

Effect of Educational Program on Menstrual Health: An Intervention Study among School Girls in Sudan

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Abstract

Background: The necessity to educate schoolgirls regarding menstruation and appropriate menstrual hygienic practices by using a suitable program especially in schools. This study aimed to evaluate the effect of an education program on secondary school girls' menstrual health in Khartoum, Sudan. **Methods:** This study was quasi-experimental (one group pre/posttest). The study was conducted on secondary-school girls, Khartoum, Sudan, from July to August 2018. The school consists of 11 classes for the three levels, the first level 4 classes, second-year 3 classes, and third year 4 classes and the total number is 400 students. One class was chosen randomly from each level (three classes involved). Non-probability sampling technique, a convenient sample of 60 secondary school students was included in the study (20 from each class) 50 students completed the study, and 10 students withdrew. The data were collected by using a validated questionnaire, which consists of three parts, part one is socio-demographic data of the students, part two is student's knowledge about menstruation, and part three student's hygienic practices during menstruation. The data were analyzed by SPSS version 20, and appropriate tests were applied. **Results:** The overall schoolgirls' knowledge was significantly improved from 25% to 76.14% after the intervention and the key source of information was their mothers followed by teachers. The hygienic practice was insignificantly improved from 27% to 39.4% after the intervention. **Conclusion:** This study concludes that menstrual health education for schoolgirls has significantly improved the knowledge and hygienic practice on menstrual health. **Recommendation:** It is recommended to conduct further research with a more representative sample that could show the appropriate effect. Consequently, the outcome of this study is a part of the school health program and a base for further interventions at this age group.

Keywords: Education program, Menstrual health, Secondary school, Sudan.

Introduction

The adolescence stage is a time of transition from childhood to adulthood, characterized by the appearance of secondary sex characteristics, and maturation of the reproductive organs, according to the World Health Organization (WHO), adolescence is between 10-19 years. The first menstrual time is known as menarche, is the most prominent event during puberty which is related to several physiological changes and is considered to contribute to inequality in education (Shiferaw et al., 2014, Sharma et al., 2016, Mason et al., 2013, Ali et al., 2011). Poor hygiene during menstruation was related to severe illness, including genitourinary tract infections (Tegegne and Sisay, 2014).

United Nations (UN) defines suitable menstrual hygienic practices for mothers and

girls during the menstrual period as a practice of cleaning menstrual wastage, gathering materials used, kept in a private location, cleansing the body utilizing soap and water, and access to disposal services. One of the things used in menstruation (Kuhlmann et al., 2017), good hygiene practices, such as the use of sanitary pads and suitable washing for genital areas, are necessary during menstruation (Upashe et al., 2015).

Menstrual hygiene management has become an internationally known community health issue. United Nations agencies, grassroots women's organizations, multinational women's cleaners, and social entrepreneurs are mobilizing their efforts to attract the attention and resources needed to address the shame associated with the blemishes, embarrassments, and taboo suffered by many girls in low and middle-income countries (Sommer et al., 2015, van Eijk et al., 2016, Boosey et al., 2014).

Students' school absenteeism and disconnection have been confirmed as significant for inadequate menstrual hygiene management (Hennegan et al., 2016). Feelings of shame, fear of stigma, and anxiety were defined across a range of circumstances (Hennegan and Montgomery, 2016).

Mothers and girls around the globe have developed strategies to deal with menstruation. These vary considerably from country to other, within countries, depending on individual favorites, accessible resources, economic status, local customs, cultural views, knowledge, and education. Because of these restrictions, women often manage menstruation in ways that may be unhealthy or uncomfortable, especially in poor places. Estimates of the prevalence of management methods vary widely across contexts, but studies suggest the widespread use of unhealthy absorbent materials, and insufficient wash and drying of reused across Africa, Southeast Asia, and the Middle East (Sumpter and Torondel, 2013).

