of the girls believed that it was a curse from God. 62.9 % knew that the cause of menstruation was hormone. Majority 79.3 % knew about menstruation before attaining menstruation (12). 75.1 % and 63.6 % of girls knew about menstrual hygiene and knew that there was a foul smell during menstruation respectively. In Ethiopia, Amhara region also 71.5% participants reported that there is foul smelling during menstruation and 68.5% said menstrual blood is unhygienic (11,12).

School based cross sectional study in Ethiopia, Amhara region also shows that the main menstrual hygiene management materials known by most 49.18% respondents were commercially made sanitary pads followed by underwear and homemade pad. 85.2% participants reported that poor menstrual hygiene predisposes to an infection. 90.7% and87.6% participants responded that use of sanitary pad and genital wash respectively should be done frequently (11). Based on the research conducted in Nepal abdominal pain or discomfort is the commonest medical problem experienced by the respondents. Only 85% reported abdominal pain, followed by excessive bleeding (8%) and breast pain (5%) in North East Ethiopia regarding knowledge about menstruation; During the onset of menarche girls reported different feelings such as: embarrassment among 42.86% of the girls, 31.65% were upset and tensioned and 16.92% were irritated or disgusted (6,13).

2.2 Adolescent school girls' hygienic practices during menstruation

A qualitative study in Kenya girls reported that it is difficult to manage their periods in school due to a lack of water and an inability to bathe, which is a preferred practice if a girl is menstruating while at home. Girls reported that bathing is difficult or impossible because school washrooms are not private, lack water, or have cold water. Girls bathe immediately before going home at the end of the day (20). A cross sectional study done in four selected High Schools in rural areas in three districts of Bangalore Urban, Bangalore Rural and Kolar around Bangalore city shows that personal practices and hygiene play a very important role during menstruation. It was seen that during menstruation 34.7% of the study population used cloth, 44.1% used sanitary pad and 21.2% used both cloth and sanitary pad. The queries on the frequency of change during the time of menstruation revealed that 39.8% changed sanitary pad or cloth twice a day, 29.5% three times a day and 21.7% once a day. A large proportion 56.8% of the study population used soap and water to clean their private parts while the rest used only water. 88.8% of the girls took bath every day during menstruation (19).

Community based cross-sectional survey conducted in Nepal in 2010 shows that, all participants used disposable absorbency products. About half of the girls 51.5% changed sanitary pads every 8 to 10 hours; 40.4%, every 3 to 4 hours; and 8.7%, once every 24 hours. The majority of the adolescents did not shower until after the third day of menstruation 66.9%. Most adolescent girls 95.4% said they washed their genitalia after urination during menstruation, with 42.2% using ordinary soap and water so as to remove impure blood and 40.9% using water only (23).

A 2014 case-control study in India shows women who used reusable cloths were 2 times more likely to be a case than women using disposable absorbents. Washing (bath or vaginal wash) with water only as compared with water and soap during menstruation was associated with symptomatic cases (95% CI 1.01–5.7, p = 0.045). Other practices such as number of absorbent material changes, staying at home when menstruating, the place where the absorbent material was changed and washing practices during menstruation (only vagina or body or both) did not differ significantly between cases and controls (25).

School based cross-sectional study design was employed in Nekemte Town, Western Ethiopia hygienic practices during menstruation as to the data obtained, 39.9% of the respondents had

good practice on menstrual hygiene. Majority 82.2 % of girls were using absorbent material during menstruation and two third of girls were using commercial made sanitary pads as absorbent material during menstruation. Out of girls who were using clothes 52.9 % of the respondents were washing clothes with soap and water. Half of girls change their pads or clothes three and above times per day. 20.2 % of the respondents were disposing their used sanitary pads in dustbin. 67.3 % of respondents were taking bath daily with soap during menstruation. 83.5 % of the girls clean their external genitalia during menstruation with soap and water (12). School based cross sectional study in Amhara region was conducted and the result shows most of the respondents 92.9% and 96.5% had access for water and toilet facility respectively. The privacy of the school toilet was kept for 82.7% respondents. Majority of the respondents 69.3% felt uncomfortable being in school during menstruation due to lack of private place to change sanitary pad by 39.2% and absence of water for washing by 19.1% (11).

Research conducted in the Northeast Ethiopia Menstruation and its hygienic management Only 35% of students used sanitary napkins and the rest 55% and 9% of them used homemade cloth and underwear as menstrual soak-up during their last menstrual period respectively. Among students who had used soak-ups other than sanitary napkins, 91.84% of them reused the material. The main reasons for not using sanitary napkins were lack of knowledge on how to use, followed by high cost, and shame to buy from shop. 58.24% and 20.88% of girls reported that they changed their menstrual soak up twice and more than twice a day respectively. 85.49% of them did not change menstrual soak up at school. The main reasons mentioned by students were absence of separate toilet for female students, fear of other students, lack of water sources, and the rest reported shortage of sanitary napkins or material used as absorbent as a reason. Regarding the method of disposal of the used material at school, home and/or everywhere 77.58% girls disposed the cloth pieces or sanitary napkins used into latrines and 33.41% of them in the open field and also in Ethiopia, Amhara region place of disposal for used menstrual hygiene materials 69.3% and 6.3% participants reported that they disposed used pad in school latrine and open field respectively(11,13).

2.3 Adolescent school girls' hygienic practices during menstruation

Adolescent girls attending school during menstruation require girl appropriate toilets, water supply for washing and receptacles for discarded sanitary pads. Without appropriate facilities, adolescent girls may be unable to remain comfortably in class. Although scientific evidence on the subject is limited, girls often mention the lack of sanitary protection during menstruation as a barrier to their regular attendance in school. Absence from school several days a month, amounting to 10–20 per cent of all school days, can be detrimental to a girl's learning and academic performance. Eventually this absenteeism can lead her to dropout completely (14,18,26).

Challenges have been identified as the experiences girls have at school during menstruation that make this time more difficult than other days at school. The most prominent challenges girls face at schools include fear, shame and teasing, which were linked to: keeping menstrual status hidden, leaks and stains, odor, lack of preparedness for menses, inability to manage menstrual hygiene effectively, lack of understanding of menstruation, discomfort about seeking guidance menstrual headaches or cramps (2).

Girls' absence from school also has an economic impact. Research shows that for every 10 per cent increase in female literacy, a country's economy grows by 0.3 per cent. Another unmet need is that school curricula typically do not cover the topic of menstruation and puberty in a girl friendly way. The treatment of the subject fails to help girls understand the changes in their maturing bodies (14)(27). A study on the long-term effect of community hygiene education programmes for both adults and children found that new behaviours do not fade as years go by. People do not revert to earlier, less hygienic practices. On the contrary, data indicate that hygiene behaviours are sustained beyond the end of an intervention(14,16,18, 27,28).

For five countries, comparisons were made between hygiene behaviour and the end date of the programme. The results showed that even where the programme had ended seven or nine years before the survey, about four out of five or 80 per cent of the women were still consistently using their latrines. Researchers presume that hand washing, like tooth brushing, occurs as part of daily routines and that these routines are often established in childhood. Therefore, schools are ideal settings for hygiene education, where children can learn and sustain lifelong adequate hygiene

practices(18,28). A comparative study of four schools in different settings of Nepal in the FGD, many girls shared that in addition to these physical symptoms they feel mentally stressed now and then during menstruation. They become very cautious about their mobility especially in the classroom. They take a lot of care when they stand, sit and walk - all due to the fear of accidental blood stain in the uniform or the place where they sit on. The effects of the pain on regular studies and specifically during (6).

A cross-sectional study in Uganda adopts a mixed methods approach shows menstrual-related absenteeism was prevalent amongst respondents 61.7% of whom miss school at least one day per month. The main reason girls reported for menstrual-related absenteeism was the lack of a private place for them to wash and change at school 63.8%. This was followed by fear of staining their clothes 59.4%, discomfort from bloating and tiredness 55.1%, and pain 51.4% (1). In addition, study in Ethiopia, Amhara region the main reason for school absenteeism during menstruation was lack of privacy for washing or cleaning mentioned by 13%, pain or discomfort 10.6% and fear of accidental leakage of menstrual blood by 9.5%. Poor menstrual hygiene interfered students school performance as reported by 40.9%respondents. Among those who were restricted, religious activities were mentioned by 39.2% study participants (11).

Studies on menstrual hygiene management and school absenteeism among female adolescent students in Northeast Ethiopia shows that most, 90.06% of the students didn't feel comfortable when they came to school during menstruation days. 20.22% students had missed exams when exams coincided with their menstruation days because of lack of pads and underwear to manage their menstrual bleeding, severe pain related to menstruation and embarrassment. Over half, respondents had perceived that menstruation had affected their academic performance or rank negatively as compared to what they had before their menarche due to lack of their class concentration during their period 79.47%, poor class attendance 72 27.38%, concentration on pain 19% (13).

2.4 Conceptual frame work

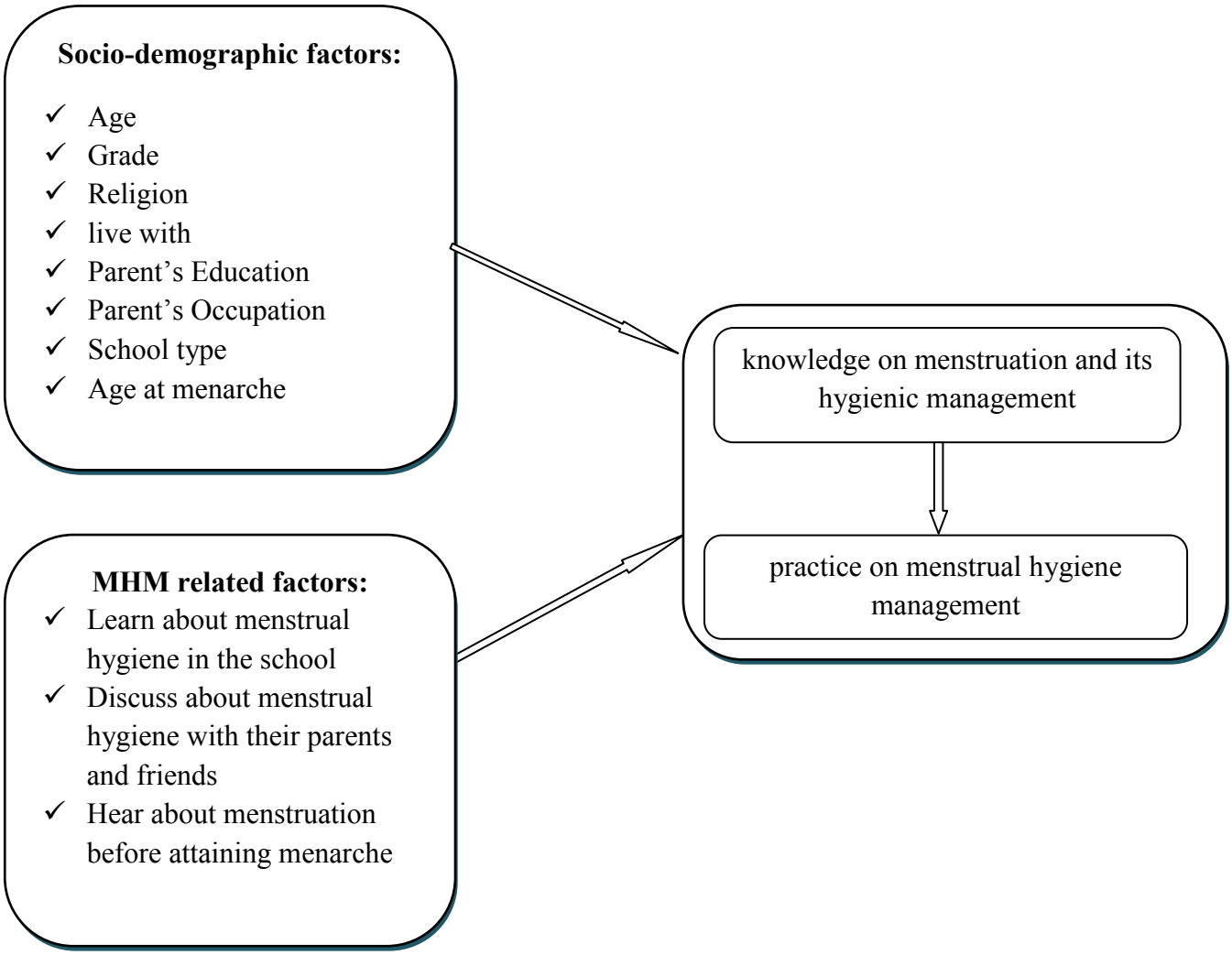

Figure 1 Conceptual framework of menstrual hygiene management and associated factors among adolescent school girls in Addis Ababa, 2017.

