National Board of Examinations - Journal of Medical Sciences
Volume 4, Issue 2, Pages 216–227, February 2026
DOI 10.61770/NBEJMS.2026.v04.i02.010

ORIGINAL ARTICLE

Rural Realities: Assessing Menstrual Hygiene Knowledge and Practices among Women of Reproductive Age in Kanchipuram, Tamil Nadu

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Accepted: 12-January-2026 / Published Online: 3-February-2026

Abstract

Background: Menstruation is a key physiological milestone in a woman's life, yet it remains surrounded by taboos and cultural misconceptions, particularly in rural India. Poor menstrual hygiene can lead to various health complications and negatively impact psychological and social well-being. This study aimed to assess the knowledge and practices related to menstrual hygiene among women of reproductive age in a rural area of Kanchipuram District, Tamil Nadu, and to explore the influence of socio-demographic factors on these practices. **Methods:** A community-based analytical cross-sectional study was conducted among 330 women aged 15–49 years in the rural field practice area of Chettinad Hospital and Research Institute. Participants were selected using multistage random sampling. Data were collected through a structured, validated questionnaire. Statistical analysis was performed using SPSS version 21.0. Associations between variables were analyzed using the Chi-square test, with a p-value of <0.05 considered statistically significant. **Results:** While 90.9% of participants demonstrated good knowledge about menstrual hygiene, a substantial proportion still practiced less hygienic methods—23.6% used cloth and 3.1% used locally prepared napkins, compared to 73.3% who used sanitary napkins. Burning was the most common disposal method (54.5%). Lower educational status and socioeconomic class were significantly associated with both the type of absorbent used and disposal practices. Community health workers (47%) and healthcare professionals (41%) were the primary sources of information, while mass media played a minimal role (3%). **Conclusion:** Despite high awareness, gaps in hygienic practices persist. Addressing these requires culturally appropriate, affordable and accessible interventions that consider the socio-economic and educational context of rural women.

Keywords: Menstrual hygiene, Reproductive-age women, Rural health, Socio-demographic factors, Sanitary practices

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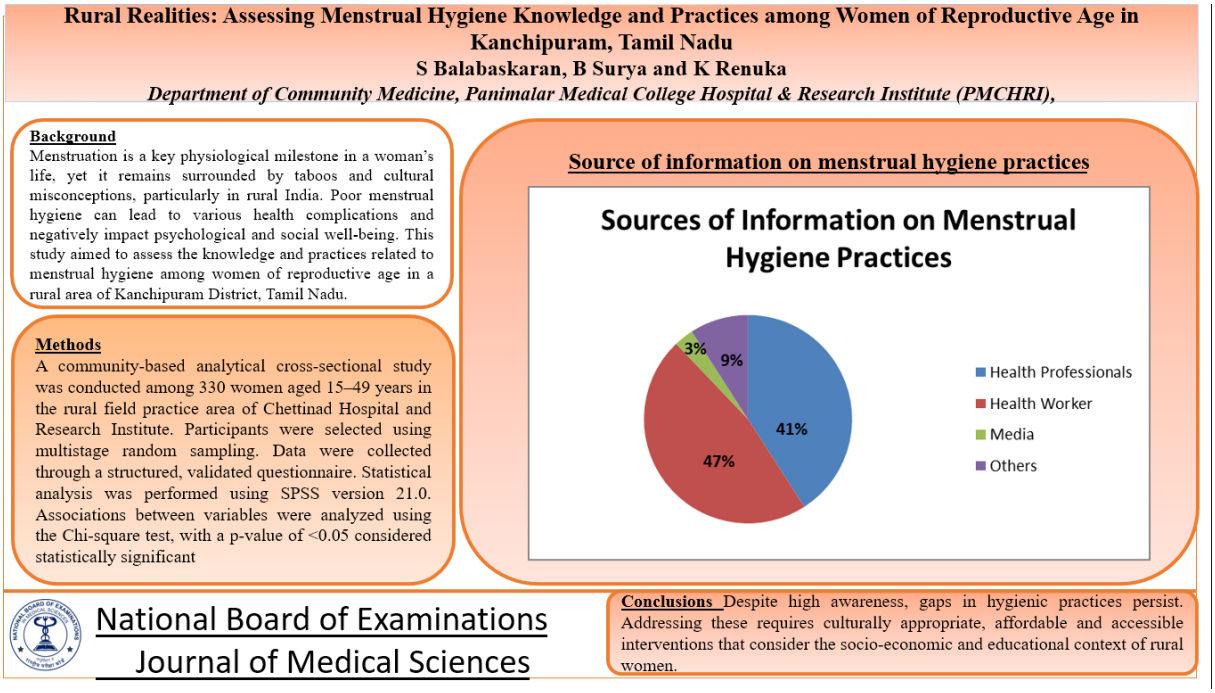
Graphical Abstract



