ORIGINAL ARTICLE

Menstrual Hygiene Practices among Rural Women in Kumaon Community Nainital, Uttrakhand: A Cross-Sectional Study

Running Title: Menstrual Hygiene among Kumaon Community

Shweta Sharma[1,2]*, Jaya Tiwari[3], Jitendyra A. Pritam[4], Sangeeta Sharma[5]

Author Affiliations
[1]National Health Mission, Balodabazar, Chhattisgarh, India .
[2]Asian Institute of Public Health, Bhubaneswar, Odisha,India
[3]Post Graduate Institute of Medical Education and Research, Chandigarh, India
[4]All India Institute of Medical Science, Bhubaneswar, India
[5]The George Institute for Global Health, Ambikapur, India

Corresponding Author: *Shweta Sharma

E-mail: shwetasharma4592@gmail.com

Abstract

In developing countries, poor menstrual hygiene practices become a major health issue. Women's menstrual hygiene practices are essential since they have a health impact in becoming more susceptible to reproductive tract infections (RTI). This population-based cross-sectional study was carried out to examine the prevalence of menstrual hygiene practices and their association with socio-demographic characteristics. 346 people aged 15 to 49 years old from Okhalkanda Block in Nainital district, Uttrakhand, participated in the survey. According to the survey, 35.2% of participants used sanitary napkins and there is a statistically significant relationship between socio-demographic characteristics and menstrual hygiene practice. 86.4% of women change their pads three times or fewer per day. 42.5% of females prefer to dry their clothes outside at night, while 21.7% prefer to dry them inside. This study highlighted the critical need for accurate menstrual information. Personal hygiene was not adequate during menstruation, which was influenced by factors such as water accessibility and education. Adolescent education is critical for health defense. Women must be educated about the physiological elements of menstruation and conventional beliefs must be challenged. Menstruation should be openly discussed by mothers.

Keywords: Menstrual hygiene practices, absorbent materials,sanitary pad, Nainital, India

Introduction

Ensuring accurate and sufficient information on menstruation is vital for women's well-being. Adequate personal hygiene practices during menstruation, such as using sanitary pads and proper genital washing, are crucial[1]. The Joint Monitoring Program of the WHO and UNICEF, in 2012, defined Menstrual Hygiene Management (MHM) as using clean materials for absorption, changing in privacy, washing with soap and water, and having proper facilities for disposal. Adequate MHM involves clean absorbents, frequent changes, body washing, proper disposal, and privacy[3]. Menstruation is a natural and essential aspect of a woman's life, involving reproductive changes and a menstrual rhythm influenced by the hypothalamus-pituitary-ovarian function[7]. Unhygienic practices during menstruation can lead to health complications and increased vulnerability to infections[8,9]. Reproductive Tract Infections (RTIs) pose serious consequences such as infertility, ectopic pregnancy, low birth weight, fetal

wastage, and prenatal complications. Lack of hygiene during menstruation contributes to RTIs, and millions of women suffer from it's complications[10,1]. Sociocultural restrictions and taboos still shroud menstruation, leading to ignorance among adolescent girls about scientific facts and hygienic practices[11,12]. Taboos around the disposal of menstrual blood and restrictions on bathing and social activities are reported across various contexts[13]. Due to these restrictions, women often resort to unhygienic practices, especially in poorer settings[14]. Globally, around 52% of women in the reproductive age group face menstrual challenges. In India, a significant percentage of girls use reusable cloth instead of disposable pads, influenced by factors like high costs[12,15]. In Odisha, Juang women predominantly use old clothes during menstruation, citing cost as a significant barrier to sanitary napkin usage[4]. Studies in low and middle-income countries reveal inadequate MHM in more than 50% of girls, particularly in rural areas[17]. Research conducted in Assam reveals diverse menstrual hygiene practices, with 74.12% opting for sanitary pads, 18.82% using cloth, and 7.06% employing both methods[6]. Lack of knowledge about menstruation is prevalent, but positive attitudes towards daily activities during menstruation are observed[15]. Good menstrual hygiene practices boost confidence, while poor practices increase susceptibility to reproductive health issues. Privacy and access to resources like water, soap, washing space, drying space, and storage space significantly impact MHM practices. Failure to provide appropriate menstrual hygiene facilities at home or school hinders good menstrual hygiene practices[2]. Effective menstruation management is crucial for women's health, but taboos, misconceptions, and practices related to menstruation sometimes jeopardize women's well-being[19]. Cost remains a major barrier to sanitary pad usage, affecting a significant percentage of menstruating women in India[20]. Factors like water insecurity and inadequate sanitation present psychosocial risks, especially for women and girls, affecting menstrual hygiene management[18]. International efforts focus on improving water and sanitation practices in schools, creating awareness, breaking stigma, ensuring access to safe MHM absorbents, and improving school facilities [21]. Using clean, soft, and hygienic practices during menstruation is essential for maintaining the health of girls and women[22].

