Knowledge, Attitude, Practice and its associated factors on menstrual hygiene among high school students of North Wollo Zone, Ethiopia, 2019: A cross-sectional study

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Research article

Keywords: Menstrual hygiene, knowledge, high school students, Ethiopia

Posted Date: September 24th, 2019

DOI: https://doi.org/10.21203/rs.2.14907/v1

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Abstract

Introduction Menstruation is the physiologic manifestation of cyclic uterine bleeding due to shedding and proliferation of the endometrium following invisible action and interplay of hormones mainly through the hypothalamus-pituitary-ovarian axis. Lack of proper menstrual hygiene predisposes women to different infectious and chronic obstetric and gynecological problems. Therefore, this study aimed to assess knowledge, attitude, practice and its associated factors of menstrual hygiene among high school students in North Wollo Zone, Woldia, Ethiopia.

Methods A Facility based cross-sectional study was implemented from October 1-December 10, 2018. The data was collected using structured, pretested questioners among female high school students. Systematic random sampling technique was implemented. Data was entered and analyzed through Epi data 3.1 and SPSS respectively.

Results This study revealed that 365(89.2%), 200(48.9%) and 196(47.9%) of the study participants have good knowledge, good practice and good attitude about menstrual hygiene respectively. Being grade 10 students [AOR=3.96, 95% CI =2.0-7.8], and having good practice of menstrual hygiene (AOR=2.52, 95% CI= 1.26-5) had positive association with menstrual hygiene knowledge. Maternal education level (AOR=1.86, 95% CI=1.18-2.9), being grade 10 students (AOR =2.3, 95% CI=1.48-3.56) were associated factors for practicing menstrual hygiene. Being grade 10 students (AOR=1.9, 95% CI=1.2-2.8), age ≥18 years (AOR=1.67, 95% CI=1.09-2.55) were statistically and positively associated with the attitude of menstrual hygiene.

Conclusion This study revealed that the knowledge of the study participants towards menstrual hygiene was high whereas attitude and practice regarding menstrual hygiene was low. Being grade 10 students and having good practice were the associated factors of knowledge. Higher level maternal of education, being grade 10 students and having good knowledge towards menstrual hygiene were the identified associated factors for practicing of menstrual hygiene. Being grade 10 students and age ≥18 were statistically and positively associated with the attitude of menstrual hygiene. Therefore, creating awareness to reproductive health groups, educating their families and parents can change their poor practicing and attitude of menstrual hygiene.

Introduction

Menstrual hygiene is personal hygiene during menstrual flow. It includes bathing once a day, changing clothes regularly, and changing pads at least two- four times per day (1, 2). In developing country menstrual hygiene is a problem for adolescent girls, particularly when attending schools (3). During menstruation, girls have been facing both practical and strategic gender problems. These have negative impacts for their personal lives and development opportunities: absent from their work and mobility, increased stress, early marriage, early and premature childbirth, and higher infant mortality, obstetric
fistula, complicated labor and potential vaginal and uterine infections resulting in the worst condition in infertility (4).

Reproductive age women who had not well hygienic practices are also prone to infertility. The management of menstruation presents significant challenges for women in lower income countries like Ethiopia. The effect of poor menstrual hygiene management, however, remains unclear even though menstrual hygiene management can affect the reproductive tract with unclear route of transmission (5).

Menstrual hygiene is an issue that is insufficiently acknowledged and has not received adequate attention in the reproductive health as well as water, sanitation, and hygiene (WASH) sectors in developing countries (6, 7). Giving health education for adolescent girls helps to develop the knowledge of adult's menstrual hygiene through their life. Menstrual hygiene is an issue that every woman of reproductive age is faced with in Ethiopia (8). Lack of knowledge and poor personal hygienic practices during menstruation can lead to various gynecological problems in the reproductive life of girls. Therefore to manage menstrual complications, essential reproductive health services and youth friendly services should be well addressed including access to water and sanitation (9, 10). There is also a need for both men and women to have a greater awareness of good menstrual hygiene practices (11). Menstrual hygiene is one of the reproductive health components which are not addressed in Ethiopia. This study critically addresses an issue that faces every woman in every society in the world with the aim of providing viable information for managing menstrual hygiene in girls and women. Studies are too limited in Ethiopia regarding knowledge, practice, and attitude towards menstrual hygiene. Therefore, this study helps to identify gaps relevant to attitude, practices, environmental, social and health factors and challenges of menstrual hygiene among high school students.