3 Objectives

3.1 General objective

- To assess the menstrual hygiene management and its determinant among adolescent school girls in Addis Ababa, Ethiopia.

3.2 Specific objective

- To measure level of menstrual hygiene management practice among adolescent school girls.
- To measure level of knowledge about menstrual hygiene management among adolescent school girls.
- To determine factors affecting menstrual hygiene management knowledge and practice among adolescent school girls.

4 Methods

4.1 Study area

The study was conducted among primary and secondary school girls in Addis Ababa a capital of Ethiopia, from April 1 to May 15, 2017.

The city has administrative structures: one city council, 10 sub-cities and 116 woredas. The total population of the city projected for the year 2016, by Population Census Commission, was 3.3 million with male to female ratio of 0.92 (29).

The city has a total of 203 governments and 612 private schools. Of the total number of 107,106 students enrolled from grade 7^{th} to 10^{th} education in the year 2016/17 were females (26).

4.2 Study design

School based cross-sectional study with a quantitative research methods was employed. The survey was conducted among female adolescent students.

4.3 Population

4.3.1 Source population

The source population of the study was all grade 7th to 10th students in public and private schools of the selected sub cities of Addis Ababa.

4.3.2 Study population

The study population was all grade 7^{th} to 10^{th} students from the selected public and private schools who were 770 randomly selected students and from whom data were collected.

4.4 Inclusion and Exclusion criteria

4.4.1 Inclusion criteria:

All students who were from grade 7th to 10th and has menarche was included in the study.

4.4.2 Exclusion criteria:

All female students who had sight problems and with mental disorders were not be included in this study.

4.5 Sampling

4.5.1 Sample size determination for quantitative study

To determine the number of adolescent school girls to be included in the study, a two-population proportion formula were used. Since the specific objectives are three, were calculated a sample size for each in order to take a large sample size.

Specific objective 1

The sample size of the specific objective was determined using a single population proportion formula $n = (z_{\frac{\alpha}{2}})^2 \frac{P(1-p)}{d^2}$ where $z_{\frac{\alpha}{2}} = 95\%$ level of confidence (1.96), p= proportion of menstrual hygiene management practice among adolescent school girls in previous study (prevalence of use of sanitary napkins 35.38%) (13) and d= margin of error (5%), based on these assumption that sample size found to be 350 and to maximize the response rate of the study and in order to correct cluster effect design effect 2 and 10% non-response rate were used. Based on the above assumptions the total sample size for objective one "n" was 770 school girls.

Specific objective two and three

For the second objectives: factors affecting menstrual hygiene management knowledge and practice among adolescent school girls, sample size was calculated using two population proportion formula (13).

$$n=\frac{Z\alpha_{/2}\sqrt{(1+1/r)\,p(1-p)}-Z_{\beta}\sqrt{P1(1-P_1)+[P_2(1-P_2)/r}\}^2}{(P1-P2)^2}$$

Where

$Z_{\alpha/2}$: 95% confidence level

Z_{β}: power

P1: the probability of event in the unexposed

P2: the probability of event in the exposed

r: ratio of exposed to unexposed

OR: 1.5

Design effect 2 and 10% non-response rate.

Based on the above assumptions the total sample size for objective two and three "n" was 434,304,314, and 78 school girls. It was calculated using statcalc sample size and power calculation for descriptive study of Epi info version 7

So, decision was made based on the comparison between the first specific objective (770) and second objectives (434). Finally, due to the issue of representativeness a sample size of 770 were used in the study. By using sample proportional to size, determine sample size to each school. Twenty primary and secondary schools at private and public were selected systematically from the list of schools from the selected sub-cities of Addis Ababa. A total of 770 school girls were randomly selected from students networking list of selected schools based on the proportion to the size of grade seven to ten of each school.

4.5.2 Sampling procedures

The target participants for this study was adolescent school girls from grade 7^{th} to 10^{th} in very selected schools of five sub cities of Addis Ababa. A multi-stage sampling procedure was used to select participant respondents. twenty Primary and secondary schools were selected randomly from the list of schools which have grade seven to ten in the Regional Education bureau. A total of 770 School girls were randomly selected from students networking list of selected schools based on the proportion to the size of grade seven to ten of each school. The reason for the choice of school girls in grade seven to ten was because they start their menarche.

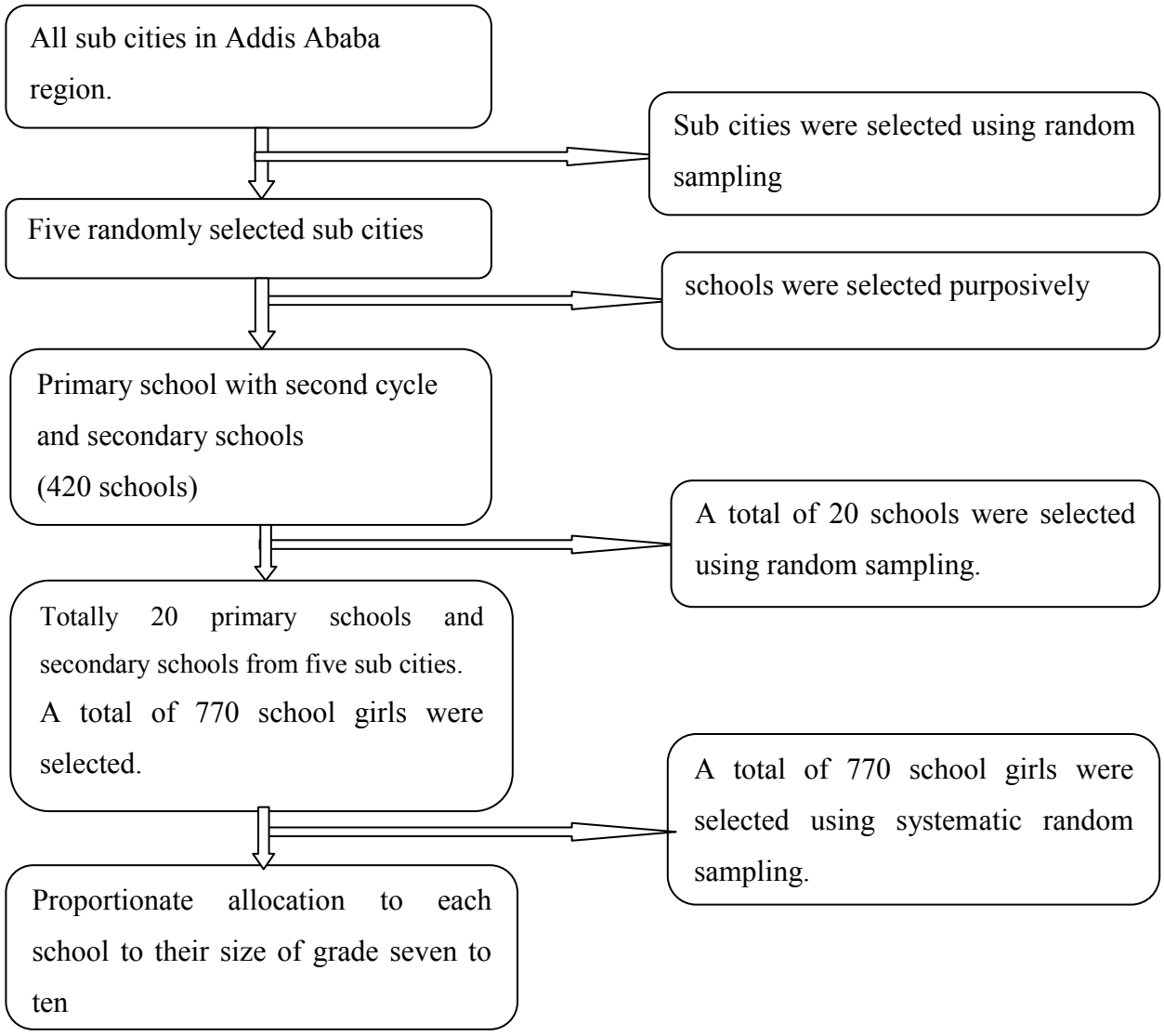

Figure 2 A diagram shows the sampling procedures of primary and secondary schools and school girls who will be participated in the study

4.6 Data collection tool and procedure

A self-administered pre-test close ended Amharic questionnaire at school setting were used. The questionnaire was contained variables related to socio-demographic characteristics, knowledge about menstruation and menstrual hygiene management, practice about menstrual hygiene. Study subjects were invited to take part voluntarily by explaining the purpose of the study and data were collected after obtaining verbal consent. Data was collected by ten female health professional data collectors with health background one supervisor.

Students were instructed on how to fill the questionnaire. Data quality was assured through careful design of the questionnaire. Data collectors and supervisor were received a one-day training on the purpose and procedure of data collection related to this research. During the training, special emphasis was given to establishing trust before asking questions. The training session were also pay attention to careful consideration for sensitive questions, observations where needed, and avoidance of participation bias. Data were checked for completeness and consistency after each day of data collection checking filled questionnaires by supervisors. The overall data collection process was coordinated by the principal investigator.

4.7 Variables

4.7.1 Dependent variables

- Knowledge on menstrual hygiene management.
- Practice on menstrual hygiene management.

4.7.2 Independent variables: -

Socio-demographic variables

- Age
- Grade
- School type
- Religion
- Parent's education
- Parent's occupation.

Menstrual hygiene related Variables including:

- School learning on menstrual hygiene.
- Discussion with parents on menstrual hygiene.
- Information before menarche on menstrual hygiene.

4.8 Data analysis

All responses to the survey questionnaires were coded on pre-arranged coding sheet by the principal investigator to minimize errors. The coding will be using the original English version and were entered to EPI-7 software. The data file will export to statistical package for social studies (SPSS) version 25.0 software for analysis. Descriptive analysis including frequency, proportions, and measures of mean were done. Cross tabulations were made to calculate Crude and adjusted odds ratio. All variables with p<=0.20 in bivariate analysis were fitted in to the multiple logistic regression model to identify factors associated with menstrual hygienic practice. P value <= 0.05 were considered as a level of significance.

