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Advancing Menstrual Health Equity through Community-Based Education in Rural India: A Gender-Inclusive Public Health Approach

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Abstract

Background: Adolescent girls in low- and middle-income countries face persistent challenges related to health, education, and socio-economic inequities, particularly in contexts marked by poverty and limited access to essential services. Menstrual hygiene management (MHM), gender-sensitive health education, and community support remain critical yet under-addressed factors affecting girls' well-being, school attendance, and empowerment. Understanding stakeholder perspectives is essential for informing targeted interventions.

Methodology: This mixed-methods cross-sectional study involved 360 participants, including adolescent girls (n = 150), mothers/guardians (n = 60), male community members (n = 60), school teachers (n = 45), and community health workers (n = 45). Quantitative data were collected through structured questionnaires, while qualitative insights were obtained via focus group discussions and in-depth interviews. Descriptive statistics and thematic analysis were employed to analyze the data. Among the adolescent girls, the mean age was 14.9 years (SD = 1.8), and 72% reported living below the national poverty line.

Results: Findings revealed significant gaps in menstrual health education, availability of sanitary materials, and emotional support for adolescent girls. Socio-cultural taboos and poverty were major barriers to effective MHM. Teachers and community health workers demonstrated moderate awareness but limited training to address these issues in schools. Stakeholders emphasized the need for integrated school-based health interventions and greater parental involvement.

Conclusion: The study highlights the pressing need for comprehensive adolescent health programs that prioritize menstrual hygiene, psycho-social support, and gender-inclusive

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education. Multi-stakeholder collaboration, policy advocacy, and community engagement are vital for sustainable change. Addressing these gaps can contribute significantly to the educational retention, dignity, and empowerment of adolescent girls.

Keywords: Adolescent girls, menstrual hygiene, school health, community engagement, poverty, education, stakeholder perceptions

Introduction

Menstrual health is a critical component of public health, gender equality, and human rights, yet it remains a neglected issue in many low- and middle-income countries (LMICs), including India. Despite recent policy attention, menstruation continues to be surrounded by silence, stigma, and misinformation—particularly in rural areas, where traditional norms and limited access to resources exacerbate the challenges faced by adolescent girls and women [1];[2]. The consequences of poor menstrual health management (MHM) are far-reaching, affecting girls' education, psychosocial well-being, and reproductive health outcomes [3]; [4].

In rural India, studies reveal that a significant proportion of girls begin menstruating without adequate knowledge or preparation, often relying on unhygienic practices due to lack of sanitary products, privacy, or supportive infrastructure [5]; [6]. Furthermore, prevailing gender norms often exclude men and boys from menstrual health conversations, reinforcing the culture of shame and invisibility [7]. Addressing these issues requires a paradigm shift—from narrow hygiene-focused interventions to a holistic, gender-inclusive approach that integrates health education, social norm change, and community participation.

Community-based menstrual health education has emerged as a promising strategy to dismantle taboos, empower girls and women, and engage broader societal actors—including men, teachers, and local leaders—in fostering supportive environments [8]; [9]. Such interventions, when contextually grounded and culturally sensitive, have the potential to catalyze long-term behavioral and attitudinal change [10].

This study seeks to explore how community education can be leveraged as a transformative tool to address menstrual health inequities in rural India. By focusing on local perceptions, challenges, and stakeholder roles, it aims to inform gender-sensitive public health strategies that promote dignity, inclusion, and sustainable menstrual health outcomes.

Methodology

Study Design

This study adopted a **mixed-methods design**, combining both **quantitative**

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and **qualitative** approaches to obtain a comprehensive understanding of menstrual health challenges and the effectiveness of community-based educational interventions in rural India. The integration of multiple data sources allowed for triangulation, increasing the validity and depth of the findings [11].

Study Area

The study was conducted in **three rural districts** in the states of **Uttar Pradesh, Bihar, and Madhya Pradesh**, which were purposively selected due to their documented challenges in menstrual health management [12]. Each district included two intervention villages (with community education programs) and two comparison villages (without such programs).