Methods

Study setting

Woldia is the capital city of North Wollo zone, Amhara region which is situated 521 km from Addis Ababa, the capital city of Ethiopia. Woldia town has a total population of 75,496 with 38,167 male and 37,279 female in 2008. Woldia town has one preparatory school and three high schools (selam, millinium, and woldia general high school). The town has four rural and three urban kebelle. In these high schools, there are about 7,027 (3217 in Woldia high school, 1500 in Wergiesa high school and 2310) in Mekiet high school.

Study design

An institution-based cross-sectional study was implemented from October 1- December 10, 2018

Source population
All female students in the selected North wollo high schools

**Study population**

Female students who have had menarche in selected high schools during the data collection time were included

**Sample size determination and sampling procedure**

The sample size was determined by using Epi info 7 software Stat Cal with the assumptions of single population proportion formula.

The actual sample size is calculated using single population proportion formula.

\[
\begin{align*}
n &= (Z_{\alpha/2})^2 \cdot p \cdot (1-P) = (1.96)^2 \cdot 0.513(1-0.513) = 384 \\
&\quad \frac{d^2}{(0.05)^2}
\end{align*}
\]

\[
d^2 (0.05)^2
\]

Where: - \( n \) = minimum sample size required for the study

\( Z = \) standard normal distribution (\( Z = 1.96 \)) with confidence interval of 95%

\( P = \) knowledge of girls on menstrual hygiene in Ethiopia (\( p = 51.36\% \))[17].

\( d = \) is a tolerable margin of error (\( d = 0.05 \))

The final sample size was come up by adding a non-response rate of 10% to the sample size from 384. Therefore, the final sample size for this study was 423.

The systematic random sampling technique was applied. The study was carried out among high school students in North Wollo Zone, Amhara Region.

North Wollo zone has a total of fifteen Woredas. We have been selected high schools by using a proportional sample allocation system. Among the fifteen woredas, three of them were selected by using the lottery method. These are Woldia, Mekiet and Habru woredas. Accordingly, we selected high schools in the respective woredas. Therefore, from Woldia town; Woldia high school, Millinium high school and Selam high school were conveniently selected. Filakit and Wurgesa high schools were randomly selected from Mekiet and Habru woreda respectively. Out of these five selected high schools, we have selected our study participants every k (3389/423 = 8) unit by allocating the sample proportionally. The total female
students in the selected high schools in North wollo zone were 3436. 423 high school students were selected by systematic random sampling technique with a proportional allocation of the sample in each selected high schools of North wollo zone.

**Data Collection tools**

The data were collected using structured, pretested questioners from the selected female students, using a questionnaire adapted from relevant literature of similar studies. The questionnaires consists of basic socio-demographic characteristics, knowledge on menstrual hygiene, attitude on menstrual hygiene, and practice of menstrual hygiene.

**Operational definition**

*Menstrual hygiene:* personal hygiene during menstrual flow includes bathing once a day, changing clothes regularly, and changing pads at least two- four times per day.

*Knowledge:* To measure the respondent’s knowledge of menstrual hygiene, there are 14 questions with the coding of 1 for correct and 0 for incorrect or don’t know.

*Good Knowledge:* Study participants who scored below the mean score of the respondents

*Poor knowledge:* Study participants who scored below the mean score of the respondents

*Practice:* The measurement of practice of menstrual hygiene focus on the use of material during menstruation there are 10 questions regarding menstrual hygiene practice and coding is similar to the knowledge questions.