Many studies have shown that most adolescent girls have inadequate and imperfect knowledge about menstrual health. The most dominant sources of information for girls in this aspect were friends, teachers, relatives, and mothers. Inadequate health education in girls' schools leads to improper choices about their health and menstrual management (Morowatisharifabad et al., 2018). The absorbent material is used as cloth and can often seep out, or a tattered outfit or outer garment. In addition, cleaning and changing sorbents pose major challenges (Montgomery et al., 2016).

1.1 Significance of the study:

Throughout the menstrual cycle, many girls have inadequate knowledge and practices on menstrual health. Furthermore, many girls have a stigma to talk about their menstruation with their peers of health care providers. Thus, there is a necessity to educate girls regarding menstruation and appropriate menstrual hygienic practices using a suitable program especially in schools (Morowatisharifabad et al., 2018). This study aimed to evaluate the effect of an education program on secondary school girls' menstrual health in Khartoum, Sudan. The information obtained from this study will be used by policymakers and stakeholders to provide information on menstruation and hygienic

practice for secondary school girls in the study area.

Aim of the study

The aim of this study is:

To evaluate the effect of an education program on secondary school girls' about menstrual health in Khartoum, Sudan.

This aim will be achieved through the following objectives:

1. To assess the effect of an education program on schoolgirls' knowledge regarding menstrual health.
2. To assess the effect of an education program on schoolgirls' hygienic practice during menstruation.

1.3 Research questions

1. What is the effect of an education program on schoolgirls' knowledge regarding menstrual health?
2. What is the effect of an education program on schoolgirls' hygienic practice during menstruation?

1.4 Hypotheses

Hypothesis 1: schoolgirls improved their knowledge of menstrual health after an education program.

Hypothesis 2: schoolgirls improved hygienic practice about menstrual health after an education program

1.5 Operational definitions:

Educational program: menstrual health education program which conducted for schoolgirls at Zat –Alnitageen school, Khartoum city.

Menstrual health: knowledge and practice about menstruation known by schoolgirls at Zat –Alnitageen school, Khartoum city.

Intervention study: intervention program applied for one group of schoolgirls, pre-test, post-test study.

Schoolgirls: secondary school student at Zat –Alnitageen school, Khartoum city.

Materials and Methods

2.1 Design: This is quasi-experimental (one group pre/posttest) research design was adopted.

2.2 Duration of study: The study was conducted during the period from July to August 2018.

2.3 Setting: The study was carried out at secondary-school students (Zat –Alnitageen school), Khartoum, Sudan, the school was

selected by purposive sampling method due to the large number of students, it is the only school in this area, and limited time. The school consists of 11 classes for the three levels, the first level 4 classes, second-year 3 classes, and third year 4 classes and the total number is 400 students.

2.4 Sample: A multistage sampling technique was used to select the required sample size as follows:

One class was chosen randomly from each level (three classes involved) from Zat – Alnitageen school, Khartoum - Sudan.

Non- probability sampling technique, a convenient sample of 60 secondary school students was included in the study (20 from each class) as elaborated in the figure (1) .

The sample size was calculated for the paired sample (before-after study) using the MedCalc software based on the following parameters: Type I error rate/two-tailed test $\alpha = (0.05)$, Type II error rate/ $\beta= 20$, Effect size (E)=0.5, SD=1 with 80% power and 95% confidence limit (Chow S-C et al 2008& Rosner B, 1995). This resulted in a minimum required sample size of 50. Thus, the final sample size adopted in this study was adjusted to 60 participants to compensate for potential non-response.

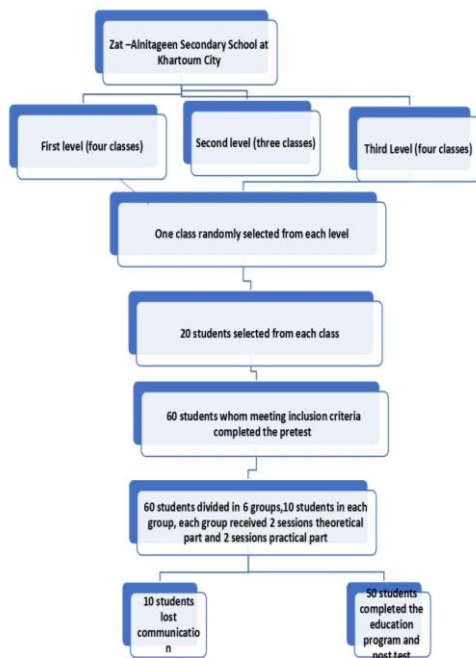


Figure (1): Graphic illustration of the studied sample flowchart

2.4.1 Inclusion criteria:

Students who were registered at the selected secondary school

Students willing to participate were included.