4.9 Data quality management

The quality of data was assured at the maximum attainable level by using standardized adapted questionnaire and following the necessary procedures in order to get the intended results. To ensure quality of data, pre-test of data collection tools was done on primary school girls in New Era primary school by taking 5% of the total sample size. Data collectors were given orientation. Besides, the questionnaire was checked for completeness and correctness on daily basis by immediate supervisors.

4.10 Operational definition

- The **students' knowledge** was scored using a scoring system adapted from a past study. Students' menstrual knowledge score was calculated out of the 12 knowledge specific questions (Table 3). Each correct response earned one point, whereas any wrong or don't know response attracted no mark and thus the sum score of knowledge was calculated (12 points). Accordingly, the mean score of menstrual knowledge (7 ± 1.67) was used to decide the cutoffs of the rank. Good knowledge of menstruation and menstrual hygiene was given to

those respondents who scored 7–12 points and Poor Knowledge of menstruation and menstrual hygiene was given to those respondents who scored 0–6 points.

- **Students' practice** of menstrual hygiene score was calculated out of the practice specific questions (Table 4). Each correct response earned one point, whereas any wrong or don't know response attracted no mark and thus the sum score of practice was calculated (15 points). And also, the mean score of menstrual practice (8± 3.619) was used to decide the cutoffs of the rank. Good practice of menstrual hygiene was given to those respondents who scored 8–15 points and poor knowledge of menstruation and menstrual hygiene was given to those respondents who scored 0–7 points. Each correct response earned one point, whereas any wrong or don't know response attracted no mark (12).
- **Hygienic menstrual management practice in school** – adolescent school girls using a clean menstrual management material to absorb or collect blood that can be changed in privacy as often as necessary for the duration of the menstruation period, using soap and water for washing the body as required, and having access to facilities to disposed of used menstrual management materials (4).
- **Secondary school** – a high school or a senior high school which provides secondary education, between the ages of 14-19, after primary school and before higher education(26).
- **Primary school** - a primary school or elementary school which provides primary education, between the ages of 6-14, after kinder-garden school and before secondary education(16).
- **Access to water supply**– Sufficient water-collection points and water-use facilities are available in the school to allow convenient access to, and use of, water for drinking, personal hygiene, cleaning and laundry (4).
- **Address the gender-related needs:** The number, location, orientation of school WASH facilities should take into consideration of the gender factor (gender mainstreaming) (8).
- **Adequacy of safe water**- is the availability of 5 liters per person per day for all schoolchildren and staff at day schools(4).
- **Appropriate designs for different age groups**: The detailed design of the facilities provided must also be young child friendly. Steps must be easy to climb. Door handles must be easy to reach. The toilet interior cannot be too dark. Squatting plates must be designed to accommodate a child's feet rather than those of an adult (8).

- **Improved sanitation** - are those more likely to ensure privacy and hygienic use /easily cleanable which is not full, do not have fecal matter in the squat (24)
- **Physically separate facilities**: Physically separated facilities must be provided for girls, spaced sufficiently apart to ensure that girls do not feel embarrassed but secure when approaching and using the facilities. Separate hand-washing areas should also be provided, affording privacy for girls who may need to wash and dry menstrual cloths (8).
- **Use appropriate orientation of facilities**: Specifically, the direction that the toilet entrance faces, must also take into account the perceived security and safety of girls. The orientation of the squatting plate should also take into account cultural and religious norms (8).

4.11 Ethical consideration

Ethical clearance was secured from School of Public Health, College of Health Sciences, Addis Ababa University Research Ethics Committee. Approval letter was obtained from Addis Ababa City Administration Education Bureau in the respective schools included in this study. School directors and directresses were briefed on the objectives of the study and permission to conduct the study was obtained from participating schools. The questions from the questionnaire prove not to affect the morale and personality of study subjects. Informed verbal consent was obtained from each study subject after explanation of the objective of the study. Confidentiality was ensured from all data collectors via using code numbers than names and keeping questionnaires locked. Data collectors also give health education and advice to the subjects during the data collection process.

4.12 Dissemination of results

The research is presented for thesis examiners and submitted to Addis Ababa University School of Public Health. Effort will be made to present it in different seminars and workshops. It will be published.

5. Result

5.1 Socio-demographic characteristics of study population

A total of 756 primary and secondary school girls were participated from twenty primary and secondary schools, with response rate of 98%. Among these participants 38.1 % (288) were from private and the rest 61.9 % were from government schools. Among the total respondent 156 (20.6%), 160 (21.2%), 220 (29.1%) and, 220 (29.1%) were grade seven, eight, nine and ten respectively. The mean age of the study participants was 14.89 with SD $\pm$ 1.285 years, while their age range between 12-20 years. The mean age of menarche of the respondents was 12.84 with SD $\pm$0.745 years.

The study also indicated that 267 (35.3%) and 226 (29.9 %) of the respondents' father completed secondary and higher level of education respectively. Regarding respondent's mother occupation, 255 (33.7%) of them were house wife while 156 (20.6%) government employed. The majority 70.2% (531) of the respondents didn't earn pocket money form their families. The quintile division showed that, wealth was almost equally distributed across the five quintiles. 20.5% of respondents were in the lowest quintile whereas 18.7% in the highest quintile (See table 2)

Table 1Table 11 Socio-demographic characteristics of primary and secondary school girls, April 1 to May 15, 2017 Addis Ababa, Ethiopia. (n =756)

Characteristics of respondents		Frequency	Percentage
Age	Less than 15	305	40.3
	15 and above	451	59.7
Religion	Orthodox	528	69.8
	Muslim	154	20.4
	Protestant	59	7.8
	Catholic	15	2.0
Wealth using the wealth index	Quintile One	155	20.5
	Quintile two	148	19.6
	Quintile three	151	20.0
	Quintile four	161	21.3
	Quintile five	141	18.7
Mothers educational status	Illiterate	206	27.2
	Read & write	84	11.1
	Primary	175	23.1
	Secondary	163	21.6
	College and above	128	16.9
Live with	Both parents	651	86.1
	only mother	59	7.8
	Relatives	24	3.2
	Only father	22	2.9
Fathers occupation	Merchant	204	27.0
	Employed in private organization	197	26.1
	Governmental employee	180	23.8
	Driver	94	12.4
	Daily laborer	81	10.7

5.2 Adolescent school girls' knowledge about menstruation and its hygienic management

This study also found that 83 percent of respondents knew about menstruation before it occurred and their chief source of information was mothers (68.3%) followed by friends (41.08%), elder sister (32.48%) and school (28.18%). Out of the total respondents, 392 (50.9%) didn't learn about menstrual hygiene in the school. Two hundred three (26.9%) of the respondents didn't discuss about menstrual hygiene with their parents and friends.

Out of the total, 599 (79.2%) of girls knew that menstruation was a physiological process, whereas 42 (5.6 %) of the them believed that it was a curse from God. Majority of girls (69.3%)

correctly responded hormone as the cause of menstruation. More than half, 64.6% of the respondents knew that uterus is the source of menstrual blood. (See table 3)

Table 2 School girls' Information and knowledge grading on menstruation and its management, April 1 to May 15, 2017 Addis Ababa, Ethiopia. (n =756)

Variables	Frequency	Percentage
Normal menstruation cycle		
Less than 25 days	84	11.1
25 to 28 days	515	68.1
28 to 35 days	104	13.8
More than 35 days	53	7.0
Normal regular menstrual bleeding duration		
< 2 days	52	6.9
2 to 7 days	676	89.4
>7	28	3.7
Knew that there is foul smelling during menstruation		
No	142	18.8
Yes	614	81.2
Knew that menstrual blood is unhygienic		
No	200	26.5
Yes	556	73.5
Knew Pain during menstruation means that's one not sick		
No	254	33.6
Yes	502	66.4
Knew menstruation is not harmful for a woman's body if she runs or dances during her period		
No	229	30.3
Yes	527	69.7
Hear about menstruation before attaining menarche		
No	116	15.3
Yes	640	84.7
Menstruation is not a lifelong process		
No	130	17.2
Yes	626	82.8
Knew that a girl should take more nutritious diet during menstruation		
No	190	25.1
Yes	566	74.9

Based on the Knowledge summary of the respondent, 70.1% (67.1-73.5) had good knowledge about menstruation and its hygiene while 29.9 % of them had below the mean score of knowledge and categorized as poor knowledge.

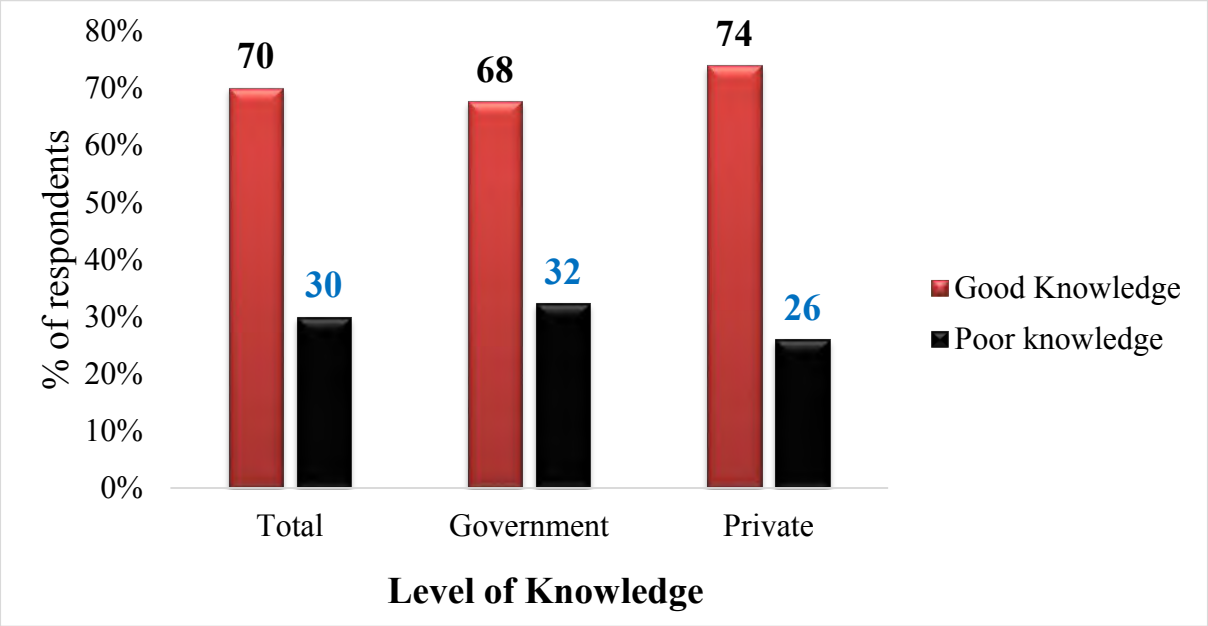

Figure 3. Over all knowledge regarding menstruation and its hygienic management among private and government school girls in Addis Ababa, Ethiopia, 2017.

5.3 Menstrual Hygiene Practice

Out of the total respondents, 52.5 % (48.7-56.1) of the respondents had good practice on menstrual hygiene. Majority 457 (60.4%) of students used sanitary napkins and the rest 295 (39%) and 4 (0.5%) of them used homemade cloth and underwear as menstrual soak-up during their last menstrual period respectively. This study also enlisted the main reason for the non-use of sanitary napkins includes; 149(53.02%) high cost, 99(35.23%) difficulty in disposal, and 33(11.74%) lack of knowledge. Five hundred thirty-one participants change their pads during menstruation at school. Half 384 (59.3 %) of girls change their pads three and above times per day and 129(17.1%) changed their pads once in a day.

