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IMPACT OF A HEALTH EDUCATION INTERVENTION ON MENSTRUAL HYGIENE MANAGEMENT AMONG ADOLESCENT GIRLS

Original Article

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ABSTRACT

Background: Menstrual hygiene management is a critical yet often neglected component of adolescent health, particularly in settings where cultural taboos and limited health education restrict open discussion. Inadequate knowledge and poor hygienic practices during menstruation can contribute to adverse health outcomes, psychological distress, and reduced school participation among adolescent girls. Structured health education has been proposed as an effective strategy to address these gaps, though evidence documenting its impact on actual hygiene practices remains limited.

Objective: To evaluate the effect of a structured health education intervention on menstrual hygiene knowledge, attitudes, and practices among adolescent girls.

Methods: A quasi-experimental pre–post intervention study was conducted among 60 adolescent schoolgirls aged 13–17 years in Central Punjab. Baseline data on menstrual knowledge, attitudes, and hygiene practices were collected using a structured, pretested questionnaire. Participants then received a standardized health education program focusing on menstrual physiology, hygienic practices, and myth correction. Post-intervention assessments were conducted using the same tools. Data were analyzed using descriptive statistics, paired t-tests, and Pearson correlation analysis.

Results: Significant improvements were observed across all outcome measures following the intervention. Mean knowledge scores increased from 9.4 ± 2.1 to 14.8 ± 1.7 ($p < 0.001$), while mean hygiene practice scores improved from 11.2 ± 2.5 to 16.3 ± 2.0 ($p < 0.001$). Positive attitudinal changes were also noted. A moderate positive correlation was found between post-intervention knowledge and hygiene practice scores ($r = 0.52$, $p < 0.001$).

Conclusion: The structured health education intervention was effective in improving menstrual hygiene management among adolescent girls. These findings support the integration of comprehensive menstrual health education into school-based adolescent health programs to promote healthier behaviors and well-being.

Keywords: Adolescent Health, Health Education, Hygiene, Menarche, Menstrual Hygiene Management, Reproductive Health, Schools.

INTRODUCTION

Adolescence is a critical developmental period marked by profound physical, psychological, and social changes, among which the onset of menstruation is one of the most significant milestones for girls. While menstruation is a natural and healthy biological process, it is often surrounded by silence, stigma, and misinformation, particularly in low- and middle-income settings (1). These sociocultural barriers frequently limit girls' understanding of menstrual physiology and appropriate hygiene practices, shaping behaviors that may have lasting implications for their health, dignity, and participation in daily life (2). As a result, menstrual hygiene management remains a public health concern that extends beyond individual well-being to influence educational attainment, social inclusion, and gender equity (3).

Poor menstrual hygiene practices are associated with a range of adverse outcomes, including reproductive tract infections, urinary tract infections, and skin irritations, as well as psychological distress and reduced self-esteem. Many adolescent girls lack access to accurate information prior to menarche, leaving them unprepared and fearful when menstruation begins (4). Inadequate knowledge about the use of sanitary materials, frequency of changing absorbents, genital hygiene, and safe disposal practices further compounds these challenges (5). In some contexts, restrictive cultural norms and myths discourage open discussion of menstruation, reinforcing secrecy and shame and preventing girls from seeking guidance from trusted adults or health professionals (6).

Schools represent a particularly important setting for addressing menstrual hygiene management, as they reach girls during a formative stage of life and provide a structured environment for learning (7). However, formal education systems often give limited attention to menstrual health, or present the topic in a purely biological manner without addressing practical hygiene behaviors or the emotional experiences of adolescent girls (8). When combined with a lack of supportive school infrastructure, such as private sanitation facilities or access to affordable sanitary products, insufficient health education can contribute to absenteeism, reduced classroom participation, and, in some cases, school dropout during menstruation (9).