Introduction

One of the key indicators of puberty is menstruation, which is the recurring vaginal bleeding brought on by the loss of the uterine mucosa. Menstruation usually starts one or two years after the emergence of secondary sexual features [1]. For women in the reproductive age group, the menstrual cycle is a crucial indicator of reproductive health and a typical physiological function. Menstruation is frequently associated with a number of customs and myths. In Indian society, menstruation is still seen as filthy or disgusting. A negative perception of this condition has been fostered by the family's isolation of menstruating girls and women and the restrictions placed on them [2]. Menstrual hygiene is basically the idea of keeping the body clean while a woman is having her menstruation. Inadequate menstrual hygiene can cause serious complications like toxic shock syndrome and pelvic inflammatory disease, as well as minor issues like rashes or itching in the perineal area and poor odor [3]. It also has negative psychological and social effects [4]. Social prohibitions prevent women in India, particularly in rural cultures, from knowing about menstrual hygiene practices and from discussing the issue [5].

Menstrual hygiene is becoming increasingly important, as seen in recent times in India. Ministries understand that MHM can enhance the health, nutritional status, and overall well-being of young women while also increasing their school enrollment and retention, which may have long-term positive effects on their social, economic, and health outcomes. The educational, economical, and cultural standing of a household influences menstrual hygiene [6]. Reducing levels of awareness among communities, practitioners, and policymakers are correlated with a cyclical causal relationship between menstrual hygiene neglect and inadequate awareness. This disregard has numerous detrimental repercussions on women's lives as well as

the accomplishment of larger development objectives [7]. There is an urgent need to start policy-making and awareness campaigns because of the alarmingly high rate of menstrual hygiene among rural populations [8]. With this context in mind, the current study was carried out among reproductive-age women residing in rural Kanchipuram District, Tamil Nadu with the aim of learning about their knowledge of menstrual hygiene, as well as their practices related to maintaining it and the impact of socio-demographic factors on these practices.

Aims and Objectives

To assess the knowledge about Menstrual Hygiene and its Practices among women in Reproductive age group in Rural area of Kanchipuram District, Tamil Nadu.

Materials and Methods

A cross-sectional study was conducted in the rural field practice area of Chettinad hospital and research institute for a period of 6 months. The total population of rural field practice area was 39,545 among which 19,065 were females. About 5,062 women were in the reproductive age category, and samples were selected by line listing. Antenatal, postnatal, and postmenopausal women were excluded from the study. After reviewing several articles, the sample size was estimated to 292 based on the formula $n=4pq/l^2$ and to account for nonresponse rate (among 15%) due to non-cooperation and non-availability of the participants, a total of 330 subjects were enrolled. Where n is the sample size, p is the prevalence of the previous study, q is 100 – prevalence, l is the allowable error. Multistage random sampling was followed in sample selection and samples were selected on the basis of population proportion to size. A structured validated questionnaire (cronach alpha – 0.85) on menstrual hygiene referred from other studies (9) was used. The data collected was entered in Microsoft Excel and coding done for further statistical analysis. The statistical analysis was done using the SPSS software version 21.0. Chi-square test was applied for significance. *P* value < 0.05 was considered significant. Institutional Ethical Approval was obtained with the approval number 23/ IHEC/ 3-16.