*Good Practice:* Study participants who scored the mean score of the respondents

*Poor practice:* Study participants who scored below the mean score of the respondents

*Attitude:* The measurement of attitude towards menstruation and its hygiene there are 10 questions regarding attitude of menstrual hygiene and coding is similar to the knowledge questions.

*Good attitude:* Study participants who scored the mean score of the respondents

*Poor attitude:* Study participants who scored below the mean score of the respondents

**Data processing and analysis**

Completeness of the questionnaire was rechecked then the data were coded, entered and analyzed using Epi Data3.1 and SPSS Version 23 respectively. Bivariate logistic regression analysis was done after
dichotomizing the dependent variables with coding ‘1’ for good and ‘0’ for poor. After checking associations of the variables in the bivariate model, those variables with $p<0.2$ were a candidate to multivariable logistic regression analysis so as to control confounding factors in the association. Finally, P-value of $< 0.05$ was used to declare the statistical significance of the variables.

Results

Socio-demographic factors of the study participants

Among 423 of the study participants, 409 of them have provided valuable information with a response rate of 96.7%. The mean age of the study participants was 16.4 years (ranged from 14– 20 years) with SD of $\pm$ 1.5 years. Regarding the age of the study participants, more than half of them 211(51.6%) was within the range of 16–17 years. More than half of the study participants, 213(52.1%) of them were grade 10 students (table 1).

Knowledge on menstrual hygiene

Out of 409 study participants, 365(89.2%) of them had good knowledge about menstruation and its hygiene. About 361(88.3%) of the participants reported that poor hygiene during menstruation may cause diseases and 298(72.9%) of them reported that having good hygiene during menstruation may reduce diseases concurrence due to poor hygiene during menstruation (table 2).

Practice on menstrual hygiene

From the total study participants, 200(48.9%) of them had good menstruation hygiene practice. Nearly all of the respondents 356(87%) of them had reported that the type of absorbent that they have been used during menstruation was sanitary pad (table 3).

Attitude on menstrual hygiene

Among 409 study participants, 196(47.9%) of them had good attitude about menstrual hygiene. Among the total respondents, 354(86.6%) of them had reported that menstruation is good for health and 207(50.6%) of them considered that menstrual blood is waste and contaminated (table 4).

Factors associated with knowledge on menstrual hygiene

There were three explanatory variables in a bivariate analysis which had $p<0.2$: grade level, fathers’ level of occupation, and practice of the participants.
In the multivariable analysis: students grade level and practice of the students were statistically associated with menstrual hygiene knowledge \((p<0.05)\) via backward stepwise regression.

Girls who were grade 10 student’s had 3.96 times more likely to have good knowledge as compared to girls who were grade 9 students \([\text{AOR} = 3.96, 95\% \text{CI} = 2 – 7.8]\).

Students who had good menstrual practice had 2.52 times more likely to have good knowledge on menstrual hygiene as compared to those who had poor practice on menstrual hygiene \((\text{AOR} = 2.52, 95\% = \text{CI} (1.26 – 5))\) (table 3).

**Factors associated with practice on menstrual hygiene**

There were three explanatory variables in a bivariate analysis which had \(p<0.2\): grade level, mother’s level of education, and knowledge participants.

In the multivariable analysis: students grade level, higher level of maternal education and knowledge of the students were significantly associated \((p<0.05)\) using backward stepwise regression.

Girls who had good knowledge on menstrual hygiene have 3.74 more likely good practices on menstrual hygiene as compared to Girls who had poor knowledge on menstrual hygiene \((\text{AOR} = 3.74, 95\% \text{CI}(1.18 – 7.7))\).

Respondents whose mothers level of education is secondary and above had 1.86 more likely good practice as compared with those whose mothers level of education is elementary and no formal education \((\text{AOR} = 1.86, 95\% \text{CI}(1.18 – 2.9))\).