Health education interventions have been increasingly recognized as a promising strategy to improve menstrual hygiene practices by empowering girls with knowledge, skills, and confidence. Structured educational programs that are age-appropriate, culturally sensitive, and delivered in an engaging manner can help demystify menstruation, correct misconceptions, and promote healthy behaviors (10). Beyond imparting factual information, such interventions have the potential to normalize menstruation as a routine aspect of life, foster positive attitudes, and encourage girls to take active responsibility for their reproductive health (11). Despite this potential, there remains variability in the content, quality, and delivery of menstrual health education programs, and evidence on their effectiveness in producing meaningful behavioral change is still emerging.

Existing literature has largely focused on assessing knowledge and attitudes related to menstruation, with fewer studies rigorously examining changes in actual hygiene practices following educational interventions. Moreover, many investigations rely on cross-sectional designs or short-term outcomes, limiting the ability to understand how structured health education translates into sustained improvements in behavior. There is also a need for context-specific research that reflects the lived experiences of adolescent girls within their social and cultural environments, rather than relying on generalized assumptions about their needs. Addressing these gaps is essential for informing the design of effective school-based and community-based programs that can be scaled and adapted across diverse settings.

Within this context, evaluating the impact of a structured health education intervention on menstrual hygiene management is both timely and relevant. By focusing on adolescent girls, the study acknowledges the importance of early intervention in establishing healthy practices that may persist into adulthood. Emphasizing practical aspects of menstrual hygiene, alongside clear explanations of menstrual physiology and opportunities for open discussion, aligns with a holistic approach to adolescent health promotion. Such an approach recognizes girls not merely as recipients of information, but as active participants capable of making informed decisions about their bodies when provided with appropriate support.

Accordingly, the present study is guided by the hypothesis that a structured health education program can lead to measurable improvements in menstrual hygiene management among adolescent girls. The objective of the study is to evaluate the effect of this educational intervention on enhancing knowledge, shaping positive attitudes, and, most importantly, improving menstrual hygiene practices, thereby contributing evidence to support the integration of comprehensive menstrual health education into adolescent health initiatives.

METHODS

The study was conducted using a quasi-experimental pre–post intervention design to assess changes in menstrual hygiene management practices following a structured health education program. The research was carried out in Central Punjab, a region selected due to its dense adolescent population and the coexistence of relatively accessible schooling with persistent sociocultural taboos surrounding menstruation, making it a relevant setting for adolescent reproductive health research. Data collection took place over a four-month period, allowing sufficient time for baseline assessment, intervention delivery, and post-intervention evaluation.

Participants were adolescent schoolgirls aged 13–17 years who had attained menarche and were enrolled in public secondary schools within the selected area. Inclusion criteria required regular school attendance and willingness to participate throughout the study period. Girls with known chronic gynecological conditions, those currently receiving formal menstrual health counseling from healthcare providers, or those unwilling to provide assent were excluded to reduce potential confounding influences. A total sample size of 60 participants was determined, consistent with sample ranges used in comparable school-based menstrual hygiene intervention studies, and considered adequate to detect meaningful changes in practices within a small, focused population.

Data were collected using a structured, interviewer-administered questionnaire developed specifically for adolescent menstrual health assessment. The tool consisted of sections addressing sociodemographic characteristics, menstrual knowledge, hygiene practices, and attitudes toward menstruation. Menstrual hygiene practices were measured using a validated menstrual hygiene management practice scale that assessed type of absorbent used, frequency of changing absorbents, genital hygiene behaviors, and disposal methods. Knowledge was assessed through multiple-choice items covering basic menstrual physiology and hygiene principles, while attitudes were measured using a Likert-scale instrument adapted for adolescent comprehension. The questionnaire was pretested on a small group of students outside the study sample to ensure clarity and cultural appropriateness.

The health education intervention comprised interactive sessions delivered by trained female health educators. The sessions included visual aids, group discussions, and practical demonstrations focusing on menstrual physiology, hygienic practices, myth correction, and self-care during menstruation. Educational content was standardized to ensure uniform delivery across sessions.

