International Journal of Population Issues
https://journal-center.litpam.com/index.php/ijpi

February 2025 Vol. 2, No. 1
e-ISSN: 3046-9244
pp. 29-48

Investigating Usage of Menstrual Hygiene Methods among Young Tribal Women in India: A Regional Analysis

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Accepted: September 2024. Published: February 2025

Abstract

The portrayal of menstrual blood varies widely, being depicted as sacred, a divine gift, or even a punishment for sin among tribal societies. Meanwhile, maintaining menstrual hygiene is of utmost importance. Very few studies have explored this issue. To address this gap, the present study examines the menstrual hygiene methods region-wise among tribal women aged 15-24 using the National Family Health Survey. The bivariate analysis revealed that the groups of indigenous people who fall outside the predominant Indian social hierarchy are most deprived among all the caste/tribe groups in the usage of hygienic methods. About three-fifths of the young tribal women still use clothes. The prevalence of usage of unhygienic methods among tribal women is highest in Madhya Pradesh (59%), followed by Jammu & Kashmir, Gujarat, Bihar, and Chhattisgarh. Half of the young tribal women from the central region still use unhygienic methods, followed by those from the western, eastern, and northern regions. However, there is an improvement in the usage of menstrual hygiene methods among tribal women. There is a wide cross-sectional variation in educational level, religion, mass media exposure, wealth index, and the type of toilet facility across the regions of India, as revealed by multivariate analysis. The government should mitigate the regional disparity.

Key Words: Young tribal women; Menstrual methods; Hygienic methods; Unhygienic methods

How to cite Verma, A., & Sahoo, H. (2024). Investigating Usage of Menstrual Hygiene Methods among Young Tribal Women in India: A Regional Analysis. *International Journal of Population Issues, 2*(1), 29–48. https://doi.org/10.36312/ijpi.v2i1.2185

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INTRODUCTION

Scheduled tribe is a category embracing indigenous peoples who fall outside the predominant Indian social hierarchy. They are concentrated mainly in Madhya Pradesh, Maharashtra, Rajasthan, Meghalaya, Mizoram, Nagaland, Chhattisgarh, Jharkhand, and Odisha. As per the data obtained from the Census of India, 2011, the tribal population of India was recorded at 104.3 million, which constitutes approximately 8.6% of the total population, containing one-third of the global indigenous population. A total of 705 individual ethnic groups are notified as scheduled Tribes in 30 states/Union Territories (UTs) (Chandramouli, 2013).

Menstrual health has been defined, in alignment with WHO's definition of health, as a "*state of complete physical, mental and social wellbeing and not merely the absence of disease or information about the menstrual cycle*" (Winkler, 2019). A comprehensive definition of menstrual hygiene management was developed by the Joint Monitoring Program of Emory University and UNICEF in 2012, defining menstrual hygiene management as: "*Women and adolescent girls using a clean menstrual management material to absorb or collect blood that can be changed in privacy as often as necessary for the duration*

of the menstruation period, using soap and water for washing the body as required and having access to facilities to dispose of used menstrual management materials". Daily bathing, adequate cleansing of genitalia, and utilisation of sanitary pads constitute a crucial component of a girl's routine for maintaining hygiene. Continuing with regular activities, such as engaging in customary tasks, including physical exertion, and upholding a well-rounded diet abundant in fruits and vegetables teeming with iron and calcium, hold equal significance (Budhathoki et al., 2018).

Menstruation, a normal biological process experienced by all women, remains shrouded in secrecy, taboos, and societal stigma across numerous cultures (Winkler, 2019). Among 355 million menstruating women and girls in the world, many still face significant barriers to enjoying a respectable and comfortable period (Mitra & Hazra, 2023).

The portrayal of menstrual blood varies widely, depicted as sacred, a divine gift, or even a punishment for sin, yet consistently imbued with a sense of magic and strength (Tan et al., 2017). Despite its universality, tribal girls often lack proper menstrual hygiene practices (Borkar et al., 2022). They face restrictions in religious activities, usually imposed by their families, including prohibitions on burning used menstrual materials due to fears of future health issues (Sharma et al., 2006; Mahapatra, 2023). Practices such as the isolation of menstruating individuals and the persistence of restrictive measures perpetuate negative perceptions of menstruation (Dhingra et al., 2009; Thakre et al., 2011). Tribal women, influenced by cultural and traditional beliefs, often feel inhibited and lack the confidence to openly discuss menstrual issues (Senapathi & Kumar, 2018). The absence of open dialogue, particularly between mothers and daughters, leaves young girls in rural and urban settings uninformed about menstruation (Gupta et al., 2018; House et al., 2013).

Menstrual hygiene is defined as the principle of bodily cleanliness during menstruation. It requires basic amenities such as appropriate clothes, absorbent material, water, soap, and toilet amenities with privacy. Poor menstrual hygiene may lead to problems such as irritations or blotches in the perineal area, bad odour, and also major complications such as pelvic inflammatory disease. It is an experience unique to females; the commencement of menstruation marks a crucial milestone in the journey of growth and maturation called menarche (Kumar et al., 2017).

The utilisation of unhygienic menstrual methods poses a barrier to achieving Sustainable Development Goals-3 (SDG-3) (ensuring healthy lives and well-being for all at all ages), SDG-4 (ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all), SDG-5 (promoting gender equality and empowering all women and girls), and SDG-6 (ensuring the availability and sustainable management of water and sanitation for all). According to the World Health Organization, approximately 1.7 billion individuals lack access to basic sanitation. Research indicates that unsafe menstrual hygiene practices are prevalent among young tribal women of India in many regions (Mittal et al., 2023).

Studies in India have shown that economically disadvantaged women bear a significant burden of reproductive morbidity; most of them are not related to pregnancy, and these arise from reproductive tract infections (RTIs), many of which are sexually transmitted. These reproductive illnesses among women often go unreported due to the pervasive 'culture of silence' surrounding them, and women lack access to healthcare for these ailments (Pachauri & Sokhi, 1999). A critical aspect

of managing menstrual hygiene is selecting and effectively using menstrual absorbents. Moreover, many girls and women, obstructed by socio-cultural barriers, lack knowledge about menstruation and safe hygiene practices, putting them at risk of infections (Dasgupta & Sarkar, 2008).

Menstrual hygiene practices are influenced by various factors, including women's understanding and perception of menstruation and the availability of appropriate facilities (Lawan et al., 2010). Research suggests that menstrual behaviours are influenced by several socioeconomic and demographic factors as well (Ghosh & Bose, 2021). In many low and middle-income countries, a significant proportion of the female population practices unhygienic methods during menstruation, with a majority residing in rural areas. Among young women, unhygienic menstruation practices are exacerbated by inadequate information passed down from their mothers, who themselves lack knowledge of reproductive health and hygiene due to illiteracy and low socioeconomic status (Kuhlmann et al., 2017). Additionally, girls are often hesitant to seek help during menstruation from family, friends, and healthcare providers, leading to ignorance of hygienic menstrual methods (Haque et al., 2014).