Materials and Methods

A population-based cross-sectional study was conducted among the 15-49 age group women of the Kumaon community, Okhalkanda, Nainital. Dataaboutage, caste, educational level, marital Status, Socioeconomic Status, and Occupational Status, were collected from 346 individuals, and using as standard questionnaire, Illiterate people were helped by asking the same questions in the local language. Collected data were alphanumerically coded and enteredintoan Excel sheet. The analysis was done using STATA 11 version software, and the Chi-square test was employed to determine the difference between variables. P - Value ($p<0.05$) was considered statistically significant for the chi-squaretest.

Sample Size

By applying an open-epicalculator, got 328 sample sizes ata 95% confidence level. After accounting for 10%non-respondents,thefinal sample size was 346.

Study Settings

Ookhalkanda, a village Panchayat located in the Nainital district of Uttrakhand state was chosen for this study. It is located 35 km east of the District headquarters, Neonatal. 35 villages of Okhalkanda block. The total population is still dependent on the continuation of farming for their livelihood and there are few commercial and industrial enterprises to support large-scale employment in the interior mountainous regions. There are 346 authorized localities situated in Nainital. Among those 346 localities, bousing simple random techniques, several localities were chosen randomly.

Data collection technique

All the participants wereen couraged to participate in the study. The interview was conducted by usinga self-administered questionnaire.

Inclusion / exclusion criteria
Only those subjects who had been residents of Ookhalk and a for at least one year at the time of the survey were enrolled as per the protocol of the study from the age group (15-49)years.

Any one suffering from debilitating condition and hence, unable to comprehend / respond to the questions was excluded.

Quality control and quality assurance
Pretesting of the pre-designed questionnaire guide was carried out before actual data collection. To prevent errors during data collection following 3 steps were followed:

A. Data collection: Collected by the authors.
B. Data entry: data enteredin to hard copy to Excel
C. Data missing: 100% of the data range was checked.

Data analysis
This study is a population-basedcross-sectional study, where a random sample is selected from the population census. The data collected was analyzed using "STATA" software. Data cleaning was done to identify outliers. Descriptive statistics and chi-square were calculated.

Expected outcome
This research will help to know the practices of menstruation in the Kumaon community. The research data would be helpful for policymakers to formulate better strategies and a better implementation plan for menstrual hygiene.

Results
Socio-Demographic Profile: The socio-demographic profile of the respondents is shown in (Table 1).Age in the survey ranges from 15-49 years, with a mean of 20-29 years of age group (41.04%).The dominant religion among the study participants was Hinduism. There were 286 (82.66%) study participants that belonged to the General caste, which was followed by 59 (17.05%) OBC, and 1 (0.29%) ST. Since the study was carried out in rural areas, it was not feasible to capture the higher socio-economic class however, it was found that the majority were of the lower class 179 (51.73%) followed by the lower middle class 120 (34.68%) and the upper class 11(3.18%). The majority of the participants 102 (29.48%) were educated up to secondary school followed by no formal education 81 (23.41%), participants with higher education 79 (22.83%), and the least participants were primary school educated to college 64 (18.50%) and the other 20 (5.78%). There were 269 (77.75%) married women, followed by 66 (19.08%) unmarried women, 10 (2.89%) widows, and the least 1 (0.29%) divorced participants. The most common source of income was farming 178 (51.45%), followed by household help 78 (22.54%) with the students 43 (12.43%).

