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The Application of Menstrual Hygiene Management towards the Elementary Students Hygiene Personal Attitude during Menstruation

Nur Asnah Sitohang [1], Diah Lestari [1], Cut Adeya Adella [2], Nur Asiah [1]
[1]*Faculty of Nursing, Universitas Sumatera Utara, Medan, Indonesia*
[2]*Faculty of Medicine, Universitas Sumatera Utara, Medan, Indonesia*
Corresponding author: *sitohangnurasnah@gmail.com*

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ABSTRACT
The main problem among adolescents related to menstruation is the lack of knowledge about Menstrual Health Management (MHM) and poor water sanitation. This study aims to determine the effectiveness of MHM on the knowledge and personal hygiene behavior of elementary school students in Medan. The research employed a quasi-experimental design with a one-group pretest-posttest approach. The population is all elementary school students in grades 4 and 5. The sample included 67 female and 43 male students, totaling to 110 participants. Data were collected using a questionnaire administered before the intervention (pretest), followed by a health education program consisting of lectures, discussions, and role plays, supported by LCD/PowerPoint presentasions, leaflets, and videos, and then after the intervention (posttest).The sampling technique used was total sampling. Dependent t-test analysis was utilized to assess the data. The results showed a significant difference in respondents' knowledge before and after the intervention. For attitudes, the mean difference was 3.440 with a p-value of 0.000, indicating a significant effect of the intervention on respondents' attitudes. Specifically, for male students, the mean difference in knowledge was 7.721 (p = 0.000), and the mean difference in attitudes was 1.628 (p = 0.000), confirming a significant improvement in both knowledge and attitudes after the intervention. Therefore, it is recommended that health workers implement MHM education programs to improve adolescent reproductive health status.

Keyword: Menstrual hygiene knowledge, Attitude, Elementary student management.

1. Introduction

Menstruation and menstrual practices still face many social, cultural, and religious restrictions which are a big barrier in the path of menstrual hygiene management. In many parts of the country especially in rural areas, girls are not prepared and aware about menstruation so they face many difficulties and challenges at home, schools, and work places (Darlan et al., 2017). While reviewing literature, we found that little, inaccurate, or incomplete knowledge about menstruation is a great hindrance in the path of personal and menstrual hygiene management (Haver et al., 2018). Girls and women have very less or no knowledge about reproductive tract infections caused due to ignorance of personal hygiene during menstruation time. In rural areas, women do not have access to sanitary products or they know very little about the types and method of

using them or are unable to afford such products due to high cost. So, they mostly rely on reusable cloth pads which they wash and use again (Kaur et al., 2018).

Educating girls has been proposed as the world's highest yielding investment for developing countries. The improvement of knowledge has been consistently linked to economic growth and productivity (CDC WASH, 2024). For them, it has benefits including: health for women and their children, literacy, delayed sexual debut and marriage, self-efficacy improvements in labour force participation, and involvement with household decision making. These benefits rise substantially with increasing years of schooling (Kaur et al., 2018).

According to World Health Organization. a person aged 10-19 years is considered as an adolescent. The transition period between the childhood and adulthood is called adolescence marked by the growth and development of the child. During this period, physical, psychological. and biological development of the child occur (Amalia & Diniyah, 2023). Menarche is an important biological milestone in woman's life as it marks the onset of the reproductive phase of her life. Unfortunately, due to some reasons such as lack of knowledge menstruation preparedness, management, shyness, and embarrassment, the situation worsens for girl (Vinod & Kaimal, 2023). Research conducted by Kotwal et al., (2022) on menstrual health management shows that adolescent girls rarely change sanitary napkins in a day, do not maintain genital hygiene, lack proper and adequate sanitation and hygiene facilities, which causes feelings of shame, awkwardness and discomfort in adolescent girls, and can cause girls to be absent from school during menstruation.

Menstrual beliefs refer to misconceptions and attitudes towards menstruation within a given culture or religion. Menstrual beliefs, knowledge and practices were all interrelated to the MHM (Hastuti et al., 2019). External factors may also have contributed to the increased attention to MHM. As birth rates and age at menarche decrease, women are faced with MHM for more years. It has also been suggested that there has been great success in diminishing gender inequality in primary school education, and therefore attention is turning to factors which might cause girls to drop out of secondary education, including inadequate MHM (Hennegan et al., 2016).

The fact nowadays is that MHM is widely recognized as a right and a development issue. Menstrual hygiene management is the management of hygiene and health when women experience menstruation. Women also must be able to use clean pads, can be replaced as often as possible during menstrual periods, and have access to their disposal, and can access toilets, soap and water to clean themselves in comfortable conditions with maintained privacy. The adequate MHM would require the clean absorbents, adequate frequency of absorbent change, washing the body with soap and water, adequate disposal and privacy for managing menstruation (Hennegan et al., 2016).

