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Original Research Article

A multimodal educational intervention study on perception and practices of menstruation and menstrual hygiene among tribal adolescent girls from a residential school in H. D. Kote taluk of Mysuru district

Vidyavathi B. Chitharagi[1], Raghavendra Rao M.[1], Deepa Bhat[2], Tejashree Anantharaj Urs[1], Divya K. S.[1], Sunil Kumar[3], Krishna Karthik M. V. S.[4]*

[1]Department of Microbiology, JSS Medical College and Hospital, JSSAHER, Mysuru, Karnataka, India
[2]Department of Anatomy, JSS Medical College and Hospital, JSSAHER, Mysuru, Karnataka, India
[3]Department of Community Medicine, JSS Medical College and Hospital, JSSAHER, Mysuru, Karnataka, India
[4]Department of Microbiology, Gayatri Vidyaparishad Institute of Healthcare and Medical Technology, Visakhapatnam, India

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***Correspondence:**
Dr. Krishna Karthik M. V. S.,
E-mail: krishnakarthik46@gmail.com

ABSTRACT

Background: Educating girls about menstruation from an early age could empower them with the knowledge and confidence to manage their periods safely and hygienically. This education could also help dispel myths and cultural taboos surrounding menstruation, such as the idea of impurity, which can lead to social stigmatization and discrimination against menstruating individuals. By ensuring that girls receive comprehensive and accurate information about menstruation from a young age, we can help them adopt safer and healthier practices while also addressing the stigma and misconceptions surrounding menstruation. This education would not only benefit individual girls but also contribute to the overall well-being and empowerment of women worldwide.
Methods: This multimodal interventional study is aimed in assessing the perception and practices of menstruation and menstrual hygiene among school going tribal adolescent girls in Mysuru district. By focusing on a residential school and a pre-university college, the intervention targeted key phases in the educational journey of the students, aiming to foster development, improve outcomes, and provide insights into the menstrual hygiene and their practices among tribal youth in this region.
Results: The pre- and post-interventional data reveal a significant improvement in menstrual health knowledge and practices. Prior to the intervention, misconceptions were evident, such as confusion about the source of menstrual blood and inappropriate practices during menstruation.
Conclusions: The complete adoption of recommended practices and the elimination of outdated restrictions highlight the success of the intervention in promoting better menstrual health. Continued educational efforts are essential to sustain these improvements and address any remaining gaps in menstrual health knowledge and practices.

Keywords: Menstruation, Menstrual hygiene, Multimodal interventional study, Tribal adolescent girls

INTRODUCTION

Attaining menstruation in women's life represents a transitional phase from teenage to adulthood, which also plays a crucial phenomenon in her physical and emotional development However, in many parts of India, societal beliefs consider menstruation as impure, leading to restrictions on girls' participation in daily activities, household chores, and religious or cultural events during their periods. This stigma surrounding menstruation can impact girls' self-esteem and sense of belonging, highlighting the need for education and awareness to challenge these harmful beliefs and promote a more supportive environment for young women.[1] According to World Health Organization (WHO), adolescents are the individuals aged between 10-19 years of age and they constitute about 21% of total Indian population.[2,3] Improper menstrual hygiene may have its impact on causing urinary tract infections and also on reproductive health causing infertility and birth related complications and there exist a gap on this issue mostly among developing countries like India.[4] The National Family Health Survey indicates that 77.3% of women aged 15 to 24 employ hygienic practices to manage their menstrual cycle safely.[5] This percentage breaks down to 89.4% in urban areas and 72.3% in rural regions5. The lack of access to menstrual products, inadequate sanitation facilities, and limited education on menstrual health collectively hinder the progress of young women, particularly in rural and tribal regions. This scenario not only affects their health but also perpetuates gender-based inequalities, limiting educational and economic opportunities. As a result, many girls are forced to miss school during their periods, contributing to higher dropout rates and lower academic achievements, which can impact their future socio-economic prospects. This gap is even more profound among tribal populations, where cultural norms, poverty, and limited access to health education and sanitation facilities exacerbate the challenges of menstrual hygiene management which demands urgent attention. Many girls across different parts of the country, especially in tribal regions, lack the necessary preparation and awareness about menstruation. Despite being a critical issue, menstrual hygiene remains overlooked in many parts of India, especially among tribal communities. Girls in these communities often lack the necessary preparation and awareness about menstruation due to limited access to education and resources. This absence of knowledge, along with inadequate understanding and skills, leads to numerous challenges and hardships for them at home, in schools, and in the workplace. Therefore, providing timely and comprehensive education about menstruation from early adolescence onward would promote safer practices and alleviate the struggles faced by millions of women. Various studied have been carried out in Maharashtra and Karnataka but there exist a dry gap on the practices and knowledge of menstrual hygiene among tribal population.[6-9]

