



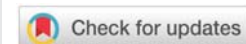
Received: 30 January, 2021

Accepted: 07 July, 2021

Published: 08 July, 2021

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## Research Article

# Menstrual hygiene management practice and associated factors among secondary school girls in finot selam town, northwest Ethiopia, 2019

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## Abstract

**Background:** Menstrual hygiene is vital to the health, well-being, dignity and productivity of women and girls. However, there is a problem on menstrual hygiene management especially among communities in which discussing about menstrual hygiene is taboo in their culture.

**Objective:** The study was aimed to assess menstrual hygiene management practice and associated factors among secondary school girls in Finot Selam town, Ethiopia 2019.

**Method:** A cross-sectional study was conducted among randomly selected school girls in Finot Selam town from March 20 to 30, 2019. Descriptive summary was done as a mean, frequency and proportion. In bivariate analysis variables with a p-value<0.25 were candidate for multivariable logistic regression and those with a p-value<0.05 in multivariable analysis were considered as having statistically significant association with menstrual hygiene practice. Thematic analysis was employed for the qualitative data.

**Result:** A total of 442 school girls were participated in the study, with response rate of 99.1%. About 68 % of adolescent girls had good practice of menstrual hygiene management. The odd of good practice was 3.4 times higher [AOR=3.40; 95% C.I: (1.16, 9.97)] among girls whose fathers' education was colleges and above compared to those whose father was illiterate. Information before menarche [AOR=3.95; 95% C.I: (2.13, 7.33)], discussion about menstrual hygiene with their parents [AOR =2.75; 95% C.I: (1.71, 4.43) and knowledge on sanitary pads in the market [AOR=2.10; 95% C.I: (1.18, 3.28)] were the other factors associated with menstrual hygiene management. Findings from in-depth interview found that inadequate sanitation facility was reported as a problem for girls to manage their menstrual hygiene in school.

**Conclusion:** Most of girls in this study have good practice of menstrual hygiene management. Paternal education, discussion with parents about menstruation, knowledge on sanitary pads and prior information were the factors associated with the practice of menstrual hygienic management.

## Introduction

Menstruation is the periodic shedding of the inner lining of the uterus under the control of the hormones of the hypothalamus-pituitary-ovarian axis [1]. Women begin menstruation at an average age of 13 and on average continue menstruating till age 51. Menarche, or the onset of menstruation, is a landmark feature of female puberty and signals reproductive maturity [2].

Menstrual hygiene management is the practice of using clean materials to absorb menstrual blood that can be changed privately, safely, hygienically, and as often as needed throughout the duration of the menstrual cycle [3].

The subject of menstruation is too often taboo and has many negative cultural attitudes associated with it [4]. For Example, in Egypt because of cultural and religious beliefs, menstruation is not considered an appropriate topic of discussion that lead to lack of accurate information for girls to manage their menstruation hygienically [5]. Similarly in Ethiopia most of adolescent girls didn't discuss on menstrual issues, due to fear, shame, taboos, religious reasons and the fact that it is not customary to talk about it [6].

Due to the misconception associated with menstruation, most adolescents do not have adequate information about how to maintain hygiene during menstruation [7]. In order for women and girls to live healthy, productive and dignified lives, it is essential that they are able to manage menstrual bleeding effectively. This requires access to appropriate water, sanitation and hygiene services, having somewhere private to change clothes or disposable sanitary pads, facilities to dispose used cloths and pads, and access to information to understand the menstrual cycle and how to manage menstruation hygienically [8].

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 more likely to be affected in different ways from inadequate water, sanitation and hygiene conditions in schools, because of the lack of such facilities they cannot attend school during menstruation [9,10].

According to World Health Organization (WHO), globally, 2.3 billion people lack safely managed sanitation. Further, owing to high cost and ignorance, women and girls often use old rags, clothes or other unhygienic materials as menstrual absorbents, which may lead to ascending infections and many other health problems [11].

UNICEF estimates that 1 in 10 school age African girls do not attend school during menstruation [12]. Unavailability of sanitation facilities including menstrual hygiene facilities will obviously influence the attendance of girls in school and the inability to have affordable sanitary napkins force the girls and women to use insanitary rag which is leading for the development of bad odor, RTI and skin problems. This leads to young girls to be anxious, restless and absent from school [13].

In Ethiopia 17% of girl miss class due to menstruation with a roughly equal proportion of urban and rural girls missing school. The most common reasons for missing class are pain/discomfort, fear of having an accident at school, embarrassment, and having nothing to manage their periods. The likelihood of absenteeism seemed to vary based on girls' method for managing their periods [14].