Being a grade 10 students had 2.3 more likely had good practice on menstrual hygiene as compared to grade 9 students \((\text{AOR} = 2.3, 95\% \text{CI}(1.48 – 3.56))\) (table 3).

**Factors associated with attitude on menstrual hygiene**

There were two explanatory variables in the bivariate analysis which had \(p<0.2\): grade level, and age of the participants.

In the multivariable analysis: students grade level and age of the students were statistically associated \((p<0.05)\) through backward stepwise regression.

Grade 10 respondents 1.9 more likely good attitude on menstrual hygiene as compared with grade 9 respondents \((\text{AOR} = 1.9, 95\% \text{CI} (1.2 – 2.8))\).

Students whose age was \(\geq 18\) had 1.67 more likely good attitude on menstrual hygiene as compared with 13–14 and 16–17 age group respondents \((\text{AOR} = 1.67(1.09 – 2.55))\) (tab
Discussion

This study revealed that 89.2%, 48.9% and 47.9% of study participants had good knowledge, good practice and good attitude with 95% CI (86.1–92.2), 95% CI (44.3–53.5) and 95% CI 42.6–53.3) respectively.

Regarding the knowledge of menstruation, this study finding is in line with the study done in America (15). The possible reason may be due to both the study was conducted in high school students. This study finding is higher than the study conducted in Ethiopia (Nekemte), Nigeria; Ethiopia (Amhara), India and Saudi Arabia (14, 3, 13, 12 17). This could be due to the number of study participants and the study site in each study.

Regarding the practice of menstruation, the finding of this study is higher than the study done in Ethiopia (Wogera), and Nigeria (2, 3). The discrepancy might be due to this study only incorporates secondary school students, unlike other studies.

The finding of this study is also lower than the study conducted in America (15). This might be due to the fact that in developing countries there is low reproductive health coverage than developed countries and also the socioeconomic capacity of the developing countries has a direct impact on the utilization of reproductive health services.

This study finding is higher than the study implemented in western Iran (16). This could be due to the report from Iran showed that the study is done in all school girls.

Regarding the attitude of menstruation, this study finding is lower than the study implemented in western Iran. This could be due to in this study the sample size as small as compared to the study done in western Iran (16).

Good knowledge is one of the associated risk factor for menstrual hygiene practice. A similar finding is reported in Gondar (13). This could be due to the fact that being knowledgeable has a direct impact to practice menstrual hygiene management.

Being a grade 10 student is another important associated risk factor for menstrual hygiene practice. This is because when students are learning more about menstruation and its hygiene they can easily understand the future risk and complications of poor practicing of menstrual hygiene management.

Good practicing of menstrual hygiene was associated with the knowledge of menstrual hygiene. This might be due to the fact that when students having good menstrual hygiene practice they have good menstrual knowledge before.

Being a grade 10 student is another important associated risk factor for knowledge of menstrual hygiene. This might be due to the fact that grade 10 students’ may have learned more about menstrual hygiene
and they may have more exposure to some reproductive and youth friendly services that makes aware them about menstrual hygiene in their schools.

The age of the students within the range of above 18 is associated with the attitude of menstrual hygiene. This could be due to the fact that when their age increases their exposure to reliable information about menstrual hygiene practice is also increasing and when they have found correct information about menstrual hygiene they may have a positive attitude towards menstrual hygiene.

A grade 10 student and age >18 are associated factor for the attitude of menstrual hygiene. This is due to the fact that as the age and their grade level increases, the mentality is also increased and exposure to information about menstrual hygiene is also increased.

**Conclusions**

This study revealed that the knowledge of the study participants towards menstrual hygiene was high whereas attitude and practice regarding menstrual hygiene was low. Being grade 10 students and having good practice were the associated factors of knowledge. Higher level maternal of education, being grade 10 students and having good knowledge towards menstrual hygiene were the identified associated factors for implementing of menstrual hygiene practice. Being grade 10 students and age \( \geq 18 \) were statistically positively associated with attitude of menstrual hygiene. Therefore, creating awareness to reproductive health groups, educating their families and parents can change their poor practicing and attitude of menstrual hygiene.