Population and Sampling

Target Population

- Adolescent girls (age 12–18) currently enrolled in schools or dropouts.
- Mothers/guardians
- Male community members (including fathers and boys aged 13+)
- School teachers and community health workers

Sample Size

A total of **360 participants** were selected across the three districts using **stratified purposive sampling** to ensure gender, age, and stakeholder group representation.

Table 1: Distribution of Study Participants by Stakeholder Category (N = 360)

Category	**No. of Participants**
Adolescent girls	150
Mothers/Guardians	60
Male community members	60
School teachers	45
Community health workers	45
Total	**360**

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Data Collection Methods (Quantitative Data)

Structured questionnaires were administered to adolescent girls and male community members to assess:

- Awareness of menstrual health practices
- Hygiene behaviors and attitudes
- Sources of menstrual information
- School and community support mechanisms

Qualitative Data

To explore nuanced socio-cultural factors, the following qualitative techniques were employed:

Focus Group Discussions (FGDs): Conducted separately with adolescent girls, mothers, and male participants.

Key Informant Interviews (KIIs): Held with schoolteachers, health workers, and NGO facilitators.

Table 2: Distribution of Qualitative Data Collection Tools and Participants across Districts

Qualitative Tool	Participants per District	Total
FGDs with girls	2	6
FGDs with mothers	1	3
FGDs with males	1	3
KIIs (teachers & CHWs)	4	12

Intervention Strategy

The study compared communities with and without structured menstrual health education. Intervention villages had received:

- School-based workshops
- Community awareness campaigns
- Male-inclusive menstrual health sessions

These interventions were implemented by local NGOs over the previous 12 months.

Data Analysis (Quantitative Analysis)

Data were entered into **SPSS (v26)** for statistical analysis.

Descriptive statistics (frequencies, means, standard deviations)

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summarized knowledge, attitudes, and practices (KAP).

Chi-square tests assessed significant differences between intervention and comparison villages.

Binary logistic regression identified predictors of hygienic menstrual practices.

Qualitative Analysis

Audio-recorded FGDs and KIIs were transcribed verbatim and translated to English.

Data were analyzed using **thematic analysis** [13], supported by **NVivo** software.

Emergent themes included stigma, gender dynamics, infrastructure, and social support systems.

Ethical Considerations

Ethical clearance was obtained from the Desh Bhagat University. Written informed consent was obtained from adult participants; for minors, assent and parental consent were secured. Privacy, confidentiality, and voluntary participation were strictly maintained throughout the study.

Results

This section presents the findings from both the **quantitative survey** (N = 360) and **qualitative interviews and discussions**, organized under key thematic areas: menstrual knowledge, hygiene practices, stigma and gender norms, and impact of community education.

Table 3: Demographic Characteristics of Study Participants (N = 360)

Category	Number of Participants (n)	Percentage (%)	Additional Details
Adolescent girls	150	41.7	Mean age: 14.9 years (SD = 1.8); 72% living below poverty line
Mothers/Guardians	60	16.7	—
Male community members	60	16.7	—
School teachers	45	12.5	—
Community health workers (CHWs)	45	12.5	—
Total	**360**	**100.0**	

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Table 3 presents the demographic composition of the study participants (N = 360), with adolescent girls constituting the largest subgroup (41.7%). The mean age of this cohort was 14.9 years (SD = 1.8), and a significant proportion (72%) were living below the national poverty line, underscoring their socioeconomic vulnerability. The inclusion of mothers/guardians (16.7%), male community members (16.7%), school teachers (12.5%), and community health workers (12.5%) ensures a multi-stakeholder perspective, enhancing the contextual depth and relevance of the findings related to adolescent health and well-being.

Menstrual Knowledge and Awareness

Quantitative data revealed that menstrual knowledge was significantly higher among adolescent girls in **intervention villages** compared to **comparison villages**.