Unhygienic practice of menstrual hygiene management can increase the incidence of Reproductive Tract Infection (RTI). Thus, the consequences of RTIs are severe and may result in significant negative impact to a woman's health including chronic pelvic pain, dysmenorrhea (painful periods) and in severe cases infertility [15].

In Ethiopia, Studies have found that 25% of girls in Ethiopia do not use any MHM products to manage their periods and isolate themselves during menstruation. And only 25% of schoolgirls had learned about menstruation and hygienic management in school [16].

Different studies indicate that good menstrual hygiene is practiced among those girls whose mothers were literate, girls studying in more than grade 10 in school, older girls, having prior knowledge about menstruation before menarche, presence of proper sanitary latrine at home, exposure to advertisements regarding usage of sanitary napkins [17]. Another cross-sectional study among rural adolescent girls in India showed that 89.2 %of girls uses sanitary pads as a menstrual absorbent and the remaining 7.2% and 3% uses fresh cloth and reusable cloth respectively [18].

Interventional study conducted in Bangladesh found that only 24% of girls use menstrual pad even after the health intervention with 16% baseline. The remainder used poor quality cloths dyed with toxic pigments, which might make them susceptible to uterine pain [19]. School based cross sectional study in Iran showed that More than half of adolescents have moderate practice and 95.6% of the participants were using disposable pads during menstruation [20].

School based study in western Ethiopia also found that around 66.2 % of girls use commercial made sanitary pads as absorbent material during menstruation, but only 20.2 % of girls dispose their used sanitary pads in dustbin [21]. A Similar study in Adama town shows that 43% of adolescent school girls have poor level of menstrual hygiene practice [22].

The study in northern Ethiopia showed that there was statistically significant association between menstrual practice and exposure to advertisement regarding usage of sanitary napkins in mass media (radio/TV) and knowledge on menstrual hygiene. The likelihood of good menstrual practice among girls who had exposure to advertisement is two times higher compared to girls who had no exposure to advertisement [23].

However, much attention is not given to this problem and studies on menstruation and its hygienic management and factors associated with it are limited in the study area. Therefore, this study was designed with the aim of assessing

menstrual hygiene management practice and associated factors among secondary school adolescent girls at both private and public schools in Finot selam town.

## Methods

### Study setting and design

The study was conducted in Finot Selam town, the capital city of west Gojjam zone, located 396 km away from Addis Ababa and 170 km from Bahirdar. According to the population projection of Ethiopia for all regions at woreda level in 2017, the total population of the town is estimated to be 38,399. Out of these, 19,923 are male and 18,476 females [24]. Amharic is the official language spoken in the city. The town is administratively divided into five kebeles. In the town there is one primary hospital, one health Centre, and four private clinics. There is 1 high school and 1 preparatory school in the town. The study was conducted from March 20 to March 30, 2019.

School based cross-sectional study with both quantitative and qualitative methods was employed.

### Population

All school girls who have reached menarche and attending their education in secondary and preparatory schools in Finot Selam town were the source population. And the study population were School girls in secondary and preparatory schools in Finot Selam town for 2018/19 academic year who met the eligibility criteria. All girls from grade 9<sup>th</sup> to 12<sup>th</sup> who were attending their education on the regular program were included in the study.

### Sample size determination

The sample size for menstrual hygiene management practice was calculated using single population proportion formula, with the following assumptions: 95% CI, 5% margin of error and 52.5% proportion of good menstrual hygiene practice among adolescent school girls in previous study [25]. The calculated sample size was 383.

For the second objective (factors associated with menstrual hygiene management), the sample size was calculated by STATCALC of epi info version 7.2.2.6 as follows.

So, decision was made based on the comparison between the first specific objective (383) and second objective (477). Finally, due to the issue of representativeness a sample size of 477 was used. since the source population was <10,000(2736) finite population correction formula was used and adding 10% non-response rate the final sample size for this study was 446. For in-depth interview and key informants interview, 8 adolescent girls & 3 female teachers, 4 male students and 2 school directors, who can reflect the different inputs required to support to meet the set objectives were participated.

A stratified sampling technique was used to select participants from secondary and preparatory schools in the town. Respective sample was allocated to each year of study

(grade) proportionally based on number of female students. Purposive sampling for in-depth interview and key informant interview was employed.

