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Original Research Article

Knowledge, Attitude, and Practices Regarding Menstrual Hygiene among Adolescent Girls in Tribal Areas of Rajasthan: A Cross-Sectional Study

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Abstract

Background: Menstrual hygiene is a critical aspect of adolescent health, yet it remains neglected, especially in tribal and rural settings where taboos, lack of education, and limited access to sanitary facilities prevail. This study aimed to assess the knowledge, attitude, and practices (KAP) related to menstrual hygiene among adolescent girls in tribal areas of Rajasthan.

Objectives: To evaluate the level of knowledge, prevailing attitudes, and menstrual hygiene practices among adolescent girls in tribal regions and identify associated sociodemographic factors.

Methods: A community-based cross-sectional study was conducted among 422 adolescent girls aged 10–19 years in selected tribal villages of Udaipur district, Rajasthan. A pretested, semi-structured questionnaire was used to collect data on sociodemographic variables, knowledge, attitude, and practices regarding menstruation. Descriptive statistics and chi-square tests were used to analyze the data using SPSS version 25.0.

Results: Only 38.6% of the participants had knowledge of menstruation before menarche. Mothers were the primary source of information (52.7%). While 29.4% understood that menstruation is a normal physiological process, 64.2% considered it impure and 71.3% reported facing social or religious restrictions. Regarding hygiene, 47.9% used cloth alone, and only 17.3% used sanitary pads exclusively. Genital hygiene and safe disposal practices were poor. A statistically significant association ($p < 0.001$) was found between the mother's education level and the adoption of hygienic menstrual practices.

Conclusion: Menstrual hygiene among tribal adolescent girls in Rajasthan is suboptimal, with prevailing misconceptions, negative attitudes, and unhygienic practices. Targeted health education, improved access to menstrual products, and WASH infrastructure, along with culturally sensitive community engagement, are urgently required to improve menstrual health outcomes in these underserved populations.

Keywords: Menstrual Hygiene, Adolescent Girls, Tribal Areas, Knowledge Attitude And Practices, Rajasthan, Reproductive Health, Sanitary Practices.

Introduction

Menstruation is a natural and essential physiological process experienced by adolescent girls and women during their reproductive years. It marks the transition from childhood to womanhood and is an important indicator of reproductive health.

Despite being a biological function, menstruation continues to be surrounded by myths, misconceptions, and taboos, especially in rural and tribal communities of India. These socio-cultural barriers contribute to the perpetuation of poor menstrual hygiene practices, adversely affecting the physical and psychological health of adolescent girls [1]. Adolescence, defined by the World Health Organization (WHO) as the period between 10 and 19 years of age, is a critical phase in an individual's life characterized by rapid growth and development [2]. It is during this time that most girls experience menarche, the first occurrence of menstruation.

However, in many parts of India, particularly in tribal areas, girls enter this phase of life with little or no knowledge about menstruation and how to manage it hygienically [3]. The lack of awareness, compounded by inadequate access to sanitary

facilities and menstrual products, leads to poor menstrual hygiene management (MHM), which in turn can result in reproductive tract infections (RTIs), urinary tract infections (UTIs), and long-term health issues [4,5].

India is home to over 104 million tribal people, constituting approximately 8.6% of the country's total population, with a significant proportion residing in Rajasthan [6]. The tribal communities in the state are known for their socio-economic vulnerabilities, low literacy levels, and traditional belief systems that often exclude discussions around menstruation [7]. In such settings, menstruation is often seen as a subject of shame and secrecy, and girls are conditioned to view it as impure or dirty [8]. These perceptions prevent open dialogue, making it difficult for adolescent girls to seek accurate information or support related to their menstrual health [9].

Previous studies conducted in rural and tribal regions across India have highlighted the urgent need for menstrual hygiene education. A study in rural Maharashtra revealed that over 70% of girls had no knowledge of menstruation before menarche [10], while another study in Jharkhand showed that traditional practices and restrictions were deeply embedded in the lives of tribal adolescent girls [11]. These findings underline the importance of understanding the knowledge, attitude, and practices (KAP) related to menstrual hygiene to design effective interventions.

Menstrual Hygiene Management (MHM) encompasses the use of clean menstrual absorbents, access to water and sanitation, proper disposal facilities, and an enabling environment that supports menstrual health [12].

The Government of India, through initiatives like the Menstrual Hygiene Scheme (MHS) and the Rashtriya Kishor Swasthya Karyakram (RKSK), has attempted to improve MHM by distributing sanitary napkins and conducting awareness programs among adolescent girls [13]. However, these efforts often fail to reach the tribal population due to logistical challenges, language barriers, and cultural resistance [14].