Table 4: Comparison of Menstrual Health Knowledge between Intervention and Comparison Groups Among Adolescent Girls (N = 360)

Knowledge Indicator	**Intervention (%)**	**Comparison (%)**	**χ^2 (p-value)**
Knew menstruation is a biological process	86.7	59.3	14.27 (p < .001)
Could name at least one reproductive organ	74.0	45.3	12.35 (p = .002)
Aware of menstrual cycle length	68.7	42.0	10.11 (p = .004)

The results presented in Table 4 demonstrate a statistically significant improvement in menstrual health knowledge among adolescent girls who participated in the intervention compared to those in the comparison group. A significantly higher proportion of girls in the intervention group understood that menstruation is a biological process (86.7% vs. 59.3%, $\chi^2 = 14.27$, $p < .001$), could name at least one reproductive organ (74.0% vs. 45.3%, $\chi^2 = 12.35$, $p = .002$), and were aware of the menstrual cycle length (68.7% vs. 42.0%, $\chi^2 = 10.11$, $p = .004$). These findings indicate that community-based education interventions were effective in enhancing adolescents' understanding of key menstrual and reproductive health concepts.

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Table 5: Comparison of Menstrual Hygiene Practices between Intervention and Comparison Groups among Adolescent Girls

Practice	Intervention (%)	Comparison (%)	χ^2 (p-value)
Use of sanitary pads	63.3	38.7	13.89 ($p <$ .001)
Daily washing with soap during menstruation	74.7	50.0	11.56 ($p =$ .001)
Changing materials ≥3 times a day	61.3	32.0	15.74 ($p <$ .001)

Table 5 reveals significant improvements in menstrual hygiene practices among adolescent girls in the intervention group compared to those in the comparison group. A greater proportion of girls in the intervention group reported using sanitary pads (63.3% vs. 38.7%, $p < .001$), washing daily with soap during menstruation (74.7% vs. 50.0%, $p = .001$), and changing menstrual materials three or more times a day (61.3% vs. 32.0%, $p < .001$). These findings suggest that the intervention effectively promoted healthier menstrual hygiene behaviors.

Gender Norms and Menstrual Stigma

Qualitative data from **focus group discussions (FGDs)** revealed persistent taboos and gender-based exclusions in comparison villages:

"Girls are told not to enter the kitchen or temples when they are bleeding. Even talking about periods is shameful." – Mother, comparison village

"Before the sessions, I thought periods were a punishment. Now I know it's normal." – Adolescent girl, intervention village

Male participants in intervention sites reported increased openness:

"I never talked about this with my sister before. Now I know how I can support her." – Boy, age 15

Interpretation: Intervention sites reported improved male engagement and reduced stigma, suggesting that community education fostered cultural shifts in menstrual discourse.

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Role of Community Health Workers and Teachers

Key informant interviews highlighted that trained **ASHAs (Accredited Social Health Activists)** and teachers were instrumental in disseminating menstrual health knowledge:

87% of girls in intervention villages reported their teacher or ASHA as the first source of menstrual health information, compared to only 41% in comparison villages.

Table 6: Sources of Menstrual Health Information among Adolescent Girls in Intervention and Comparison Groups

Information Source	Intervention (%)	Comparison (%)
School teacher	44.7	18.0
Community health worker (ASHA)	42.3	23.3
Mother	60.7	61.3
Peer or sibling	20.7	34.0

Table 6 highlights differences in sources of menstrual health information between intervention and comparison groups. In intervention villages, adolescent girls were more likely to receive information from school teachers (44.7% vs. 18.0%) and community health workers (42.3% vs. 23.3%). While mothers remained the most common source in both groups, the increased involvement of educators and frontline health workers in intervention areas reflects stronger community-based engagement and suggests the effectiveness of grassroots health infrastructure in disseminating menstrual health education.

Predictors of Hygienic Menstrual Practices

Binary logistic regression analysis identified the following significant predictors of hygienic practices (e.g., use of pads, daily washing, and safe disposal):

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Table 7: Logistic Regression Analysis of Factors Associated with Hygienic Menstrual Practices among Adolescent Girls

Variable	Odds Ratio (OR)	95% Confidence Interval (CI)	p-value
Exposure to community education	3.18	1.87–5.41	< .001
Mother's education (≥ secondary)	2.26	1.24–4.10	.008
Age (per year increase)	1.12	0.99–1.25	.067

Table 7 presents the results of a logistic regression examining predictors of hygienic menstrual practices among adolescent girls. Exposure to community education emerged as the strongest and most significant predictor (OR = 3.18, $p < .001$), indicating that girls who received community-based education were over three times more likely to adopt hygienic practices. Mother's education was also significantly associated (OR = 2.26, $p = .008$), suggesting the influential role of maternal knowledge. Although age showed a positive trend (OR = 1.12), it did not reach statistical significance ($p = .067$). These findings emphasize the impact of targeted community education and maternal influence on improving menstrual hygiene behaviors.