This is particularly concerning as poor hygiene during periods increases susceptibility to RTIs, which affect millions and can even be transmitted to unborn babies. Poor hygienic menstrual methods often result in severe and long-term health complications such as gastrointestinal, genital, and perineal infections, recurrent RTIs, and even cervical cancer (Dasgupta & Sarkar, 2008; Das et al., 2015; Barman et al., 2017; Mathiyalagen et al., 2017). Additionally, menstruating girls frequently face unnecessary constraints in their daily lives due to insufficient and inaccurate knowledge about menstruation, leading to various psychological issues.

Menstrual hygiene is often overlooked. Therefore, it is crucial to pay close attention to the menstrual needs of this sizable population. Recognising women's health as a fundamental human right underscores the importance of addressing menstrual health. Despite many studies on menstrual methods in India, most have focused on knowledge, awareness, and health issues, with few based on nationally representative data. Research on the determinants of usage of menstrual hygiene methods among tribal women and girls is rare. Additionally, gaining a comprehensive understanding of the complexity of the issue and the factors influencing menstrual methods among young tribal women of India is crucial for effective menstrual hygiene management.

Therefore, this study aimed to assess the level of menstrual hygiene practices and associated factors among young tribal women, identifying socioeconomic and demographic determinants. The findings of this research could inform the development of strategies, policies, and impactful intervention approaches in this critical area.

DATA AND METHOD

Data Source

The data for this study used the fifth round of the National Family Health Survey (NFHS-5) carried out during 2019–21 in India. The International Institute for Population Sciences (IIPS) served as the nodal agency to carry out the survey under the stewardship of the Ministry of Health and Family Welfare (MoHFW), Government

of India, with technical support from ICF International. The NFHS is a large-scale, multi-phase survey conducted across a nationally representative sample of households. The primary aim was to obtain national and state-level insights on various aspects, including fertility, family planning, reproductive health, nutrition, maternal and child health, women's autonomy, and domestic violence. Each successive round of the NFHS has two specific goals. One is to provide essential data on health and family welfare needed by the Ministry of Health and Family Welfare and other agencies for policy and programme purposes, and the other is to provide information on important emerging health and family welfare issues. IIPS, the nodal agency, was responsible for obtaining ethical approval to conduct and disseminate the survey data. The fifth round of the National Family Health Survey adopted a stratified two-stage sampling strategy. Primary sample units (PSUs) were chosen in the first step through population proportion to size sampling (PPS), with villages designated as PSUs in rural areas and Census Enumeration Blocks (CEBs) in urban locales. Subsequently, 22 households were selected per cluster using equal probability systematic sampling.

A total of 664,972 households were chosen for the sample, with 636,699 successfully interviewed and a response rate of 98 per cent. Additionally, 747,176 eligible females aged 15–49 and 111,179 eligible males aged 15–54 were selected for individual interviews. However, interviews were conducted with 724,115 women, with a response rate of 97 per cent, and 101,839 males, with a response rate of 92 per cent. The analysis for the present study was focused on young tribal women aged 15–24 years, with a total sample size of 44,392 individuals. Figure 1 shows the steps to select a representative sample of women of scheduled tribes aged 15-24 for the study from NFHS-5.

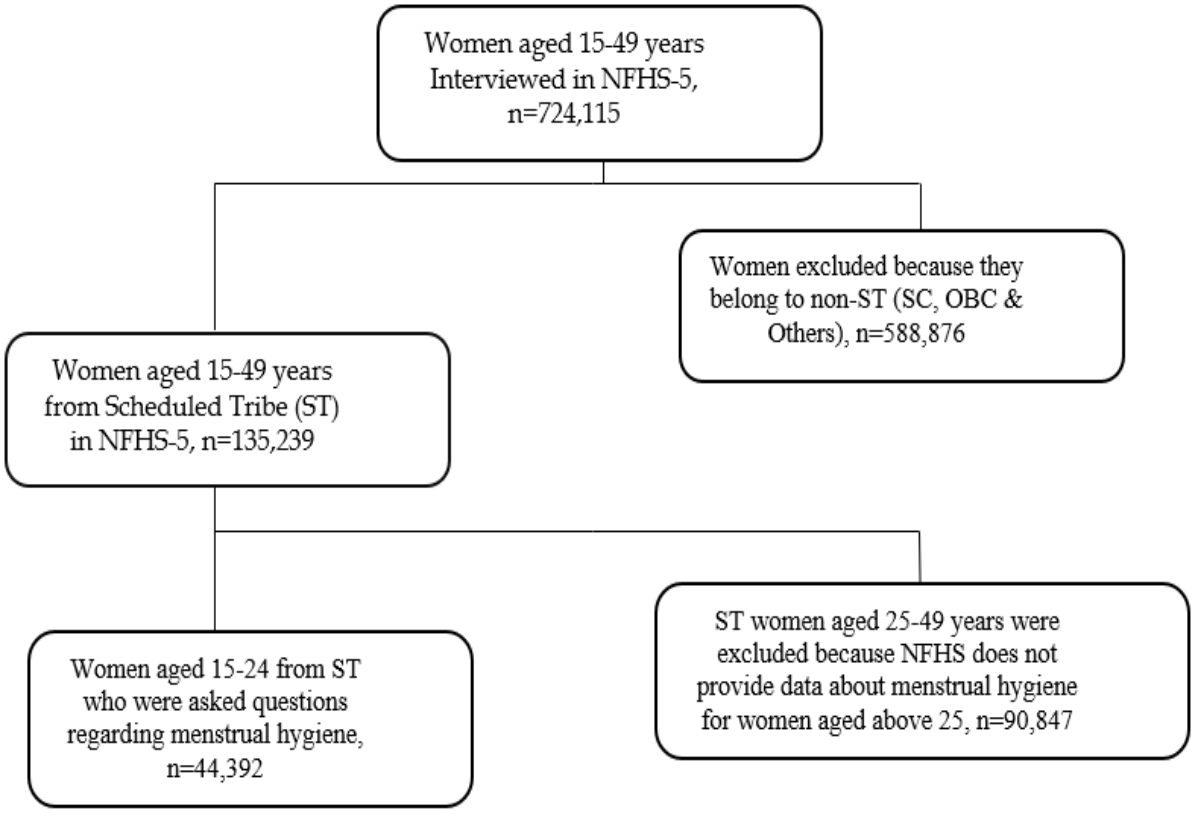


Figure 1. The Steps to Select a Representative Sample of Scheduled Tribe Women aged 15-24 for the Study from NFHS-5 (2019-21)

Outcome Variable

The outcome variable for the study was Menstrual Methods. Women aged 15–24 were asked a direct question about their menstrual methods, i.e., "Women use different methods of protection during their menstrual period to prevent bloodstains from becoming evident. What do you use for protection, if anything?" There were seven responses, i.e. sanitary napkins, locally prepared napkins, tampons, menstrual cups, clothes, nothing, etc. These methods are classified into two categories:

- Hygienic methods, including those women who use hygienic methods: sanitary napkins, locally prepared napkins, tampons, and menstrual cups, and those who also use both hygienic and unhygienic methods.
- Unhygienic methods, including those women who only use unhygienic methods: clothes, others and used nothing.