Hygiene practices during menstruation: Table 2 reveals that 52% of females know about menstruation and the rest 48% don't know about menstruation before the age of menarche. 54% from relatives (mother, sister, and family), 42% of females get knowledge from their teachers, and only 4% from other outer sources. Most women used cloth (50.87%) as the absorbent material, 35.26% used sanitary pads, and about 1% used cotton and others whereas 13% didn't use any kind of absorbent materials (Figure 1). About 86.42% of females change pads 3 or less than 3 times a day. Rest 13.58% of females change their pad 4 or more than 4 times a day, which is good from the hygiene point of view, but this is very low in number. 92.49% clean their genital part, which is a good hygiene practice. 42.49% of females dry their clothes outside the house at night, 21.68% of females prefer to dry them inside the house, 20.81% dry them along with other clothes, 3.47% throw them away, and the rest 3.18% used to dry them outside the house in sunlight. 8.38% of female goes with other options. 46.24% of females hide used pads, 40.75% keep them with regular clothes, 8.09% discard them after use, 3.18% hide in the washroom, and the rest 1.73% store them in another place (Figure 2). 69.94% of females have a foul smell apart from the time before or after menstruation and the rest 30.06% do not have any foul smell.

Association between menstrual hygiene practices & socio-demographic variables: the association between menstrual hygiene practices and socio-demographic variables, chi-square was applied and the result

revealed a statistically significant association between the two variables (p-value< 0.05) (tab.2) . We found that regarding sanitary napkins during menstruation with socio-demographic variables like age, education, occupation, and income are statistically related. Regarding the frequency of changing absorbents per day, we found that a woman who changes less than 3 times in a day has a significant association with socio-demographic variables like age and occupation.

Discussion

Numerous studies have explored menstrual hygiene practices, primarily focusing on rural populations or school girls. However, a notable gap exists in understanding the practices among medical students, prompting this study to address the scarcity in the literature. Menstrual disturbances are prevalent among adolescents, and unhygienic practices during menstruation can lead to adverse consequences, including pelvic inflammatory diseases and infertility.

This study aimed to assess menstrual hygiene practices in a rural community, providing insights into the types of practices prevalent in the selected area. The study revealed associations between menstrual hygiene practices, such as the frequency of changing absorbent materials, cleaning the genital area, and the presence of a foul smell before or after menstruation, with socio-demographic variables[5].

The majority of women attained menarche at 15 years and above, with small variations across studies conducted in different parts of India[1]. Cloth emerged as the predominant choice for menstrual absorbents, with only 35.26% of women consistently using sanitary pads throughout menstruation. The common practice involved washing cloth with soap after use and storing it in various hidden and sometimes unhygienic places until the next menstrual period. Privacy during washing, changing, or cleaning was emphasized as crucial for appropriate menstrual hygiene[16].

Regarding the disposal of used materials, 64.74% of women used cloth, highlighting challenges in personal hygiene practices, including irregular changing of pads and insufficient bathing during menstruation. A significant proportion (86.42%) changed their pads less than three times a day[23], and concealment of absorbent materials was reported by 46.24% of participants[16].

The socio-economic status of respondents showed a significant association with menstrual hygiene practices, with higher education and economic status correlating with better practices. However, no significant associations were found between socio-demographic variables and the frequency of changing absorbent materials or cleaning the genital area. This lack of association could be attributed to limited discussions on menstrual problems before menarche, and mothers may not engage in such discussions with their daughters at the pre-menarcheal stage. Additionally, the religious environment at home and internet exposure did not significantly contribute to creating awareness regarding menstruation

Conclusion

This study highlights the vital need for accurate menstruation information. Personal hygiene during menstruation was suboptimal, influenced by factors like water accessibility and knowledge. Educating adolescents is crucial for health defense. Women require education on menstruation's physiological aspects, and breaking traditional beliefs is essential. Mothers should openly discuss menstruation.

Ethical consideration: Ethical clearance was taken from the institutional ethical committee of the Asian Institute of Public Health (AIPH), Bhub aneswar. Permission was taken from the concerned local authority as well as study participants and were informed that this study will not harm anyone but will be rather benefit for community.

Conflicts of Interest

Authors declare that they haven conflict of interest.

Acknowledgment

My earnest gratitude goes to the Aarohi Organization, supervisors of the Aarohi, ASHA, and Anganwadi workers of the study community, and the study participants for their cooperation throughout this study.