### Data collection procedure

Data were collected by using pre-tested structured self-administered questionnaires adapted from review of related literatures. It consists of three sections (socio-demographic information, menstrual hygiene management practice and menstrual hygiene management practice associated factors questions). For qualitative data semi structured IDI guide was used. Self-administered questionnaire was distributed to the students by trained four health extension workers with past experience on data collection, and the data were collected in class rooms and female instructors have facilitated the orientation and dissemination of the questionnaire. Finally, the filled questionnaire was checked for completeness and consistency of the data by the supervisors (BSc Midwives). In-depth interview was conducted with adolescent girls & male students and key informant interview with school directors, female teachers.

### Data quality management

The quality of data was assured by using structured questionnaire adapted after reviewing related literatures and following the necessary procedures. To check for its conceptual equivalence, the questionnaire was translated to Amharic language and back translated to English by language professionals of similar status. Pre-test of data collection tools was also done in Burie high school by taking 5% of the sample size (n=23) and appropriate amendment was taken. Training was given for data collectors and supervisors one day before data collection. The questionnaire was checked for completeness on daily basis by immediate supervisors

### Variables

Menstrual hygiene management practice is the outcome variable which was computed from items related with menstrual hygiene. The independent variables were Socio-demographic and socio-economic variables (Age, Grade, Religion, Ethnicity, Marital status, Place of residence, Age at menarche, Permanent pocket money), parental factors (Mothers educational status, Fathers educational status, Mothers occupation, Fathers occupation, Wealth index) and Information on menstrual hygiene (Discussion with parents on menstrual hygiene, Hear about menstruation before attaining menarche, Knowledge on sanitary pads available in the market, Learn about menstrual hygiene at school).

### Operational definition

The students' practices were scored using a scoring system adapted from a past study [26]. The measurement of practice of menstrual hygiene score was calculated out of 12 practice specific questions (Table 1). Each correct response earned one point, where as any wrong or don't know response attracted no mark and thus the sum score of practice was calculated. And the mean score of menstrual hygiene practice (7.92 ± 1.83) was used to decide the cutoffs of the rank.

**Table 1:** Bivariate and multivariable logistic regression analysis for factors affecting the practice of menstrual hygiene.

Variables		Practices		COR(95% C.I)	AOR(95% C.I)
		Good(%)	Poor(%)		
Residency	Urban	190(72.5)	72(27.5)	1.53(1.02,2.29)*	0.77(0.43,1.38)
	Rural	114(63.3)	66(36.7)	1	1
Mothers educational status	Illiterate	118(59.2)	81(40.8)	1	1
	Read & write	111(72%)	43(28%)	0.28(0.14,0.60)*	0.36(0.13,1.01)
	Primary	22(88)	3(12)	0.51(0.24,1.02)	0.52(0.18,1.50)
Fathers educational status	Secondary & above	51(83.6)	10(16.4)	1.44(0.36,5.74)	1.39(0.25,7.47)
	Illiterate	57(59.4)	39(40.6)	1	1
	Read & write	136(67)	67(33)	1.40(0.84,2.29)	1.13(0.64,2.00)
	Primary	27(79.4)	7(20.6)	2.64(1.05,6.66)*	1.65(0.61,4.45)
Fathers occupation	Secondary	29(63)	17(37)	1.17(0.57,2.41)	0.57(0.25,1.30)
	College and above	53(91.4)	5(8.6)	7.25(2.66,11.78)	<b>3.40(1.16,9.97)**</b>
	Merchant	69(85.1)	12(14.9)	1	1
	private organization	15(46.8)	17(53.2)	0.15(0.06,0.39)*	0.12(0.04,0.53)
Pocket money	Governmental employee	64(86.5)	10(13.5)	1.11(0.45,2.75)	0.57(0.19,1.70)
	Farmer	150(61.7)	93(39.9)	0.30(0.16,0.59)*	0.22(0.09,0.50)
	Yes	181(75.7)	58(24.3)	2.03(1.35,3.05)*	0.76(0.45,1.29)
Wealth index	No	123(60.2)	81(39.8)	1	1
	quantile one	55(61.7)	34(38.3)	0.33(0.17,0.67)*	1.03(0.39,2.72)
	quantile two	48(54.5)	40(45.5)	0.25(0.12,0.49)*	1.03(0.41,2.61)
	quantile three	62(70.4)	26(29.6)	0.49(0.24,1.01)	1.61(0.65,3.99)
	quantile four	66(74.1)	23(25.9)	0.59(0.28,1.22)	1.84(0.69,4.87)
Heard about menstruation before menarche	quantile five	73(83)	15(17)	1	1
	Yes	279(75.2)	92(24.8)	5.58(3.24,9.59)*	<b>3.95(2.13,7.32)**</b>
Discussion with parents about menstruation	No	25(35.2)	46(64.8)	1	1
	Yes	208(80)	52(20)	3.58(2.35,5.46)*	<b>2.75(1.71,4.43)**</b>
Learn about menstrual hygiene in the school	No	96(52.7)	86(47.3)	1	1
	Yes	224(74.9)	75(25.1)	2.35(1.54,3.58)*	1.62(0.97,2.72)
Know sanitary pads in the market	No	80(55.9)	63(44.1)	1	1
	Yes	220(75.8)	709(24.2)	2.58(1.69,3.91)*	<b>2.10(1.30,3.39)**</b>
	No	83(54.9)	68(45.1)	1	1