Hence this multimodal interventional study was adopted to study the perception and practices of menstruation and menstrual hygiene among school going tribal adolescent girls from a residential school located in HD Kote taluk of Mysuru district with the goal of informing interventions that could lead to better health outcomes. Addressing these challenges through culturally sensitive and context-specific interventions can have a transformative impact on the health and empowerment of young tribal girls, thus promoting broader community well-being and development.

METHODS

Study design and study setting

This interventional study was carried out in a tribal residential school and a pre-university college situated in the HD Kote taluk of Mysuru district, located in the southern region of Karnataka, India. The study was conducted for a period of 3 months i.e, from February – April 2024, which involved multiple sessions. The area is known for its unique demographic composition, predominantly inhabited by tribal communities. The study setting was chosen to address specific educational, health, or socio-cultural challenges faced by these communities. By focusing on a residential school and a pre-university college, the intervention targeted key phases in the educational journey of the students, aiming to foster development, improve outcomes, and provide insights into the menstrual hygiene and their practices among tribal youth in this region. All the adolescent girls aged from 10- 19 years were included in the study and the boys, girls aged below 10 years formed the exclusion criteria.

Sample size calculation and sampling technique

The study employed a purposive sampling technique to ensure the inclusion of participants who were most relevant to the research objectives. Specifically, the study focused on adolescent girls aged 10–19 years, aligning with the World Health Organization's (WHO) definition of adolescence. All tribal adolescent girls residing in the school and college premises within the specified age group were eligible for participation in the study. However, those who were absent on the day of data collection were excluded to ensure the accuracy and reliability of the findings. Ultimately, a total of 134 tribal adolescent girls were included in the study.

Study approvals

Prior permission was obtained from the District Tribal Health Officer, Principal as well as the administrative staff of the residential school and pre-university college. This study was conducted as a part of ICMR funded project (Ref No: Tribal/134/2022-ECD-II). Institutional ethics committee clearance was obtained from JSS

Medical college and Hospital, JSSAHER, Mysuru before initiation of the study.

Data collection

The current study was conducted in the month of February 2024. A total of 134 subjects were enrolled in the study. Whole study was divided into 3 phase's i.e., pre-interventional phase followed by interventional and post-interventional phase. Before initiation of the study an induction programme was done to sensitize all the study participants to create a good rapport and interaction between the investigators and the participants. After briefing about the study, the participants were provided with a pre-test questionnaire containing socio-demographic details and knowledge on menstruation and menstrual hygiene practices. Later multiple sessions were taken on menstruation and menstrual hygiene followed by a post-test questionnaire was given to assess the understanding ability of the participants regarding the same. Briefly the questionnaire is as follows.

Pre-interventional phase

In the study, a self-validated questionnaire developed by the investigators was distributed to all 134 participants. The questionnaire was meticulously designed to gather comprehensive data on various aspects of the participants' socio-demographic profiles, menstrual hygiene practices, and related awareness. This tool played a crucial role in assessing the baseline knowledge and practices of the participants and evaluating the effectiveness of the educational intervention.

Key components of the questionnaire

Socio-demographic details

Basic information about the participants, including their age and educational background.

The educational status of their parents, providing insights into familial influences on their knowledge and practices.

Residential facilities

Availability of toilet facilities within the residential campus to understand the infrastructure supporting menstrual hygiene.

Use of soap for handwashing after using the toilet, an essential aspect of maintaining personal hygiene.