Predictor Variable

- *Age of respondent*: Respondents were asked about their current age during the survey. This study classified the age of respondents into "15– 19 years" and "20–24 years".
- *Marital status*: When respondents were asked about their current marital status, the responses were, "Never in union" (includes married but Gauna not performed), "Married", "Living with partner", "Windowed", "Divorced", and "Separated". However, in this study, the variable was categorised into three groups: "Never in union", "Currently married/ Living with partner", and "Widowed/Divorced/Separated".
- *Education level*: It was categorised into four groups- 'No education', those who had no formal education; 'Primary', those who had 1-5 years of schooling; 'Secondary', those who had 6-9 years of education; and 'Higher', those who had ten or more than ten years of schooling.
- *Place of Residence*: It was categorised into two groups; 'Urban' and 'Rural'.
- *Wealth Quintile*: The wealth index is a composite index of household amenities and assets; it indicates the socioeconomic condition of a household. In NFHS-5, every household was given a score based on the number of consumer goods they own. A total of 33 assets ranging from a television to a bicycle or car, as well as housing characteristics such as drinking water source, toilet facilities, and floor materials, were considered to prepare a factor score using Principal Component Analysis. This factor score was divided into five equal categories, 'Poorest', 'Poorer', 'Middle', 'Richer', and 'Richest'.
- *Religion*: Religion was recoded into four categories – 'Hindu', 'Muslim', 'Christian', and 'Others'. Others include all religious groups except Hindu, Muslim, and Christian.
- *Region*: The "state" variable was grouped into six categories: 'Northern' includes Jammu & Kashmir, Ladakh, Himachal Pradesh, Punjab, Rajasthan, Haryana, Uttarakhand, Chandigarh (UT) and Delhi; 'Central' includes the states of Uttar Pradesh, Madhya Pradesh, and Chhattisgarh; 'Eastern' includes the states of Bihar, Jharkhand, West Bengal, and Odisha; 'North-Eastern' includes the states of Sikkim, Assam, Meghalaya, Manipur, Mizoram, Nagaland, Tripura, and Arunachal Pradesh. 'Western' consists of the states of Gujarat, Maharashtra, Goa and UTs of Dadra & Nagar Haveli and Daman & Diu; 'Southern' consists of the states of Kerala,

Karnataka, Andhra Pradesh, Tamil Nadu and the UTs of Andaman & Nicobar Islands, Pondicherry and Lakshadweep.

- *Mass media Exposure*: Three questions were asked to women in the NFHS-5 survey. They are (i) how often they read newspapers/magazines, (ii) how often they watch television, iii) how often they listen to the radio, and (iv) how often they go to the cinema hall or theatre to see a movie at least once a month. The responses were 'not at all', 'less than once a week' and, at least once a week'. Based on these responses, a composite index was computed and divided into three categories: 'No Exposure' if the respondent was not exposed to any mass media; 'Partial Exposure' if the respondent was exposed to at least one type of mass media; 'Full Exposure' if the respondent was exposed to all kind of mass media.
- *Type of Toilet*: The type of toilet was categorised into four groups- "Improved toilet facility" includes flush to piped sewer system, flush to septic tank, flush to pit latrine, flush to somewhere else, flush, do not know where, ventilated Improved pit latrine, pit latrine with slab, composting toilet; "Unimproved toilet facility" includes pit latrine without slab/open pit, dry toilet, other; "No facility/Open space" consists of no facility/bush/field; and "not a de jure resident" includes not a de jure resident.
- *Type of home*: We recoded the variable v150 (labeled as "Relationship to household head" in NFHS-5 'individual' dataset) to generate a categorical variable, 'Type of home'. Based on the respondent's relationship with the household head, four categories were created: Marital home, Natal home, Other's home, and Household head. 'Head of the household' respondents who are household heads themselves; 'Marital home' includes wife, daughter-in-law, parent-in-law, sister-in-law; 'Natal home' includes daughter, grandchild, sister, niece, other relatives; 'Other's home' includes non-relatives such as domestic servants working in the household, orphans, deserted young women, and adopted/foster child.

Statistical analyses

Data analysis was performed in STATA MP statistical software version 17. The study started with a descriptive analysis of outcome and predictor variables. Bivariate analysis was performed to provide the percentage distribution of menstrual hygiene practices by the categories of predictor variables. As the outcome variable had two categories (hygienic method and unhygienic methods), logistic regression was used to find the variables related to the use of 'hygienic' and 'unhygienic' methods. The unhygienic method was taken as the reference category in the regression model.

RESULTS AND DISCUSSION

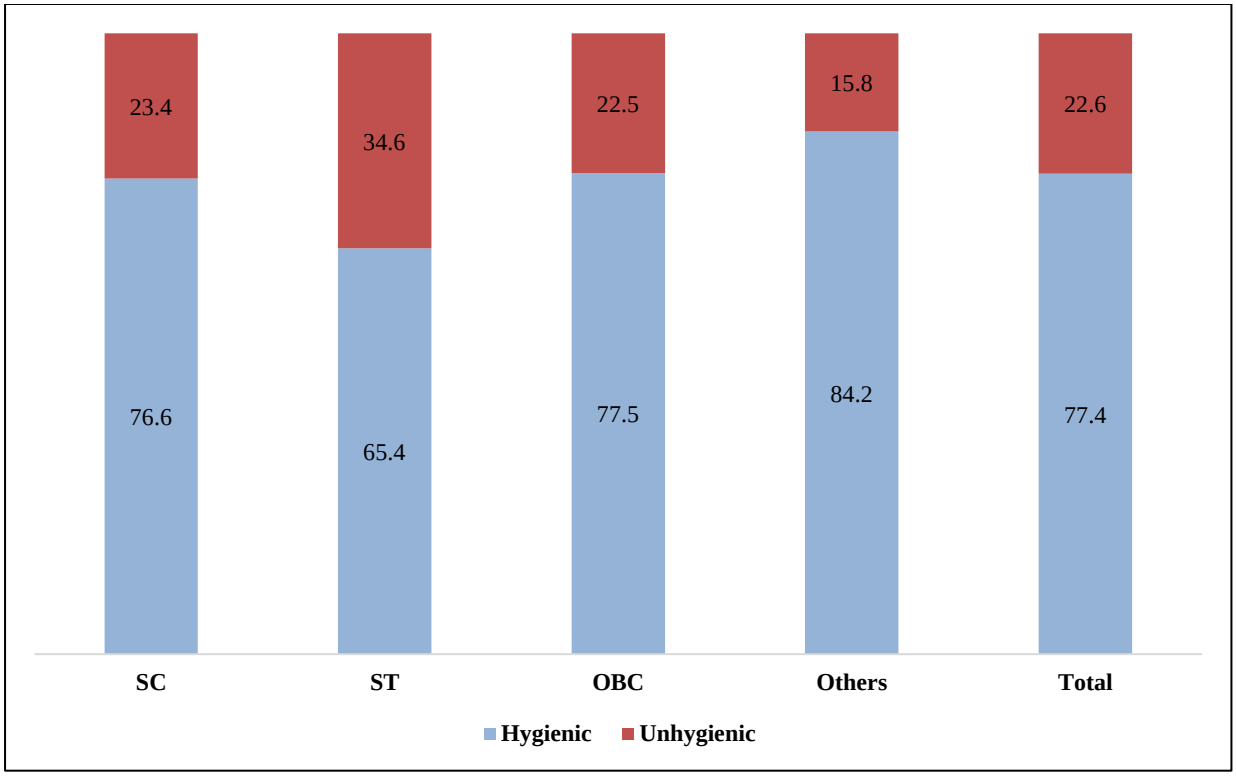
Prevalence of Menstrual Hygienic Methods

Table 1 and Figure 2 show the percentage distribution of young tribal women aged 15-24 using Hygienic and Unhygienic Menstrual methods by Caste/Tribe. It presents that about one-fifth of the women in India were still using unhygienic methods during menstruation. Among them, young tribal women had the lowest prevalence of hygienic methods (65.4 %), followed by Scheduled Caste (SC) (76.6 %), Other Backward Classes (OBC) (77.5 %), and Others (84 %). Most of the tribal women still used clothes (60.5 %), followed by Sanitary napkins (53%) and locally prepared napkins (14 %).

