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Role of socio-economic factors, women empowerment, and governance in menstrual hygiene management in EAG states, India

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Abstract

Objective: The study aims to examine the progress in menstrual hygiene management in the Empowered Action Group (EAG) states, India between 2015-16 and 2019-21 and identify its correlates in terms of household characteristics, women's characteristics, and quality of governance at the state level.

Methods: The National Family Health Survey (NFHS) is the primary data source for state-wise data on hygienic methods of menstrual protection (HMMP) and its potential correlates, namely household-level and women-specific characteristics. To assess the role of the quality of governance in the adoption of HMMP practices, the Governance Index is constructed using data on eleven variables from various secondary sources. The method of principal component analysis is used to construct the Women Empowerment Index and the Governance Index. The statistical methods also include computation of Karl Pearson's bivariate correlation coefficients between the percent of women adopting HMMP practices and the covariates namely, household and women's characteristics and the governance index as well as testing the statistical significance of the estimated correlation coefficients.

Results: The study finds that the use of HMMP is positively correlated with household characteristics namely household wealth and general caste; women's characteristics namely women's education, empowerment, and exposure to the internet; and governance factors at the state-level. The study, however, does not find religion and exposure to mass media as exhibiting a statistically significant relationship with menstrual hygiene practices. Among the EAG states, Bihar and Madhya Pradesh exhibit the worst performance in HMMP, while Uttarakhand is the best performer and is an outlier with its exemplary performance in HMMP as well as in socio-economic indicators. Odisha and Rajasthan, despite mediocre performance in some of the socio-economic characteristics, show considerable improvements in menstrual hygiene largely due to successful government initiatives.

Conclusion: The interplay of household, women's characteristics and governance contributes to the poor performance of EAG states of Uttar Pradesh, Madhya Pradesh, Bihar and Chhattisgarh as compared to other states. The experience of EAG states highlights the importance of targeted state interventions and governance along with a supportive socio-economic environment in achieving the menstrual health of women. In addition to ensuring adequate income support, reducing social disparities, dispelling myths and taboos regarding menstrual health, and empowering women; the allocation of adequate funds and trained personnel can contribute significantly to the effective implementation of government schemes for improvements in menstrual hygiene.

Introduction

Ensuring safe and affordable methods of protection during menstruation is a basic feminine right that has received global and national recognition in the last two decades.[1,2] The ability of women to effectively manage their menstrual health requires the availability of affordable menstrual hygiene materials, and access to WASH facilities (i.e. water, sanitation, and hygiene).[1] In addition, greater awareness is necessary for the adoption of healthy menstrual practices. In many countries where menstruation is associated with social and cultural taboos, women face additional challenges. Although effective menstrual hygiene management (MHM) is not mentioned as a separate sustainable development goal (SDG), it is embedded in many of the SDG goals, including SDG 3, (ensuring healthy lives and promoting well-being for all), SDG 4, (ensuring inclusive and equitable quality education), SDG 5, (achieving gender equality and empowering all women and girls), SDG 6, (ensuring clean water and sanitation for all) and SDG 8, (productive employment and decent work for all).

For long considered a taboo subject, with the opening up of conversations on menstrual issues and concerted public campaigns, there has been a significant increase in the adoption of hygienic methods of menstrual protection by girls and women in India, from 57.6 percent in 2015-16 to 77.6 percent in 2019-21.[3,4] However, there are significant inter-state disparities. The prevalence of hygienic practices is observed to be highest in the state of Tamil Nadu (98%), followed by Goa (97%), and Kerala (93%) while the states of Bihar and Madhya Pradesh have the lowest prevalence of nearly 60% in 2019-21.[4] The Empowered Action Group (EAG) was set up in India in 2001 to facilitate area-specif-

ic programmes in eight states namely, Bihar, Jharkhand, Madhya Pradesh, Chhattisgarh, Orissa, Rajasthan, Uttar Pradesh, and Uttarakhand. These eight states lag in many socio-economic indicators and account for nearly half of India's population.[5]