The main problem in adolescents related to menstruation is the lack of knowledge about menstrual health management (MHM) and poor water sanitation. Many girls don't have the right understanding that menstruation is a normal biological process. They just knew it when they had menarche or menstruation for the first time . This is getting worse by the fact that girls often have difficulty buying or getting pads when needed. A study conducted by UNICEF in Indonesia in 2015 found that one in six girls was reluctant to go to school for one or more days, during menstruation. Research conducted by (Hennegan et al., 2016) states that 90.5% (95% CI 85.6% to 93.9%) of girls failed to meet available criteria for adequate MHM, with no significant different between those using reusable sanitary pads (88.9%, 95% CI 79.0% to 94.4%) and those using existing methods, predominantly cloth (91.5%, 95% CI 85.1% to 95.3%; x^2).

The aspect of MHM predicts some consequences for female students including shameness, not brave enough to answer questions in front of the class, and concerns about odor. Menstrual events are the discharge of dirty blood. If it is not kept clean, it will have the potential to cause infection in the reproductive organs. Meanwhile, if hygienic behavior is not carried out and young girls are less concerned about the cleanliness of their reproductive organs, do not maintain appearance and health during menstruation, they can get cervical cancer, vaginal discharge, reduce menstrual activity due to laziness, lack of confidence, believe in the myths surrounding menstruation circulating in the community, shunned by friends because of fishy body odor and others (Hastuti et al., 2019).

Therefore, during menstruation, women should be able to maintain extra cleanliness of the reproductive organs, especially in the vagina. If it is not maintained clean, it will cause excess microorganisms that interfere with the function of the reproductive organs. In Indonesia, there is less research on menstrual hygiene management (MHM). As a result, the causes and effects of MHM on women are not widely understood. So, there are not many programs and interventions to improve menstrual hygiene management In Indonesia.

Therefore, this study aims to determine the effectiveness of MHM on knowledge and personal hygiene behavior of elementary school students in Medan, Indonesia.

2. Methods

A quasi-experimental design was employed as the research design with one group of pretest-post-test. The population in this study was 110 students of grade 4 and 5 elementary school students at SD Darul Ilmi Murni Medan. The sampling technique used was total sampling. The reason of the researchers to choose this location was because there were no programs from schools or from Community Health Centers (or Pusat Kesehatan Masyarakat) related to MHM.This study was conducted from March to October 2018. The data collection was carried out after obtaining a research permit from the faculty of nursing. - Universitas Sumatera Utara, the research institute, and the school principal.

Before collecting the data, the researchers conducted socialization to class teacher and students about the aims, objectives, benefits and procedures of the study and the rights of respondents in this study. To get permission to become a respondent, in relation to prospective respondents who are 10-11 years old, the researchers sent research informed consent to parents. If parents refuse their children to be included in the research or withdraw themselves from the research, the researcher will not force and continue to respect their rights. The next activity was to conduct a pretest using a questionnaire, which the respondents completed within 50 minutes. Then the researchers intervened in menstrual education management. The educational media uses LCD / Power Point, leaflet and video. The educational methods consisted of lectures, discussions, and role plays. After the intervention, a posttest was conducted. The data analysis technique used t-dependent test with a significance level (α) of 5%. The guideline for hypothesis testing was that if the p-value was smaller than alpha ($p < 0.05$), the alternative hypothesis (Ha) was accepted. The normality test using the Kolmogorov–Smirnov (KS) test showed that the pre-test data on knowledge had a p-value of 0.308, and the post-test data on knowledge had a p-value of 0.152. The pre-test data on attitude had a p-value of 0.273, and the post-test data on attitude had a p-value of 0.097. These results indicate that both knowledge and attitude data were normally distributed ($p > 0.05$). The guideline for accepting hypotheses is that if the P value is smaller than alpha ($p <0.05$). The study was conducted after obtaining ethical clearance from the ethics committee of the Faculty of Nursing with ethical approval number SK161/KEPK/USU/2018. Each prospective respondent was asked to sign an informed consent from indicating their willingness to participate in the study**.**

3. Results

Table 1 Respondent's characteristics (n=110)

Variable	f	%
Gender		
- Female	67	60.90
- Male	43	39.10
Grade		
- IV (Four)	78	70.90
- V (Five)	32	29.10

Respondents in the study were 110 people with a frequency of 60.9% female and 39.1% male. As many as 70.9% of respondents were in the fourth grade and 29.1% in the fifth grade.