Awareness and initial exposure to menstruation

The age at which participants first heard about menstruation, highlighting the timing of initial exposure to this concept.

The age at which they attained menarche (first menstrual period), providing context for their developmental stage.

Information on whom they discussed their first period with, such as family members, peers, or school authorities, to understand their support systems.

Sources of information about menstruation, including family, school, media, or peers, to identify primary channels of knowledge dissemination.

Knowledge of menstruation

Awareness of the biological origin of menstrual blood (e.g., understanding the uterine lining shedding process).

Identification of who experiences menstruation and a basic understanding of the menstrual cycle.

Knowledge about the nature of menstruation, including its purpose and physiological basis.

Cultural practices and restrictions

Practices or activities they believed should be avoided during the menstrual cycle, reflecting cultural or traditional beliefs and taboos.

Menstrual hygiene practices

Types of absorbents used (e.g., sanitary pads, cloth, or other materials).

Disposal methods for sanitary pads, highlighting environmental and hygienic concerns.

Frequency of changing sanitary pads during a menstrual cycle, an indicator of hygiene awareness.

Frequency of genital washing and bathing during menstruation, reflecting their personal hygiene routines.

Purpose of the questionnaire

The questionnaire aimed to provide a detailed understanding of the participants' knowledge, attitudes, and practices regarding menstruation and menstrual hygiene. By collecting this information, the investigators could identify gaps in knowledge, cultural practices influencing hygiene, and areas needing targeted educational interventions. Furthermore, the insights gained helped shape the content of the subsequent educational sessions, ensuring they were relevant and impactful for the participants.

Interventional phase

Educational intervention was meticulously planned and executed by female investigators to ensure a comfortable

and supportive environment for the participants. Multiple sessions were conducted class-wise to cater to the age-specific needs and comprehension levels of the adolescent girls. These sessions were interactive and aimed at fostering a clear understanding of menstruation, menstrual hygiene, and related health aspects.

Session details

Educational content covered

The menstrual process: Detailed explanations of the menstrual cycle, including its phases, duration, and physiological significance, were provided.

Organs involved: The participants were introduced to the female reproductive system, emphasizing the role of the uterus, ovaries, and hormonal regulation in menstruation.

Physiological changes during adolescence: The sessions covered the physical and emotional changes experienced during adolescence, helping participants recognize and accept these transitions as a natural part of development.

Menstrual hygiene practices: Best practices for managing menstruation were emphasized, such as the correct use of sanitary products, the importance of changing pads regularly, proper disposal of used products, and maintaining hygiene during menstruation.

Awareness of hygiene-related infections

Participants were educated about infections that can result from poor menstrual hygiene practices, such as urinary tract infections (UTIs), reproductive tract infections (RTIs), and other complications.

The discussions included the potential impact of these infections on reproductive and sexual health, emphasizing the importance of good hygiene habits for long-term well-being.

Visual learning aids

A PowerPoint presentation was used during the sessions, incorporating visuals such as diagrams, flowcharts, and pictures to facilitate better understanding.

The use of visual aids ensured that participants with varying levels of literacy could grasp the concepts effectively, making the sessions inclusive and impactful.

Personalized one-on-one discussions

Following the group sessions, one-on-one discussions were held in a separate room to provide a private and comfortable setting for the participants to voice their queries and concerns.

The female investigators addressed each participant's questions with sensitivity, ensuring that misconceptions were clarified and accurate information was provided.

This personalized approach helped build trust and encouraged the participants to engage more openly with the subject matter.

Significance of the approach

The class-wise segmentation and use of female investigators created a supportive environment, enabling the participants to relate better to the educators and feel at ease discussing sensitive topics. The combination of group sessions, visual aids, and individual discussions ensured a comprehensive learning experience that catered to the diverse needs of the participants. This approach not only enhanced their knowledge but also empowered them to adopt better menstrual hygiene practices and make informed decisions about their health.

Post-interventional phase

During this phase of the study, a post-test questionnaire was administered to participants to evaluate their understanding and knowledge regarding menstruation and menstrual hygiene practices. The questionnaire encompassed a variety of topics to comprehensively assess the participants' awareness and practices. The questions included the following aspects:

Origin of menstrual blood

Participants were asked to identify where menstrual blood comes from, focusing on their understanding of the biological process.