Results

Out of 330 female participants in the reproductive age group , majority of the study population were in the age group 28-37 years of age with 47.3%(156), 90.6% (299) were married and living with their spouse, 233(70.6%) belongs to the Hindu community, 23.9% (79) were completed their high school level of education and 40.6% (134) were from the lower socio economic class according to B.G.Prasad's classification and 58.8% (194) were living in a nuclear family.Majority of the study participants, i.e., 186 (56.4%) had the history of age of menarche >13 years while 144 participants (43.6%) had menarchial age <=13 years of age.

Table 1 describes the percentage and frequency distribution of the study participants based on the socio-demographic characteristics.

Table 1. Frequency distribution of the study participants based on the socio- demographic characteristics

S.NO	VARIABLES	FREQUENCY (n=330)	PERCENTAGE (%)
1.	**Age group**		
	18-27	75	22.7
	28-37	156	47.3
	38-49	99	30.0
2.	**Marital status**		
	Living with husband	299	90.6
	Widow	18	5.5
	Divorce	13	3.9
3.	**Religion**		
	Hindu	233	70.6
	Christian	66	20.0
	Muslim	31	9.4
4.	**Educational status**		
	Primary	56	16.9
	Middle school	32	9.7
	High school	79	23.9
	Higher secondary	54	16.4
	Graduate	58	17.6
	Illiterate	51	15.5
5.	**Socio economic class**		
	Upper	9	2.7
	Upper middle	49	14.8
	Lower middle	134	40.6
	Upper lower	103	31.3
	Lower	35	10.6
6.	**Type of family**		
	Nuclear	194	58.8
	Joint	81	24.5
	Three generation	55	16.7

Menstrual hygiene practice was assessed from the use of material of napkins and the methods used for the disposal of used napkins. Out of the study participants, as a majority, 73.3 % (242) used sanitary napkins followed by the use of clothes with 23.6 % (78) and the locally prepared napkins with 3.1 % (10) as the least usage.

Table 2 describes the distribution of study participants based on the usage of type of napkin according to the demographic characteristics of the study population. The statistical association was found be significant with the type of napkin used and the educational status of the study population with p- value of 0.043, and the association was also found to be significant with the socio economic status with the p- value of 0.010.

Table 2. Distribution of study participants based on the usage of type of napkin and Association between the demographic characteristics

S.NO	VARIABLES	MENSTRUAL HYGIENE PRACTICES TYPE OF NAPKIN USED			STATISTICAL SIGNIFICANCE
		SANITARY NAPKINS	CLOTHES	LOCALLY PREPARED NAPKINS	Chi-square P-value
1.	**Age group**				
	18-27	58	14	03	6.389
	28-37	120	32	04	0.172
	38-49	64	32	03	
2.	**Religion**				
	Hindu	167	58	08	0.231
	Christian	50	14	02	0.891
	Muslim	25	06	0	
3.	**Educational status**				
	Primary	43	11	02	
	Middle school	25	06	01	
	High school	55	21	03	18.773
	Higher secondary	46	08	0	**0.043**
	Graduate	45	10	03	
	Illiterate	28	22	01	
4.	**Socio economic class**	06	01	02	
	Upper	41	08	0	20.179
	Upper middle	96	37	01	**0.010**
	Lower middle	74	24	05	
	Upper lower	25	08	02	
	Lower				
5.	**Type of family**				
	Nuclear	147	42	05	2.815
	Joint	57	20	04	0.589
	Three generation	38	16	01	
6.	**Marital Status**				
	Living with	217	72	10	1.749
	husband	14	04	0	0.782
	Widow	11	02	0	
	Divorce				
7.	**Age of Menarche**				
	<=13 years	108	35	01	4.748
	>13 years	134	43	09	0.093

Burying, burning, washing and reusing the napkin and wash and throw away are the different methods considered for the disposal of used napkins. Most of the study participants, 180 participants (54.5 %) used the burning technique to dispose the used napkin while 72 participants (21.8%) used burying method, 41 study participants (14.2%) reused the napkins by washing and 31 study subjects 9.3 % wash and throw away the used napkins.

