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Original Research Article

Menstrual hygiene practices among rural adolescent girls in a north Karnataka village: a cross-sectional study

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ABSTRACT

Background: Menstrual hygiene management (MHM) is vital for adolescent girls' health and participation in education and society. However, rural girls face unique challenges due to cultural taboos, poor infrastructure, and limited access to menstrual products. This study aimed to assess the menstrual hygiene practices of adolescent girls in Ukkali village, Karnataka, and identify factors influencing their behaviors and social restrictions during menstruation.
Methods: A cross-sectional study was conducted among 280 school-going adolescent girls aged 12-17 years in Ukkali village, Karnataka, from September to October 2024. Participants were selected using systematic random sampling across six schools. Data were collected through a validated self-administered menstrual hygiene questionnaire and analyzed using SPSS version 26.
Results: The mean age of participants was 13.9 years, with a mean age of menarche of 12.85 years. Most participants (75%) used disposable sanitary pads, 22.5% relied on cloth, and 26.4% reused materials. Hygiene practices were suboptimal, with only 35.7% washing genitals once daily and 6.1% washing only at the end of their period. Social restrictions during menstruation included avoiding places of worship (39.3%) and discontinuing physical exercise (28.6%). Significant associations were observed between menstrual flow and restrictions ($p=0.010$) and between genital washing frequency and restrictions ($p<0.001$).
Conclusions: Suboptimal menstrual hygiene practices and restrictive social norms persist among rural adolescent girls in Ukkali village. Comprehensive strategies, including education, enhanced access to menstrual products, and improved infrastructure, are essential to promote health, dignity, and gender equality.

Keywords: Adolescent girls, Education, Menstrual hygiene management, Menstrual products, Rural health, Public health, Social restrictions

INTRODUCTION

Menstruation is a biological process that transitions from adolescence to womanhood.[1-4] The World Health Organization (WHO) and United Nations International Children's Emergency Fund (UNICEF) have given particular attention to menstrual hygiene management (MHM) which would ensure healthy and dignified menstruation.[5] However, managing menstrual hygiene remains a significant challenge, particularly in rural areas of developing countries.

Adolescent girls are often unschooled in menstrual health and hygiene management, which are critical aspects of their well-being.[6-8] These girls face significant challenges, particularly in rural areas with limited resources and education. Adolescent girls often lack comprehensive knowledge about their bodies, particularly the reproductive system and its functioning.[6] This lack of understanding can lead to social taboos that discourage open discussions about these topics. The inability to effectively manage menstrual hygiene can have detrimental consequences for their physical, mental, and

emotional well-being, as well as their social development and educational achievements.[2] Providing comprehensive education and resources to improve menstrual health and hygiene is crucial for supporting the overall development and empowerment of rural adolescent girls. Managing menstrual health and hygiene among adolescent girls in low- and middle-income countries, including India, is a critical public health concern for policymakers.[5] India is home to approximately one-fifth of the world's adolescent female population. Unfortunately, adolescent girls living in rural areas often face numerous restrictions that limit their agency and autonomy.[9] During menstruation, these restrictions become significantly more severe, hindering their participation in various social activities, religious practices, bathing, and even cooking.[10,11]

Inadequate menstrual hygiene management can lead to adverse reproductive and urinary tract health consequences, including infections, rashes, itching, and foul odor.[12-14] Poor menstrual hygiene can impede women's educational and economic opportunities. Ensuring safe and dignified menstruation is crucial for achieving several sustainable development goals, such as SDG 3, SDG 4, SDG 5, and SDG 8.[15,16] This study aimed to assess the menstrual hygiene practices of rural adolescent girls, addressing the gap in understanding these important aspects of their health and well-being.

METHODS

Study area

The research was undertaken in educational institutions situated within Ukkali village, located in the north Karnataka region.

Study period

The study was carried out from September to October 2024.

Study design and participants

This cross-sectional study was conducted among 280 school-attending adolescent girls aged 12 to 17 years.

Inclusion and exclusion criteria

The study included all female students aged 12-17 years who provided informed consent to participate. Participants who were absent during data collection were excluded from the analysis.