**Abbreviations**

AOR: Adjusted odd ratio, COR: Crude odd ratio, CI: Confidence interval.

**Declarations**

**Acknowledgment**

The authors would like to thank the data collectors and supervisors for their invaluable and timely fashion work. The author's deep gratitude also goes to the study participants, school directors, supervisors and unit leaders who were volunteered and took their time to give us all the relevant information for the study.

**Funding**

Not applicable

**Availability of data and materials**
All related data has been presented within the manuscript. The data set supporting material is available from the authors on request.

**Author’s Contributions**

FE, ES, BW, and AZ have initiated the research, wrote the research proposal, conducted the field work, supervised data entry, analyzed the data and wrote the manuscript. GG and FE participated in refining the research proposal, analyzed the data and wrote the report. All authors read and approved the final manuscript.

**Ethics approval and consent to participate**

Ethical clearance was obtained from Woldia University Institutional Review Board. Permission letter was also obtained from school administration office. School directors, unit leaders, participants, school child parents/ guardians and school supervisors were briefed about the study objectives, expected outcomes, benefits and risks associated with the study. Written and informed consent was obtained from the partner or legal guardians for those school children aged less than 18 years. Moreover, data collectors went to home to take written consent for those students whose age group is less than 18 by briefing the importance and the objective of the study for their family after selecting students via class attendance sheet. Besides, assent was secured from participants aged below 18 years. School children whose aged 18 years and above provided by written consent on their own. Confidentiality and privacy of participants were secured.

**Consent for publication**

Not applicable.

**Competing interest**

The authors declared that they have no competing interests.

**Funding**

Woldia University

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**Tables**

**Table1:** Socio-demographic characteristics of menstrual hygiene among high school female students in North Wollo Zone, North East Ethiopia, 2019

| Characteristics                        | Frequency | Percent |
|----------------------------------------|-----------|---------|
| **Grade of students**                  |           |         |
| Grade 9                                | 196       | 47.9    |
| Grade 10                               | 213       | 52.1    |
| **Age of students**                    |           |         |
| 14-15                                  | 109       | 26.7    |
| 16-17                                  | 211       | 51.6    |
| ≥18                                    | 89        | 21.8    |
| **Educational level of the father**    |           |         |
| No formal education                    | 72        | 17.6    |
| Elementary                             | 122       | 29.8    |
| Secondary and above                    | 215       | 52.6    |
| **Educational level mother**           |           |         |
| No formal education                    | 91        | 22.2    |
| Elementary                             | 152       | 37.2    |
| Secondary and above                    | 166       | 40.6    |
| **Occupation of father**               |           |         |
| Farmer                                 | 179       | 43.8    |
| Merchant                               | 43        | 10.5    |
| Employee                               | 187       | 45.7    |
| **Occupation of mother**               |           |         |
| Housewife                              | 224       | 54.8    |
| Merchant                               | 59        | 14.4    |
| Employee                               | 126       | 30.8    |
| **Monthly income in ETB**              |           |         |
| <500                                   | 96        | 23.5    |
| 500-1000                               | 33        | 8.1     |
| 1001-2000                              | 41        | 10.0    |
| 2001-3000                              | 43        | 10.5    |
| ≥3000                                  | 196       | 47.9    |
Table 2: Knowledge, Attitude and practice on menstrual hygiene among high school female
students in North Wollo Zone, North East Ethiopia, 2019
### Characteristics of knowledge