Table 1. Percentage of Young Tribal Women Aged 15-24 Using Hygienic and Unhygienic Menstrual Methods by Caste/Tribe, India, NFHS-5 (2019-21)

Menstrual Methods	SC	ST	OBC	Others	Total
Hygienic	**76.6**	**65.4**	**77.5**	**84.2**	**77.4**
Sanitary napkins	63.3	52.7	63.4	72.3	64.1
Locally prepared napkins	15.0	13.9	15.9	13.6	15.0
Tampons	1.5	1.9	1.7	1.4	1.6
Menstrual cups	0.3	0.3	0.3	0.3	0.3
Unhygienic	**23.4**	**34.6**	**22.5**	**15.8**	**22.6**
Clothes	50.8	60.5	51.0	39.4	49.5
Others	0.2	0.2	0.2	0.2	0.2
Nothing	0.3	0.3	0.2	0.1	0.2
N	**49,136**	**44,392**	**93,969**	**42,212**	**229,709**

Source: Computed from individual data file of NFHS-5



Source: Computed from individual data file of NFHS-5

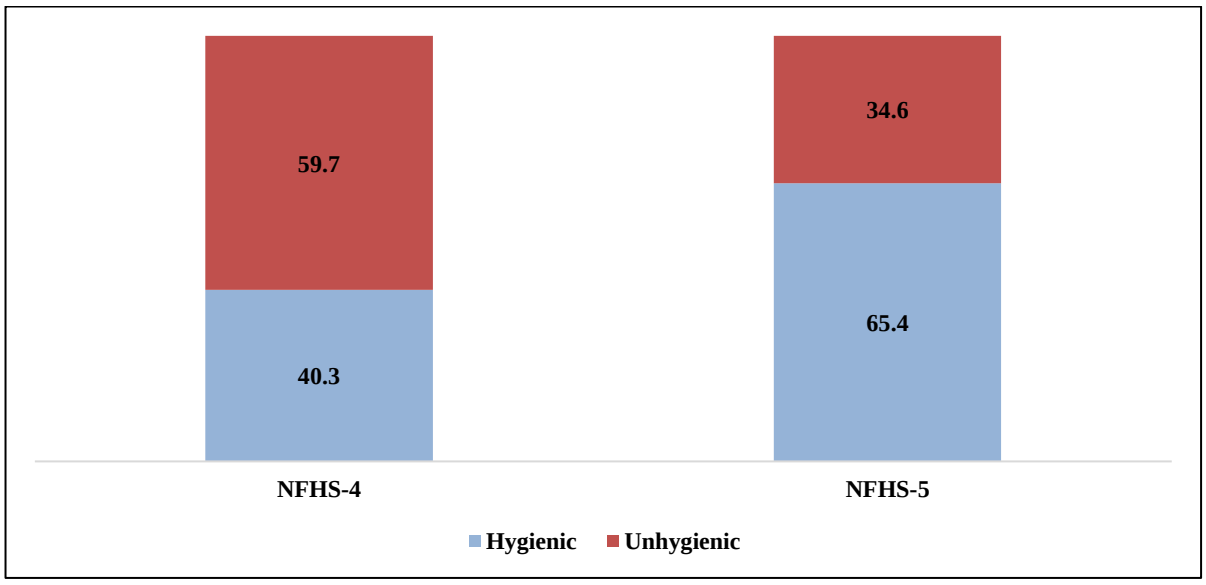
Figure 2. Percentage Distribution of Young Tribal Women Aged 15-24 Using Hygienic and Unhygienic Menstrual Methods by Caste/Tribe, India, NFHS-5 (2019-21)

Table 2 and Figure 3 show the percentage distribution of young tribal women aged 15-24 using Hygienic and Unhygienic Menstrual methods between NFHS-4 and NFHS-5. This indicates a substantial decrease (59.7% in NFHS-4 to 34.6% in NFHS-5) in using unhygienic methods, specifically cloth. Conversely, there was an increase in the utilisation of hygienic methods during menstruation, comprising sanitary pads, locally prepared pads, tampons, and menstrual cups, rising from 40.3 % (NFHS-4) to 65.4 % (NFHS-5).

Table 2. Percentage Distribution of Young Tribal Women Aged 15-24 Using Hygienic and Unhygienic Menstrual Methods in NFHS-4 (2015-16) and NFHS-5 (2019-21)

Menstrual Methods	NFHS-4	NFHS-5
Hygienic	**40.3**	**65.4**
Sanitary napkins	28.03	52.7
Locally prepared napkins	12.4	13.9
Tampons	1.7	1.9
Menstrual cups	NA	0.3
Unhygienic	**59.7**	**34.6**
Clothes	75.4	60.5
Others	0.1	0.2
Nothing	0.7	0.3
N	**44,043**	**44,392**