Table 3 Practice grading on MHM among private and government school girl's, April 1 to May 15, 2017 Addis Ababa, Ethiopia.

Variables	Frequency	Percentage
Change pads at school		
No	225	29.8
Yes	531	70.2
Frequency of changing absorbent material per day		
Once	129	17.1
Twice	179	23.7
Three times	399	52.8
More than three times	49	6.5
Clean genitalia		
No	212	28.0
Yes	544	72.0
Material used for genital cleaning		
Soap and water	207	38.05
Water only	307	56.43
Plain paper	30	5.51
Clean external genitalia		
No	254	33.6
Yes	502	66.4
Materials for cleaning external genitalia		
Soap and water	148	29.48
Water only	314	62.55
Plain paper	40	7.97
Hand washing		
No	370()	48.9
Yes	386()	51.1
Materials for hand washing		
Soap and water	163	42.23
Water only	223	57.77
Shower		
No	238	31.5
Yes	518	68.5
Materials for showering		
Soap and water	506	97.68
Water only	12	2.22
Drying of washed reusable cloths		
In the shade, outside	68	9.0
In the shade, inside	20	26.6
In the sunlight, inside	201	26.6
In the sunlight, outside	131	17.3
Hidden under other clothes	60	7.9
Hidden elsewhere	95	12.6

Six hundred forty (84.7 %) of the respondents disposed their used sanitary pads in the latrine, 68(9%) wrap in paper and put in the bin, and the rest 48(6.3%) threw in the open field. Three hundred thirty-one (43.9%) of the respondents dried their reusable sanitary pads in sunlight. 32.4% of the study participants store their sanitary pads in separated plastic bag for the next use. (see table 4)

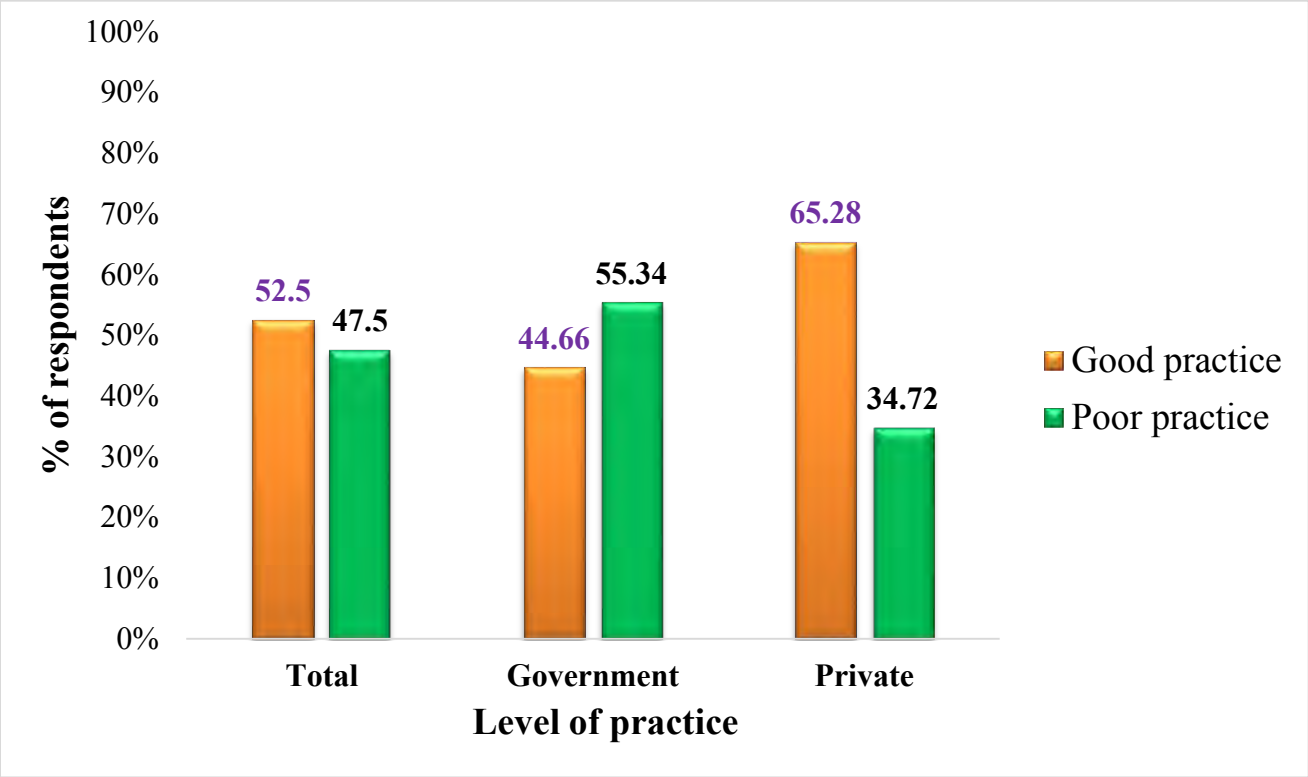

Figure 4. Over all practice of menstrual hygiene management among private and government school girls in Addis Ababa, Ethiopia, 2017.

This study evidenced that menstrual hygiene practice related school absenteeism was prevalent amongst respondents, 64.3% of whom miss school at least once in a month (mean 1.14, SD 1.132). Out of these respondents, 348(46.03%) of the girls were absent from school during their last menstrual period up to four days. The main reasons for school absenteeism during menstruation were; pain 294 (79.03%), followed by lack of washing facility at school 292 (78.49%), feel uncomfortable or tired 207 (55.65%), no private place to change sanitary pad 197 (48.12%), and didn't have sanitary pad, 98 (26.34%).

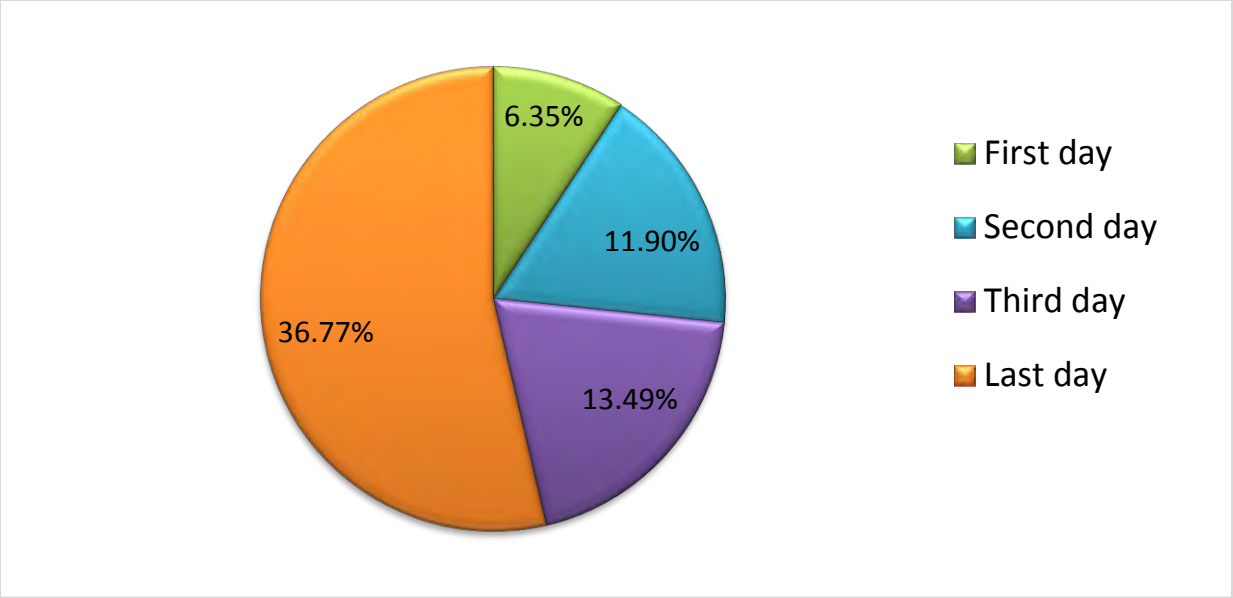

Figure 5. Bath days during menstruation among primary and secondary school girls in Addis Ababa, Ethiopia, 2017. (n=518)

5.4 Association between overall good knowledge of menstrual hygiene management and socio demographic factors

The crude value in the bivariate analysis, some of socio-demographic characteristics of the respondents were significantly associated with the outcome variable-knowledge of menstrual hygiene. The odds of good knowledge about menstruation and menstrual hygiene were 7.01 times higher for those respondents from private school compared to the government once (COR=7.01%, 95% CI: 4.936-9.952). Whereas the odds of good knowledge about menstruation and menstrual hygiene were 31.493 times higher for respondents' mother education collage and above compared to the illiterate (COR=31.493%, 95% CI: 13.959-71.053). Unlike the crude value, the controlled model found that only the highest categories of wealth were associated with the knowledge. Girls from the wealthiest family were [AOR = 3.199, 95 % CI: 1.082-9.454] more likely to have good knowledge about menstruation and menstrual hygiene when compared to those from non-wealthy. The controlled effect indicated that girls whose mother's education college and above were 6.101) [AOR, 95% CI: 1.779-20.919] times more likely to have good knowledge about menstruation and menstrual hygiene than their counterparts. The model also found that girls from secondary schools were [AOR = 13.742, 95 % CI: 5.390-

35.037] more likely to have good knowledge about menstruation and menstrual hygiene when compared from primary school girls. Respondents whose mothers from government employee were strongly associated with good knowledge about menstruation and menstrual hygiene 10.555 (2.047-54.411) [AOR = 10.555, 95 % CI: 2.047-54.411]. This study also found that girls from the wealthiest family were [AOR = 3.199, 95 % CI: 1.082-9.454] more likely to have good knowledge about menstruation and menstrual hygiene when compared to those from lowest quantile. (see table 6)

Table 4 Association between socio demographic factors and knowledge about MHM among primary and secondary school girls, April 1 to May 15, 2017 Addis Ababa, Ethiopia. (n =756)