| Question                                                                 | Frequency (n=409) | Percent (%) |
|------------------------------------------------------------------------|-------------------|-------------|
| Do you think menstrual blood is waste?                                 |                   |             |
| Yes                                                                    | 220               | 53.8        |
| No                                                                     | 189               | 46.2        |
| What is the cause of menstruation?                                     |                   |             |
| Hormone                                                                | 113               | 27.6        |
| God punishment                                                         | 169               | 41.3        |
| Age                                                                    | 116               | 28.4        |
| Disease                                                                | 3                 | 0.7         |
| Others                                                                 | 8                 | 2           |
| Is sexual intercourse allowed during pregnancy?                        |                   |             |
| Yes                                                                    | 46                | 10.5        |
| No                                                                     | 363               | 89.5        |
| Is there menstrual bleeding during pregnancy?                          |                   |             |
| Yes                                                                    | 42                | 12.8        |
| No                                                                     | 357               | 87.3        |
| What is the age in years at menarche?                                  |                   |             |
| 10-12                                                                  | 138               | 33.7        |
| 13-15                                                                  | 239               | 58.4        |
| 16-18                                                                  | 32                | 7.8         |
| Length of normal menstrual cycle                                       |                   |             |
| <21                                                                    | 55                | 13.5        |
| 21-35                                                                  | 350               | 85.5        |
| >35                                                                    | 4                 | 1.0         |
| Duration of normal menstrual bleeding                                  |                   |             |
| <3days                                                                 | 62                | 15.2        |
| 3-5days                                                                | 312               | 76.3        |
| >5days                                                                 | 35                | 8.6         |
| Have you ever heard about menstruation before?                         |                   |             |
| Yes                                                                    | 347               | 84.8        |
| No                                                                     | 62                | 15.2        |
| What is the source of information?                                     |                   |             |
| Mother                                                                 | 131               | 37.7        |
| Teacher                                                                | 36                | 10.4        |
| Friends                                                                | 83                | 23.9        |
| Books                                                                   | 12                | 3.5         |
| Sister                                                                  | 69                | 19.9        |
| Mass media                                                             | 3                 | 0.9         |
| Others                                                                  | 13                | 3.7         |
| Do you think poor hygiene can cause disease                            |                   |             |
| Yes                                                                    | 361               | 88.3        |
| No                                                                     | 48                | 11.8        |
| Knowledge on menstrual hygiene                                         |                   |             |
| Good knowledge                                                         | 365               | 89.2        |
| Poor knowledge                                                         | 44                | 10.8        |

### Characteristics of Practice (n=409)

| Type of absorbent material used | Frequency (n=409) | Percent (%) |
|---------------------------------|-------------------|-------------|
| Sanitary pad                    | 356               | 87.0        |
| Homemade pad | 34 | 8.3 |
|-------------|----|-----|
| Soft        | 13 | 3.2 |
| Others      | 6  | 1.5 |

| Frequency of changing pant | 85 | 20.8 |
|---------------------------|----|------|
| Once                      | 196| 47.9 |
| Twice                     | 108| 26.4 |
| Three times and above     | 20 | 4.9  |
| I don’t change             |    |      |

| Where do you dispose your pant | 136 | 33.3 |
|--------------------------------|-----|------|
| Solid waste container         | 25  | 6.1  |
| In the pipe                   | 226 | 55.3 |
| Toilet                        | 22  | 5.4  |
| Field                         |     |      |

| Practice on menstrual hygiene | 200 | 48.9 |
|--------------------------------|-----|------|
| Good practice                  |     |      |
| Poor practice                  | 209 | 51.1 |