The review of the literature shows that the use of hygienic methods for menstrual protection (HMMP) is found to be higher among women living in urban areas, and those belonging to higher wealth quantiles, having media exposure and using toilet facilities; and lower among Muslims and scheduled tribes in various states in 2015-16 (NFHS-4) and/or 2019-20 (NFHS-5).[6,7,8] Other important determinants of HMMP are found to be water and sanitation facilities[8,9]; women's education, household wealth, media exposure, having toilet facilities, awareness of sexually transmitted infections (STIs)[10] and women empowerment indicated by having a bank account, mobile phone, and participation in making household decisions.[11] Lack of knowledge and the high cost of sanitary napkins act as barriers to ending period poverty.[12] Adoption of good practices is also hindered by cultural and religious beliefs of people regarding menstruation.[13] Lack of proper disposal facilities is another critical factor in MHM.[13,14] The market penetration rate for sanitary napkin use among the Indian female population is a meagre 10–11% in sharp contrast with 73-92% in Europe and the United States.[15]

The objective of the present study is to examine the progress in menstrual hygiene management in the eight EAG states of India between 2015-16 and 2019-21 and identify the correlates in terms of household characteristics, women's characteristics, and governance for 2019-21. Most existing studies have either primarily focused on household and women-related characteristics or issues related to governance. This study investigates the role of all three covariates in the prevalence of menstrual hygiene and how differential outcomes across EAG states can be understood in the context of state-level efforts and the performance of menstrual hygiene schemes.

Materials and Methods

The National Family Health Survey (NFHS) is a nationwide survey conducted by the Ministry of Health and Family Welfare, Government of India, related to population, health, family planning, nutrition, and women empowerment.[3,4] The secondary data sources used in this study include fact sheets and reports from NFHS-4 for 2015-16 and NFHS-5 for 2019-21.

The data collection on menstrual hygiene was initiated in 2015-16 in NFHS-4. In NFHS-5, a total of 1,26,828 young women in the age group 15-24 in the EAG states, who have ever menstruated, were enquired about the materials used during the menstrual period, the options being locally prepared napkins, sanitary napkins, tampons, menstrual cups, cloth, nothing, and others. The methods of protection categorized as hygienic include locally prepared napkins, sanitary napkins, menstrual cups, and tampons.[4]

This study analyses three types of correlates of menstrual hygiene practices – household-level characteristics, women-specific characteristics, and efficacy of state-level governance. The household characteristics include household wealth, caste, and religion. The women-specific characteristics include women's education, exposure to mass media, and the internet, women's employment, and the status of women. As an indicator of women's status, the Women Empowerment (WE) index is constructed using five variables-currently married women who usually participate in household decisions (%), women having a bank or savings account that they themselves use (%), women having a mobile phone that they themselves use (%), ever-married women who have ever experienced spousal violence (%) and women age 20-24 years married before age 18 years (%). The data on variables related to household and women's characteristics are accessed from NFHS-5.

The Governance Index is constructed using eleven variables namely, density per ASHA worker, training of ASHA and health workers, number of beneficiaries receiving provision of sanitary napkins, sales of Suvidha sanitary napkins, coverage of Adolescent Friendly Health Clinics, State Programme Implementation Plan approvals under Menstrual Hygiene Scheme, and status of WASH facilities in schools, namely provision of girls' toilet facility, handwash facility and tap water facility for drinking water. For indicators on the Governance Index, data sources include the Annual Status of Education Report (ASER) 2022, Annual ASHA Update 2020-21, Health Management Information System (HMIS) 2020-21 & 2021-22, and responses to questions raised in the Lok Sabha.

The statistical methodology includes use of Principal Components Analysis (PCA) to construct the two indices i.e. Women Empowerment and Governance Index. The scores obtained from the first component, with an eigenvalue greater than 1, are subjected to linear transformation on a scale of 1 to 10. Karl Pearson's coefficient of correlation is used to compute the linear correlation between the percent of women using MHM and its potential correlates, namely, household and women's characteristics and the governance index. The p-value or significance value is also reported for each estimated coefficient of correlation. To ascertain whether the correlation between the two variables is significant or not, three conventional levels of significance- 1%, 5% and 10% - are used. STATA 14 is used to compute the Pearson's correlation coefficients and also to construct the Women's Empow-

erment and Governance Index by performing principal component analysis while graphs are made using EXCEL.