\*= $p$ -value<0.25; \*\*= $p$ -value<0.05(significant)

**Good practice:** Respondents who scored 8–12 points from practice questions were declared as having good practice.

**Poor practice:** Respondents who scored 0–7 points from practice questions were declared as having poor practices [26].

### Data analysis

The quantitative data were checked, coded and entered in to Epi-data version 3.1 software, and then exported to Statistical Package for Social Sciences (SPSS) version 20 for statistical analysis. First descriptive summaries (including frequency, proportions, and mean) were carried out for both independent and dependent variables. Principal component analysis was used to compute wealth index from house hold assets and utilities. Appropriateness of PCA for the items was checked by Kaiser Meyer Olkin measure of sampling adequacy and Bartlett test of sphericity. Bivariate analysis was done to identify association between the independent and the dependent variables. Those variables with a  $p$ -value <0.25 in bivariate analysis were a candidate for multivariable logistic regression, and then those variables with a  $p$ -value<0.05 in multivariable analysis was declared as having statistically significant association with menstrual hygiene management practice. Multicollinearity was checked by using VIF and not detected (VIF<10). Hosmer and Lemeshow goodness of fit test was used to assess the model fitness ( $p$ -value >0.05). Data from in-depth interview were

transcribed, translated, coded and then overarching themes were identified based on recurring patterns.

### Ethical consideration

Ethical clearance was obtained from the Institutional Review Board of Jimma University institute of Health. Approval letter was obtained from Finot Selam town education office and support letter was written for the respective schools. School directors were briefed on the objectives of the study and permission to conduct the study was obtained from participating schools. Informed consent was obtained from each study participants and assent from parents/guardians was taken for those with age.

### Results

#### Socio-demographic characteristics of the respondents

A total of 442 adolescent girls, 299 from secondary and 143 from preparatory school were participated in the study, with response rate of 99.1%. Almost two third (66.1%) were within the age group between 16 and 18 with the mean ( $\pm$ SD) age of 17.39  $\pm$ 1.59 years. The mean( $\pm$ SD) age of menarche was 14.1 $\pm$ 1.36 years. The majority, 434 (98.2%) of respondents were from Amhara ethnic group and 422 (95.5%) were orthodox Christians. Most, 422(95.5%) of adolescents were single and 346 (78.3 %) lives with both parents, whereas 52 (12%) lives



with mothers only. A little above half (54.1%) of respondents earned permanent pocket money from their families. One hundred fifty-four (35.1%) of respondent's mother can read and write and only 58 (13.2%) of their fathers completed college and above. More than three fourth (76.5%) of respondent's mother were housewife and two hundred thirty (53.5%) of their fathers were farmers (Table 2).

### Information about menstrual hygiene management

According to the data obtained from the participants, three hundred seventy-one (83.9 %) of the participants had heard about menstruation before menarche (Figure 1). Mothers

**Table 2:** Socio-demographic and economic characteristics of the study participants.

Variables	Category	Percentage
Age in years	13-15	12.4
	16-18	66.1
	>=19	21.5
Age at menarche in years	9-14	60.0
	15-20	40.0
Residence	Urban	59.3
	Rural	40.7
Religion	Orthodox	95.5
	Muslim	2.3
	Protestant	1.1
	Catholic	1.1
Ethnicity	Amhara	98.2
	Agew	0.9
	Others <sup>1</sup>	0.9
Marital status	Single	95.5
	Married	2.9
	Others <sup>2</sup>	1.6
Live with	Both parents	78.3
	Mother only	12.0
	Relatives	6.1
	Others <sup>3</sup>	3.7
Mothers educational status	Illiterate	45.3
	Read & write	35.1
	Primary	5.7
	Secondary and above	13.9
Fathers educational status	Illiterate	22.0
	Read & write	46.5
	Primary	7.8
	Secondary	10.5
Mothers occupation	Housewife	76.5
	Merchant	10.5
	Governmental employee	6.4
Fathers occupation	Others	6.6
	Merchant	18.8
	Private employee	7.4
	Governmental employee	17.2
Pocket money	Farmer	53.5
	Others <sup>4</sup>	3.1
	Yes	54.1
Wealth index	No	45.9
	quantile one	20.1
	quantile two	19.9
	quantile three	19.9
	quantile four	20.1
	quantile five	19.9