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Table 1: Socio-demographic characteristics of participants (n=346)

	Total (n=346)	
Characteristics	**N**	**%**
Age		
15 – 19 years	**47**	**13.58%**
20 – 29 years	**142**	**41.04%**
30 – 39 years	**105**	**30.35%**
40 – 49 years	**52**	**15.03%**
Age of menarche		
Less than or equal to 11	**2**	**0.58%**
12	**13**	**3.76%**
13	**49**	**14.16%**
14	**100**	**28.90%**
Greater than or equal to 15	**182**	**52.60%**
Caste		
Scheduled Caste	**59**	**17.05%**
Scheduled Tribes	**1**	**0.29%**
Other Backwards Caste	**00**	**00%**
General	**286**	**82.66%**
Other Religions	**00**	**00%**
Education		
Illiterate	**81**	**23.41%**
Primary School	**64**	**18.50%**
Secondary School	**102**	**29.48%**
Higher	**79**	**22.83%**
Others	**20**	**5.78%**
Marital Status		
Married	**269**	**77.75%**
Unmarried	**66**	**19.08%**
Widow	**10**	**2.89%**
Divorce	**1**	**0.29%**
Occupation		
Student	**43**	**12.43%**
Farming	**178**	**51.45%**
Labor	**15**	**4.34%**
Government Job	**6**	**1.73%**
Private Job	**8**	**2.31%**
Teacher	**4**	**1.16%**
Household Help	**78**	**22.54%**
Others	**14**	**4.05%**
Income		
Upper Class	**11**	**3.18%**
Upper Middle	**13**	**3.76%**
Upper Lower	**23**	**6.65%**
Lower Middle	**120**	**34.68%**
Lower Lower	**179**	**51.73%**

Table 2: Association between menstrual hygiene practices and socio-demographic variables (n=346)

Variables	Sanitary Napkins				P-value	The frequency of changing absorbents				P-value	Cleaning of genitalia				P-value
	Yes		No			<=3		>=4			Yes		No		
Age	**N**	**%**	**N**	**%**		**N**	**%**	**N**	**%**		**N**	**%**	**N**	**%**	
15 – 19 years	37	78.72%	10	21.28%	**0.000***	38	80.85%	9	19.15%	**0.022***	42	89.36%	5	10.64%	**0.676**
20 – 29 years	67	47.18%	75	52.82%		116	81.69%	26	18.31%		132	92.96%	10	7.04%	
30 – 39 years	14	13.33%	91	86.67%		95	90.48%	10	9.52%		99	94.29%	6	5.71%	
40 – 49 years	4	7.69%	48	92.315		50	96.15%	2	3.85%		47	90.38%	5	9.62%	
Caste															
Scheduled Caste	17	28.81%	42	71.19%	**0.216**	50	84.75%	9	15.25%	**0.853**	57	96.61%	2	3.39%	**0.398**
Scheduled Tribes	1	100%	0	0.00%		1	100%	0	0%		1	100%	0	0%	
Other Backwards Caste	0	0%	0	0%		0	0%	0	0%		0	0%	0	0%	
General	104	36.36%	182	63.64%		248	86.71%	38	13.29%		262	91.61%	24	8.39%	
Education															
Illiterate	3	3.70%	78	96.30%	**0.000***	75	92.59%	6	7.41%	**0.116**	76	93.83%	5	6.17%	**0.618**
Primary School	10	15.63%	54	84.38%		58	90.63%	6	9.38%		59	92.19%	5	7.81%	
Secondary School	42	41.18%	60	58.82%		87	85.29%	15	14.71%		91	89.22%	11	10.78%	
Higher	51	64.56%	28	35.44%		63	85.29%	15	14.71%		75	94.94%	4	5.06%	
Others	16	80.00%	4	20.00%		16	80.00%	4	20.00%		19	95.00%	1	5.00%	
Marital Status															
Married	74	27.51%	195	72.49%	**0.000***	235	87.36%	34	12.64%	**0.258**	250	92.94%	19	7.06%	**0.598**
Unmarried	48	72.73%	18	27.27%		53	80.30%	13	19.70%		59	89.39%	7	10.61%	
Widow	0	0%	10	100%		10	100%	0	0%		10	100%	0	0%	
Divorce	0	0%	1	100%		1	100%	0	0%		1	100%	0	0%	
Occupation															
Student	31	72.09%	12	27.91%	**0.000***	34	79.07%	9	20.93%	**0.025***	37	86.05%	6	13.95%	**0.145**
Farming	46	25.84%	132	74.16%		162	91.01%	16	8.99%		160	89.89%	18	10.11%	
Labor	1	6.67%	14	93.33%		14	93.33%	1	6.67%		15	100%	0	0%	
Government Job	6	100%	0	0%		5	83.33%	1	16.67%		6	100%	0	0%	
Private Job	3	37.50%	5	62.50%		5	62.50%	3	37.50%		8	100%	0	0%	
Teacher	4	100%	0	0%		2	50.00%	2	50.00%		4	100%	0	0%	
Household Help	27	34.62%	51	65.38%		64	82.05%	14	17.95%		76	97.44%	2	2.56%	
College	4	28.57%	10	71.43%		13	92.86%	1	7.14%		14	100%	0	0%	
Income															
Upper Class	6	54.55%	5	45.45%	**0.000***	10	90.91%	1	9.09%	**0.599**	10	90.91%	1	9.09%	**0.943**
Upper Middle	1	7.69%	12	92.31%		13	100%	0	0%		12	92.31%	1	7.69%	
Upper Lower	14	60.87%	9	39.13%		20	86.96%	3	13.04%		21	91.30%	2	8.70%	
Lower Middle	52	43.33%	68	56.67%		101	84.17%	19	15.83%		113	94.17%	7	5.83%	
Lower Lower	49	27.37%	130	72.63%		155	86.59%	24	13.41%		164	91.62%	15	8.38%	
Discharge															
Yes	58	28.43%	146	71.57%	**0.001***	176	86.27%	28	13.73%	**0.927**	186	91.18%	18	8.82%	**0.268**
No	64	45.07%	78	54.93%		123	86.62%	19	13.38%		134	94.37%	8	5.63%	
Foul Smell															
Yes	31	29.81%	73	70.19%	**0.164**	93	89.42%	11	10.58%	**0.285**	93	89.42%	11	10.58%	**0.157**
No	91	37.60%	151	62.40%		206	85.12%	36	14.88%		227	93.80%	15	6.20%	