Characteristics	**Knowledge**		**Crude OR**	**Adjusted OR**
	Poor	**Good**	**95% (CI)**	**95% (CI)**
Age of the respondents				
<15 years	132	173	1	1
>=15 years	94	357	2.898(2.102-3.904)	0.819(0.344-1.950)
Wealth index				
Quintile One	109	46	1	1
Quintile two	58	96	3.677 (2.282-5.925)	2.090 (0.826-5.289)
Quintile three	35	116	7.853(4.709-13.098)	2.079 (0.815-5.303)
Quintile four	8	153	45.318(20.568-99.85)	**4.050(1.265-12.966) ***
Quintile five	16	125	18.512 (9.917-34.556)	**3.199(1.082-9.454) ***
Grade				
Primary	166	150	1	1
Secondary	60	380	7.01(4.936-9.952)	**13.742(5.390-35.037) ***
Mothers educational status				
Illiterate	133	73	1	1
Read & write	27	57	3.846 (2.242-6.598)	0.705 (0.257-1.934)
Primary	36	139	7.035 (4.420-11.195)	**5.718(2.548-12.831) ***
Secondary	23	140	11.090 (6.558-18.7530)	**10.012(3.628-27.629) ***
College and above	7	121	31.493 (13.959-71.053)	**6.101(1.779-20.919) ***
Fathers educational status				
Illiterate	57	29	1	1
Read & write	42	30	1.404 (0.735-2.683)	1.245 (0.376-4.125)
Primary	30	75	4.914 (2.655-9.095)	1.284 (0.444-3.709)
Secondary	82	185	4.434 (2.644-7.438)	0.796 (0.302-2.098)
College and above	15	211	27.648 (13.887-55.045)	2.197 (0.648-7.450)
Fathers occupation				
Merchant	55	149	7.740(4.311-13.898)	0.880 (0.284-2.726)
Private employee	36	161	12.778 (6.912-23.621)	0.888 (0.274-2.874)
Governmental employee	26	154	16.923(8.854-32.346)	2.973(0.863-10.250)
Driver	49	45	2.624(1.382-4.981)	1.568 (0.510-4.821)
Daily laborer	60	21	1	1
Mothers occupation				
Housewife	113	142	1.374(0.802-2.357)	2.301 (0.686-7.721)
Merchant	29	86	3.244(1.714-6.138)	1.135 (0.300-4.289)
Private employee	41	123	3.281(1.809-5.953)	0.391 (0.103-1.488)
Governmental employee	8	147	20.098(8.522-47.398)	**10.555(2.047-54.411) ***
Daily laborer	35	32	1	1
Age at first menarche				
<=13	157	461	1	1
>13	69	69	2.936 (2.009-4.292)	2.093 (0.914-4.793)
Earn pocket money				
Yes	46	179	1.99(1.378-2.890)	0.741(0.392-1.400)
No	180	351	1	1

*P<0.05 cutoff point for significance

5.5 Association between overall practice of menstrual hygiene management and socio demographic factors

Based on the bivariate analysis, among the ten socio-demographic variables, level of grade (secondary), respondent's mother's educational status (college and above), respondent's father educational status (college and above), both respondent's mother and father occupational status, Age at first menarche (>=13) and pocket money were significantly associated with 95 % CI COR at P<0.05 with overall practice of menstrual hygiene management among respondents.

The crude value also showed that the odds of overall practice of menstrual hygiene management among secondary school girls were 2.364 (95% C.I: 1.759-3.177) times higher compared to primary school girls. In this study, it was found that pocket money was associated with overall practice of menstrual hygiene management. The odds of overall practice of menstrual hygiene management among girls 2.177 (95% C.I: 1.575-3.009) times higher for respondent who had earned pocket money from their families. The odds of overall practice of menstrual hygiene management among girls 2.330 (95% C.I: 1.720-3.156) times higher among respondent who were from private school than government school girls.

After controlling interaction effect of all the variables, it was found that the current age of school girl students above fifteen years old were 2.283 [AOR (95% C.I: 1.613-4.971)] times more likely to have good practice than their counterparts. Girls whose mother's education secondary and above were eight times more likely to have good practice about menstrual hygiene compared to those from illiterate mothers [AOR = 7.761, 95 % CI: 3.583-16.809)]. Girls whose fathers from private employee were [AOR (95% C.I): 3.654 (1.215-10.991) times more likely had good menstrual hygiene management practice than those who were daily laborer family. This study also found that girls whose age at first menarche greater than thirteen were 2.572 times more likely to have good practice about menstrual hygiene compared to those who were less than thirteen years old. [AOR (95% C.I): 2.572 (1.409-4.694)]. Practice of MHM was also distributed unequally across the wealth quintile. The odd of good practices were 3 times higher in the highest quintile compared to the 2nd. In addition, the overall knowledge of the respondents was significantly associated with their practice [AOR (95% C.I): 4.581 (2.462-8.526)] (See table 8)

Table 5 Association between socio demographic variables and level of MHM practice among primary and secondary school girls, April 1 to May 15, 2017 Addis Ababa, Ethiopia. (n =756)

Characteristics	Practice		Crude OR	Adjusted OR
	Poor	Good	95% (CI)	95% (CI)
School type				
Government	259	209	1	1
Private	100	188	2.330(1.720-3.156)	1.09(0.64-1.85)
Age of the respondents				
<15 years	180	125	1	1
>=15 years	179	272	2.188(1.627-2.942)	**2.832(1.62-4.97) ***
Wealth index				
Quintile One	133	22	1	1
Quintile two	91	57	3.787 **(**2.164-6.626**)**	**2.968(1.32-6.67) ***
Quintile three	74	77	6.291 **(**3.620-10.931**)**	**3.80(1.730-8.35) ***
Quintile four	32	129	24.371 **(**13.45-44.16**)**	**14.776(6.23-35.04) ***
Quintile five	29	112	23.348 **(**12.71-42.91**)**	**9.038(3.728-21.91) ***
Grade				
Primary	189	127	1	1
Secondary	170	270	2.364(1.759-3.177)	**3.115 (1.606-6.04) ***
Mothers' educational status				
Illiterate	150	56	1	1
Read & write	42	42	2.679(1.582-4.535)	1.588(0.71-3.560)
Primary	100	75	2.009(1.308-3.084)	1.929(0.95-3.933)
Secondary	48	115	6.417(4.069-10.122)	**7.761(3.58-16.81) ***
College and above	19	109	15.367(8.639-27.352)	**17.91(6.65-48.22) ***
Fathers' educational status				
Illiterate	64	22	1	1
Read & write	49	23	1.365(0.683-2.730)	0.482(0.146-1.588)
Primary	39	66	4.923(2.634-9.203)	0.552(0.218-1.403)
Secondary	135	132	2.844(1.657-4.884)	0.570(0.110-1.663)
College and above	72	154	6.222(3.556-10.887)	0.574(0.099-1.761)
Fathers' occupation				
Merchant	74	130	9.189(4.757-17.750)	1.933(0.705-5.295)
Private employee	55	142	13.505(6.911-26.391)	**3.65(1.22-10.991) ***
Governmental employee	86	94	5.717(2.951-11.078)	1.178(0.413-3.363)
Driver	76	18	1.239(0.565-2.716)	0.481(0.166-1.391)
Daily laborer	68	13	1	1
Mothers' occupation				
Housewife	145	110	2.630(1.407-4.916)	2.125 (0.759-5.952
Merchant	41	74	6.257(3.140-12.470)	1.570 (0.522-4.718
Private employee	63	101	5.558(2.887-10.699)	1.259 (0.448-3.539
Governmental employee	58	97	5.798(2.996-11.219)	0.813 (0.272-2.435
Daily laborer	52	15	1	1
Age at first menarche				
<=13	268	350	1	1
>13	91	47	2.529(1.718-3.721)	**2.57(1.41-4.69) ***
Earn pocket money				
Yes	77	148	2.177(1.575-3.009)	1.11(0.67-1.81)
No	282	249	1	1

*P<0.05 cutoff point for significance.

5.6 Association between overall knowledge and practice of menstrual hygiene management and other menstrual related factors

The regression model also evidenced other menstrual related factors like learning and discussing about MHM in the school and with parents and friend and also hearing about it before menarche were significantly associated with both the outcome variables. The odds of good knowledge about menstrual hygiene management among those who learn about menstrual hygiene at school were 3.110 (95% CI: 1.569-6.162) times higher than those who didn't learn at their school. (See table 9)

Table 6 Association between MHM related variables and knowledge about MHM among primary and secondary school girls, April 1 to May 15, 2017 Addis Ababa, Ethiopia. (n=756)

Characteristics	**Knowledge**		**Crude OR**	**Adjusted OR**
	Good	**Poor**	**95% (CI)**	**95% (CI)**
Learn about menstrual hygiene in the school				
Yes	316	55	4.59(3.24-6.51)	**3.11(1.57-6.16) ***
No	214	171	1	1
Discuss about menstrual hygiene with their parents				
Yes	481	72	20.99(13.99-31.51)	**10.89(5.39-21.98) ***
No	49	154	1	1
Heard about menstruation before attaining menarche				
Yes	500	140	10.24(6.49-16.15)	**5.03(2.21-11.48) ***
No	30	86	1	1

*P<0.05 cutoff point for significance.

This study found that the odds of good practice about menstrual hygiene management among those who discuss about menstrual hygiene with their parents were 13.651 (95% CI: 7.087-26.296) times higher than those who didn't discuss about menstrual hygiene with their parents. (See table 10)

Table 7 Association between MHM related variables and MHM practice among primary and secondary school girls in Addis Ababa, 2017. (n=756)

Characteristics	**Practice**		**Crude OR**	**Adjusted OR**
	Good	**Poor**	**95% (CI)**	**95% (CI)**
Learn about menstrual hygiene in the school				
Yes	259	112	4.14(3.05-5.61)	**2.47(1.52-4.01) ***
No	138	247	1	1
Discuss about menstrual hygiene with their parents				
Yes	371	182	13.88(18.86-21.73)	**13.65(7.09-26.296) ***
No	26	177	1	1
Hear about menstruation before attaining menarche				
Yes	37	269	4.78(3.003-7.59)	0.779(0.366-1.656)
No	26	92	1	1

*P<0.05 cutoff point for significance.

6. Discussion

The onset of menstruation is one of the most important changes occurring among the girls during the adolescent years. The bodily changes associated with puberty will have an impact in the girl's physical, psychological and social development (19–21). This study was conducted to identify factors affecting practice of menstrual hygiene among school girls in Addis Ababa.

In this study, the mean age of menarche of the respondents was 12.84 with SD +0.745 years which is similar to studies conducted in Jammu district, India and Argoha village of Haryana with the mean age of menarche 13.43±.83 and 12.76 ± 0.936 years respectively (30,31).

In consistent with study reports from Jimma district, India (66.15%) (30), for about 68% school girls, their mothers were main source of information on menstruation. This could be suggestive of the contribution of mothers for hygienic practice of girls during menarche. In contrast to this finding, school teachers and sisters respectively, were reported to be important source of such information in Amhara North East, Ethiopia (13).

6.1 Factors of menstrual hygiene management

Present study also reported that, majority (70.1 %) of the students had good knowledge about menstruation and menstrual hygiene. The finding was similar with the result from studies done in western Ethiopia; 60.9%. This study notified that Five hundred ninety-nine (79.2%) of girls knew that menstruation to be normal a physiological process. Such prevalence found to be consistent with a result of a study done in western Ethiopia (76.9%), Argoha village of Haryana 71.3%, and Central India 89% of school girls knew correctly that menstruation as physiologic process(12,31,32). A possible explanation for this similarity may be that girls had good discussion in families openly. This finding however, was higher than that of those in previous a study done in Northeast Ethiopia; 319 (57.89%) This difference might be due to the study method difference (mixed qualitative and quantitative method for the previous study (12).

Adolescent girls who knew that uterus was the source of blood in menstruation were 64.6% which is similar to studies conducted in Amhara Ethiopia, western Ethiopia, and Central India was found out to be 60.9%, 59.3% and 60% respectively (12,32,33). This study disagrees with results obtained from a study in Argoha village of Haryana 38.7%, possibly due to minimum information provided about menstruation and menstrual hygiene by schools and families (31).

In this study, multivariable analysis showed that girls whose mother's educational status secondary school and above were 10.012 times more likely to had good knowledge about menstruation and menstrual hygiene than their counterparts [AOR = 10.012, 95 % CI: 3.628-27.629]. A similar study done in western Ethiopia and Jammu District India showed that, parental education was positively associated with girls' menstrual knowledge (12,30). The reason could that educated mothers may provide information about menstruation and menstrual hygiene to their daughters. Girls from educated families may discuss openly about menstruation.