In Rajasthan, tribal populations are concentrated in districts such as Udaipur, Banswara, Dungarpur, and Pratapgarh, where poverty and lack of education further exacerbate menstrual hygiene issues [6]. Girls from these areas often depend on cloth during menstruation, which is reused without proper sanitation.

Furthermore, they face restrictions during their periods, such as being barred from entering the kitchen, participating in religious activities, or attending school, which adversely affects their social inclusion and academic performance [15]. Understanding the KAP related to menstrual hygiene among adolescent girls in these tribal communities is critical for identifying knowledge gaps, harmful beliefs, and risky practices. Such information can guide the development of targeted, culturally sensitive educational programs and health interventions [16]. Furthermore, it can help policymakers and public health professionals design inclusive menstrual hygiene policies that address the unique challenges faced by tribal populations [17].

This study was undertaken with the aim to assess the knowledge, attitude, and practices related to menstrual hygiene among adolescent girls residing in the tribal areas of Udaipur district, Rajasthan. It seeks to evaluate the influence of socio-demographic factors, such as age, mother's education, and access to sanitation, on menstrual hygiene behaviors. By highlighting the existing barriers and opportunities for improvement, this research intends to contribute to the national discourse on menstrual health and Help Bridge the gap in menstrual hygiene management among India's marginalized tribal communities.

Methods and Materials

Study Design: A community-based cross-sectional study.

Study Setting: The study was carried out in selected tribal villages of Udaipur district, located in southern Rajasthan. The district has a substantial tribal population, mainly comprising Bhil, Meena, and Garasia tribes. These areas are characterized by poor access to health services, low literacy rates, and deeply entrenched traditional practices.

Study Population: The study population included adolescent girls aged 10 to 19 years who had attained menarche and were residing in the selected tribal villages for at least the past six months.

Inclusion Criteria

- Adolescent girls aged 10–19 years
- Those who had attained menarche
- Residing in the village for at least six months
- Gave informed assent (and parental consent where necessary)

Exclusion Criteria

- Girls who had not yet attained menarche
- Girls with known cognitive or psychological impairments affecting participation
- Refusal to participate or non-availability during data collection

Sample Size: The sample size was calculated using the formula for estimating proportions:

$n = Z^2 \times P \times (1-P) / d^2$

Where:

- Z = 1.96 for 95% confidence level
- p = expected prevalence of good menstrual hygiene practice (assumed 50% due to lack of local data)
- d = absolute precision (0.05)

$n = (1.96)^2 \times 50 \times 50 / 5^2 = 384$

Adding 10% non-response rate:

Final sample size = ~422 participants

Sampling Technique: A multistage random sampling technique was used:

1. Stage 1: From the list of tribal-dominated blocks in Udaipur, two blocks were randomly selected.
2. Stage 2: From each selected block, 3–4 villages were randomly chosen.
3. Stage 3: A house-to-house survey was conducted to identify eligible participants using purposive enumeration until the required sample size was achieved.

Study Tool:

A pre-tested, semi-structured questionnaire was developed in Hindi, based on prior literature and expert input. The questionnaire had four sections:

1. Sociodemographic Information – Age, education, socioeconomic status, parental education
2. Knowledge Assessment – Awareness about menstruation, source of information, physiology
3. Attitude Assessment – Cultural beliefs, restrictions, perception about menstruation
4. Practice Assessment – Type of absorbent used, frequency of changing, washing and disposal habits, school attendance during menstruation

The tool was validated through a pilot test on 30 participants in a non-sampled village and modified accordingly. The Cronbach's alpha for internal consistency was 0.78.

Data Collection: Data were collected from March to May 2024 by trained female field investigators through face-to-face interviews in the local language to ensure privacy and comfort. Each interview lasted approximately 20–25 minutes. Data confidentiality and anonymity were strictly maintained.

Ethical Considerations:

- Informed written consent was obtained from parents/guardians, and assent from adolescent girls.
- Participation was voluntary, and girls could withdraw at any stage without consequence.
- Privacy was ensured by conducting interviews in a safe and quiet corner of the home or Anganwadi centre.

Data Analysis:

Data were entered into Microsoft Excel and analyzed using SPSS version 25. Descriptive statistics including frequencies, percentages, means, and standard deviations were used to summarize the data. Inferential statistics were applied using the Chi-square test to determine associations between sociodemographic variables and levels of knowledge, attitude, and practices (KAP) related to menstrual hygiene. A p-value of <0.05 was considered statistically significant.