<sup>1</sup> Ethnicity= Oromo, Tigray, <sup>2</sup> marital status= divorced, widowed, <sup>3</sup> live with= their husband, individually, <sup>4</sup> father's occupation = no work at all, daily laborer

(63.3%) were the main sources of information followed by teachers (19.4%), health professionals (8.9%), mass media (2.4%). The in-depth interviews in the qualitative session also revealed that most girls had prior knowledge about menstruation and its management. But they become frustrated during their first menstruation and they reported to have been faced different psychological and emotional problems, including being shocked and scared.

“... I was attending class when I had my first menstruation.... my cloth was stained with blood as I was not ready and had only underwear's. I felt ashamed because of others might gossip at me. I went to home running ahead of the students in order not to be seen by others.....” (IDI participant, G11 female student).

“During my first menstruation I was shocked and embarrassed. Generally, whenever I have it, I think that I'm below humans, depressed ..... I hate being female; I assumed it as a disease....” (IDI participant, G9 female student).

### Hygienic practices during menstruation

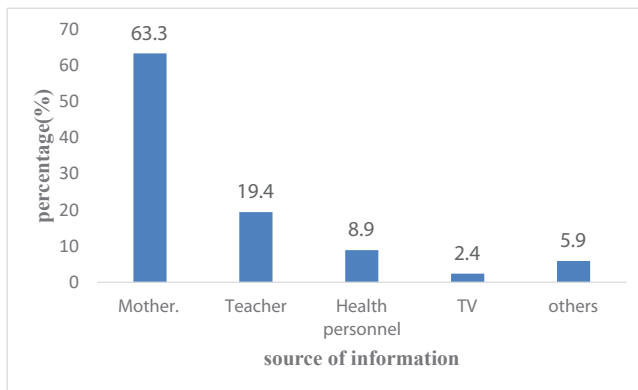
Out of the total respondents, 304 (68.8%) of respondents had good practice on menstrual hygiene management (Figure 2). Majority, 410(92.8%) of girls were using absorbent material during menstruation of whom 293 (71.5%) of girls use commercially made disposable sanitary pads, 73 (17.8%) use reusable sanitary pads, 39 (9.5%) use disposable piece of rag and 1.2% use toilet paper/underwear as absorbent material during menstruation.

Shyness to purchase (46.9%) was the main reason for not using sanitary pads followed by high cost (37.5%), unavailability (12.5%) & lack of knowledge (3.1%) (Figure 3). It was also found in the IDI that even though girls know sanitary pads, most of them used homemade cloths or underwear. Lack of money, local access and knowledge and skill gap on how to use sanitary pads were some of the reasons explained why they didn't use sanitary pads. In addition to these some girls didn't buy sanitary pads from shops since they were shameful to do so.

“..... I felt ashamed to buy sanitary pads from shop and I thought that people might talk about my monthly menstrual period while I ask the sanitary pads and thus I didn't use....” (IDI participant).

“.....Our teacher has taught and told us, in the gender club, to use sanitary pads even at school. However, since male students follow us while we change menstrual soak ups in school and teased at us, we didn't use sanitary pads...” (IDI participant).

One hundred forty-one (39.8%) of the respondents change sanitary pads or clothes three times and above, 179 (41.7%) change twice & (17.8%) change once per day. More than two third (70%) of the respondents didn't change their sanitary materials at school. The findings from qualitative survey related with this concept showed that the majority of the respondents changed their pad/cloths 2-3 times a day during their menses indicating averagely good menstrual hygiene management practice. A girl in damote preparatory says:



Others = books, peer to peer training & friends.

Figure 1: Respondents source of Information about menstruation.