Unlike a study done in Amhara region, Ethiopia 2016 [AOR = 0.94, 95 % CI: 0.46–1.92], this study found that, the grade level of respondents was positively and significantly [AOR = 13.74, 95 % CI: 5.39-35.04] associated with knowledge about menstruation and menstrual hygiene management. Due to the fact that high school girls might have high possibility for exposure to information regarding menstruation and its hygienic management (11). in another study done in Odisha, India 2015, none of the mother's occupational category were significantly related with knowledge (25). But in this study only government employed mothers were the one associated with knowledge on menstruation.

Regarding hygiene related practices during menstruation, this study found that 9.27% girls took daily bath during menstruation and 29.48% clean their external genital with soap and water during menstruation. A similar study done in Jammu and Kashmir, India indicated that 93.18% had daily bath and 66.67% clean external genital with soap and water (30). The difference might be due to socio cultural, weather condition and economic factors.

In this study, three hundred ninety-seven (52.5%) of the respondents had good practice of menstrual hygiene. The finding of this study was lower than studies conducted in the Amhara region of Ethiopia and Jammu and Kashmir, India which were 84.28 % and 59.09%, respectively (30,33). Comparatively, lower level of practice of menstrual hygiene was recorded from similar study conducted on high school girls in Western Ethiopia, it was indicated that only 39.9 % of the study participants practice good menstrual hygiene (12). Thus, the reason for the observed difference could be due to low awareness and communication of menstrual hygiene by high school Western Ethiopia girls which affects their menstrual hygienic practice.

In this study, it was found that 17.3% of the study participants dried their reusable pads in the sun light outside which is similar with the finding in Amhara, Ethiopia 15.5% of the participants dried in the sun light. In contrast, a study done in central India indicated that 93% of adolescent girls dried reusable pads in the sun light (32,33). This difference might be due to different in the socio-cultural factors. 457(60.4%) of participants use disposable sanitary pads during menses. In a similar study done in Argoha village of Haryana and central India Indicated that, 80.7 % and 98% girls use only napkin during menses respectively (31,32). Comparatively, lower level of use of sanitary pads was recorded from similar study conducted on high school girls in north east Ethiopia, it was indicated that 35.38% of the study participants use disposable sanitary pads during menses. This may be due to differences in socio economic differences. The main reason for not using pads in present study was non-affordability due to high cost (53.02%) followed by non-availability and disposal problems which is similar to study in Jammu district India(78.94%) (30).

The adjusted value of this study found that, both mother's educational category was [AOR = 7.761, 95 % CI: 3.583-16.809] positively associated with practice of menstrual hygiene which agrees with the study done in western Ethiopia, in 2014 and Northeast Ethiopia [AOR = 2.03, 95 % CI: 1.38–2.97] [AOR = 4.26, 95 % CI: 1.61 - 11.28] respectively (11,12). Multivariable analysis showed that girls who learn about menstrual hygiene in their school and with their parent were 2.472 times more likely to had good practice about menstruation and menstrual hygiene than their counterparts. A similar study done in northeast Nigeria that learn about menstrual hygiene in the school was positively associated with girl's menstrual practice (34). Possibly due to information provided about menstrual hygiene management at schools. Students whose age above fifteen were 2.832 times more likely to have good practice than age less than fifteen a similar study done in northeast Nigeria. A significant association was also observed between girls whose first menarche were above thirteen (AOR= 2.572) and below with the practice of MHM. Which was also significant in another study done in south India (24).

7. **Strength of the study**

This study used large sample size plus simple random sampling and all factor variables were controlled during analysis. Its findings therefore, could be generalized for the source population.

8. Limitation of the Study

This research may not capture the accurate age of menarche as a result recall bias. Another limitation this paper encounters, it is culturally sensitive issue so, it is prone to bias called social desirability.

9. Conclusion

Large number of the participants had good knowledge of menstruation and menstrual hygiene and it was better among private school girls than the government.

Half of the total respondents had good practice of menstrual hygiene among respondents, and alike to that of knowledge, the large proportion of them were from private school.

Good knowledge of menstruation showed a significantly positive association with the level of grade, educational status of the mother, and mother's occupational status.

Educational status of the mother, mother's occupational status, plus current age of respondents' and age at first menarche were positively associated with practice of menstrual hygiene management.

All those factors considered in addition to socio demographic variables, which assume to be predictive of the outcome variables including learn about menstrual hygiene in the school, discuss about menstrual hygiene with their parents and friends and hear about menstruation before attaining menarche were positively associated with MHM.

10. Recommendation

Regional Level: in addition to federal recommendations, regional level managers are advised to:

- Give technical assistance and advocacy to prioritize budgets and investment in WASH facilities in schools by health, and education bureau.
- Strengthen teachers' capacities and equips them with tools to provide in-depth and medically accurate information to students in a safe learning environment by education bureau.
- Strengthen school health packages provided by health extension professionals by health bureau.

School level managers suggested to:

- Establish coordination between students, teachers and parents to improve MHM conditions at schools.
- Complement menstrual hygiene management as part of the school health programs and should also give special attention towards making schools a comfortable place for girl's menstrual hygiene practice by continuous provision of sanitary pad especially for the neediest ones.
- Consult parents about the need to support their children with sanitary materials for menstrual hygiene in addition to other basic hygienic products during parent-school teacher meeting.
- Educate and counsel girls about the important and the need for good personal hygiene including hand washing practice during menstruation by using peer group discussion which supposedly mediated by female school teachers.

Parents are advised to:

- Educate their daughters about the process, good personal hygiene, use of proper pads, and its proper disposal.
- Support their children with sanitary materials for menstrual hygiene.

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ANNEX 1 Study information sheet and verbal consent

ADDIS ABABA UNIVERSITY SCHOOL OF PUBLIC HEALTH

Consent in English

Title of Study: Assessment of menstrual hygiene management and its determinants among secondary school girls.

Background: You are being requested to take part in a research study. Before you decide to take part in this study, it is important that you realize why the research is being done and what it will involve. Please take the time to read the following information carefully. Please ask the researcher if there is anything that is not clear of if you need more information.

Study Procedure: Your estimated time commitment for this study is: 25-30 minutes.

Risks: The risks of this study are negligible. These risks are similar to those you experience when revealing work-related information to others. The topics in the survey may indignity some respondents. You may decline to answer any or all questions and you may terminate your involvement at any time if you choose.

Benefits: There will be no direct benefit to you for your participation in this study. However, we hope that the information obtained from this study may be useful for planning an intervention measures at school setting.

Alternative Procedures: If you do not want to be in the study, you may choose not to participate and leave your answers blank, or you may read quietly at your desk.

Confidentiality: Please do not write any identifying information on your questionnaire. Your

responses will be unnamed.

Costs to Subject: There are no costs to you for your participation in this study.

Compensation: There is no financial compensation to you for your participation in this study.

Consent: I confirm that I have read and understood the information and have had the opportunity to ask questions. I understand that my participation is voluntary and that I am free to take out at any time, without giving a reason and without cost.

I Agree ☐ I Disagree ☐

Name of principal investigator: Ephrem Biruk

Address: Addis Ababa University, School of public health

Email: ephrembiruk@gmail.com Mobile: +251913848006

ቅጽል 2: -የ ማጠይቅ ፈቃድ ቅፅ

ርእስ: ትምህርት ቤት የሚገኙ ሴት ተማሪዎች የወር አበባ ንጽህና አጠባበቅ

መግቢያ: አንች በዚህ ጥናት ላይ እንትሳተፊ የተመረጥሽ ስለሆነ ወደ ጥናቱ ከመግባትሽ በፊት ከዚህ በታች ስለጥናቱ ነስፈላጊነት የተዘረዘሩትን መረጃዎች በአግባቡ አንብበሽ መረዳት ይኖርብሻል። ግልጽ ያላሆነ እና ተጨማሪ ማብራሪያ ካስፈለገሽ መረጃ ስብሳቢዉን መጠየቅ ትችያለሽ።

የሚፈጀው ጊዜ: ጥናቱ ከ 25 እስከ 30 ደቂቃ ሊወስድ ይችላል።

ጉዳት: ጥናቱ ምንም አይነት ጉዳት የለውም። የጥናቱ አይነት ሊያሳፍሩ የሚችሉ ሃሳቦች ሊነሱበት ይችላሉ። በመጥይቁ ወቅት ሁሉንም ወይንም በከፊል ከጥናቱ ራስሽን ማግለል ትችያለሽ።

ጥቅም: በዚህ ጥናት በመሳተፍሽ በቀጥታ የምታገኝው ምንም አይነት ጥቅም ባይኖርም ከጥናቱ በምታገኝው መረጃ በትምህርት ቤቱ ውስጥ ለሚሰሩ ስራዎቸ ግብአት ይሆንሻል.

የጥናቱ አሰራር: በመጥይቁ መሳተፍ ካልፈለግሽ ከጥናቱ ራስሽን ማግለል ትችያለሽ።

ሚስጥር ጠባቂነት: ስለ ራስሽ ማንነት የሚገልጽ ምንም አይነት መረጃ በመጠይቁ ላይ መጻፍ ስምም አይጻፍም።

የተሳታፊ ክፍያ: በዚህ ጥናት ላይ ለሚሳተፉ ምንም አይነት የተሳትፎ ክፍያ አይከፈልም፡

ማካካሻ: በዚህ ጥና ላይ ለሚሳተፉ ምንም አይነት የማካካሻ ክፍያ አይሰጥም።

ፋቃደኝነት: መረጃውን በሚገባ አንብቤ ተረድቻለሁ። ተሳትፎዬ በፍቃደኝነት ሲሆን በማንኛውም ሰዓት ምንም ምክንያት እና ክፍያ ሳልጠየቅ ከጥንቱ ራሴን ማግለል እችላለሁ። በፈቃደኝነት ጥናቱ ላይ ለመሳተፍ ተስማምቻለሁ።

ፍቃደኛ ነኝ ☐ ፍቃደኛ አይደለሁም ☐

አመሰግናለሁ

ጥናቱን በተመለከተ ጥያቄ ካለዎት ወዲያውኑ መጠየቅ ወይም ዘግተዉም ከሆነ ተመራማሪን በሚመለከተው አድራሻ መጠየቅ ይችላሉ

አድራሻ ሙሉ ስም ኤፍሬም ብሩክ

ስልክ +251913848006

ኢ-ሜል ephrembiruk@gmail.com

ANNEX 3: Part I survey questionnaires in English

Self-administered questionnaire for secondary school girls.