Table 3 describes the distribution of the study population based on the method used for disposal of the used napkins according to the demographic characteristics and the association between the two. Significant statistical association was noted between the educational status and the disposal method with p- value of 0.05. The association between the type of family was also found to be significant with p-value of 0.006.

Table 3. Distribution of the study population based on the method used for disposal and Association between the demographic characteristics

S.NO	VARIABLES	MENSTRUAL HYGIENE PRACTICES DISPOSAL OF USED NAPKINS				STATISTICAL SIGNIFICANCE
		BURRY	BURN	WASH & THROW	WASH & REUSE	Chi-square P-value
1.	**Age group**					
	18-27	16	41	05	13	6.199
	28-37	33	86	20	17	0.401
	38-49	23	53	06	17	
2.	**Religion**					
	Hindu	53	125	22	33	9.026
	Christian	12	43	03	08	0.172
	Muslim	07	12	06	06	
3.	**Educational status**					
	Primary	16	29	01	10	
	Middle school	06	20	05	01	24.379
	High school	16	46	08	09	**0.050**
	Higher secondary	10	32	01	11	
	Graduate	11	33	06	08	
	Illiterate	13	20	10	08	
4.	**Socio economic class**	02	06	01	0	
	Upper	08	31	03	07	7.655
	Upper middle	33	76	14	18	0.811
	Lower middle	24	50	11	18	
	Upper lower	06	23	02	04	
	Lower					

5.	**Type of family**					
	Nuclear	46	114	16	24	18.310
	Joint	27	38	06	10	**0.006**
	Three generation	05	28	09	13	
6.	**Marital Status**					
	Living with husband	65	160	30	44	2.923
	Widow	04	11	01	02	0.818
	Divorce	03	09	0	01	
7.	**Age of Menarche**					
	<=13 years	24	82	13	25	5.158
	>13 years	48	98	18	22	0.161

Knowledge about the menstrual hygiene was assessed using a using a series of 10 Likert scale questions adopted from different studies. The responses of each 10 item questions had a range of scores from 0 to 3 (0 = strongly disagree, 1 = disagree, 2 = agree, 3 = strongly agree). The questions had both positively and negatively worded items regarding menstruation, and negatively worded statements were scored reversely. Individuals with a total sum score of 15 (mean score) and above were considered as having a good knowledge regarding menstrual hygiene. Out of 330 study participants, 300 (90.9%) had a good knowledge about the menstrual hygiene practices.

Table 4 shows the distribution of study participants based on the knowledge about the menstrual hygiene according to the socio demographic characteristics. Chi square test was done to assess the statistical significance and it was noted that there was a statistically significant association between the good knowledge and the age of the study subjects with p-value 0.028, educational status with p-value 0.050, and socio-economic status with p- value 0.016.

Table 4. Distribution of study participants based on the knowledge about the menstrual hygiene and Association between the demographic characteristics

S.NO	**VARIABLES**	**KNOWLEDGE REGARDING MENSTRUAL HYGIENE**		**Chi-square**	**P-value**
		GOOD	**POOR**		
1.	**Age group**				
	18-27	74	03	7.141	**0.028**
	28-37	142	12		
	38-49	84	15		

2.	**Religion**				
	Hindu	211	22	0.231	0.891
	Christian	61	05		
	Muslim	28	03		
3.	**Educational status**				
	Primary	51	05		
	Middle school	30	02	10.679	**0.050**
	High school	69	10		
	Higher secondary	51	03		
	Graduate	57	01		
	Illiterate	42	09		
4.	**Socio economic class**				
	Upper	09	0		
	Upper middle	45	04	12.216	**0.016**
	Lower middle	125	09		
	Upper lower	86	17		
	Lower	35	0		
5.	**Type of family**				
	Nuclear	180	14	2.105	0.349
	Joint	72	09		
	Three generation	48	07		
6.	**Marital Status**				
	Living with husband	272	27	0.897	0.639
	Widow	17	01		
	Divorce	11	02		
7.	**Age of Menarche**				
	<=13 years	132	12	0.177	0.674
	>13 years	168	18		

Figure 1 shows the source of information on menstrual hygiene practices among the study participants. Majority of the study subjects conveyed that their source of information about the menstrual hygiene practices is mainly through the community health worker with 47%, followed by health care professionals with 41 %, other sources like family members, friend and relatives with 9% and the least 3 % of the participants conveyed that their knowledge about the menstrual hygiene was through the mass media communications.