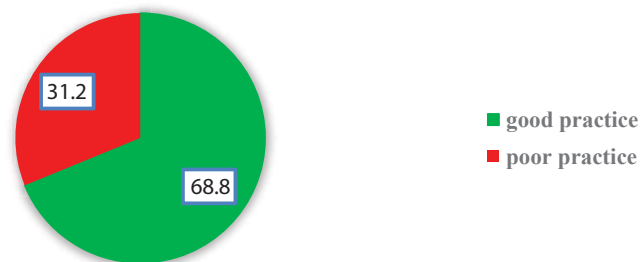
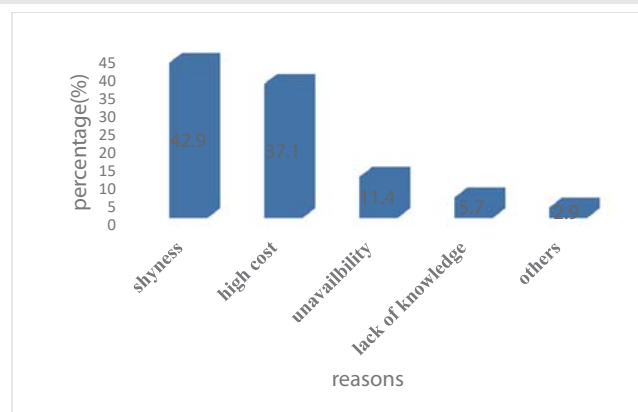


Figure 2: Level of menstrual hygiene management practice among study participants.



Others=Not bleeding highly, lack of comfort

Figure 3: Reasons why students didn't use menstrual sanitary materials among female high school students.

"I use pads during menstruation and I change the pads mostly three to four times a day depending on the flow of blood. If the flow is much I change up to five times in a day."

Inadequate sanitation facility was the reported main challenges for girls to manage their menstrual hygiene in the school.

"In our school there is no water supply in the toilet. Also there is no arrangement of disposing the cloth/rags. Sometime the used cloth/rags have to be disposed of in the toilet-pan. Some days we bleed heavily, and we need to change clothes at least 2 or 3 times during school hours. But there is no place to change and dispose the cloth -there is question of putting back those used cloth in our pockets..." (IDI participant).

"In our school there is no private space/room for menstruating girls to change their sanitary materials at school and the water supply of the toilet is inadequate even running water for drinking is infrequent....." (female preparatory teacher).

".....The school haven't its own water source and it is from the town administrative. The toilet is not adequately supplied with water which challenge specially menstruating girls. This inadequate water supply leads girls to have difficulties maintaining proper standards of hygiene during menstruation....." (high school director).

Four hundred twenty-five (92.6%) of the respondents wash their genitalia during menstruation. From these less than half (44%) use soap and water, and 237 (55.8%) use water only. One hundred thirty-seven (33.6%) of respondent store their sanitary pads with routine clothes and 88(21.6%) store in the bath rooms. Out of 392 study participants who use reusable sanitary pad, 357 (92.1%) use water and soap for washing purpose and only 111 (28%) of them dried their washed clothes in the sun light. Furthermore, girls in the in-depth interview noted that the use of materials such as rags torn from old textiles can cause vaginal itching, especially when not properly washed and dried:

"...If you don't wash and change your sanitary pads regularly you can have rashes and bruises especially. It's very common to feel itching when you are using old rags or pieces of blankets..." (IDI participant).

Moreover:

"...Sometimes if you don't change you might develop bruises or rashes ... you feel very uncomfortable....." (IDI participant) Table 3.

### Factors associated with menstrual hygiene management practice

In bivariate analysis place of residence, mother's educational status, father's educational status, father's occupation, monthly pocket money, wealth index, knowledge of sanitary pads, discussion with parents about menstruation, heard about menstruation before attaining menarche, learn about menstrual hygiene in the school were the factors that shown significant association (at  $P < 0.25$ ) with overall practice of menstrual hygiene management of respondents.

In the multivariable logistic regression analysis, it was found that the odd of good practice was 3.4 times higher [AOR=3.40; 95% C.I: (1.16, 9.97)] among girls whose fathers' education was college and above compared with girls whose father can't read and write. Adolescent girls who heard about menstruation before menarche were 3.95 times [AOR=3.95; 95% C.I: (2.13, 7.33)] more likely to have good practice of menstrual hygiene management compared to those who didn't heard about menstruation. It was also found that the odd of good practice of menstrual hygiene management among those who discuss about menstrual hygiene with their parents was 2.75 [AOR =2.75 ;95% CI: (1.71, 4.43)] times higher than those who didn't discuss about menstrual hygiene with their parents. Adolescent girls who know sanitary pads in the market was 2.1 [AOR =2.10 ;95% CI: (1.18, 3.28)] times more likely to practice