Student Identification Code: ___/___, School identification code: ___/__

Socio-demographic and Economic data			
Q.No	Questions	Possible answer	skip
01.	Your Age (years)	_____	
02.	Your Grade	_____	
03.	Your religion	1. Orthodox 2. Muslim 3. Protestant 4. Catholic 5. Others (specify) ----------	
04.	Your marital status	1. Single 2. Divorced 3. Widowed 4. Married 5. Not applicable	
05.	With whom do you live?	1. Both parents 2. Mother only 3. Relatives 4. Father Only 5. Others (specify) ----------	
06.	What is your mother's educational status?	1. Illiterate 2. Read & write 3. Primary 4. Secondary 5. College and above	
07.	What is the father's educational status?	1. Illiterate 2. Read & write 3. Primary 4. Secondary 5. College and above	
08.	What is the mother's occupational status?	1. Housewife 2. Student 3. Merchant 4. Private organization employee 5. Governmental employee 6. Daily laborer 7. Others (specify) ----------	
09.	What is the father's occupational status?	1. Merchant	

<table>
<tr><td></td><td></td><td colspan="3">2. private organization employee
3. Governmental employee
4. Driver
5. Daily laborer
6. Others (specify) ----------</td><td></td></tr>
<tr><td>010.</td><td>Your family's monthly income (ETB)</td><td colspan="3">----------</td><td></td></tr>
<tr><td>011.</td><td colspan="5">Household assets and utilities</td></tr>
<tr><td></td><td>Utilities</td><td>Yes=1, No=0</td><td colspan="2"></td><td>Yes=1, No=0</td></tr>
<tr><td></td><td>Clock</td><td></td><td colspan="2">Private shower</td><td></td></tr>
<tr><td></td><td>Radio</td><td></td><td colspan="2">Bicycle</td><td></td></tr>
<tr><td></td><td>TV</td><td></td><td colspan="2">Tracker /Automobile</td><td></td></tr>
<tr><td></td><td>Mobile phone</td><td></td><td colspan="2">Privately owned house</td><td></td></tr>
<tr><td></td><td>Home phone</td><td></td><td rowspan="3">Types of latrine</td><td>Pour flash</td><td></td></tr>
<tr><td></td><td>Refrigerator</td><td></td><td>VIP</td><td></td></tr>
<tr><td></td><td>Washing machine</td><td></td><td>Traditional</td><td></td></tr>
<tr><td></td><td>Laptop /computer</td><td></td><td colspan="2">Electric cooking materials</td><td></td></tr>
<tr><td></td><td>Indoor water plumps</td><td></td><td colspan="2"></td><td></td></tr>
<tr><td>012.</td><td colspan="2">Do you earn permanent pocket money from the family</td><td colspan="2">1. Yes
2. No</td><td></td></tr>
<tr><td colspan="6">Profile and knowledge about menstruation and its management</td></tr>
<tr><td>013.</td><td colspan="2">Age at menarche (in years)</td><td colspan="2">----------</td><td></td></tr>
<tr><td>014.</td><td colspan="2">Do You learn about menstrual hygiene in the school?</td><td colspan="2">1. Yes
2. No</td><td></td></tr>
<tr><td>015.</td><td colspan="2">Do You discuss about menstrual hygiene with their parents and friends?</td><td colspan="2">1. Yes
2. No</td><td></td></tr>
<tr><td>016.</td><td colspan="2">Which one is correct Inter menstrual interval?</td><td colspan="2">1. Less than 25 days
2. 25 to 28 days
3. 28 to 35 days
1. More than 35 days</td><td></td></tr>
<tr><td>017.</td><td colspan="2">Duration of menstrual cycle during each period</td><td colspan="2">1. Less than 2 days
2. 2 to 3 days
3. 3 to 5 days
2. More than 5 days</td><td></td></tr>
<tr><td>018.</td><td colspan="2">Did you hear about menstruation before attaining menarche?</td><td colspan="2">3. Yes
4. No</td><td>If no, skip to</td></tr>
<tr><td>019.</td><td colspan="2">What was your source of awareness about menarche?</td><td colspan="2">1. Mother
2. School (media, teacher,)
3. Friend
4. Elder sisters</td><td></td></tr>
</table>

		5. Television 6. Health professional 7. Internet 8. Father 9. Others (specify) ----------	
020.	Do you Know about menstrual hygiene?	1. Yes 2. No	
021.	What is menstruation?	1. Physiological process 2. Pathological process 3. Curse from god 4. Don't know 5. Others (specify) ----------	
022.	What is the cause of menstruation?	1. Hormones 2. Curse of god 3. Caused by disease 4. Don't know 5. Others (specify) ----------	
023.	Where is the source of menstrual blood?	1. Uterus 2. Vagina 3. Bladder 4. Abdomen 5. Don't know 6. Others (specify) ----------	
024.	Do you Know that there is foul smelling during menstruation	1. Yes 2. No	
025.	Do you Know that menstrual blood is unhygienic	1. Yes 2. No	
026.	Do you Know that Pain during menstruation means that someone is not sick?	1. Yes 2. No	
027.	Do you Know that it is not harmful for a woman's body if she runs or dances during her period?	1. Yes 2. No	
028.	Do you Know that a girl should take more nutritious diet during menstruation?	1. Yes 2. No	
029.	Do you Know that one should know regarding menstruation before menarche?	1. Yes 2. No	
030.	Do you Know that Menstruation is not a lifelong process?	1. Yes 2. No	
Practice about menstruation hygiene management			
031.	What materials do you use for absorbing blood?	1. Disposable sanitary pads 2. New cloth pieces 3. Old cloth pieces 4. Others (specify) ----------	
032.	What materials do you used during last? menstrual period	1. Disposable sanitary pads 2. New cloth pieces 3. Old cloth pieces	

		4. Others (specify) ----------	
033.	What is your perception regarding sanitary napkins?	1. comfortable 2. Adequate absorption 3. Do not stain clothes 4. Others (specify) ----------	
034.	What is your reason for not using sanitary pad?	1. Cost 2. Difficulty in disposal 3. No knowledge 4. Shyness 5. Others (specify) ----------	
035.	How often do you change absorbent material per day?	1. Once 2. Twice 3. Three times 4. More than three times	
036.	Do you clean your genitalia?	1. Yes 2. No	
037.	What material do you use for genital cleaning?	1. Soap and water 2. Water only 3. Plain paper 4. Others (specify) ----------	
038.	Do you clean your external genitalia?	1. Yes 2. No	
039.	What is do you use for cleaning your external genitalia?	1. Soap and water 2. Water only 3. Plain paper 4. Others (specify) ----------	
040.	What material do you use for Hand Washing?	water Soap and water Others (specify) ----------	
041.	Do you take shower during menstruation?	1. Yes 2. No	
042.	When do you start taking shower during menstruation?	1. First day 2. Second day 3. Third day 4. Last day 5. Others (specify) ----------	
043.	What materials do you use for showering during menstruation?	1. With soap and water 2. With water, only 3. Others (specify) ----------	
044.	Where do you dispose of menstrual material used at school?	1. Open field 2. Latrine 3. Waste bins 4. Others (specify) ----------	
045.	Where do you drying of washed reusable cloth?	1. In the shade, outside 2. In the shade, inside 3. In the sunlight, inside	

		4. In the sunlight, outside 5. Hidden under other clothes 6. Hidden elsewhere 7. Others (specify) ----------	
046.	What materials do you use for Washing of the reusable cloth?	1. With soap and water 2. With water, only 3. Others (specify) ----------	
047.	Where do you store reusable cloth between use?	1. In plastic bag, separately 2. With other clothes 3. In the bath room 4. Others (specify) ----------	
Menstruation on girls' academic performance			
048.	How many days of school have you missed in the last four weeks?	----------	
049.	In a normal month, how many days do you miss of school because of your period?	----------	
050.	Does your period make you stay at home?	1. Yes 2. No	
051.	I miss school during my period because I am afraid of staining my clothes.	1. Yes 2. No	
052.	I miss school during my period because I am afraid of others making fun of me.	1. Yes 2. No	
053.	I miss school during my period because periods can cause pain.	1. Yes 2. No	
054.	I miss school during my period because periods can make me feel uncomfortable or tired.	1. Yes 2. No	
055.	I miss school during my period because there isn't anywhere for girls to wash at school.	1. Yes 2. No	
056.	I miss school during my period because there is nowhere to dispose of sanitary products.	1. Yes 2. No	
057.	I miss school during my period because I do not have sanitary pads.	1. Yes 2. No	
058.	I miss school during my period because there isn't anywhere for girls to change at school	1. Yes 2. No	

ቅፅል 4: - የ አ ሚ ር ኛ ቃለ ማ ጠ ይ ቅ

Student Identification Code: ___/___, School identification code: ___/__

1. የአኗኗር ሁኔታ እና የኢኮኖሚ መረጃ				
ተ.ቁ	ጥያቄ		መልስ	ዝለል
1.1.	እድሜ		_____	
1.2.	የትምህርት ደርጃ		_____	
1.3.	ሃይማኖት		1. ኦርቶዶክስ 2. ሙስሊም 3. ፕሮቴስታንት 4. ካቶሊክ 5. ሌላ (ይገለፅ) ----------	
1.4.	የጋብቻ ሁኔታ		1. ያላገባ 2. ያገባ 3. የፈታች 4. የሞተባት 5. የማይመለከተው	
1.5.	የአኗኗር ሁኔታ		1. ቢጋራ 2. እናት ብቻ 3. ዘመድ 4. ጥገኛ 5. ሌላ (ይገለፅ) ----------	
1.6.	የእናት የትምህርት ደረጃ		1. ያልተማረች 2. ማንበብና መፃፍ 3. የመጀመሪያ ደርጃ 4. ሁለተኛ ደርጃ 5. ኮሌጅ እና ዩንቨርሲቲ	
1.7.	የአባት የትምህርት ደረጃ		1. ያልተማረ 2. ማንበብና መፃፍ 3. የመጀመሪያ ደርጃ 4. ሁለተኛ ደርጃ 5. ኮሌጅ እና ዩንቨርሲቲ	
1.8.	የእናት የስራ ሁኔታ		1. የቤት እመቤት 2. ተማሪ 3. ነጋዴ 4. የግል ድርጅት ሰራተኛ 5. የመንግስት ሰራተኛ 6. የቀን ሰራተኛ 7. ሌላ (ይገለፅ)) ----------	
1.9.	የአባት የስራ ሁኔታ		1. ነጋዴ 2. የግል ድርጅት ሰራተኛ 3. የመንግስት ሰራተኛ 4. ሹፌር 5. የቀን ሰራተኛ 6. ሌላ (ይገለፅ)----------	
1.1(	ወርሃዊ የቤተሰብ ገቢ ቡብር		_____	
1.1	የቤት ንብረት እና መገልገያ ቁሳቁሶች			
	የቤት ንብረት እና መገልገያ ቁሳቁሶች	አዎ=1,	የቤት ንብረት እና መገልገያ ቁሳቁሶች	አዎ=1,