2.4.2 Exclusion criteria:

- The disabled students were excluded.
- Students on sick leave were excluded.

2.5 Data Collection Instrument:

A structured interviewing validated questionnaire was used after being revised by five specialists, which consists of three parts:

Part (1): Socio-demographic characteristics of the students included student age, age of menarche, class level, marital status, student living with whom, mother's education level, mother's occupation, and students' source of information about menstruation.

Part 2: The knowledge scoring system was based on 13 questions, the schoolgirls' responses were given a value ranging between (0= not correct, 1 = partially correct, and 2=correct). The calculated score (out of 26 scores) was classified into three categories (<25% as low knowledge, 25-<50% as medium knowledge, and >50% as high knowledge).

Part 3: The practice scoring system was calculated based on 9 questions, the schoolgirls' responses were given a value ranging between (0= not correct, 1 = partially correct, and 2=correct). The calculated score (out of 18 scores) was classified into three levels (<25% as low practice, 25-<50% as medium practice, and >50% as high practice).

2.6 Phases of Education program

Pre-intervention phase:

- The letter was sent to the director of school expressing a formal request to conduct the research study and seeking permission to do so.
- Sign of agreement from the director is provided before conducting the research study.
- After agreement was obtained, the eligible students were identified by the director considering their participation in the research study.

- Prospective students attended a small group meeting (6 groups, 10 students in each group) where the researcher made it very clear to students that their participation was voluntary, and they were free to withdraw at any time.
- Information sheets and consent forms were distributed to the students, and they were asked to read and sign the consent form and return their consent form to the researcher.
- After informed consent was obtained, the students completed the pre-test questionnaires, the questionnaire was prepared in English and translated to Arabic. Only girl participants were allowed inside the class where data was collected, questionnaire included 22 items present in Arabic, questions related to menstrual health knowledge and practice. The distribution and collection of the questionnaires were carried out by two co-authors.
- Arrangements were made to prepare an effective learning environment before the education program.

Intervention phase:

- Classification of students in small groups: 10 students in each group, for teaching sessions short interactive lectures and group discussions supported by audio-visual aids like PowerPoint lectures illustrated pictures, distribution of handouts about menstruation to all students (include theoretical part and hygienic practice) in the Arabic language supported by pictures and videos for each group.
- The theoretical part took 12 sessions (repeated 6 sessions) during the first two weeks, six sessions per week for six groups, each session lasted (40) minutes, 6 sessions were covered in the first week and the same sessions were repeated in the second week. at the end of school hours.
- Continuous feedback and communication were assured to clear any misunderstanding and to reinforce learning for these sessions.
- Followed by the practical part which was about hygienic practice done during the second two weeks, which consisted of 12 sessions, each one lasted for 40 minutes and covered around 2 weeks, 6 sessions were covered in the first week and the same sessions were repeated in the second week. at the end of school hours. it's done through demonstration and re-demonstrations utilized audiovisual aids, at the end of school hours.

Post-intervention or evaluation phase

- The post-test by questionnaire was done after 3 weeks post-intervention (week 7th)
- The researchers were available for 5 days/week at school during the education program.

Ethical approval

Upon getting the formal endorsement and permission from the school director, the purpose of the study was explained to students, and informed consent was obtained, the confidentiality of information was maintained, students were asked to obtain paternal consent, and were informed of their right to withdraw from the study at any time.