Sampling and data collection

The sampling methods employed in this study were a combination of random stratified sampling and convenience sampling. Initially, six schools were randomly selected from a total of 8 schools, ensuring representation from different strata within the population. Permission was then obtained from the school principals and teachers, and parents were informed about the study through the school principals. Within the selected schools, data was collected from 280 participants who were conveniently accessible and willing to participate in the study. The students were explained the study, oral consent was obtained, and a self-administered questionnaire, the validated menstrual hygiene questionnaire, was used to assess menstrual hygiene practices.

Data analysis

The collected data was analyzed using the Statistical Package for Social Sciences (SPSS).

Ethical consideration

Ethical approval for the study was obtained from the institutional ethics review board at the BLDE Shri B. M. Patil Medical College Hospital and Research Centre in Vijayapura. Reference number (IEC/1130/2024-25).

RESULTS

The results of the study on menstrual hygiene practices among rural adolescent girls in a village in north Karnataka, provide comprehensive insights into hygiene behaviours, associated problems, and social restrictions during menstruation.

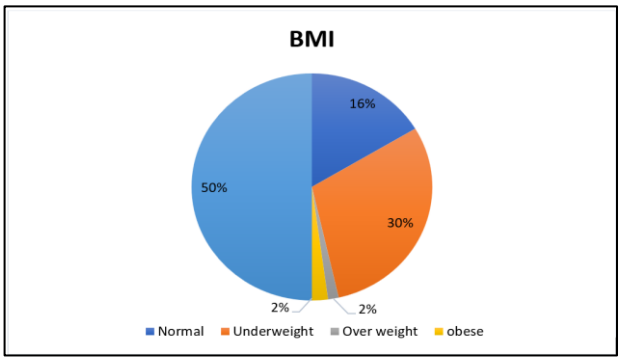

Figure 1: Body mass index of the participants.

The participants had a mean age of 13.9 years, with the mean age of menarche at 12.85 years, indicating the typical onset of menstruation in early adolescence. Figure 1 shows the mean BMI was 18.20, with 60% classified as underweight, 32.9% as normal, 2.9% as overweight, and 4.3% as obese. In Figure 2 we can see the frequency of menstrual periods varied, with 86.8% experiencing cycles of 21–35 days, 10.4% with cycles under 21 days, and 2.9% with cycles of 35–60 days or more. Also, regarding menstrual flow, we can see in Figure 3, that 95% reported normal flow, 4.3% scanty flow, and 0.7% excessive flow.

In Table 1 the study points out that 75% of participants used disposable sanitary pads, while 22.5% relied on

cloth and 26.4% reused materials. This indicates a mix of modern and traditional practices. The frequency of changing menstrual material shows that 43.9% changed materials twice a day, and 33.9% changed thrice daily, suggesting moderate adherence to hygiene practices. Notably, 64.3% washed their hands after changing menstrual materials, but only 38.2% washed their hands before the change, indicating gaps in comprehensive hygiene practices.

Table 1: Details regarding menstrual hygiene practices.

	Frequency	Percentage
Type of absorbent used during menstruation		
Sanitary pad	210	75
Fresh cloth	7	2.5
Reusable cloth	63	22.5
Type of cloth used during menstruation		
Not applicable	210	75
Don't know	10	3.6
Bought to be used during menstruation	50	17.8
Used for something else first (e.g., clothes, bedding)	10	3.6
Washed and reused menstrual materials		
Yes	74	26.4
No	206	73.6
Frequency of changing menstrual material in 1 day		
1 time	36	12.9
2 times	123	43.9
3 times	95	33.9
4 times	14	5.0
>4 times	12	4.3
Preferred place to change menstrual material		
Bathroom/washing space	171	61.1
Bedroom	21	7.5
Latrine	88	31.4
Hand washing before changing menstrual material		
Every time	107	38.2
Never	119	42.5
Sometimes	54	19.3
Hand washing after changing menstrual material		
Every time	180	64.3
Never	18	6.4
Sometimes	82	29.3
Frequency of cleaning genital area per day		
Once	100	35.7
Twice	91	32.5
>3 times	37	13.2
Every 2-3 days	35	12.5
End of the period only	17	6.1
Agents used for cleaning		
Plain water	229	81.8
Soap	51	18.2
Disposal of the absorbent material		
Household rubbish	194	69.3
Did not dispose	6	2.2
Flushed into toilet	4	1.4
Community rubbish	38	13.5
Burned	31	11.1
Buried	7	2.5
Total	280	100