Table 2 Female Student's knowledge (n=67)

Variable	Mean	SD	Minimum-Maximum Score	95% CI
Knowledge				
- Before Intervention	17.03	6.2	8.30	15.49 – 18.56
- After Intervention	29.39	1.3	25.30	29.06 – 29.72

Based on **Table 2**, the average knowledge before intervention is 17.03, SD = 6.2, minimum value of 8 and a maximum of 30.95% CI = 15.49 – 18.56. After intervention, it was obtained 29.39. SD = 1,3, a minimum value of 25 and a maximum of 30.95% CI = 29.06 – 29.72.

Tabel 3 The female student's attitude (n=67)

Variable	Mean	SD	Minimum-Maximum Score	95% CI
Knowledge				
- Before Intervention	10.28	2.08	6-14	9.77-10.79
- After Intervention	13.73	1.54	10-15	13.35-14.11

Table 3 exhibits that the average attitude of respondents before being given intervention is 10.28, SD = 2.08, minimum value 6 and maximum = 14.95% CI = 9.77-10.79. Furthermore, after the intervention, the average was 13.73, SD = 1.54, minimum value = 10 and maximum = 15.95% CI = 13.35-14.11.

Table 4 The effect of reproductive health management on menstrual personal hygiene (n=67)

Variable	Mean	SD	Mean Difference	P Score
Knowledge			-12.06	0.000
- Before Intervention	17.03	6.2		
- After Intervention	29.39	1.3		

Based on **Table 4**, the data illustrate that the mean difference of knowledge 12.06 and the value of P = 0.000, so it can be concluded that there is a significant influence of respondents' knowledge before and after the intervention.

Table 5 The female student's attitude (n=67)

Variable	Mean	SD	Minimum-Maximum Score	95% CI
Knowledge			3.440	0.000
- Before Intervention	10.28	2.08		
- After Intervention	13.73	1.54		

Table 5 presents the differences in attitudes of 3,440 mean and P = 0,000 are obtained, so it can be concluded that there is a significant influence between the attitudes of respondents before and after the intervention.

Table 6 The male student's knowledge before being given intervention in SD Darul Ilmi Medan (n=43)

Variable	Mean	SD	Minimum-Maximum Score	95% CI
Knowledge				
- Before Intervention	21.91	4.41	12-29	20.55 – 23.27
- After Intervention	29.63	0.97	26.30	26-30

In relation to table 6, the average score of knowledge before intervention is 21.91, SD = 4.41. minimum value of 12 and a maximum of 29.95% CI = 20.55-23.27. After the intervention, the average was 29.63. SD=0.97, the minimum score is 26 and maximum score is 30.95% CI = 26-30.

Table 7 The male student's knowledge before and after being given intervention (n=43)

Variable	Mean	SD	Minimum-Maximum Score	95% CI
Attitude				
- Before Intervention	10.23	1.79	2-12	9.68 – 10.79
- After Intervention	11.86	0.46	10-12	11.72 – 12.00

Table 7 shows that the average score of the respondents' attitude before being given intervention was minimum value 10.23, SD = 1.79. 2 and maximum = 12.95% CI = 9.68-10.79 and after intervention the average score is 11.86. SD = 0.46, the minimum value = 10 and the maximum = 12.95% CI = 11.72-12.00.

Table 8 The effect of reproductive health management on personal menstrual hygiene knowledge (n=43)

Variable	Mean	SD	Mean Difference	P Score
Attitude			7.72	0.000
- Before Intervention	21.91	4.41		
- After Intervention	29.63	0.97		

The result presented in table 8 shows that the mean difference of knowledge is 7.72 and the value of P = 0.000, so it can be concluded that there is a significant influence between the knowledge of respondents before and after the intervention.

Table 9 The effect of reproductive health management on menstrual personal hygiene attitude for male students (n=43)

Variable	Mean	SD	Mean Difference	P Score
Attitude			7.72	0.000
- Before Intervention	21.91	4.41		
- After Intervention	29.63	0.97		

Based on **Table 9**, it is obtained that there is different data mean of attitude ie 1.62 and the value of P = 0.000, so it can be concluded that there is a significant influence between the attitudes of respondents before and intervention.

4. Discussion

The findings of this study indicate that the MHM educational program significantly improved students' knowledge and attitudes toward menstrual hygiene. Before the intervention, the highest knowledge score was 30 and the lowest was 8. The most frequently misunderstood items were "understanding of menstrual health management" (74.63%), "understanding of menarche" (89.55%), "understanding of dysmenorrhea" (97.01%), and "menstrual cycle" (98.50%). After the intervention, the highest score was 30 and the lowest 25, with "menstrual cycle" (92.53%) and "exercise was prohibited during menstruation" (94.02%) being the most correctly answered items. Statistical analysis revealed a p-value of 0.000, confirming a significant influence of MHM education on students' knowledge. These findings suggest that the program effectively achieved its objective of enhancing both knowledge and attitudes toward menstrual hygiene.