Statistical analysis:

The data were tabulated and analyzed by SPSS (statistical package for the social science) version 20. Descriptive analysis for frequency and percentages of demographic variables was used. Paired sample t-test was used to measure the difference as pre- and post-intervention. The one-way ANOVA test was used to test the difference in total knowledge and practice before and after the intervention.

Results

The study showed that secondary school female students are less than 17 years old and only 30% were above 17 years old, the menarche was mainly reported at age of 14 years or less (90%). The participated students were from the three levels of secondary school, most of them are singles and live with their families (60% with both parents, 20% with mothers, and 10% with relatives) while married girls live with their husbands (10%). The educational level of mothers of those girls reported that 50% have a university education, 20% have a secondary certificate, 20% have intermediate or primary education and only 10% were illiterate. The girls' information on the management of menstruation was received from their mothers (50%), followed by teachers and media (19.6% for each) and books (10.8%), Table 1.

Table 2 reflected the female secondary students' knowledge in Khartoum before and after

the educational intervention. 84% heard about menstruation and its management, they were most comfortable after the intervention to talk about menstruation (86% vs 20.6%), they know the common age of menarche after intervention (80%) compared to (10.8%) before the intervention, the knowledge on the duration of the blood of menstruation improved from 20.6% to 84% after education. They were knowledgeable to apply the pads after intervention 82% compared to 50% before intervention. They were able to explain the hormonally related explanation of menstruation and the uterus as a part that bleeds after intervention (78%) compared to 10.8% before intervention. The awareness of hygienic intervention was improved from 20.6% to 70% after the intervention. They became oriented that they can attend school classes during menstruation (84%) compared to 50% before the intervention, they also became oriented that menstruation is a natural physiological process after intervention 94% compared to 20.6% before intervention. The overall female students' knowledge of menstruation management was significantly improved from 25% to 76.14% after the intervention.

The findings in table 3 showed the hygienic practices of female students on menstruation as a

comparison before and after the intervention. It showed that 78% of students use soap and water to clean genital area compared to 40 before intervention, 92% clean genital area daily compared to 60 before intervention. The overall hygienic practice was insignificantly improved from 27% to 39.4% after the intervention.

Table 4 revealed the level of knowledge and practice of schoolgirls on the management of menstruation before and after the intervention, knowledge levels before and after the intervention is categorized to low (60% versus 6%), medium (30% versus 16%), and high (10% versus 78%) respectively. Concerning the level of hygienic practice before and after the intervention, also, categorized to low (66% versus 62%), medium (24% versus 18%), and high (10% versus 20%) respectively, overall results there is an improvement.

The findings in table 5 showed there is no significant difference between the level of knowledge and level of practice (P value:0.06), since after intervention schoolgirls have a high level of knowledge, while the level of practice is still low, that may take a long time to practice in their life, later the level of practice may be improved when applying the knowledge, they have.

Table (1): Demographic characteristics of female secondary students in Khartoum, Sudan.

Variable		Percentage (n=50)
Age	<14 Years	30%
	14-17years	40%
	>17 Years	30%
Age at Menarche	<12 Years	40%
	12-14 Years	50%
	>14 Years	10%
Class at secondary school	First Class	40%
	Second Class	30%
	Third Class	30%
Marital Status	Married	10%
	Single	90%
Students live with	Parents	60%
	Mother Only	20%
	Relatives	10%
	Husband	10%
Mother's education	Illiterate	10%
	Primary	10%
	Intermediate	10%
	Secondary	20%
Mother's occupation	University	50%
	Housewife	30%
	Trader	10%
	Employed	50%
Respondents' sources of information about menstruation	Other	10%
	Teacher	19.6%
	Media	19.6%
	Mother	50.0%
	Books	10.8%

Table (2): Level of knowledge of female secondary students in Khartoum, Sudan on the management of menstruation before and after intervention (n=50)