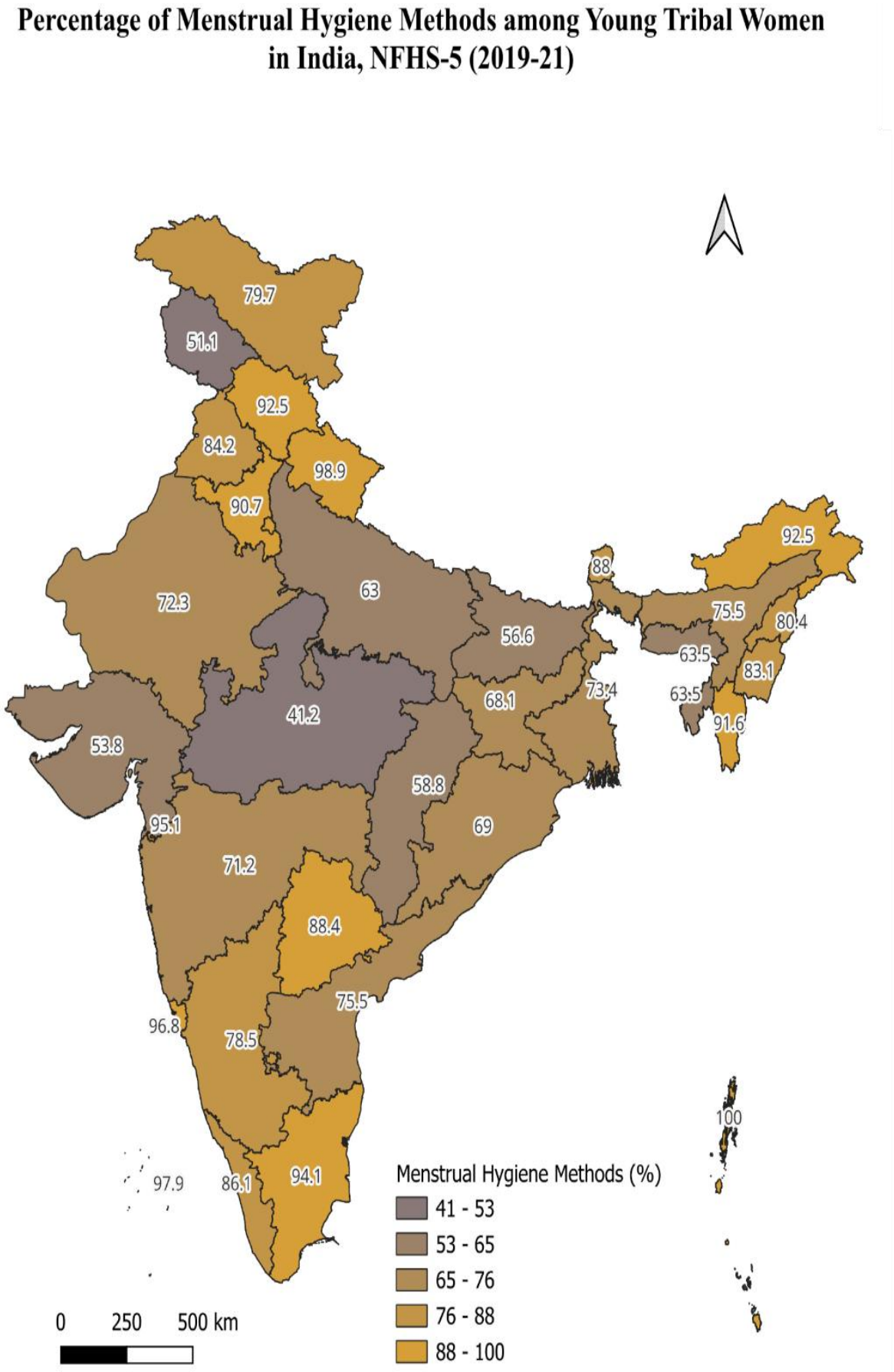
*__Note__: NA- Not Available; Source: Computed from individual data file of NFHS-4 & NFHS-5



Source: Computed from individual data file of NFHS-4 & NFHS-5

Figure 3. Percentage Distribution of Young Tribal Women Aged 15-24 Using Hygienic and Unhygienic Menstrual Methods in NFHS-4 (2015-16) and NFHS-5 (2019-21)

Figure 4 shows the percentage of Menstrual Hygiene Methods among young tribal women aged 15-24. The tribal women of central India used unhygienic menstrual methods more than in other regions. Approximately 59% of tribal women in Madhya Pradesh continue to rely on unhygienic menstrual practices, followed by 49% in Jammu & Kashmir, 46% in Gujarat, 43.4% in Bihar, and 41% in Chhattisgarh. With 36 % prevalence, the tribal women of Tripura and Meghalaya also used unhygienic menstrual methods compared to other states of the northeast region. Mizoram (92 %), Sikkim (88 %), Tripura (42 %), and Nagaland (80.4 %) used more hygienic menstrual methods. Arunachal Pradesh, Himachal Pradesh, Telangana, and Maharashtra were also better at using hygienic methods.



Source: Computed from individual data file of NFHS-5

Figure 4. Percentage of Menstrual Hygiene Methods

Differentials in Menstrual Hygiene Practices

Figure 4 shows the percentage of menstrual hygiene by region among young tribal women. The central region was the most deprived (49.5 %), followed by the western (64.4 %) and eastern (67.8 %). The tribal women from the northeastern and southern regions used more hygienic methods than other parts of the country.

Table 3 shows the percentage of young tribal women using Menstrual Hygiene Methods by region. Half of the tribal women aged 15-24 still used unhygienic methods in the central region. The tribal women from the southern part of India who were not married yet used more hygienic methods (86.5 %) during menstruation than those who were currently married or widowed/divorced/separated, followed by the northeastern (79.1%), northern (77 %), eastern (75.9 %), western (68.1 %) and central part (56.3 %) of the country.

Women with higher education used more hygienic methods (96.5 %) in the southern region, followed by women from the eastern, northern, northeastern, western, and central parts of the country. In addition, having a low level of education negatively affected the usage of hygienic methods.

Across the regions, tribal women residing in urban settings used more hygienic methods than women from rural areas. In the northern part, the tribal women following the Muslim religion used hygienic methods more than women from other religions. Only half of the tribal women practicing Hindu and Muslim religions use hygienic methods during menstruation in the central part of India. In the central and southern parts of the country, only about 30 per cent of tribal women from other religions practice hygienic methods.

Tribal women from all over the country with the highest wealth index used hygienic methods more than those with lower wealth quintiles. In the central region, only 36 % of young tribal women with the lowest wealth quintile use hygienic methods. The western region, northern region, and northeastern region followed it.

In the country, half of the young tribal women who did not have any toilet facilities still used unhygienic methods during menstruation. Improved toilet facilities indicated better menstrual practices. The availability of toilet facilities affected the central region more than any region. Here, half of the tribal women having improved or unimproved toilet facilities still used unhygienic methods. The young tribal women having improved toilet facilities used hygienic methods in the southern region (87 %), followed by the northern region (83.3 %), the northeastern region (77 %), the eastern part (74 %), the western region (73.5 %) and central part (56.4 %) of the country.

In the country, half of the young tribal women who do not have any exposure to mass media use unhygienic methods during their menstruation. Mass media exposure positively affected the usage of hygienic methods. One-third of the young tribal women from the northern region, eastern region, northeastern region, and southern region, without any exposure to mass media, still used unhygienic methods during menstruation.

Women living as heads of their households showed the highest usage of menstrual methods in the southern region (96.8%) and the lowest in the central region (29.9%). Similarly, those living in marital homes report the highest usage in the southern region (77.4%) and the lowest in the central region (37.2%). Among women residing in their natal homes, the southern region again leads with 85.2%, while the

central region shows the lowest at 55.5%. The usage of hygienic menstrual methods among young tribal women living in marital homes is worse.

Table 3. Percentage of Young Tribal Women Using Menstrual Hygiene Methods by Region, NFHS-5 (2019-21)