Results

At the all-India level, 78 percent of young women used a hygienic method of protection during menstruation as per NFHS-5 (Figure 1). All EAG states show improvements between 2015-16 and 2019-20. While only one of the eight EAG states (Uttarakhand) performed better than the national average in 2015-16, three EAG states-Uttarakhand, Rajasthan, and Odisha have better menstrual hygiene performance than the national average in 2019-20. Bihar and MP remain the worst performers.

As can be seen from Table 1, there has been progress in menstrual hygiene in rural as well as in urban areas. The rural-urban gap has declined in all eight EAG states between 2015-16 to 2019-21, with Uttarakhand having the smallest gap of 4.8 and Madhya Pradesh having the largest gap of 28.5. Since all EAG states have at least seventy percentage of their population living in rural areas, rural menstrual hygiene outcomes assume greater significance.

The scatter plots of the prevalence of HMMP and the various covariates included in the study are presented in Figures 2-12 and Table 2 presents the corresponding correlation coefficients along with their p-values and significance levels.

Role of Economic Status

The NFHS gives scores to households based on their ownership of consumer goods and housing characteristics and derives national wealth quintiles and a state-wise distribution. For our purpose, we aggregate the proportion of the population belonging to the fourth and highest quintile for each state and relate it to the use of HMMP. States with a higher proportion of the population in the top two

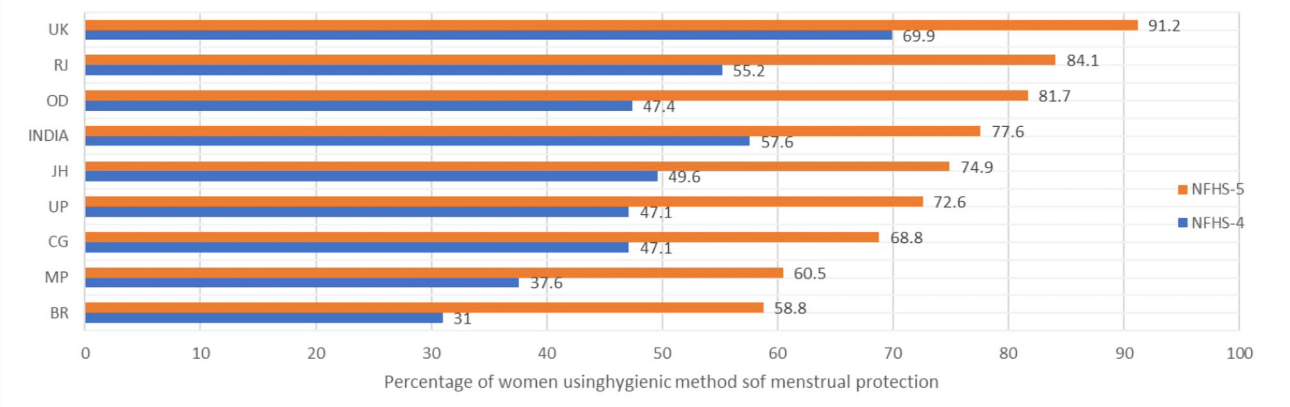

Figure 1. Percentage of women aged 15-24 years using hygienic menstrual protection methods(HMMP), NFHS-4 and NFHS-5