		የለም=0			የለም=0	
	የግድግዳ ሰዓት		የግል ወይም ቤት ውስጥ ያለ ገላ መታጠቢያ			
	ራዲዮ		ብስክሌት			
	ቴሌቭዥን		የቤት/የጭነት መኪና			
	የተንቀሳቃሽ ስልክ		የግል/የራስ/ መኖሪያ ቤት			
	የቤት ስልክ		የመፀዳጃ ቤት ዓይነት	በውሃ ግፊት የሚሰራ		
	ፍሪጅ			የተሻሻለ		
	የኤሌክትሪክ ልብስ ማጠቢያ ማሽን			ባህላዊ መጸዳጃ		
	ኮምፒውተር/ላፕቶፕ		በኤልክትሪክ የሚሰራ ምግብ ማብሰያ			
	የግል ወይም ቤት ውስት ያለ የውሃ መስመር					
1.11	ከቤተሰብ ገንዘብ ይሰጥሻል?		1. አዎ 2. አይሰጠኝም			
2. ስለወር አበባ ንፅህና አጠባበቅ ግንዛቤ በተመለከተ						
2.1.	የወር አበባ ማየት የጀመርሽበት እድሜ		1. _____			
2.2.	ስለ ወር አበባ ንፅህና ት/ቤት ተምረሽ ታዉቂያለሽ?		1. አዎ 2. አላዉቅም			
2.3.	ስለ ወር አበባ ንፅህና ከቤተሰብሽ ጋር ትወያያለሽ		1. አዎ 2. አይ			
2.4.	የወር አበባ በየስንት ቀኑ ይመጣል		2. ከ 25 ቀን በታች 3. ከ 25 እስከ 28 ቀን 4. ከ 28 እስከ 35 ቀን 5. ከ 35 ቀን በላይ			
2.5.	የወር አበባ መጥቶ እስኪሄድ ያለዉ የቀን ብዛት		1. ከ 2 ቀን በታች 2. ከ 2 እስከ 3 ቀን 3. ከ 3 እስከ 5 ቀን 4. ከ 5 ቀን በላይ			
2.6.	የወር አበባ ከማየተሽ በፊት ስለ ወር አበባ ሰምተሽ ታውቂያለሽ?		1. ሰምቻለሁ 2. አልሰማሁም			2 ከሆነ ወደ 2.6 ይለፉ
2.7.	ስለ ወር አበባ የሰማሽዉ ከማን ነዉ?		1. እናት 2. ትምህርት ቤት (ሚኒሚዲያ, መምህር,) 3. ጓደኛ 4. ታላቅ እህት 5. ቴሌቪዥን 6. ጤና ባለሙያ 7. የመረጃ መረብ (ኢንተርኔት) 8. አባት 9. ሌላ (ይገለፅ)----------			
2.8.	የወር አበባ ምንድነዉ?		1. የተፈጥሮ ዑደት 2. በበሽታ የሚመጣ 3. የእግዚአብሄር እርግማን 4. አላዉቅም 5. ሌላ ካለ (ይገለፅ)----------			
2.9.	የወር አበባ መንስኤ ምንድን ነዉ?		1. ሆርሞን 2. የእግዚአብሄር እርግማን 3. በበሽታ የሚመጣ 4. አላዉቅም 5. ሌላ ካለ (ይገለፅ)----------			

2.10.	የወር አበባ ምንጭ ምንድን ነዉ?	1. ማኅፀን 2. ከረቤዛ 3. የሽንት ፊኛ 4. ሆድ 5. አላዉቅም 6. ሌላ ካለ (ይገለፅ)----------	
2.11.	የወር አበባ መጥፎ ጠረን እንዳለዉ ታዉቂያለሽ?	1. አዎ 2. አላዉቅም	
2.12.	የወር አበባ ንጹህ ያልሆነ እንደሆነ ታዉቂያለሽ?	1. አዎ 2. አላዉቅም	
2.13.	አንድ ሴት በወር አበባ ጊዜ ህመም ከተሰማት ታማለች ማለት ነው?	1. አዎ 2. አይደለም	
2.14.	አንዲት ሴት በወር አበባ ወቅት መደነስ ወይም መሮጥ ጉዳት ያደርሳል ?	1. አዎ 2. አይደለም	
2.15.	በወር አበባ ወቅት የተሻለ ዐመጋገብ ያስፈልጋል ብለሽ ታስቢያለሽ	1. አዎ 1. አይደለም	
2.16.	አንድ ሴት የወር አበባ ከማየቷ በፊት ስለ ወር አበባ ማወቅ አለባት ብለሽ ታስቢያለሽ	2. አዎ 1. አይደለም	
2.17.	የወር አበባ ኡደት እድሜ ልክ ይኖራል ብለሽ ታስቢያለሽ	3. አዎ 1. አይደለም	
	3. የወር አበባ ንፅህና አጠባበቅ በተመለከተ		
3.1	ምን አይነት የወር አበባ ንፅህና መጠበቂያ ተጠቅመሽ ታውቂያለሽ	ነ. ሞዴስ 2. አዲስ ቁራጭ ጨርቅ 3. አሮጌ ቁራጭ ጨርቅ 4. ከላይ ያሉትን በጋራ 5. ሌላ ካለ (ይገለፅ)----------	
3.2	መጨረሻ የወር አበባ ውቅት የተጠቀምሽዉ የንፅህና መጠበቂያ ምንድ ነዉ	ነ. ሞዴስ 2. አዲስ ቁራጭ ጨርቅ 3. አሮጌ ቁራጭ ጨርቅ 4. ከላይ ያሉትን በጋራ 5. ሌላ ካለ (ይገለፅ)----------	
3.3	በወር አበባ ውቅት የንፅህና መጠበቂያ ሞዴስ ተጠቀመሽ ከነበር ያለሽ ልምድ	ነ. ምቹነት 2. በብቃት ፈሳሽ መያዝ 3. ልብስ አያስቀልምም 4. ሌላ ካለ (ይገለፅ)----------	
3.4	የንፅህና መጠበቂያ ሞዴስ የማትጠቀሚበት ምክኒያት	ነ. ዉደነት 2. ለማስወገድ አስቸጋሪ ስለሆነ 3. ዕዉቀቱ ስለሌለኝ 4. ስለማፍር 5. ሌላ ካለ (ይገለፅ)----------	
3.5	ማንኛውም የንፅህና መጠበቂያ የምትጠቀሚ ከሆነ በቀን ምን ያህል ጊዜ የመቀያየር ልምድ አለሽ	ነ. አንድ ጊዜ 2. ሁለት ጊዜ 3. ሶስት ጊዜ 4. ከሶስት ጊዜ በላይ	
3.6	በወር አበባ ወቅት የንፅህና መጠበቂያ ት/ቤት ውስጥ ትቀይሪያለሽ	ነ. አዎ 2. አልቀይርም	
3.7	በወር አበባ ወቅት ከረቤዛ የማፅዳት ልምድ አለሽ?	3. አዎ 4. የለኝም	2 ከሆነ ወደ 3.8 ይለፉ
3.8	በወር አበባ ወቅት ከረቤዛን ለማፅዳት ምን ትጠቀሚለሽ ?	ነ. ሳሙናና ዉሃ	

		2. ዉሃ ብቻ 3. ሶፍት 4. ሌላ ካለ (ይገለፅ)----------	
3.9	በወር አበባ ወቅት ከከረቡዛ ወጪ የማፅዳት ልምድ አለሽ?	1. አዎ 2. የለኝም	2 ከሆነ ወደ 3.10 ይለፉ
3.10	በወር አበባ ወቅት ከከረቡዛ ወጪ ለማፅዳት ምን ትጠቀሚለሽ ?	1. ሳሙናና ዉሃ 2. ዉሃ ብቻ 3. ሶፍት 4. ሌላ ካለ (ይገለፅ)----------	
3.11	በወር አበባ ወቅት እጅሽን የመታጠብ ልምድ አለሽ?	6. አዎ 7. የለኝም	2 ከሆነ ወደ 3.12 ይለፉ
3.12	በወር አበባ ወቅት እጅሽን ለማፅዳት ምን ትጠቀሚለሽ?	1. ሳሙናና ዉሃ 2. ዉሃ ብቻ 3. ሌላ ካለ (ይገለፅ)----------	
3.13	በወር አበባ ወቅት ገላሽን ትታጠቢያለሽ?	1. አዎ 2. አልታጠብም	2 ከሆነ ወደ 3.15 ይለፉ
3.14	በወር አበባ ወቅት ገላሽን መች መታጠብ ትጀምሪያለሽ?	1. የመጀመሪያ ቀን 2. ሁለተኛ ቀን 3. ሶስተኛ ቀን 4. መጨረሻያ ቀን 5. ሌላ ካለ (ይገለፅ)----------	
3.15	በወር አበባ ወቅት ገላሽን ለመታጠብ ምን ትጠቀሚያለሽ?	1. ሳሙናና ዉሃ 2. ዉሃ ብቻ 3. ሌላ ካለ (ይገለፅ)----------	
3.16	የንፅህና መጠበቂያ የት ታስወግጃለሽ	1. ሜዳ ለይ 2. መፀዳጃ ቤት 3. የቆሻሻ ማጠራቀሚያ 4. ሌላ ካለ (ይገለፅ)----------	
3.17	አጥበሽ መልሰሽ የምትጠቀሚዉን ልብስ የት ታደርቂያለሽ	1. ከቤት ዉጪ 2. ቤት ዉስጥ 3. የፀሀይ ብርሀን በሚያገኘዉ ቦታ 4. የፀሀይ ብርሀን በማይደርስበት 5. ከሌላ ልብስ ስር 6. ድብቅ ቦታ 7. ሌላ ካለ (ይገለፅ)----------	
3.18	አጥበሽ መልሰሽ የምትጠቀሚዉን ልብ በምን ታጥቢያለሽ	1. ሳሙናና ዉሃ 2. ዉሃ ብቻ 3. ሌላ ካለ (ይገለፅ)----------	
3.19	መልሰሽ የምትጠቀሚዉን ልብስ የት ታስቀምጫለሽ	1. በፌስታል ተለይቶ 2. ከሌሎች ልብሶች ጋር 3. መታጠቢያ ቤት 4. ሌላ ካለ (ይገለፅ)----------	
1. የወር አበባ በሴቶች ትምህርት ላይ ቢተመለከተ			
4.1	ባለፈዉ አንድ ወር ዉስጥ ስንት ቀን ከትምህርት ቤት ቀርተሻል	_____	
4.2	በወር አበባ ምክንያት በወር ዉስጥ ስንት ቀን ከትምህርት ቤት ቀርተሻል?	_____	
4.3	የወር አበባሽ ቤት እንድትቀመጪ እድርጎሽ ያውቃል ?	1. አዎ 2. አያውቅም	
4.4	በወር አበባ ምክንያት ከትምህርት ቤት የምትቀሪበት	1. ልብስሽ ስለሚበላሽ	ከአንድ በላይ

	ምክንያት ምንድን ነበር ?	2. ስለምታፍሪ 3. ስለሚያምሽ 4. ምኞት ስለማይሰማሽ 5. ትምህርት ቤት መታጠቢያ ስለሌለ 6. ትምህርት ቤት ንጽህና መጠበቂያ ማስወገጃ ስለሌለ 7. ትምህርት ቤት ንጽህና መጠበቂያ ሞዴስ ስለሌለ 8. ትምህርት ቤት ንጽህና መጠበቂያ መቀየሪያ ክፍል ስለሌለ	ምላሽ መስጠት ይቻላል

Annex 5: -Proportional allocation of samples to each private and public schools to their size of grade seven to ten.

Sub-cities	Private schools						Government schools					
	Primary (7th to 8th)			Secondary (9th to 10th)			Primary (7th to 8th)			Secondary (9th to 10th)		
	Schools	no of students	Sample size	Schools	no of students	Sample size	Schools	no of students	Sample size	Schools	no of students	Sample size
Addis ketema	Alfiya	218	19	Ethio Biherawi	610	52	Gelila	672	58	Abisiniya	765	66
Arada	Future Hops	265	23	Radical	585	50	Atse Fasil	422	36	Betlihem	585	50
Gullele	Sumeya	272	23	Enat	259	22	Addis zemen	685	59	Mieraf	405	35
Kirkos	Future Talent	265	23	Dandi boru	235	20	Yelibe fana	309	27	Misirak Goh	630	54
Yeka	Montosoria	275	24	Hilsaid	439	38	Tesfa birhan	384	33	millinium	669	58
Total		1295	111		2128	183		2472	213		3054	263