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Original Article

# The Effect of Pocket Book-Based Education on Adolescent Girls' Knowledge of Menstrual Personal Hygiene: A Quasi-Experimental Study

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### ABSTRACT

**Background:** Poor menstrual hygiene remains a significant public health concern among adolescent girls. Around 60% of adolescent girls have inadequate knowledge and practices regarding menstrual hygiene, which contributes to a 30–40% risk of reproductive tract infections (RTIs). Local studies in East Kalimantan have shown that more than half (65%) of students still have only fair knowledge of menstrual personal hygiene. Therefore, effective educational media such as pocket books are needed to improve adolescents' understanding and awareness of proper menstrual hygiene.

**Methods:** This quasi-experimental study used a pretest–posttest control group design involving 80 seventh-grade female students at SMP Negeri 29 Samarinda. The intervention group received pocket-book education, while the control group received conventional education. Data were analyzed using the Wilcoxon and Mann–Whitney tests.

**Results:** The findings showed a significant improvement in the knowledge scores of adolescent girls after receiving pocketbook education ( $p < 0.05$ ). The mean knowledge score in the intervention group increased from 14.95 before intervention to 17.00 after ( $p = 0.001$ ), while the control group increased from 14.20 to 15.58 ( $p = 0.011$ ). The Mann–Whitney test indicated that the posttest knowledge score of the intervention group was significantly higher than that of the control group ( $p = 0.001$ ).

**Conclusion:** Education using pocket books was proven effective in significantly increasing adolescent girls' knowledge of menstrual personal hygiene compared with conventional education. Pocket books can be utilized as a practical, engaging, and sustainable medium for reproductive health education among adolescents.



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## INTRODUCTION

Adolescent reproductive health, particularly menstrual hygiene, remains a global concern. The World Health Organization (WHO, 2020) reports that inadequate menstrual hygiene contributes to 30–40% of reproductive tract infection (RTI) cases among adolescent girls in developing countries. In Indonesia, around 60% of adolescent girls have poor menstrual hygiene knowledge and practices (Kementerian Kesehatan RI, 2018). This condition increases the risk of infection, discomfort, and school absenteeism during menstruation (van Eijk et al., 2016).

In Indonesia, the number of adolescent girls aged 10–19 years exceeds 43 million, and many still have limited knowledge and practices regarding menstrual personal hygiene. According to the Indonesian Basic Health Research (Kementerian Kesehatan RI, 2018), a substantial proportion of adolescents demonstrate inadequate understanding of reproductive health issues. Poor menstrual hygiene management has been associated with an increased risk of reproductive tract infections, particularly in low- and middle-income settings (Sommer et al., 2016). These findings indicate a persistent gap between adolescents' knowledge and appropriate hygiene practices, highlighting the need for effective reproductive health education interventions (van Eijk et al., 2016).

At the local level in Samarinda City, a preliminary survey at SMP Negeri 29 Samarinda found that 70% of seventh-grade female students lacked adequate knowledge about menstrual personal hygiene and still used inappropriate sanitary materials. This condition is worsened by the absence of specific school-based reproductive health education programs. Such gaps underscore the pressing need for effective and engaging educational media to enhance students' understanding of menstrual hygiene. The lack of structured menstrual health education in schools has been associated with inadequate knowledge and poor hygiene practices among adolescent girls. Such conditions increase vulnerability to reproductive health problems, reduce comfort in the learning process, and may have long-term impacts on the quality of life of adolescent girls (Chandra-Mouli & Patel, 2017; Hennegan et al., 2019; Wihdaturrahmah & Chuemchit, 2023).

The lack of menstrual personal hygiene knowledge and practice among adolescent girls continues to be a critical public health issue that requires immediate attention. Inadequate menstrual hygiene management has been associated with a range of adverse outcomes, including increased risk of reproductive tract infections, psychosocial distress, and diminished educational participation (Betsu et al., 2024). Recent evidence from systematic literature reviews indicates that school-based menstrual hygiene management interventions can improve knowledge, attitudes, and practices among adolescent girls, though sustained behaviour change remains a challenge due to methodological limitations in existing studies (Pratama et al., 2026a). These findings highlight the necessity of implementing effective, context-specific education and support programs to promote sustainable menstrual hygiene practices.