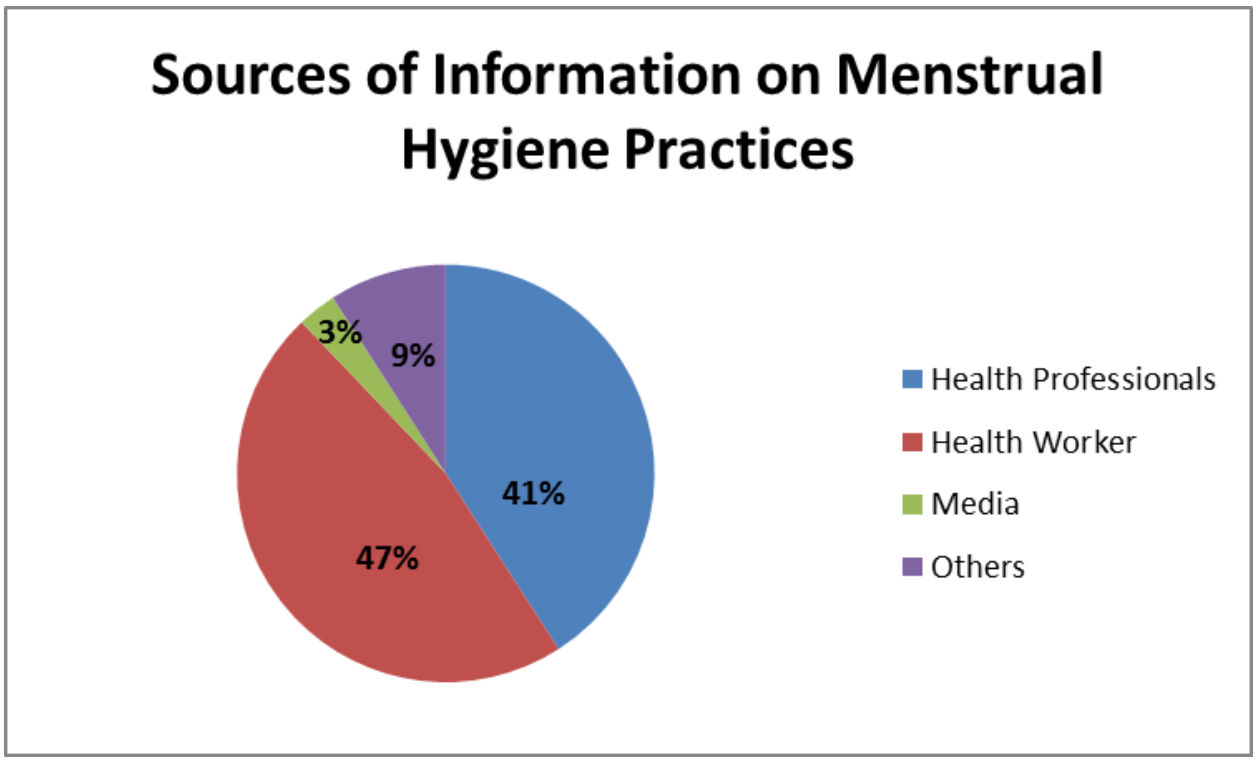


Figure 1. Source of information on menstrual hygiene practices among the study participants

Discussion

This community-based cross-sectional study in rural Kanchipuram District, Tamil Nadu, provides valuable insights into the knowledge and practices related to menstrual hygiene among women of reproductive age. The finding of this study reported knowledge (90.9%) which is contrast with the observations from the study focusing on adolescent girls in other South Asian contexts. The study conducted by Sapkota et al.'s study (2013) in rural Nepal highlighted significant gaps in knowledge among school-going adolescents. Similarly, Dhingra et al.'s (2009) study among tribal adolescent girls in India revealed limited awareness regarding menstruation.