**Characteristics of Attitude (n= 409)**

| Is menstruation good for health? | 354 | 86.6 |
|----------------------------------|-----|------|
| Yes                              |     |      |
| No                               | 55  | 13.4 |

| Do you think menstrual blood is waste? | 85 | 20.8 |
|----------------------------------------|----|------|
| Yes                                    |    |      |
| No                                     | 324| 59.4 |

| What is the reaction that you face at first menstruation? | 31 | 7.6 |
|-----------------------------------------------------------|----|-----|
| Happiness                                                 |    |     |
| Fear                                                      | 137| 33.5|
| Pain                                                      | 102| 24.9|
| Disturbance                                               | 126| 30.8|
| Others                                                    | 13 | 3.2 |

| Do you think that you will experience restriction during menstruation? | 64 | 15.6 |
|-----------------------------------------------------------------------|----|------|
| Yes                                                                    |    |      |
| No                                                                     | 345| 84.4 |

| From what do you will be restricted? | 12 | 9.4 |
|--------------------------------------|----|-----|
| Celebration                          | 5  | 7.8 |
| Certain foods                        | 17 | 26.6|
| Work                                 | 30 | 64.9|
| Praying                              |    |     |

| Attitude on menstruation            | 196| 47.9 |
|-------------------------------------|----|------|
| Good attitude                       |    |      |
| Poor attitude                       | 213| 52.1 |

**Table 3:** shows the bivariate and multivariable association of knowledge, attitude and practice on menstrual hygiene among high school female students in North Wollo Zone, North East Ethiopia, 2019.
| Characteristics of knowledge | Knowledge on menstrual hygiene | COR(95%CI) | AOR(95%CI) |
|-----------------------------|--------------------------------|------------|------------|
|                             | Good                           | Poor       |            |
| Grade level                 |                                |            |            |
| Grade 9                     | 248(68)                        | 15(34%)    | 1          | 1.792(1.02-3.09) |
| Grade 10                    | 117(32%)                       | 29(66%)    | 4.1(2.1-7.9)| 3.96(2.7-8.2)** |
| Practice on menstrual hygiene| Poor                           |            | 1.76(1.02-3.09) | 1.75(1.007-3.07) |
|                             | Good                           | 170(46.6%) | 30(68.2%)  | 2.52(1.26-5.7)** |
|                             |                                | 195(53.4%) | 14(31.8%)  | 2.5(1.3-4.77) |
| Father's occupation         | Farmer                         | 23(52)     | 150(41)    | 1          | 0.842(0.444-1.596) |
|                             | Merchant                       | 1(2.2)     | 60(16.4)   | 1          | 1(0.5-1.9) |
|                             | Governmental Employee          | 20(44.4)   | 155(42.5)  | 1.77(1.14-2.74) | 1.86(1.18-2.9)* |
| Characteristics of attitude | Attitude on menstrual hygiene  |            |            |
|                             | Poor                           |            |            |
| Grade level                 |                                |            |            |
| Grade 9                     | 106(49.8%)                     | 131(66.8%) | 1          | 1.75(1.007-3.07) |
| Grade 10                    | 107(50.2%)                     | 65(33.2%)  | 2.034(1.363-3.037) | 1.906(1.152-2.65)** |
| Age of students             | 14-15                          | 18(8.5%)   | 27(13.8%)  | 1          | 2.02(1.01-4.03) |
|                             | 16-17                          | 97(45.5%)  | 107(45.6%) | 2.37(1.26-4.66) | 2.87(1.47-5.6)** |
|                             | ≥18                            | 98(46%)    | 62(31.6%)  | 1.744(1.14-2.65) | 1.86(1.18-2.9)* |
| Characteristics of practice | Practice on menstrual hygiene  |            |            |
|                             | Poor                           |            |            |
| Grade level                 |                                |            |            |
| Grade 9                     | 117(56%)                       | 39(69.5%)  | 1          | 1.792(1.193-269) | 1.75(1.007-3.08) |
| Grade 10                    | 92(44%)                        | 61(30.5%)  | 1          | 2.3(1.48-3.56)** |
| Knowledge of the participants| Poor                           | 13(6.2%)   | 31(15.5%)  | 1          | 1 |
|       |         |         |         |         |
|-------|---------|---------|---------|---------|
| Good  | 196(93.8%) | 169(84.5%) | 2.7(1.4-5.45) | 3.74(1.8-7.7)** |

**=p<0.05, significance