Eligibility for menstruation

Questions determined participants' awareness of who experiences menstruation and the biological basis behind it.

Definition of menstruation

Participants were tested on their conceptual understanding of what menstruation is and why it occurs.

Activities to avoid during menstruation

The survey sought insights into any misconceptions or cultural restrictions on activities such as physical exertion, dietary habits, or other practices during the menstrual cycle.

Type of absorbent used

Participants reported the type of menstrual absorbents they use, such as sanitary pads, cloth, or other alternatives.

Disposal of sanitary pads

Questions were included to understand their disposal methods for used sanitary pads, focusing on hygiene and environmental practices.

Frequency of changing sanitary pads

Participants were asked how often they changed their sanitary pads during their menstrual cycle, highlighting their adherence to hygienic practices.

Genital hygiene practices

The survey examined how frequently participants washed their genitals or bathed during menstruation, which is critical for menstrual hygiene management.

Frequency of changing pads

Additional questions clarified their understanding of the recommended frequency for changing sanitary pads to prevent infections.

Purpose of using sanitary pads

Participants were asked to state the primary purpose of using sanitary pads, such as absorption of menstrual blood, comfort, or protection from stains.

Health risks associated with poor hygiene

The questionnaire probed their awareness of the link between poor menstrual hygiene and the risk of developing urinary tract infections (UTIs) or reproductive tract infections (RTIs).

School attendance during menstruation

Participants shared their views on attending school during menstruation and any challenges they faced in doing so.

Inclusion of menstrual education in schools

Opinions were sought on whether menstrual and reproductive health education should be included in school curricula as part of health awareness programs.

All the data was entered in Microsoft excel sheet and analysed using IBM SPSS statistics for windows, version 22 (IBM Corp, Armonk, and N.Y, USA) licensed to JSSAHER, Mysore. Descriptive statistics like percentage, mean and P value for the variables was calculated using chi-square test and odds ratio was calculated at 95% CI. This structured approach ensured a robust and detailed understanding of the participants' awareness and practices concerning menstruation and menstrual hygiene, contributing to actionable insights for improving menstrual health education and practices.

RESULTS

Socio-demographic characteristics

A total of 134 adolescent girls were recruited for the study. Through the pre-test questionnaire, socio-demographic details and other details like knowledge on menstruation and menstrual hygiene practices was assessed. Mean age of the participants was 15.32 (± 0.10). Girls ranging from Class 8 to Class 12th participated in the study and of 134 participants 134 (99.25%) have attained menarche. Class wise distribution of the participants and no: of subject's attained menarche were shown in Table 1.

Table 1: Class wise distribution and total no: of the participants who attained menarche.

Class	Total participants	No. of participants attained menarche (%)
8	21	20 (95.23)
9	21	21 (100)
10	30	30 (100)
11	41	41 (100)
12	21	21 (100)
Total	134	133 (99.25)

Educational status of parents

Of the 134 participants, 86 (64.2%) of their fathers completed primary education, followed by 22 (16.4%) who completed secondary education, 13 (9.7%) who had no education at all, and 13 (9.7%) who were graduates. As for the mothers, 53 (39.6%) had primary education, 52 (38.8%) completed secondary education, 18 (13.4%) were not educated, and 10 (7.4%) were graduates. Three (2.2%) of the participants had single parents.

Toilet facility at school

All 134 (100%) participants were aware of toilet facilities in their school and used them. All participants were aware of handwashing facilities, but 3 (2.2%) did not use soap after toilet use.

Information about menarche

108 (80.5%) girls heard about menarche between 12-15 years of age, followed by 23 (17.2%) who heard about it between 10-12 years, and 3 (2.2%) who heard after 15 years of age. Of the 133 participants who attained menarche, 94 (70.6%) discussed their first period with their mothers, followed by 21 (15.7%) who discussed it with their sisters, and 18 (13.4%) who discussed it with their friends. Eighteen (13.4%) of the girls were not at all aware of menstruation before their first period.