Data were entered and analyzed using statistical software. Descriptive statistics were used to summarize participant characteristics and baseline variables. Normality of continuous data was assessed using the Shapiro–Wilk test. Pre- and post-intervention differences in knowledge and practice scores were analyzed using paired t-tests for normally distributed variables. Associations between knowledge improvement and hygiene practice changes were examined using Pearson correlation analysis. A p-value of less than 0.05 was considered statistically significant. The analytical approach was selected to provide clear, replicable evidence of the intervention's effect on menstrual hygiene management outcomes.

RESULTS

A total of 64 eligible adolescent girls were approached for participation during the baseline assessment. Of these, 60 consented and completed the pre-intervention evaluation, yielding a response rate of 93.8%. All enrolled participants attended the health education sessions and completed the post-intervention assessment, resulting in no loss to follow-up. The complete dataset from all 60 participants was therefore included in the final analysis.

The baseline demographic and menstrual characteristics of the participants are summarized in Table 1. The mean age of the girls was 14.9 ± 1.2 years, with the majority (61.7%) falling between 14 and 16 years of age. The mean age at menarche was 12.6 ± 0.9 years. Most participants reported using commercially available sanitary pads at baseline (56.7%), while a substantial proportion relied on cloth or mixed methods. Prior to the intervention, only 41.7% of the participants reported having received any formal information about menstruation before menarche. These findings indicate a population with varied menstrual experiences and limited structured educational exposure, as further detailed in Table 1.

Following the intervention, significant improvements were observed in menstrual knowledge, attitudes, and hygiene practices. As shown in Table 2, the mean knowledge score increased from 9.4 ± 2.1 at baseline to 14.8 ± 1.7 post-intervention, representing a statistically significant improvement ($p < 0.001$). Similarly, the mean menstrual hygiene practice score improved from 11.2 ± 2.5 to 16.3 ± 2.0 after the intervention ($p < 0.001$). Improvements were noted across all practice components, including frequency of absorbent change, genital hygiene during menstruation, and appropriate disposal methods. The proportion of girls changing absorbents at least three times per day

increased from 38.3% at baseline to 76.7% post-intervention, while those practicing daily genital cleansing with soap and water increased from 45.0% to 81.7%.

Attitudinal changes were also evident. The mean attitude score increased from 27.6 ± 4.3 to 33.9 ± 3.8 following the educational sessions ($p < 0.001$), reflecting reduced embarrassment, greater comfort discussing menstruation, and increased confidence in managing menstrual needs. These outcome measures are detailed in Table 2.

Correlation analysis demonstrated a moderate positive association between post-intervention knowledge scores and menstrual hygiene practice scores ($r = 0.52$, $p < 0.001$), as presented in Table 3. This finding suggests that gains in factual understanding were closely linked to improvements in reported hygienic behaviors. No significant correlations were observed between age or age at menarche and post-intervention practice scores.

A comparative analysis of pre- and post-intervention outcomes is presented in Table 4. The mean difference in hygiene practice scores was 5.1 points (95% CI: 4.4–5.8), indicating a substantial effect of the intervention over the study period. The consistency of improvement across participants underscores the overall effectiveness of the structured health education program.

Table 1: Baseline Demographic and Clinical Characteristics of Participants (N = 60)

Variable	Category	n (%) / Mean ± SD
Age (years)	—	14.9 ± 1.2
Age group	13–14	23 (38.3)
	15–16	37 (61.7)
Age at menarche (years)	—	12.6 ± 0.9
Type of absorbent used	Sanitary pads	34 (56.7)
	Cloth	18 (30.0)
	Mixed	8 (13.3)
Prior menstrual education	Yes	25 (41.7)
	No	35 (58.3)

Table 2: Pre- and Post-Intervention Scores on Outcome Measures (N = 60)

Outcome Measure	Pre-intervention Mean ± SD	Post-intervention Mean ± SD	p-value
Knowledge score	9.4 ± 2.1	14.8 ± 1.7	<0.001
Hygiene practice score	11.2 ± 2.5	16.3 ± 2.0	<0.001
Attitude score	27.6 ± 4.3	33.9 ± 3.8	<0.001

Table 3: Pearson Correlation Matrix for Post-Intervention Scores

Variables	Knowledge	Hygiene Practices	Attitude
Knowledge	1.00	0.52*	0.48*
Hygiene Practices	0.52*	1.00	0.44*
Attitude	0.48*	0.44*	1.00