One promising approach to improving menstrual hygiene knowledge is health education delivered through practical and engaging media, such as pocket books. Pocket books are portable, easy to understand, and allow adolescents to review information repeatedly, thereby strengthening comprehension and retention. Previous studies have demonstrated that pocket books and other printed media are effective in enhancing adolescents' reproductive health knowledge, including menstrual personal hygiene (Juwita et al., 2023; Rahmawati et al., 2021; Sari et al., 2025). However, evidence from East Kalimantan, particularly Samarinda, remains limited.

## METHODS

This study used a quasi-experimental design with a pretest–posttest control group approach. The research was conducted at SMP Negeri 29 Samarinda and involved 80 seventh-grade female students selected using total sampling. Participants were divided equally into an intervention group, which received education on menstrual personal hygiene using a pocket book, and a control group, which received conventional education. Knowledge was measured before and after the intervention.

using a 20-item validated questionnaire. Data were analyzed using the Wilcoxon signed-rank test for within-group comparisons and the Mann-Whitney U test for between-group differences, with a significance level of  $p < 0.05$ .

## RESULTS

After researching 80 respondents, the characteristics of the respondents were described as follows:

**Table 1. Respondent Characteristics**

Characteristics	frequency	Percentage (%)
<b>Age</b>		
12 Years	31	38.8
13 Years	49	61.2
<b>Age at Menarche</b>		
11 Years	17	21.2
12 Years	30	37.5
13 Years	24	30.0
Not yet menstruating	9	11.3

Table 1 shows that most respondents were aged 13 years (61.2%), while 38.8% were aged 12 years, indicating that the majority were in the early adolescent stage, a critical period for the development of health-related knowledge and behavior. Regarding menarche, most respondents experienced their first menstruation at 12 years of age (37.5%), followed by 13 years (30.0%) and 11 years (21.2%), while 11.2% had not yet menstruated. These findings suggest that the participants were generally at the early stage of reproductive maturity, making them an appropriate target group for menstrual hygiene education interventions.

**Table 2. Comparison of Knowledge Levels Before and After Pocket Book Education in the Intervention Group**

Knowledge Category	Intervention Group		Control Group	
	Before (%)	After (%)	Before (%)	After (%)
Good	11 (27.5)	36 (90.0)	12 (30.0)	16 (40.0)
Fair	29 (72.5)	4 (10.0)	28 (70.0)	24 (60.0)

The Wilcoxon test showed a significant increase in knowledge in both groups, with a greater improvement in the intervention group ( $p < 0.001$ ). The Mann-Whitney test indicated a significant difference between groups after education ( $p < 0.001$ ), confirming the effectiveness of pocket book media.

**Table 3. Knowledge of Adolescent Girls Before and After Education in Intervention and Control Groups**

Variables	Group	Rank	N	Variables	Mean	P-Value
Knowledge of adolescent girls about personal hygiene during menstruation	Intervention	Negative Rank	1	Pretest	14.95	0.001
		Positive Rank	31	Posttest	17.00	
		Ties	8			
	Control	Negative Rank	11	Prepost	14.20	0.011
		Positive Rank	21			

<i>Variables</i>	<i>Group</i>	<i>Rank</i>	<i>N</i>	<i>Variables</i>	<i>Mean</i>	<i>P-Value</i>
		<i>Ties</i>	8	Posttest	15.58	

The Wilcoxon test analysis showed a significant increase in adolescent girls' knowledge of personal hygiene during menstruation in both groups. In the intervention group, which received education using pocket books, the mean knowledge score increased from 14.95 at pretest to 17.00 at posttest ( $p = 0.000$ ). In the control group, which received conventional education, the mean score increased from 14.20 at pretest to 15.58 at posttest ( $p = 0.011$ ). These findings indicate that pocket-book education was more effective in improving knowledge compared to conventional methods.