Variable		Knowledge before (%)	Knowledge after (%)	p-value
Did you hear about menstruation	Yes	30.4	84.0	0.02*
	No	69.6	16.0	
Did you feel comfortable talking about menstruation	Yes	20.6	86.0	0.001**
	No	79.4	14.0	
Did you know the common age range of menarche	Yes	10.8	80.0	0.001*
	No	89.2	20.0	
Did you know the normal menstrual bleeding duration	Yes	20.6	84.0	0.002**
	No	79.4	16.0	
Did you know the duration of a normal menstrual cycle	Yes	20.6	84.0	0.01*
	No	79.4	16.0	
Did you know disposable sanitary pads as menstrual soak up	Yes	50.0	82.0	0.03*
	No	50.0	18.0	
Did you aware that menstruation is due to hormones	Yes	10.8	78.0	0.002**
	No	89.2	22.0	
Did you aware that menstrual blood is from the uterus	Yes	10.8	78.0	0.00**
	No	89.2	22.0	
Did you aware that a girl cannot conceive during menstruation	Yes	40.2	84.0	0.02*
	No	59.8	16.0	
Did you learn menstruation & its hygienic management in school	Yes	20.6	70.0	0.03*
	No	79.4	30.0	
Did you aware that a girl can go to school during Menstruation	Yes	50.0	84.0	0.01*
	No	50.0	16.0	
Did you know the menstruation is a natural/physiological process	Yes	20.6	94.0	0.001**
	No	79.4	6.0	
Is menstruation a disease	Yes	50.0	73.0	0.074
	No	50.0	22.0	
Total Knowledge (mean ± SD)		25±22.87	76.14±25.47	0.001**

(*) = significant

(**) = highly significant

Table (3): Level of the practice of female secondary students in Khartoum, Sudan on the management of menstruation before and after intervention (n=50).

Variable		Practice before (%)	Practice after (%)	p-value
The best material used during menstruation	Disposable sanitary pad	40.0	12.0	0.06
	Homemade cloth	30.0	28.0	
	Underwear	30.0	60.0	
The best genital cleaning material is	Soap and water	40.0	78.0	0.04*
	Water only	50.0	22.0	
	Others	10.0	0.0	
The best bath frequency is	Daily	60.0	92.0	0.04*
	First day	10.0	8.0	
	As per convenience	30.0	0.0	
The best way of bath using	With soap and water	70.0	24.0	0.06
	With water only	30.0	76.0	
The best way of disposal of menstrual material used in	Open field	40.0	86.0	0.08
	Latrine	10.0	14.0	
	Waste bins	50.0	0.0	
The best frequency of Absorbent material change per day is	Once	20.0	8.0	0.12
	Twice	30.0	6.0	
	More than two time	50.0	86.0	
The drying of washed reusable cloth	In the shade outside	20.0	8.0	0.23
	In the shade inside	20.0	20.0	
	In the sunlight inside	20.0	72.0	
	In the sunlight outside	10.0	0.0	
	Hidden under other clothes	20.0	0.0	
	Hidden elsewhere	10.0	0.0	

Variable		Practice before (%)	Practice after (%)	p-value
Washing of the reusable cloth	With soap and water	80.0	36.0	0.082
	With water only	10.0	20.0	
	Others	10.0	44.0	
Place of the store between use	In plastic bag separately	30.0	94.0	0.02*
	With other clothes	20.0	6.0	
	In the bathroom	50.0	0.0	
Total correct practice		27%±12.8	39.4%±20.7	0.04

Table (4): Level of knowledge and practice of schoolgirls on the management of menstruation before and after intervention in Khartoum, Sudan (n=50)

Variable		Before intervention	After intervention	p-value
Knowledge Levels	Low knowledge	60%	6%	0.03*
	Medium Knowledge	30%	16%	
	High Knowledge	10%	78%	
Practice Levels	Low Practice	66%	62%	0.05
	Medium Practice	24%	18%	
	High Practice	10%	20%	

(*) =significant

Table (5): Correlation between knowledge and practice levels among schoolgirls on the management of menstruation before and after intervention in Khartoum, Sudan (n=50)

Variable		Practice Level after intervention			p-value
		Low practice	Medium Practice	High practice	
Knowledge Levels after intervention	Low knowledge	66.7%	33.3%	0%	0.06
	Medium Knowledge	50%	25%	25%	
	High Knowledge	64.1%	15.4%	20.5%	

Discussion:

This study evaluated secondary school girls' knowledge and hygienic practices about menstrual health during the menstrual cycle in Khartoum, Sudan before and after the educational program. The results presented that the knowledge of secondary school students on menstrual health was significantly improved after the intervention.