Source: Authors' Compilation using NFHS Reports

Table 1. Women using HPPM (%) by location, NFHS-4 and NFHS-5

State	Projected population	% of India's population	% of rural population	Rural		Urban		Rural-Urban gap	
	National Commission on Population March-21	2011 Census	2011 Census	NFHS-4 (2015-16)	NFHS-5 (2019-21)	NFHS-4 (2015-16)	NFHS-5 (2019-21)	NFHS-4 (2015-16)	NFHS-5 (2019-21)
Bihar	10,87,78,000	8.6	88.71	27.3	56	55.6	74.7	28.3	18.7
Chhattisgarh	2,17,97,000	2.11	76.76	39.4	64.8	72.7	83.2	33.3	18.4
Jharkhand	2,86,99,00	2.73	75.95	39.4	70.8	77.2	88.2	37.8	17.4
Madhya Pradesh	6,05,42,000	6	72.37	26.4	53.4	65.4	81.9	39	28.5
Odisha	3,59,28,000	3.47	83.31	42.8	79.5	70	91.7	27.2	12.2
Rajasthan	5,86,98,000	5.66	75.13	47.9	81.9	78.8	92.2	30.9	10.3
Uttar Pradesh	17,68,89,000	16.5	77.73	39.9	68.4	68.6	86.7	28.7	18.3
Uttarakhand	74,54,000	0.83	69.77	65	89.7	78.9	94.5	13.9	4.8
India	1,36,30,00,000	--	68.84	48.2	72.3	77.5	89.4	29.3	17.1

Source: Authors' compilation

wealth quintiles also have a higher percentage of women using HMMP (Figure 2) and the correlation coefficient is 0.670 which is significant at the 10% level (Table 2, row 1).

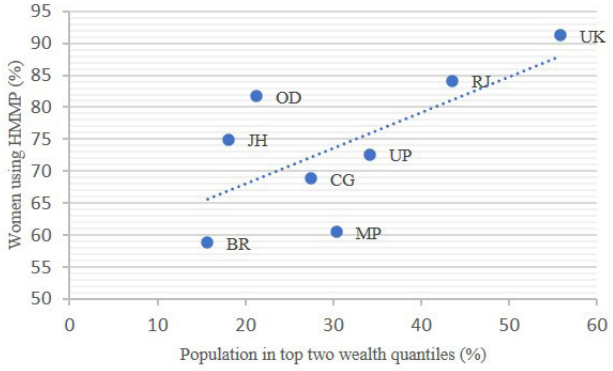

Figure 2. Women using HMMP (%) by wealth

Source: Authors' construction using NFHS data

Role of Social Factors

The data from NFHS-5 indicates the significance of caste in the use of HMMP. The smaller the percentage of scheduled caste and scheduled tribe population in the state and the larger the percentage of the general caste population, the greater the use of HMMP observed (Figure 3), with a correlation coefficient of 0.6192 that is significant at 10% as seen in Table 2. However, the proportion of Muslim communities in a state is not found to be significantly linked to the usage of hygienic methods. This is because the state of Uttarakhand, despite having the second largest percentage of Muslim population among the EAG states after Uttar Pradesh, performs best in menstrual hygiene. When the scatter plot and trend line are redrawn, omitting Uttarakhand, an inverse but insignificant relationship is observed between the extent of the Muslim population and usage of HMMP for the remaining states (Figures 4 and 5 and Table 2).