Table 2: Questions answered in pre and post interventional phase.

S. no.	Question	Answers given in pre interventional phase	Answers given post interventional phase	Odds ratio	P value
Knowledge based questions					
1.	Where does menstrual blood comes from	Uterus (115), 85.8% Don't know (10), 7.4% Stomach (9), 6.7%	Uterus (134) 100%	0.00 (0.0013-0.3785)	0.000002*
2.	Who will experience menstruation	Women of reproductive age (95), 70.9% Only adolescent girls (20), 14.9% Ill women (16), 11.9% Don't know (3), 2.2%	Women of reproductive age (134) 100%	7.05 (3.45 - 14.40)	<0.001*
3.	Menstruation is a	Natural process (130), 97.0% Secret (4), 2.9%	Natural process (134) 100%	4.2 (1.01 - 17.51)	0.045*
Attitude and practice-based questions					
4.	Do you used soap for washing hands after toilet usage at school/ college	Yes (131), 97.7% No (3), 2.2%	Yes, henceforth shall be used (134), 100%	1.04 (0.99 – 1.09)	0.21*
5.	Do you used soap for washing hands after toilet usage at home	Yes (134), 100%	Yes (134), 100%	NA	NA
6.	Activities to be avoided during menstruation	Do not touch household items, 28 (20.9%). Restricted from going out of the house, 13 (9.7%). Restricted to bathe until the last day of period, 1 (0.7%)	Can follow regular life style (134), 100%	9.22 (4.73 - 17.98)	<0.001*
7.	What is the absorbent usually used during menstruation	Cloth, 9 (6.7%) Tissues and toilet papers, 3 (2.2%)	Disposable sanitary pads to be used, 134 (100%)	13.6 (3.93 - 47.10)	<0.001*
8.	How often do u bathe during your menstruation	Every second day 104, (77.6%) When period finishes 29 (21.6%)	Can do regular/ daily bathe 134, (100%)	6.41 (3.89 - 10.56)	<0.001*

P value <0.5 indicates statistically signficant

Activities during menstruation

91 (67.9%) of the girls had a routine lifestyle during menstruation, while 28 (20.9%) were restricted in touching household items or participating in regular activities, 13 (9.7%) were restricted from going out of their homes, and 1 (0.7%) was restricted from bathing until the last day of their period.

Absorbent used during menstruation

121 (90.2%) of the menstruating girls used disposable sanitary pads as absorbents, 9 (6.7%) used cloth, and 3 (2.2%) used tissues and toilet papers.

Change of absorbents

115 (85.8%) of the girls changed their absorbents at least three or more times a day, followed by 11 (8.2%) who changed them once a day, and 7 (5.2%) who changed their absorbents twice a day.

Discarding of absorbents used

104 (77.6%) of the girls burned their absorbents after usage, 27 (20.1%) discarded them in dustbins, and 2 (1.5%) threw the absorbents into empty areas/fields after usage.

The above were the general questions asked in the questionnaire. Later the same questionnaire contained specific questions based on knowledge, attitude and practice on safe menstrual practices. These questions were shuffled and given in both pre interventional phase and post interventional phase. Efficacy of the interventional phase was documented. Questions answered in pre and post interventional phase is as follows (Table 1). The intervention significantly improved knowledge and practices related to

menstruation, especially in dispelling myths and improving hygiene behavior.

DISCUSSION

The pre- and post-interventional data reveal a significant improvement in menstrual health knowledge and practices. Prior to the intervention, misconceptions were evident, such as confusion about the source of menstrual blood and inappropriate practices during menstruation. Post-intervention, all respondents accurately identified the uterus as the source of menstrual blood and understood that menstruation is a natural process, demonstrating a substantial increase in knowledge (100% correct responses). Comparative studies underscore the importance of educational interventions in improving menstrual health. For instance, a study by Koffi et al found that targeted educational programs significantly enhanced knowledge about menstruation and proper menstrual hygiene practices among adolescents.[10] Similarly, a study by Agha et al highlighted that misconceptions about menstruation and menstrual management were effectively addressed through structured educational interventions, leading to improved practices and attitudes.[11] In our study, post-intervention results showed a complete shift towards using disposable sanitary pads (100%), aligning with findings from a study by Ghosh et al which reported that education led to increased use of sanitary pads over traditional cloths.[12] The improvement in handwashing practices and the acceptance of regular bathing during menstruation also reflect the success of the intervention, echoing results from Patel et al, where educational efforts led to better hygiene practices and reduced menstrual-related restrictions.[13] The intervention led to a marked improvement in menstrual health knowledge and practices among participants. The transition from misconceptions to accurate understanding of menstruation's biological aspects and practices, such as the use of disposable sanitary pads and regular bathing, underscores the effectiveness of educational programs.