**Table 3:** Menstrual hygiene management practice among study participants.

Hygienic practices	Category	Percentage(%)
Use of sanitary materials during menstruation	Yes	92.8
	No	7.2
Types of materials used	Disposable sanitary pads	71.5
	Disposable piece of rags	9.5
	Reusable sanitary pads	17.8
	toilet paper/Underwear.	1.2
Frequency of changing sanitary materials/ day	< three times	59.6
	≥ three times	40.4
change materials at school	Yes	30.5
	No	69.5
Practice of genital washing	Yes	96.2
	No	3.8
Frequency of genital washing	<3 times per day	31.1
	≥3 times per day	68.9
medium used for washing genitalia	Only Water	55.8
	Soap and water	44.0
take bath during menstruation	Yes	63.8
	No	36.2
frequency of bath during menstruation	≤Two times in a day	72.7
	> Two times in a day	27.3
Medium used to wash reusable cloths	Soap and water	92.5
	Water only	7.5
Disposal of sanitary materials after use	Open field	2.7
	Latrine	69.9
	Wrap in paper and put in the bin	26.2
	Others*	1.2
Drying of washed reusable cloths a	In the shade inside	50
	In the sunlight outside	28.1
	Hidden under other clothes	22

\*=burn, any hidden place

good menstrual hygiene management than those who didn't know about sanitary pads Table 1.

## Discussion

This institution based study attempted to assess the magnitude and associated factors of menstrual hygiene management in Finot Selam town. Accordingly, hygienic practice of adolescent girls during menstruation and influencing factors were identified.

The finding of this study showed that 83.9% of adolescent girls had heard about menstruation before menarche of which the majority got the information from their mothers (63.3%). This could be suggestive of the contribution of mothers for hygienic practice of girls during menarche. This is higher than similar studies in Amhara region mehalmeda high school and Nepal that found 22.9% & 37.1% of adolescent girls have informed before menarche respectively [3,27]. This might be due to difference in the source of information as the major source in these two studies were mass media which might not be easily accessed by most of adolescent girls.

In this study it was observed that 68.8% of respondents had good practice of menstrual hygiene management. This finding is similar with study done in Oromia region Boset district which showed that 70.9% had good practice of menstrual hygiene [28]. This is higher than a finding from a study conducted in

Amhara region Wugera district and Bangladesh in which only 39.9% & 28.8% practices good menstrual hygiene [19,23]. This discrepancy may be due to different socio demographic and socio cultural characteristics of the study participants. The possible explanation for this finding is residency as most of participants in the current study were from urban this in its turn will increase the access of getting health information and might have access of sanitary pads [26].

Regarding the type of sanitary materials used, the study found that 88.3% of the respondents use commercially made sanitary pads. This is higher than studies conducted in Oromia region Boset district and Uganda in which only 46.3% & 36. % respectively use commercially made sanitary pads [28,29]. This difference might be due to lack of access to and knowledge on menstrual napkins and it might be due to misperceptions about utilization of sanitary pads.

It was also found that only 31.5% of girls change their sanitary pads at school. This is lower than studies done in Addis Ababa and Bahirdar showed 70.2% & 95.1% of students change their menstrual pads at school [24,25]. This might be due to difference in sanitation facilities and lack of private space to manage menstruation in the school as the in-depth interview data documented that most girls in this study didn't change their sanitary material at school.

This study also showed that 63.8% of girls took bath during menstruation. This is consistent with similar study in Addis Ababa which found 65.8 % take bath during mensuration [25]. However, it is lower than studies done in India and Egypt where 88.8% & 70.9% of the girls took bath during menstruation [5,30,31]. This might be due to socio cultural difference in perception towards menstruation and traditional restrictions on some regular activities. This is also supported by finding from the in-depth interview that bath during menstruation is considered as it might aggravate the bleeding.

This study also showed only 2.7% of girls dispose in open field after utilization of sanitary material. This finding is consistent with the study in Bahirdar town in which open filed disposal was 4% [26]. It might indicate that how much the issue is sensitive and its management is secretive. It is much lower compared to study in northwest Ethiopia north Wullo zone where 33.4% disposed in the open field [16]. This might be due to difference in respondent's solid waste management system, access to toilet facilities and the perception for menstruation.