The improvement observed can be attributed to the structured and interactive learning strategies used in the intervention. The combination of lectures, group discussions, and audiovisual media such as videos, PowerPoint slides, and leaflets engaged students both visually and cognitively, allowing them to retain information effectively. This aligns with Piaget's theory as cited by Hockenberry et al., (2017), which states that school-age children are capable of logical thinking when learning is visual and participatory. Open discussions during the intervention also helped reduce stigma and misconceptions, while repetitive exposure through videos allowed for consistent message delivery. According to Hastuti et al., (2019), such participatory learning methods effectively promote behavioral changes and boost confidence among students. Similarly, Amalia and Diniyah (2023) emphasized that early reproductive health education helps students understand bodily changes naturally and reduces anxiety related to menstruation, particularly when delivered in an engaging and structured way.

These results are consistent with previous studies showing that educational interventions can effectively enhance both knowledge and attitudes regarding menstrual health. Bachloo et al., (2016) reported that among adolescent girls in India, 55.7% had never heard of menstruation at menarche, and 65.3% experienced fear during their first menstruation, highlighting the importance of early education. Demmu et al., (2023) found that nearly 70% of adolescent girls who received structured menstrual education demonstrated improved understanding and practices. Similarly, Daniel et al., (2023) observed a rise in menstrual awareness from 45% to 81% after interactive learning sessions, and Asha et al., (2019) confirmed that improved knowledge correlates positively with menstrual hygiene behavior. Kotwal et al., (2022) also showed that 46% of adolescent girls understood the importance of sanitation hygiene and 71.7% recognized the risks of infection

associated with poor hygiene. These findings reinforce that MHM interventions not only improve factual knowledge but also shape more positive attitudes toward reproductive health.

The inclusion of male students in this study also played an important role in shaping understanding and empathy regarding menstrual health. Before the intervention, male students' lowest knowledge score was 12 and the highest 29, with most lacking knowledge about menarche (48.8%), menstrual cycles (25.6%), and menstrual health objectives (25.6%). After the program, scores improved significantly ($p = 0.000$). This reflects the statement of UNICEF (2016) and Vinod and Kaimal (2023) that involving boys and men in menstrual education can foster greater support, empathy, and shared responsibility within schools, families, and communities.

From a practical standpoint, this study highlights the need to integrate menstrual hygiene education into school curricula. The CDC WASH (2024) initiative also advocates that menstrual health be part of comprehensive school health programs. Kaur et al., (2018) reported that schools implementing MHM education experienced up to a 60% improvement in attendance during menstruation. Budhathoki et al., (2018) and Betsu et al., (2024) further found that when menstrual education is supported by adequate facilities—such as access to clean toilets and sanitary materials—more than 80% of students reported increased comfort and dignity during menstruation. These outcomes demonstrate that combining both "software interventions" (education) and "hardware interventions" (facilities) leads to sustainable improvements in adolescent health (VanLeeuwen & Torondel, 2018; McGinnis et al., 2017).

The improvements observed in both knowledge and attitudes emphasize the broader benefits of such programs. Educating both male and female students fosters an inclusive learning environment that normalizes menstruation as a natural biological process, encourages empathy, and reduces stigma. Beyond improving personal hygiene practices, this approach can positively affect school participation, confidence, and long-term reproductive health outcomes. The findings also support Amalia and Diniyah's (2023) assertion that comprehensive education from an early age helps students build lifelong healthy habits and a respectful understanding of gender-related health issues.

However, this study has some limitations. It employed a one-group pretest–posttest design without a control group, which limits causal inference. McGinnis et al., (2017) suggested that including control groups would strengthen evidence of program effectiveness. Additionally, this study measured outcomes only in the short term; thus, the sustainability of knowledge and attitude improvements over time remains uncertain. The study was also conducted in a single school, limiting generalizability. Future studies should include larger and more diverse samples, longer follow-up periods, and possibly a qualitative component to explore deeper cultural and emotional factors influencing menstrual health management.

5. Conclusion

The study concluded that MHM education significantly improves the knowledge and attitudes of elementary school students toward personal hygiene during menstruation. Both female and male students showed marked improvements in knowledge and attitudes after the intervention, indicating that educational programs are effective in promoting menstrual hygiene awareness among students.

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