Age	Northern	Central	Eastern	Northeast	Western	Southern	India
15-19	74.4	51.6	72.1	75.1	64	85.9	67.3
20-24	71.2	47.4	63.4	73.6	64.9	79.4	63.4
Marital Status							
Never in union	77	56.3	75.9	79.1	68.1	86.5	70.8
Currently married/Living with partner	66.2	37	57.8	65.1	60.1	77.7	57.5
Widowed/Divorced/Separated	37.5	39.9	63.9	52.7	49.7	68.3	52.3
Education level							
No education	43.2	19	38.3	41.5	41	50	36.1
Primary	53.5	31.6	52.4	49.2	46.5	55.3	46.1
Secondary	78.3	52.7	75.1	75.9	66.3	85.4	69.2
Higher	90.6	83.1	92.3	90.1	89.8	96.5	90.2
Residence							
Urban	89.7	76.5	83.9	89.7	83.1	90.1	84.8
Rural	71.3	46.6	65.9	70.8	61	79.9	62.4
Religion							
Hindu	73.9	49.5	66.5	74	64.2	82.6	64.4
Muslim	55.5	53.5	63.8	76.1	72	85.5	63.9
Christian	87.6	70.6	73.7	74.5	60.8	77.1	74.1
Other	87.9	30.8	74	74.8	86.3	29.8	70.9
Wealth Index							
Poorest	58	35.9	61.5	58.3	46.2	66.2	51.3
Poorer	72.4	57.7	76.5	74.3	65.2	77.4	69.1
Middle	82.8	67.6	84.2	85.6	69.5	84.3	77.6
Richer	91.7	84.7	84.2	91.3	82.7	93	87.6
Richest	96.3	92.9	98.4	93.4	92.2	97.9	94.7
Toilet Facility							
Improved toilet facility	83.3	56.4	74.4	76.7	73.5	87	72.1
Unimproved toilet facility	50.9	51	73.5	59.3	57.7	59.6	60.3
No facility/open space	63.2	35.4	60.3	55.1	51.4	74.2	54.3
Not a de jure resident	65.8	52.4	62.3	66.6	61.9	78.4	63.4
Mass media Exposure							
No Exposure	66.7	38.9	61	66.4	52.4	65.6	55
Partial Exposure	81.1	62.2	80.4	80.8	71.2	83.4	74.8
Full Exposure	90.4	74.3	80.2	85.5	85.8	93.9	85.4
Type of Home							
Household head	79.4	29.9	63.4	64.3	78.8	96.8	60.1
Marital home	67.3	37.2	58.2	68.5	60.6	77.4	57.7
Natal Home	75.5	55.5	74	76.8	66.7	85.2	69.5
Other's home	58.6	69.2	74.9	80.5	62.8	96.5	77.5
Total	**72.9**	**49.5**	**67.8**	**74.4**	**64.4**	**82.5**	**65.4**

Source: Computed from individual data file of NFHS-5

Factors affecting the Usage of Hygienic Menstrual Methods

Table 4 analyses the odd ratios and confidence intervals logistic regression for each background characteristic to understand the association between these factors and the use of hygienic and unhygienic menstrual methods. The unhygienic methods was selected as the reference category. The tribal women aged 20-24 were 1.1 times more likely to use hygienic methods [OR 1.116, 95% C. I.: 1.019-1.223] compared to women aged 15-19 in the northeastern region and were 57% less likely to use hygienic methods [OR 0.575, 95% C. I.: 0.433-0.765] in the southern region.

In the northern region, the currently married or living with partner tribal women were 40% less likely to use hygienic methods than those never in a union [OR 0.606, 95% C. I.: 0.387-0.948]. The Widowed/Divorced/Separated women were 74 % less likely to use hygienic methods [OR 0.266, 95% C. I.: 0.085-0.837]. In the central region, the currently married or living with partner tribal women were 50 % less likely to use hygienic methods than those never in a union [OR 0.515, 95% C. I.: 0.393-0.675]. The Widowed/Divorced/Separated women were 63 % less likely to use hygienic methods [OR 0.37, 95% C. I.: 0.183-0.749]. In the eastern region, the currently married or living with partner tribal women were 37 % less likely to use hygienic methods than those never in a union [OR 0.638, 95% C. I.: 0.5-0.814]. In the northeastern region, the currently married or living with partner tribal women were 58 % less likely to use hygienic methods than those never in a union [OR 0.419, 95% C. I.: 0.361-0.487]. The Widowed/Divorced/Separated women were 63 % less likely to use hygienic methods [OR 0.37, 95% C. I.: 0.287-0.489]. In the western region, the currently married or living with partner tribal women were 40 % less likely to use hygienic methods than those never in a union [OR 0.605, 95% C. I.: 0.45-0.812]. At the India level, the currently married or living with partner tribal women were 50 % less likely to use hygienic methods than those never in a union [OR 0.516, 95% C. I.: 0.467-0.571]. The Widowed/Divorced/Separated women were 56 % less likely to use hygienic methods [OR 0.441, 95% C. I.: 0.357-0.544].

In northern [OR 0.63, 95% C. I.: 0.423-0.938] and central region [OR 0.606, 95% C. I.: 0.486-0.754], those who were living in rural areas were 40 % times less likely to use hygienic methods compared to tribal women living in urban areas. At the country level, those living in rural areas were 30 % times less likely to use hygienic methods than tribal women living in urban areas [OR 0.712, 95% C. I.: 0.649-0.782].

In the country, young tribal women practising the Muslim religion were 50 % less likely to use hygienic methods [OR 0.483, 95% C. I.: 0.42-0.556]. Those young tribal women following the Muslim religion were 68 % less likely to use hygienic methods in the northern region [OR 0.324, 95% C. I.: 0.259-0.405] and 40 % less likely in the eastern region [OR 0.607, 95% C. I.: 0.393-0.936] compared to Hindu women. Women belonging to the Christian religion were 2.5-fold in the central region [OR 2.463, 95% C. I.: 1.489-4.073] and 1.3-fold in the eastern region [OR 1.337, 95% C. I.: 1.113-1.606] more likely to use hygienic methods compared to Hindu women. In the southern region, the tribal women following the the Christian religion were 4.9 times more likely to use hygienic methods than those practising the Hindu religion [OR 4.867, 95% C. I.: 2.21-10.722].

A positive relationship could be found between the usage of hygienic methods and the years of schooling. In India, the tribal women having the highest year of

schooling were 5.6-fold more likely to use hygienic methods during menstruation [OR 5.593, 95% C. I.: 4.929-6.346].

The tribal women belonging to the southern region were more likely to use hygienic methods [OR 9.778, 95% C. I.: 5.46-17.511] followed by the central region [OR 7.831, 95% C. I.: 5.941-10.322], eastern region [OR 7.674, 95% C. I.: 5.379-10.95], northern region [OR 5.542, 95% C. I.: 3.942-7.791]. Across the regions, the likelihood of using hygienic methods during menstruation increased with the increasing wealth quintile. For example, women with the highest wealth index were more likely to use hygienic methods than women with a lower wealth index. In the northern region, poorer tribal women were 50 % less likely to use hygienic methods than the poorest women [OR 1.521, 95% C. I.: 1.271-1.821]. In the central part of India, the poorer tribal women were 1.7 times more likely to use hygienic methods in comparison with the poorest tribal women [OR 1.785, 95% C. I.: 1.591-2.004] followed by the northeastern region [OR 1.778, 95% C. I.: 1.622-1.949], and western region [OR 1.649, 95% C. I.: 1.396-1.946].

In the country, women having unimproved toilet facilities [OR 0.701, 95% C.I.: 0.631-0.78] or not having any toilet facilities [OR 0.739, 95% C.I. 0.696-0.784] were less likely to use hygienic methods compared to women having improved toilet facilities. In the central region [OR 0.765, 95% C.I.: 0.688-0.851], western [OR 0.793, 95% C.I.: 0.704-0.893] and southern part of India [OR 0.767, 95% C.I.: 0.58-1.015], tribal women not having any toilet facility were equally less likely to use hygienic methods compared to women having improved toilet facility.