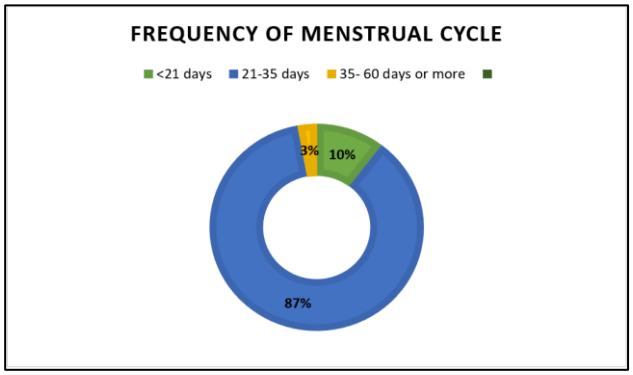

Figure 2: Frequency of menstrual cycle among the participants.

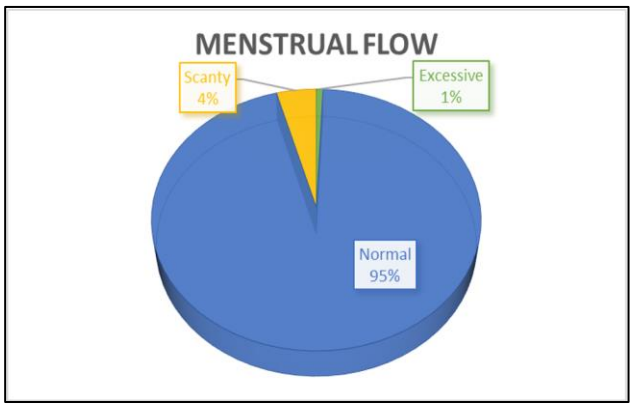

Figure 3: The nature of menstrual flow among the participants.

Regarding genital hygiene, 35.7% of participants cleaned their genital area once per day, while 32.5% did so twice daily, and 6.1% only at the end of their menstrual period. This suboptimal practice poses health risks, highlighting the need for better education and resources. Most participants (81.8%) relied on plain water for cleaning, with only 18.2% using soap. For disposal, 69.3% discarded absorbents with household rubbish, while burning and burial were fewer common methods 11.1% and 2.5%, respectively (Table 1).

In Table 2, we can see that menstrual problems reported included lower abdominal pain (47.9%), tiredness (16.4%), and mood swings (10.4%), which emphasize the need for supportive measures during menstruation.

Table 2: Problems experienced during menstruation.

Problems	Frequency	Percentage
Foul-smelling discharge	2	0.7
Itching	5	1.8
Lower abdominal pain	134	47.9
Lower backache	28	10
Mood swings	29	10.4
Muscle cramps	6	2.1
Nausea/Vomiting	4	1.4
Rashes	3	1.1
Sleepy	8	2.9
Staining of cloths	15	5.4
Tiredness	46	16.4
Total	280	100

Table 3: Restrictions faced by participants during menstruation.

Restrictions	Frequency	Percentage
Avoidance of visits to places of worship	110	39.3
Being isolated at home	07	2.5
Discontinuation of physical exercise	80	28.6
Not attending schools/ marriages/other rituals	32	11.4
Not serving/cooking food	09	3.2
Practicing dietary restrictions	04	1.4
Staying indoors	38	13.6
Total	280	100

Table 4: Association between cleaning practices and restrictions during menstruation.

Restrictions	Cleaning frequency per day										Chi-square	P value
	Once		Twice		>3 times		Every 2-3 days		End of the period only			
	n	%	n	%	n	%	n	%	n	%		
Avoidance of visits to places of worship	46	46	42	46.2	11	29.7	8	22.9	3	17.6	71.225	0.001*
Being isolated at home	0	0	3	3.3	0	0	2	5.7	2	11.8		
Discontinuation of physical exercise	24	24	23	25.3	18	48.6	14	40.0	1	5.9		
Not attending school/marriages/ other rituals	6	6	7	7.7	3	8.1	8	22.9	8	47		
Not serving/cooking food	3	3	2	2.2	2	5.4	1	2.8	1	5.9		
Practicing dietary restrictions	2	2	0	0	2	5.4	0	0	0	0		
Staying indoors	19	19	14	15.3	1	2.8	2	5.7	2	11.8		
Total	100	100	91	100	37	100	36	100	17	100		

*P value <0.05

Table 3 gives insight into the social restrictions that were prevalent, with 39.3% avoiding places of worship, 28.6% discontinuing physical exercise, and 13.6% staying indoors. These restrictions highlight the cultural stigma and taboos associated with menstruation.