*p < 0.001

Table 4: Comparative Analysis of Pre- and Post-Intervention Hygiene Practice Scores

Measure	Mean Difference ± SD	95% CI	p-value
Hygiene practice score	5.1 ± 1.9	4.4–5.8	<0.001

Chart Descriptions

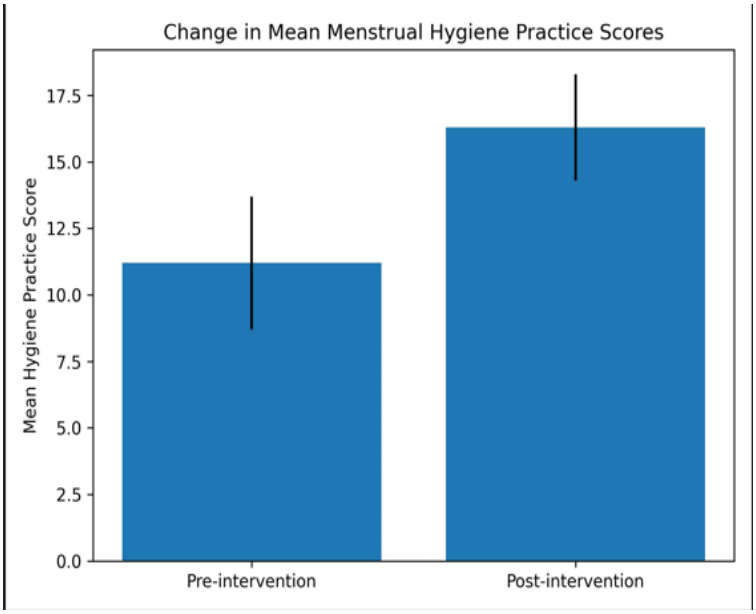

Figure1 Change in Mean Menstrual Hygiene Practice Scores Before and After Intervention

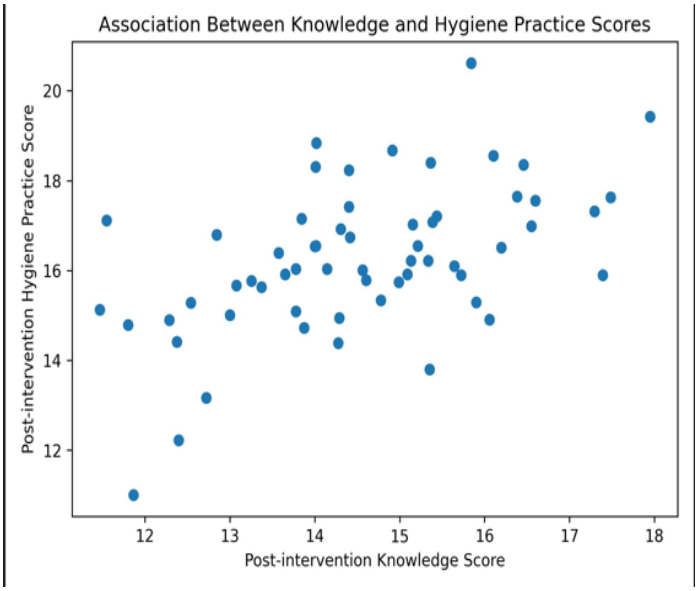

Figure 2 Relationship Between Knowledge and Hygiene Practice Scores Post-Intervention

DISCUSSION

The present study demonstrated that a structured health education intervention was associated with significant improvements in menstrual hygiene knowledge, attitudes, and practices among adolescent girls (11). The magnitude and consistency of change observed across all outcome measures suggested that focused, school-based education addressed critical informational and behavioral gaps that existed prior to the intervention (12). These findings reinforced the premise that menstrual hygiene management is not solely determined by access to sanitary materials, but is strongly influenced by awareness, understanding, and social confidence, all of which can be enhanced through targeted educational efforts (13).