**Table 4. Comparison of Knowledge of Personal Hygiene Between Intervention and Control Groups After Health Education**

<b>Group</b>	<b>N</b>	<b>Mean Rank</b>	<b>p-value</b>
Intervention	40	55.75	0.000
Control	40	25.25	

The Mann–Whitney test revealed a significant difference in knowledge scores between the two groups after education. The intervention group, which received pocket book education, had a higher mean rank (55.75) compared with the control group (25.25). The p-value of 0.000 ( $p < 0.05$ ) indicates that the difference was statistically significant. These findings demonstrate that pocket book education was more effective than conventional methods in improving adolescent girls' knowledge of personal hygiene during menstruation.

## DISCUSSION

This study showed that education using pocket books significantly improved adolescent girls' knowledge of menstrual personal hygiene. The increase in the intervention group's knowledge score was greater than in the control group, indicating that pocketbook media are more effective than conventional learning methods. This finding supports the concept that appropriate educational media can enhance comprehension, attention, and message retention among adolescents (Amalia et al., 2022; Chandra-Mouli & Patel, 2017; Hana Harahap et al., 2025; Putri et al., 2025; Sari et al., 2025). Studies have shown that booklet-based health education significantly improves adolescents' knowledge and attitudes toward reproductive health and hygiene after intervention compared with baseline measurements. This study showed that education using pocket books significantly improved adolescent girls' knowledge of menstrual personal hygiene. The increase in the intervention group's knowledge score was greater than in the control group, indicating that pocketbook media are more effective than conventional learning methods. This finding supports the concept that appropriate educational media can enhance comprehension, attention, and message retention among adolescents

Pocket books are concise, portable, and visually engaging, which allows adolescents to study independently and repeatedly review materials. This learning style suits adolescents who are in the formal operational stage of cognitive development, where abstract thinking and logical reasoning begin to mature (Monalisa et al., 2024; Triana et al., 2024). The interactive and self-paced nature of pocket book media helps learners internalize key information about personal hygiene practices.

The results of this study align with recent research demonstrating that health education interventions are effective in improving menstrual hygiene knowledge and practices among adolescents (Ghimire et al., 2024a)(Triana et al., 2024). The results of this study align with recent

research demonstrating that health education interventions are effective in improving menstrual hygiene knowledge and practices among adolescents. Several studies have reported that structured school-based educational programs significantly increase knowledge and improve hygiene behaviors among adolescent girls. For example, an intervention study showed that knowledge scores increased substantially in the intervention group compared with the control group after menstrual hygiene education was delivered in schools (Ghimire et al., 2024b). In addition, systematic reviews of menstrual hygiene management interventions have found that school-based educational programs consistently improve adolescents' knowledge, attitudes, and hygiene practices (Pratama et al., 2026b). Other research also demonstrated that educational interventions using structured teaching sessions significantly improved adolescents' knowledge and practices regarding menstrual hygiene compared with conventional learning approaches (Nastit et al., 2023). These studies reported that structured education, including peer group and printed media interventions, significantly improved knowledge scores and hygiene behaviors compared to conventional learning methods.

The higher knowledge improvement in the intervention group may also be related to the accessibility and attractiveness of pocketbook media, which allow adolescents to learn at their own pace. This method is particularly effective in schools that have limited access to technology-based media. Therefore, integrating pocketbook education into school health programs could be a practical and low-cost approach to strengthen reproductive health education. However, this study was limited by its short intervention period and focus on a single school. Future research should examine the long-term effects of pocketbook education and its influence on attitudes and hygiene practices, not only knowledge.

## CONCLUSION

Education using pocket books was proven effective in significantly improving adolescent girls' knowledge of menstrual personal hygiene compared with conventional education. The use of pocket book media is a practical, engaging, and low-cost alternative that can enhance adolescents' understanding of reproductive health topics. Schools and health professionals are encouraged to integrate pocketbook-based education into adolescent reproductive health programs to promote better menstrual hygiene practices. Future studies should explore the long-term effects of pocketbook education on attitudes and behaviours, and test its effectiveness in broader settings or with digital adaptations for wider accessibility.

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**Conflict of Interest:** This authors declare no conflict of interest related to this study.

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