Mass media exposure and usage of hygienic methods had a positive relationship with each other. In the country, young tribal women with full exposure to mass media are 1.77 times more likely to use hygienic methods than those without exposure to mass media [OR 1.778, 95% C.I.: 1.588-1.992]. Those who are partially exposed to mass media were 1.5 times more likely to use hygienic methods compared to not have any exposure to mass media in the central region [OR 1.547, 95% C.I.: 1.392-1.72], eastern region [OR 1.539, 95% C.I.: 1.335-1.775], western [OR 1.501, 95% C.I.: 1.297-1.737] and southern region [OR 1.507, 95% C.I.: 1.155-1.966].

In the country, women living in marital home were 1.5 times more likely to use hygienic methods compared to women who were heads of their household [OR 1.502, C.I.: 1.26-1.79], and women residing in other's home are 30 % less likely to use hygienic methods compared to women who are the head of their household [OR 0.702, C.I.: 0.478-1.029]. Young tribal women living in marital home were 2.1 times more likely to use hygienic methods compared to women who were head of the household in the region of central [OR 2.14, C.I.: 1.15-3.984] and northeast India [OR 2.101, C.I.: 1.673-2.638].

The tribal women from the eastern region [OR 1.18, C.I.: 1.069-1.303] and southern region [OR 1.249, C.I.: 1.09-1.43] were 1.2 times more likely to use hygienic methods than the northern region. In addition, women from the central, northeastern, and western parts of the country were less likely to use hygienic methods compared to the northern region.

Table 4. Odd Ratio (OR) Showing the Effects of Background Variables on Menstrual Hygiene Methods among Young Tribal Women by Region: Results from Logistic Regression Analysis, NFHS-5 (2019-21)

Background Characteristics	Northern		Central		Eastern		Northeast		Western		Southern		India	
	OR	95 % C.I.	OR	95 % C.I.	OR	95 % C.I.	OR	95 % C.I.	OR	95 % C.I.	OR	95 % C.I.	OR	95 % C.I.
Age														
15-19®														
20-24	0.933	0.774-1.126	1.018	0.908-1.142	0.911	0.798-1.041	1.116**	1.019-1.223	1.05	0.889-1.239	0.575***	0.433-0.765	1.003	0.95-1.059
Marital Status														
Never in Union®														
Currently married/Living with partner	0.606**	0.387-0.948	0.515***	0.393-0.675	0.638***	0.5-0.814	0.419***	0.361-0.487	0.605***	0.45-0.812	0.984	0.617-1.569	0.516***	0.467-0.571
Widowed/Divorced/Separated	0.266**	0.085-0.837	0.37***	0.183-0.749	1.012	0.547-1.87	0.374***	0.287-0.489	0.549	0.241-1.25	1.328	0.432-4.086	0.441***	0.357-0.544
Residence														
Urban®														
Rural	0.63**	0.423-0.938	0.606***	0.486-0.754	0.707**	0.536-0.933	0.71***	0.619-0.814	0.795	0.589-1.074	1.311	0.922-1.864	0.712***	0.649-0.782
Religion														
Hindu®														
Muslim	0.324***	0.259-0.405	0.831	0.459-1.503	0.607**	0.393-0.936	1.584	0.564-4.451	0.875	0.388-1.976	2.491***	1.412-4.393	0.483***	0.42-0.556
Christian	1.813	0.184-17.841	2.463***	1.489-4.073	1.337***	1.113-1.606	0.81***	0.731-0.898	0.659	0.384-1.131	4.867***	2.21-10.722	0.936	0.865-1.013
Other	1.614*	0.957-2.723	0.423***	0.278-0.644	1.518***	1.272-1.812	1.21**	1.046-1.398	5.94**	1.31-26.935	0.1*	0.01-1.033	1.319***	1.193-1.457
Education level														
No Education®														
Primary	1.283*	0.959-1.716	1.723***	1.382-2.15	1.448***	1.195-1.756	1.242**	1.015-1.52	1.184	0.882-1.588	0.902	0.569-1.432	1.402***	1.272-1.545
Secondary	3.217***	2.578-4.015	3.314***	2.796-3.928	3.384***	2.918-3.925	2.45***	2.061-2.912	1.771***	1.404-2.234	2.707***	1.924-3.809	2.883***	2.67-3.113
Higher	5.542***	3.942-7.791	7.831***	5.941-10.322	7.674***	5.379-10.95	3.837***	3.017-4.881	3.438***	2.375-4.978	9.778***	5.46-17.511	5.593***	4.929-6.346
Wealth index														
Poorest®														
Poorer	1.521***	1.271-1.821	1.785***	1.591-2.004	1.326***	1.136-1.548	1.778***	1.622-1.949	1.649***	1.396-1.946	1.344*	0.975-1.853	1.644***	1.555-1.739
Middle	2.167***	1.689-2.781	2.306***	1.94-2.743	1.5***	1.145-1.964	2.775***	2.454-3.139	1.965***	1.592-2.424	1.598**	1.106-2.31	2.288***	2.118-2.471
Richer	4.014***	2.778-5.8	4.245***	3.177-5.67	2.076***	1.213-3.554	3.698***	3.087-4.429	2.854***	2.104-3.871	2.933***	1.804-4.769	3.53***	3.138-3.971
Richest	6.48***	3.513-11.955	6.089***	3.631-10.211	6.737***	1.62-28.024	4.22***	3.139-5.675	6.037***	3.356-10.859	3.225***	1.432-7.265	5.079***	4.13-6.247

Continue…

Continue….

Toilet Facility														
Improved toilet facility®														
Unimproved toilet facility	0.822	0.621-1.088	0.931	0.663-1.306	1.224	0.862-1.737	0.632***	0.547-0.731	1.06	0.646-1.74	0.271***	0.141-0.518	0.701***	0.631-0.78
No facility/open space	0.681***	0.562-0.825	0.765***	0.688-0.851	0.793***	0.704-0.893	0.622***	0.501-0.771	0.753***	0.646-0.878	0.767*	0.58-1.015	0.739***	0.696-0.784
Not a de jure resident	0.776	0.495-1.216	1.551**	1.108-2.172	1.164	0.786-1.725	1.02	0.71-1.467	0.926	0.623-1.378	0.997	0.54-1.841	1.137	0.971-1.333
Mass Media Exposure														
No Exposure®														
Partial Exposure	1.206**	1.018-1.429	1.547***	1.392-1.72	1.539***	1.335-1.775	1.293***	1.188-1.408	1.501***	1.297-1.737	1.507***	1.155-1.966	1.377***	1.309-1.45
Full Exposure	1.633**	1.062-2.511	2.306***	1.813-2.934	1.71***	1.224-2.388	1.314***	1.094-1.578	2.148***	1.575-2.931	3.305***	2.142-5.097	1.778***	1.588-1.992
Type of home														
Household head®														
Marital home	0.413	0.106-1.616	2.14**	1.15-3.984	0.841	0.57-1.24	2.101***	1.673-2.638	0.978	0.299-3.204	0.449	0.052-3.909	1.502***	1.26-1.79
Natal home	0.273*	0.066-1.131	1.982**	1.07-3.672	0.817	0.541-1.235	1.094	0.868-1.379	0.744	0.23-2.407	0.4	0.045-3.525	1.08	0.902-1.294
Other's home	0.144*	0.017-1.199	1.026	0.293-3.594	0.526	0.128-2.163	0.666*	0.421-1.054	2.007	0.136-29.532	0.673	0.031-14.722	0.702*	0.478-1.029
Region														
Northern®														
Central													0.371***	0.338-0.408
Eastern													1.18***	1.069-1.303
Northeast													0.971	0.871-1.082
Western													0.497***	0.447-0.553
Southern													1.249***	1.09-1.43
Constants	**5.185****	**1.17-22.978**	**0.213*****	**0.109-0.416**	**1.473**	**0.878-2.472**	**1.258**	**0.908-1.743**	**0.951**	**0.281-3.216**	**2.176**	**0.23-20.599**	**1.069**	**0.847-1.35**