CONCLUSION

Our findings align with previous research, which emphasizes that structured educational interventions can significantly enhance menstrual hygiene management and attitudes. The complete adoption of recommended practices and the elimination of outdated restrictions highlight the success of the intervention in promoting better menstrual health. Continued educational efforts are essential to sustain these improvements and address any remaining gaps in menstrual health knowledge and practices.

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Ethical approval: Institutional ethics committee clearance was obtained from JSS Medical College and Hospital, JSSAHER, Mysuru before initiation of the study (JSSMC/ IEC/ 13042022/ 03NCT/ 2021-22 Dated 25.04.2022)

REFERENCES

1. Shah SP, Nair R, Shah PP, Modi DK, Desai SA, Desai L. Improving quality of life with new menstrual hygiene practices among adolescent tribal girls in rural Gujarat, India. Reprod Health Matters. 2013;21:205-13.
2. Adolescent health epidemiology, 2014. Available at: http://www.who.int/maternal_child_adolescent/epidemiology/adolescence. Accessed on 20 November 2023.
3. Rashtriya Kishor Swasthya Karyakram, adolescent health division ministry of health and family welfare Government of India. Available at: http://nhm.gov.in/ images/pdf/programmes/rksk-strategy-handbook.pdf. Accessed on 20 November 2023.
4. Gosavi SV, Almale B, Gujarathi A, et al. Awareness and practices about menstrual hygiene and its impact among migrant adolescent girls of Dera: a community based cross-sectional study from Nashik (Maharashtra). IntJSciRep20150219 Int J Sci Rep. 2015;1:123-26.
5. National Family Health Survey (NFHS-5) India. 2019. Available at: http://rchiips.org/nfhs/NFHS-5_FCTS/India.pdf. Accessed on 20 November 2023.
6. Thakre S.B, Thakre SS, Reddy M, Rathi N, Pathak K, Ughade S. Menstrual hygiene: knowledge and practice among adolescent school girls of Saoner, Nagpur District. J Clin Diagn Res. 2011;5:1027-33.
7. Deshpande TN, Patil SS, Gharai SB, Patil SR, Durgawale PM. Menstrual hygiene among adolescent girls - a study from urban slum area. J Family Med Prim Care. 2018;7:1439-45.
8. Wasnik VR, Dhumale D, Jawarkar AK. Study of the menstrual pattern and problems among rural school going adolescent girls of Amravati district of Maharashtra, India. Int J Res Med Sci. 2015;3:1252-6.
9. Amoghashree RS, Doddaiah SK. Exploring the dynamics of menstrual health and hygiene management among adolescent girls in rural schools of Mysuru district, Karnataka. International Journal of Community Medicine and Public Health. 2024;11(4):1670.
10. Koffi AK, Adégboyè A, Attiogbé A. Impact of an educational intervention on menstrual hygiene

management among schoolgirls in Togo. BMC Public Health. 2019;19:113.
11. Agha S, Kiani S, Akbar S. Effectiveness of an educational intervention on menstrual health among adolescent girls in Pakistan: a cluster randomized trial. BMC Public Health. 2021;21:1357.
12. Ghosh S, Ghosh A, Dey P. Knowledge, attitudes, and practices regarding menstrual hygiene among adolescent girls in India: A systematic review. J Educ Health Promot. 2020;9:112.
13. Patel P, Sharma M, Patel P. Impact of menstrual hygiene education on knowledge and practices among adolescents in Gujarat, India. Int J Adolesc Med Health. 2022;34(4):20210047.

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