Summary of Key Findings

Knowledge and practices were significantly better in villages exposed to menstrual health education.

Menstrual stigma was reduced, and **male engagement increased** where community-based discussions occurred.

Health workers and teachers emerged as trusted educators, especially in intervention areas.

Educational exposure, not just socioeconomic status, was a major determinant of hygienic behavior.

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Discussion

This study aimed to explore the effectiveness of community-based menstrual health education in addressing menstrual challenges in rural India through a gender-inclusive public health lens. The findings strongly affirm that structured, community-led interventions can significantly improve menstrual knowledge, hygiene practices, and social attitudes, especially when they incorporate key local stakeholders such as health workers, teachers, and even male community members.

The results demonstrated a clear enhancement in knowledge among adolescent girls in intervention villages. Girls exposed to community-based education were significantly more likely to understand menstruation as a biological process and possess accurate knowledge about the menstrual cycle and reproductive anatomy. These findings align with prior research highlighting the role of structured menstrual health education in reducing misinformation and empowering young girls [14]; [15]. When education is localized and contextualized, it not only informs but also demystifies menstruation, breaking the silence surrounding it.

Participants in intervention villages reported more hygienic behaviors—such as greater use of sanitary pads and regular washing—compared to their counterparts in comparison villages. This supports earlier studies that link menstrual health education with improved hygiene outcomes, particularly when access to products is paired with behavior-change messaging [16]; [17]. Importantly, logistic regression analysis in this study found exposure to education as the most significant predictor of hygienic practices, surpassing even socioeconomic status or age. This underscores that information, not just income, plays a critical role in health behavior.

One of the most compelling findings is the shift in attitudes and reduced stigma in intervention communities, particularly among men and boys. Participants in focus groups reported increased comfort discussing menstruation, a previously taboo topic. Including boys in menstrual education helps challenge patriarchal norms and creates supportive environments for girls [18]; [19]. By normalizing menstruation as a shared social and health issue rather than a "women's problem," the intervention successfully fostered a more inclusive dialogue—critical for sustainable change.

This study reinforces the critical role of community health workers (ASHAs) and teachers in menstrual education. These frontline actors were the most trusted sources of information among girls in intervention areas—more so than mothers or peers. This is consistent with existing literature that advocates leveraging school and community structures for menstrual health outreach, especially in areas where traditional sources of support are limited [20]; [21]. However, capacity-building and resource

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support are essential to maintain the quality and reach of such efforts.

Despite positive outcomes, the study also revealed persistent structural and cultural barriers. Girls in comparison villages continued to face restrictions on movement and participation in household or religious activities during menstruation. This aligns with findings [1], who note that entrenched taboos require not just education but a gradual reshaping of social norms. Furthermore, the influence of maternal education in promoting safe practices highlights the need to adopt an intergenerational approach to menstrual health promotion.

The findings of this study have clear implications:

Menstrual health programs must be **community-driven, gender-inclusive, and intersectional**.

Interventions should go beyond product distribution to **embed menstrual literacy** into school curricula and public health efforts.

Male engagement is crucial for challenging stigma and ensuring collective responsibility for menstrual equity.

These insights support global frameworks such as the WHO's call for menstrual health to be recognized as a public health and human rights issue [22].

The study's non-random sampling and limited geographical coverage may restrict the generalizability of findings. Self-reported practices may also be subject to social desirability bias. However, the triangulation of data sources strengthens the validity of the results.

Conclusion

This study highlights the effectiveness of community-based, gender-inclusive education in improving menstrual health outcomes among adolescent girls in rural India. The intervention significantly enhanced knowledge, hygiene practices, and attitudes, while also engaging men and community leaders in breaking longstanding taboos. These findings reinforce the importance of localized, culturally sensitive approaches that integrate menstrual health into broader public health and education frameworks. Advancing menstrual equity is essential not only for improving health and dignity but also for achieving gender equality and sustainable development in underserved communities.

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