The multivariable analysis showed that girls whose fathers education was colleges and above were 3.4 times more likely to practice good menstrual hygiene than Girls whose father was illiterate. It is consistent with the finding from study in Iran which showed that girls whose father's educational status was university and above was 4.3 times higher than those whose father was illiterate [20]. The reason could be that educated fathers are more likely to be aware of the physiology of menstruation and to be supportive for their daughter's in material as well as to discuss openly on menstrual hygiene. Studies in Adama town and Nekemtie town revealed the significant association between Menstrual hygiene practice

and maternal educational status [21,22]. But the finding of this study did not support these findings. It might be related to adolescent girls are more intimate and open to deal their problem with their mothers irrespective of maternal educational status.

Information about menstruation before menarche was found to be significantly associated with hygienic practice. It was observed that good practice was 3.95 times more among those who had information before they reach menarche compared to their counter parts. It might be due to prior information made them ready to practice safe hygienic management. Other studies [23-25] found that there was no significant association between information before menarche and menstrual hygiene management practice. It might be due to difference in source of information in which mothers were the main source of information in this study it may increase their confidence to practice what they informed.

Discussion with parents about menstruation was the other predictor of menstrual hygiene management. Those who have discussion with their parents at home were 2.7 times more likely to have good practice than those who didn't discuss. Study done in Addis Ababa also found significant association between these variables [25]. It might be related to getting freedom to ask for sanitary materials from their parents and to consider it as a natural phenomenon to manage without frustration. Knowledge on sanitary pads available on the market was the other significantly associated factor. The study done in Bahirdar town also showed this significant association that good practice was 2.49 times higher among those who know about sanitary pads [26]. This might be related that having an information and knowing sanitary pads could initiate them to utilize sanitary pads.

### Limitation

Due to its cross-sectional nature of the study, it was difficult to establish causal relationship between the dependent and predicting variables. Basically, the study addressed the sensitive issue about menstrual hygiene and there will be possibility of social desirability bias. Was tried to minimize it by using experienced female data collectors and female teachers to facilitate the orientation and it was self-administered. It was difficult to acquire the exact age of menarche as there may be recall bias. To minimize it attempt was made to link with their grade level and other events to identify the exact age of their first menstruation.

### Conclusions

According to the study finding most adolescent school girls have good practice of menstrual hygiene management and most utilize commercially made sanitary pads whereas paternal educational status, discussion with parents, prior information on menstruation and knowledge on sanitary materials on the market revealed significant association with practice of menstrual hygiene. Maternal education, pocket money & residency were the factors that didn't show association with menstrual hygiene management practice. However only a little above half of respondents have discussion

with their parent's about menstruation at home. Shyness to purchase and high cost were found to be the major reasons of not utilizing commercially made sanitary pads. Most of the students didn't change their sanitary material at school related with lack of WASH facilities in the school. Program designers and stakeholders should setup health education program to adolescent on menstrual hygiene at all levels starting from the elementary schools and should also give special attention towards making schools a comfortable place for girl's menstrual hygiene management. Researchers are advised to do large scale study on menstrual hygiene by employing both qualitative and quantitative methods to identify deeply rooted socio cultural and environmental factors and, the risk of RTIs related with poor menstrual hygiene and the effect on their academic performance.

### Acknowledgments

I want to express my great thanks to Mizan - Tepi university. I am pleased to thank Finot selam town education office administrative and to both Finot selam high school and Damot preparatory for their sharing necessary background information to develop the study setting. Finally, I would like to extend my thanks to supervisors, data collectors and study participants, without them this scientific paper couldn't have been into existence.

### Authors' contributions

ZA developed the study protocol, collected data and drafted the manuscript. BA & RA assisted in developing the data collection instruments, data analysis and interpretation of the results. ZA prepared the manuscript. All authors revised the manuscript critically and read and approved the final manuscript.

### Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

### Ethical approval and consent to participate

Ethical clearance was obtained from the Institutional Review Board of Jimma University institute of Health. Informed consent was obtained from each study participants and their confidentiality, privacy and anonymity was maintained.

### Paper context

Critical point added in this study is exploration of deeply rooted cultural practices and beliefs related with menstruation through qualitative method. In adequate sanitation facility in schools is the major challenge to manage menstrual hygiene at school. Therefore schools should be a suitable place for students and responsible bodies should deal with it.

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**Citation:** Abita Z, Ali R, Admassu B (2021) Menstrual hygiene management practice and associated factors among secondary school girls in finot selam town, northwest Ethiopia, 2019. *Int J Sex Reprod Health Care* 4(1): 053-061. DOI: <https://dx.doi.org/10.17352/ijshrhc.000024>