Results

A total of 422 adolescent girls participated in the study. The mean age was 15.2 ±2.3 years. Most participants belonged to Scheduled Tribes (92.6%) and came from lower socio-economic backgrounds. Around 61.1% were currently attending school, while the remaining had dropped out or never attended. (Table 1)

Table 1: Sociodemographic Characteristics of Participants (n = 422)

Variable		Frequency (%)
Age Group (years)	**10–13**	98 (23.2%)
	14–16	217 (51.4%)
	17–19	107 (25.4%)
Education Status	**Currently in school**	258 (61.1%)
	Dropped out	111 (26.3%)
	Never attended school	53 (12.6%)
Mother's Education	**Illiterate**	239 (56.6%)
	Primary	111 (26.3%)
	Secondary & above	72 (17.1%)
Socioeconomic Status	**Low**	287 (68.0%)
	Middle	106 (25.1%)
	High	29 (6.9%)

Knowledge Regarding Menstruation: Out of the 422 participants in the study, only 38.6% (n = 163) had heard about menstruation before the onset of menarche, indicating a significant lack of pre-menarcheal awareness. Mothers were the most common source of information, reported by 52.7%

of the girls, followed by peers (28.2%) and teachers (13.5%), highlighting the predominant role of informal sources in menstrual education. Furthermore, only 29.4% of the participants correctly recognized menstruation as a normal physiological process, reflecting a considerable gap in scientific understanding and the persistence of misconceptions within the community. (Table 2)

Table 2: Knowledge about Menstruation (n = 422)

Knowledge Parameter		Frequency (%)
Heard of menstruation before menarche		163 (38.6%)
Source of first information	**– Mother**	223 (52.7%)
	– Friends/Peers	119 (28.2%)
	– Teacher/School	57 (13.5%)
	– Media/Others	23 (5.5%)
Aware it is a physiological process		124 (29.4%)
Knowledge about source of bleeding (uterus)		88 (20.9%)
Aware of average cycle duration (28–30 days)		103 (24.4%)

Attitude Towards Menstruation

The attitude assessment revealed deeply ingrained cultural taboos and stigma surrounding menstruation among the participants. A significant 64.2% of the girls believed that menstruation is impure, and 71.3% reported experiencing various restrictions during their menstrual periods, such as being prohibited from entering kitchens or places of worship.

Moreover, only 25.8% of the respondents felt comfortable discussing menstruation openly, indicating a persistent sense of shame and secrecy that can hinder proper menstrual health education and emotional well-being. (Table 3)

Table 3: Attitudes Related to Menstruation (n = 422)

Attitude Statement	Agree (%)	Disagree/Don't Know (%)
Menstruation is impure	271 (64.2%)	151 (35.8%)
Faced restrictions during menstruation	301 (71.3%)	121 (28.7%)
Felt shame/discomfort during menstruation	267 (63.3%)	155 (36.7%)
Comfortable discussing periods with others	109 (25.8%)	313 (74.2%)

Menstrual Hygiene Practices: The assessment of menstrual hygiene practices among participants revealed suboptimal and potentially harmful behaviors. Nearly half of the girls (47.9%) used only reusable cloth as absorbents, while 34.8% used a combination of cloth and sanitary napkins, and only 17.3% relied exclusively on sanitary pads. Among those who used cloth, a concerning 62.2% reported reusing it without proper drying, increasing the risk of infections. Additionally, only 19.7% of the girls practiced adequate genital hygiene using soap and water.

Waste disposal practices were also poor, with 42.4% of participants discarding used absorbents in open fields or drains, reflecting both a lack of awareness and inadequate disposal infrastructure. (Table 4)

Table 4: Menstrual Hygiene Practices (n = 422)

Practice Parameter		Frequency (%)
Type of absorbent used	**– Only cloth**	202 (47.9%)
	– Only sanitary pads	73 (17.3%)
	– Both	147 (34.8%)
Washed and reused cloth hygienically		77 (38.1% of cloth users)
Cleaned genital area with soap and water		83 (19.7%)
Frequency of changing absorbent (≥3 times/day)		116 (27.5%)
Disposal of sanitary material	**– Dustbin/Burning**	112 (26.5%)
	– Open drain/field	179 (42.4%)
	– Buried in ground	131 (31.1%)

Association between Mother's Education and Good Menstrual Hygiene Practice: Girls whose mothers were educated up to at least primary level were significantly more likely to follow good hygiene practices ($p < 0.05$).(Table 5)

Table 5: Association of Mother's Education with Hygiene Practices

Mother's Education	Good Hygiene (%)	Poor Hygiene (%)	Total
Illiterate	38 (15.9%)	201 (84.1%)	239
Primary	43 (38.7%)	68 (61.3%)	111
Secondary & above	41 (56.9%)	31 (43.1%)	72
Total	122	300	422

Chi-square = 32.41, df = 2, $p < 0.001$ (significant)

These findings highlight significant gaps in menstrual knowledge, negative attitudes, and poor hygiene practices among adolescent girls in tribal areas, underscoring the urgent need for targeted interventions and awareness programs.