Fig1: Distribution of uses of absorbent material during menstruation

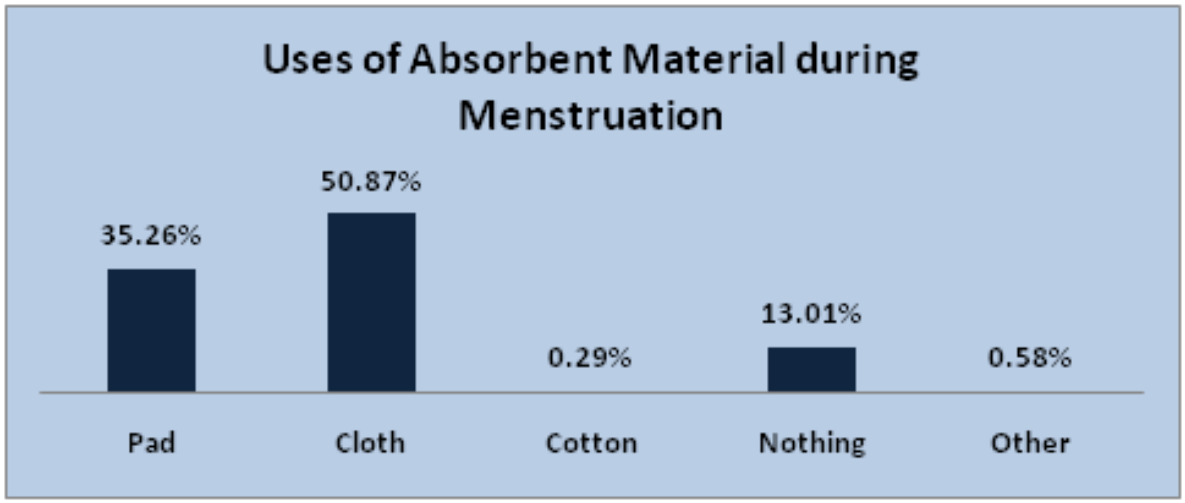

Fig2: Storage of Pads during Menstruation