However, the study conducted by Dasgupta and Sarkar's (2008) revealed high self-reported knowledge, the persistence of less hygienic practices such as the use of cloth (23.6%) and locally prepared napkins (3.1%) raised concerns about the hygiene practices among adolescent girls in India. The significant association found between the type of absorbent used and both educational and socioeconomic status aligns with the moderate knowledge that socioeconomic factors play a major role in health behaviors according to the study conducted by Kasper et al., 2012, for the general influence of socioeconomic status on health. Women with higher education and better socioeconomic standing are more likely to adopt sanitary napkins, indicating that access to information and resources are critical determinants of menstrual hygiene practices. This is further supported by the significant association between disposal methods and education and family type. The prevalence of burning as a disposal method (54.5%)

raises environmental and potential health concerns and underscores the need for education on safe and sustainable disposal practices.

The study's finding that community health workers and healthcare professionals are the primary sources of information suggests the effectiveness of these category workers in disseminating good knowledge. This supports with the importance of school-based educational interventions highlighted by Haque et al.'s (2014) study in Bangladesh, although the current study focused on adult women in the community rather than schoolgirls. The limited role of mass media (3%) as a source of information suggests that targeted community-based approaches might be more effective in this rural setting.

Balamurugan et al.'s (2014) community-based study in rural Tamil Nadu, revealed a similar finding like our study with high degree of self-reported knowledge (90.9%), mostly from healthcare professionals and community health workers. Despite this awareness, a significant minority continued to use cloth (23.6%) or locally made napkins (3.1%), while 73.3% of people used sanitary napkins

Summary

In this study, 330 women of reproductive age in Tamil Nadu's rural Kanchipuram District had their knowledge and habits on menstrual hygiene evaluated. The results showed a high degree of self-reported knowledge (90.9%), mostly from healthcare professionals and community health workers. Despite this awareness, a significant minority continued to use cloth (23.6%) or locally made napkins (3.1%), while 73.3% of people used sanitary napkins. The most popular form of disposal (54.5%) was burning. Women who are better educated and have greater socioeconomic position are more likely to use sanitary napkins, according to the study, which also revealed strong correlations between the type of absorbent used and these factors. Likewise, there was a substantial correlation between disposal techniques and family type and educational position. Additionally, age, education, and socioeconomic level were all substantially correlated with good knowledge. In order to improve menstrual hygiene practices in this rural community, the study draws attention to a possible knowledge gap and emphasizes the necessity of interventions that address accessibility, affordability, and cultural issues. It also highlights how important healthcare professionals and community health workers are to the spread of knowledge.

Conclusion

In conclusion, women of reproductive age who participated in this study in the rural Kanchipuram District self-reported having a good degree of knowledge on menstrual hygiene. However, as seen by the persistence of less hygienic options and the widespread use of burning as a disposal method, this knowledge did not always translate into good behaviors. Menstrual absorbent type and disposal practices were strongly influenced by socio-demographic characteristics, especially socioeconomic position and education. The need of enhancing these channels for efficient health education is highlighted by the important role that healthcare professionals and community health workers play as primary information

sources. Multifaceted interventions are essential to bridge the knowledge-practice gap and improve menstrual health in this rural area. These should include culturally sensitive education by ASHA workers and healthcare professionals, affordable/ subsidized hygienic absorbents, promotion of safe disposal methods (e.g., incinerators or burial pits), and integration into existing community health programs to address socio-economic and cultural barriers effectively.

Limitations of the study

The study was carried out in a particular rural region of Tamil Nadu's Kanchipuram District. Because cultural norms, resource availability, and knowledge levels can differ greatly, the results may not apply to other rural areas in Tamil Nadu or other Indian states.

Statements and Declarations

Conflicts of interest

The authors declare that they do not have conflict of interest.

Funding

No funding was received for conducting this study.

Ethical Approval

Ethical approval was obtained with the approval number 23/ IHEC/ 3-16

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