Discussion

The present study assessed the knowledge, attitude, and practices (KAP) regarding menstrual hygiene among adolescent girls residing in tribal areas of Rajasthan. Findings reveal major gaps in awareness and hygiene behavior, underlining the need for focused menstrual health education and infrastructural support in tribal populations.

In this study, only 38.6% of girls had heard about menstruation before menarche, indicating that most girls were unprepared for this physiological change. Similar findings were reported in a study from West Bengal, where only 36% of girls had prior knowledge about menstruation [3]. Lack of pre-menarcheal awareness often leads to anxiety, fear, and poor hygiene management at the onset of menstruation [10].

Mothers (52.7%) were the primary source of menstrual information, which aligns with findings from studies in Madhya Pradesh [1] and Tamil Nadu [18], indicating that family plays a central role in health communication. However, reliance on informal sources often results in misinformation and perpetuation of taboos. The involvement of trained schoolteachers and community health workers could bridge this knowledge gap [5]. Only 29.4% of participants knew that menstruation is a physiological process, with even fewer understanding its uterine origin. This low level of biomedical awareness reflects the influence of myths and cultural taboos prevalent in tribal communities. Comparable studies from Jharkhand and Odisha have similarly found poor conceptual knowledge among tribal adolescent girls [19][20].

Attitudes toward menstruation were largely negative or restrictive. A significant proportion of respondents viewed menstruation as impure (64.2%) and faced religious or social restrictions (71.3%), consistent with results from a tribal region in Maharashtra [21]. This stigmatization leads to concealment of menstruation-related concerns and poor emotional well-being among adolescents [22]. Regarding hygiene practices, 47.9% of the participants used only cloth, and among these, a majority reused it without proper drying and sanitization. Sanitary pad usage was limited to 17.3%, much lower than urban or semi-urban counterparts [23]. Reasons for low uptake of sanitary napkins include poor accessibility, financial constraints, and lack of awareness [24]. Girls who used sanitary pads or practiced hygienic reuse of cloth were significantly more likely to have mothers with higher education, a trend confirmed by other studies in Rajasthan and Chhattisgarh [16][25].

Genital hygiene was also suboptimal, with only 19.7% using soap and water for cleaning, and 42.4% disposing absorbents in open drains or fields. These unhygienic practices can contribute to reproductive tract infections and other morbidities [26]. Such behaviors are often a result of inadequate WASH (Water, Sanitation, and Hygiene) facilities in schools and households, which is a major barrier in rural and tribal India [27].

The association of mother's education with menstrual hygiene practices was statistically significant in our study ($p < 0.001$), emphasizing the critical role of maternal literacy in promoting healthy behaviors. This finding is echoed in multiple national and state-level studies [11][17].

The study highlights a need for culturally sensitive menstrual health programs that address both knowledge gaps and infrastructural deficiencies. Promoting school-based education, improving access to sanitary products, and integrating menstrual health into existing tribal health and adolescent programs could have a long-term impact.

Conclusion

The present study reveals significant gaps in knowledge, restrictive attitudes, and unhygienic practices related to menstruation among adolescent girls in tribal areas of Rajasthan. Many girls remain unaware of the physiological basis of menstruation, face cultural taboos, and lack access to affordable sanitary products and proper sanitation facilities. These factors collectively contribute to poor menstrual hygiene, which can adversely impact their health, education, and dignity. To address this, there is a pressing need for comprehensive menstrual health education through school curricula, community outreach programs, and

involvement of frontline workers like ASHAs and Anganwadi workers. Ensuring regular supply of low-cost sanitary pads, improving WASH infrastructure in schools and households, and promoting mother–daughter communication can lead to sustainable improvements.

However, this study has certain limitations: it relied on self-reported data, which may be affected by social desirability bias; was limited to a specific geographic tribal region, affecting generalizability; and did not include in-depth qualitative exploration of cultural norms.

Future studies incorporating mixed methods and involving key influencers like parents and teachers are recommended for a holistic understanding and intervention design

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