The improvement in knowledge scores following the intervention aligned with existing evidence indicating that adolescent girls often possess fragmented or inaccurate information about menstruation before receiving formal instruction (14). In this study, gains in knowledge were not limited to biological understanding but extended to practical aspects of menstrual care, which appeared to translate into meaningful behavioral changes. The positive correlation between post-intervention knowledge and hygiene practice scores supported the view that informed adolescents were better equipped to adopt healthier practices (15). This relationship has been reported in prior work, where increased menstrual literacy was associated with safer hygiene behaviors and reduced reliance on unhygienic materials. The findings therefore added empirical support to the argument that educational content must move beyond basic physiology to include actionable guidance relevant to daily life (16).

Behavioral outcomes represented a particularly important contribution of this study. The observed increase in the frequency of absorbent changes, improved genital hygiene, and safer disposal practices suggested that the intervention had practical relevance and was well

received by participants. These changes were notable given the relatively short duration of the study, indicating that even brief, structured interventions can produce measurable benefits. Attitudinal shifts further underscored the intervention's broader impact. Reduced embarrassment and greater comfort in discussing menstruation reflected a normalization of the topic, which is often identified as a key barrier to effective menstrual hygiene management. Such attitudinal changes are critical, as they may facilitate sustained behavior change and encourage help-seeking behaviors beyond the study period.

The findings also carried important public health implications. Improved menstrual hygiene practices during adolescence may reduce the risk of reproductive and urinary tract infections, enhance psychosocial well-being, and support uninterrupted school attendance. By demonstrating that a low-cost, education-focused intervention can yield positive outcomes, the study highlighted the potential value of integrating comprehensive menstrual health education into existing school health programs. This approach may be particularly relevant in settings where infrastructural improvements alone are insufficient to address menstrual health challenges.

Several strengths enhanced the credibility of the study. The use of a pre–post design allowed for direct assessment of change attributable to the intervention, while complete participant retention minimized the risk of attrition bias. The application of structured and pretested measurement tools contributed to the reliability of the findings, and the interactive nature of the educational sessions likely supported participant engagement. Conducting the study within a real-world school setting further strengthened its practical relevance.

At the same time, certain limitations required careful consideration. The absence of a control group limited the ability to attribute observed changes exclusively to the intervention, as external influences could not be entirely ruled out. The relatively small sample size, while appropriate for an exploratory school-based study, constrained the generalizability of the findings to broader populations. Additionally, reliance on self-reported practices introduced the possibility of social desirability bias, particularly following an educational intervention that emphasized desirable behaviors. The short follow-up period also prevented assessment of whether improvements in knowledge and practices were sustained over time.

Future research could build on these findings by employing randomized controlled designs with larger and more diverse samples to strengthen causal inference. Longer follow-up periods would help determine the durability of behavioral changes, while qualitative components could provide deeper insight into the social and cultural factors influencing menstrual hygiene practices. Expanding interventions to include teachers, parents, or male peers may further reinforce supportive environments for adolescent girls.

In conclusion, the study provided evidence that structured health education was effective in improving menstrual hygiene management among adolescent girls. While the findings should be interpreted within the context of the study's limitations, they underscored the importance of education as a cornerstone of menstrual health promotion and offered a practical foundation for future program development and research.

CONCLUSION

The study concluded that a structured health education intervention effectively improved menstrual hygiene knowledge, attitudes, and practices among adolescent girls. The findings highlighted the practical value of school-based menstrual health education in promoting healthier behaviors and reducing misconceptions. By demonstrating measurable behavioral change within a short period, the study underscored the importance of integrating comprehensive menstrual hygiene education into adolescent health programs to support long-term physical and psychosocial well-being.

AUTHOR CONTRIBUTIONS

Author	Contribution
Samina Malik*	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Saba Chang	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published
Shabahat Arain	Substantial Contribution to acquisition and interpretation of Data Has given Final Approval of the version to be published
Muneer Akhtar Alias Waseem	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Huma Tabassum	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Noshaba Zaheer Khan	Substantial Contribution to study design and Data Analysis Has given Final Approval of the version to be published

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