In Table 4, we can see the association between hygiene practices and restrictions shows a significant relationship, with improved genital washing frequency correlating with fewer restrictions. Those who cleaned their genitals more frequently reported reduced social restrictions, including participation in rituals and physical activities. However, the frequency of material changes and handwashing practices did not show a statistically significant association with restrictions. These findings underscore the multifaceted challenges faced by rural adolescent girls, from suboptimal hygiene practices to significant social restrictions.

DISCUSSION

The study provides valuable insights into the menstrual hygiene practices of adolescent girls in a rural north Karnataka village. The participants had a mean age of menarche at 12.85 years, indicating the typical onset of menstruation in early adolescence. The study's findings suggest a mix of modern and traditional menstrual hygiene practices among the participants.

Our study reported that 75% of participants used disposable sanitary pads, while 22.5% relied on cloth, and 26.4% reused materials, reflecting a mix of modern and traditional practices. Comparatively, the study by Parikh et al conducted in Gujarat highlighted a higher prevalence of sanitary pad usage at 96%, with only 2.36% using reusable cloths, indicating better access to commercial pads in urban Gujarat.[17] The meta-analysis by van Eijk et al further reinforced these regional disparities, reporting pad usage rates of 67% in urban areas and only 32% in rural areas.[18] These findings collectively emphasize the significant impact of geographic and socioeconomic factors on menstrual product accessibility, aligning with the article's observation of rural-urban divides in menstrual hygiene management.

The frequency of changing menstrual materials shows that a significant proportion of participants changed materials twice or thrice daily, suggesting moderate adherence to hygiene practices. In comparison, the study by Vidhi Parikh et al found that 72.7% of participants changed absorbents twice daily, with only 11.7% changing more than thrice daily, reflecting a lower frequency of changes than observed in the article.[17] The meta-analysis by van Eijk et al noted that about a third of girls changed their absorbents in school, but many avoided doing so due to inadequate facilities, underscoring the critical need for improved infrastructure to support menstrual hygiene management.[18]

Regarding genital hygiene, the study found that a substantial proportion of participants cleaned their genital area once or twice daily, while a smaller percentage only did so at the end of their menstrual period. This suboptimal practice poses health risks, highlighting the need for better education and resources.[19] In contrast, the study by Vidhi Parikh et al. found that nearly half of the participants cleaned their genital area 2-3 times daily, with only 12% cleaning less than twice a day, indicating better overall practices.[17]

The study also found that a significant proportion of participants reported experiencing menstrual problems, including lower abdominal pain, tiredness, and mood swings, which can impact their overall well-being and school attendance.

Our study and the study by Majeed et al converge on the critical role of education and access to menstrual products in improving hygiene practices.[20] However, the broader scope of the study by Majeed et al emphasized systemic barriers, such as inadequate school infrastructure and the persistence of stigma, which disproportionately affects rural adolescents.[20] Both studies highlight the adverse impact of poor menstrual hygiene on reproductive health outcomes, advocating for targeted policy interventions to address these challenges effectively.

The limitations of this study include its focus on a single rural village, which restricts the generalizability of the findings to other rural areas. Additionally, the reliance on self-reported data introduces the potential for social desirability bias, as participants may have responded in a manner they perceived as favourable.

CONCLUSION

This study provides valuable insights into the menstrual hygiene practices of rural adolescent girls in north Karnataka, highlighting both the progress made and the remaining challenges in ensuring comprehensive menstrual health and hygiene. Targeted interventions addressing the identified gaps are crucial to improving the overall well-being and educational outcomes of this vulnerable population.

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Conflict of interest: None declared
Ethical approval: The study was approved by BLDE Shri B. M. Patil Medical College Hospital and Research Centre in Vijayapura. Reference number (IEC/1130/2024-25)

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