The menarche is the preliminary experience for girls which requires sufficient preparation before occurring. So, inadequate preparation for menarche could lead to sexually transmitted infections and early pregnancy (White, 2013, Arasteh et al., 2019). Previous researches showed similar findings to our study; the menstrual teaching to school girls certainly improve their knowledge on menstruation management (Arasteh et al., 2019, Marván ML, 2014, El-Lassy RB). The age of first menstruation is exaggerated by wellbeing, genetics, and nutrition & economic condition (Arasteh et al., 2019). The current study pointed that, the menarche mainly occurred at age

higher than the study which was reported by (Arasteh et al., 2019) study; and inline to findings of Krunal et al (Krunal M, 2014), also the current study is similar to the study of (Kulkarni MV, 2012, Mittal K, 2010). These variations could be explained by social, economic, and genetic factors. The source of information in the present study was mothers, which is similar to one study by Vandana when mothers were the main source of information on menarche (Vandana V, 2016), and different from other studies which reported that the main source of information on menarche is friends (Upashe et al., 2015) and classmates (El-Mowafy RI, 2014) and other study mentioned the main source of information their sisters (Tegegne and Sisay, 2014) This difference may be due to cultural variations. The current study revealed that illiterate mothers are lower than the study by (Tegegne and Sisay, 2014) This difference also may be due to cultural variations and economic status.

The overall schoolgirls' knowledge concerning menstruation management was significantly improved after the intervention. This

education program improves the level of knowledge more than an increase in awareness reported by Arasteh et al after intervention (Arasteh et al., 2019), also more than the study done by (Tegegne and Sisay, 2014). The level of knowledge before intervention in the current study is similar to the study done by (Upashe et al., 2015). Our study is like the study by (Emdadul et al,2014), and (El-Mowafy RI, 2014) study, all studies mentioned that there is a significant improvement in the level of knowledge and level of practice after the intervention program. The current study pointed that the student's hearing about menstruation is less than (Tegegne and Sisay, 2014) study, and less than the study by (Upashe et al., 2015). The present study pointed that, the student aware that menstrual blood is from the uterus is lower than the study conducted by (Boosey et al., 2014).

The overall hygienic practice was insignificantly improved after menstrual health intervention. There was an improvement in the skills of cleaning the genital area. These findings are similar to the findings by Arasteh et al and other studies when reported that menstrual hygiene such as cleaning external genitalia and washing with water and soap the cloths (Dhingra R, 2009, Nagaraj C, 2016, Nemade D, 2009), and higher than (Upashe et al., 2015) study. Also, the present study mentioned that the percentage of using absorbent material was less than the study by (Upashe et al., 2015) and higher than the study by (Hennegan et al., 2016). The best frequency of absorbent material change per day is more than twice in the current study compared to (Upashe et al., 2015) is more than three times per day, and similar to (Hennegan et al., 2016) these similarities and differences may be due to study area, sample size, and study design. The current study mentioned that the percentage of washing of the reusable cloth with soap and water is lower than (Hennegan et al., 2016) study. The drying of washed reusable cloth outside in our study is lower than (Hennegan et al., 2016).

Limitations:

- Limited studies measuring the students' level of knowledge and hygienic practice about menstrual health.

- Utilizing the pre-post approach without a control group to measure the appropriate differences.
- The sample size was small and was obtained from one school

Conclusion:

A significant improvement in schoolgirls' knowledge and hygienic practices on menstrual health after menstrual health education.

Recommendations

It is recommended to conduct further research with a more representative sample that could show the appropriate effect. Consequently, the outcome of this study is a part of the school health program and a base for further interventions at this age group.

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