® represents the reference category; *, **, *** refers to < 0.05, < 0.01 and < 0.001 level of significance

Source: Computed from individual data file of NFHS-5

Discussion

It was reported that the usage of clothes decreased from 75% in the NFHS-4 to 60 % in the NFHS-5 among young tribal women but the prevalence of usage of clothes was still high. Other studies also indicated using clothes as a frequently used absorbent (Mittal et al., 2023). The present study shows a positive association between the usage of hygienic methods and the years of schooling. At the country level, the currently married tribal women were 50 % less likely to use hygienic methods compared to those who were never in a union. Similar studies also showed that the prevalence of hygienic methods was higher among never-married women than currently married women.

Many studies indicated that women's reproductive health was influenced by various factors except biological or genetic aspects, encompassing social, demographic, economic, cultural, healthcare service-related, and knowledge-related dimensions (Babu, 2017). Our study shows that women who had full exposure to mass media were 1.77 times more likely to use hygienic methods than those who had not been exposed to mass media. Those partially exposed to mass media were 1.5 times more likely to use hygienic methods than those not exposed to mass media in the central, eastern, western, and southern regions. It was consistent with similar findings which emphasised the impact of media on menstrual hygiene practices among tribal women (Upashe et al., 2015). Moreover, another study identified a similar relationship between menstrual methods, educational attainment, and mass media exposure (Ramya, 2020).

Other studies also underscored the influence of lower socio-economic status and limited access to information and resources on menstrual behaviours (El-Gilany et al., 2005; Adinma & Adinma, 2008). This study also presents that across the regions, the likelihood of using hygienic methods during menstruation increases with the increase of wealth quintile, such as women who were wealthiest in the wealth index were more likely to use hygienic methods than women with lower wealth index. In the northern region, poorer tribal women were 50 % less likely to use hygienic methods than the poorest women. Previous studies also supported the positive association (Meher & Sahoo, 2023; Anand et al., 2015). Poverty encompasses more than just income scarcity; it includes a lack of access to services, resources, skills, vulnerability, insecurity, and powerlessness (Bourne & Rhule, 2009).

Additionally, the place of residence significantly affected menstrual method usage, with rural dwellers exhibiting a lower likelihood of hygienic practices than their urban counterparts in this study. Moreover, in northern and central regions, those living in rural areas were 40 % less likely to use hygienic methods than tribal women living in urban areas. This aligned with previous research, which found that rural residents used unhygienic methods of menstrual practices (Meher & Sahoo, 2023).

The study also underscores the role of toilet facilities; women needing improved facilities were less likely to adopt hygienic methods. In the central, western, and southern parts of India, tribal women without toilet facilities were equally less likely to use hygienic methods than women who had improved toilet facilities. This echoed the findings that emphasised the relationship between toilet facilities and menstrual hygiene practices (Singh & Anand, 2018; Kathuria & TP, 2022).

Significant disparities existed regionally, with some states showing alarming dependence on unhygienic methods while others exhibited promising adoption of hygienic practices. Notably, Madhya Pradesh stood out with a high prevalence of unhygienic practices at 59 %, consistent with earlier findings (Meher & Sahoo, 2023). With the high prevalence of hygienic methods, Mizoram, Sikkim, Tripura, and Nagaland were doing much better among the northeastern states. Conversely, Arunachal Pradesh, Himachal Pradesh, Telangana, and Maharashtra demonstrated higher hygienic practices, emphasising the need for region-specific interventions to promote menstrual hygiene. Ultimately, concerted efforts were required to raise awareness, enhance access to sanitary products, and address socio-cultural barriers, fostering widespread adoption of hygienic menstrual methods and improving women's reproductive health outcomes nationwide. These findings underscore the urgency of targeted interventions tailored to each state's unique needs and practices to foster a culture of menstrual hygiene and enhance overall reproductive health outcomes nationwide.

Limitations

The National Family Health Survey (NFHS-5) provided data on menstrual hygiene practices among women who were 15 to 24 years old only. The data were self-reported and, therefore, subject to recall bias. In Indian society, socio-cultural norms play a crucial role in deciding the Menstrual practices of young women. Thus, menstrual hygiene practices might be controlled by many socio-cultural factors and existing customs. The researchers could not include these factors in the analysis due to a lack of information in the dataset. Detailed qualitative research needs to be studied, and community data is required to collect their varying socio-cultural beliefs about menstrual practices for planning future tribal health programs.

CONCLUSION

The health of the scheduled tribes is the most deprived among all the communities in India. The health of tribal women is the most crucial aspect of their community. Menstrual health has increasingly become a secretive and stigmatized issue over time. It is, therefore, essential to help them overcome these beliefs, misconceptions, and restrictions. It can be achieved with the help of awareness camps or training programmes and comprehensive menstrual health education in school curricula. All mothers should be encouraged to break inhibition about discussing with their daughters regarding menstruation and menstrual hygiene. Menstrual hygiene is the most overlooked area among reproductive health issues. Hence, young women must have adequate resources and facilities to maintain hygiene during menstruation.

The present study concludes that the poorest menstrual hygiene practices were found among Scheduled tribe women aged 15-24 compared to other caste groups. However, there was a substantial increase in the usage of Hygienic methods between the NFHS-4 and NFHS-5 among young tribal women. The study identified the tribal societies of central India, i.e. Madhya Pradesh, Gujarat, and Chhattisgarh, as using unhygienic methods at large scale, followed by tribal women of the western and eastern regions. This necessitated concentrating efforts to address unhygienic menstrual methods in these areas. Therefore, it was required to develop comprehensive menstrual health awareness among tribal communities. The states of

the northeast region, such as Mizoram, Sikkim, and Tripura, had the highest prevalence of using hygienic methods after the southern states.

Furthermore, the study underscores the significant association of religion, education level, wealth index, toilet facilities, mass media exposure, and region with the utilisation of menstrual methods among young tribal women of India. Respondents' age was a significant determinant of using hygienic methods among the tribal women of the northeastern and southern regions. Marital status had a substantial relationship with menstrual hygiene methods among tribal women all over the country except in the southern part of India. In addition, among the tribal women across the regions except the western and southern regions, the place of residence was the major factor affecting the usage of hygienic methods during menstruation. The type of home was also a determining factor in the usage of hygienic methods in the northern, central, and northeastern parts of India. These findings offered valuable insights into the varying adoption of hygienic menstrual methods across the regions, emphasising the importance of targeted interventions to promote hygienic practices and enhance women's reproductive health outcomes nationwide. The government should offer sustainable, practical, and cost-effective alternatives to mitigate the disparity in using hygienic methods across the country, where sanitary conditions are not good.

Funding

The authors received no funding for this study.

Conflicts of Interest

None declared.

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