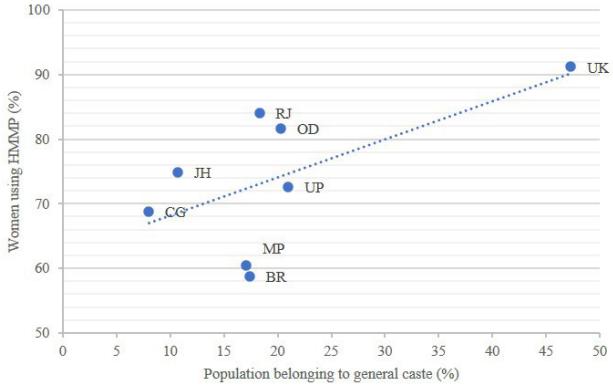

Figure 3. Women using HMMP (%) by general caste population

Source: Authors' construction using NFHS data

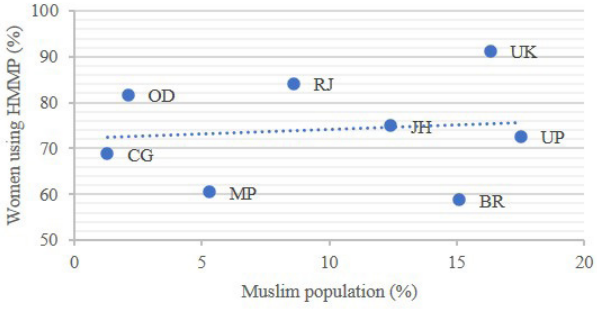

Figure 4. Women using HMMP (%) by Muslim population

Source: Authors' construction using NFHS data

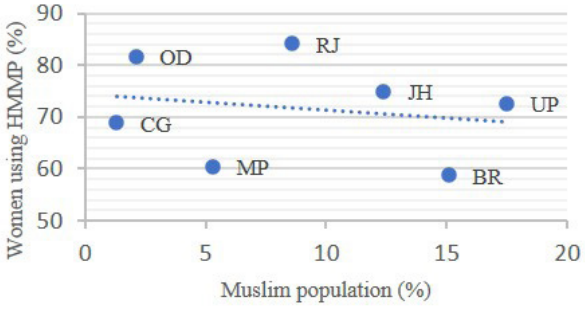

Figure 5. Women using HMMP (%) by Muslim population, excluding Uttarakhand

Source: Authors' construction using NFHS data

Role of Education

In 2019-21, the female literacy rate varied between 55% in Bihar to 80% in Uttarakhand and the percentage of women with ten or more years of schooling was lowest at 29% in Bihar and Madhya Pradesh and highest at 50% in Uttarakhand. The prevalence of HMMP is found to rise with years of schooling of women in all states (Figure 6). States with a higher female literacy (Figure 7) and a larger percentage of women with 10 or more years of schooling (Figure 8) exhibit significantly higher use of HMMP among women and both variables are positively and significantly correlated with the use of HMMP at the 5% level of significance as seen in Table 2.

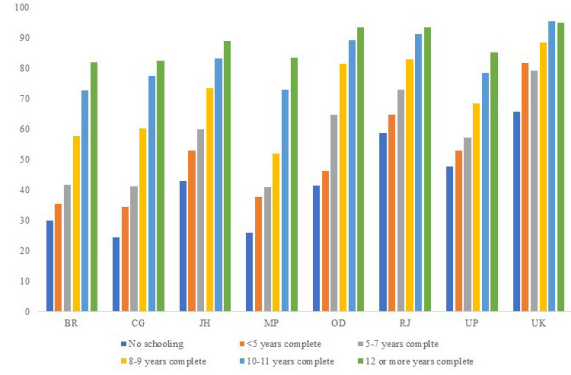

Figure 6. Women using HMMP (%) by years of schooling of women

Source: Authors' construction using NFHS data

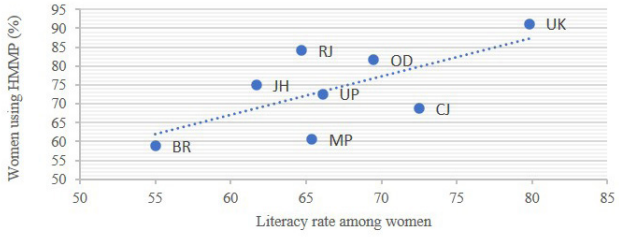

Figure 7. Women using HMMP (%) by literacy rate among women

Source: Authors' construction using NFHS data

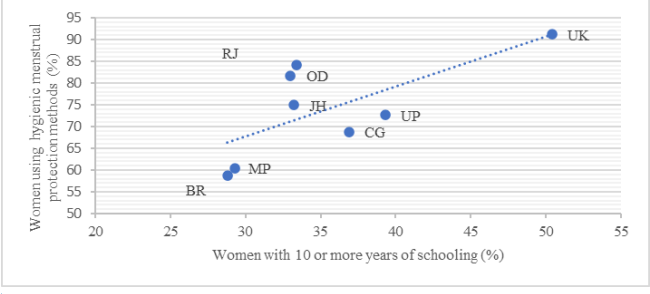

Figure 8. Women using HMMP (%) by women with 10 or more years of schooling

Source: Authors' construction using NFHS data

Role of Awareness

Exposure to Media: Exposure to the media plays a role in changing mindsets by providing complimentary and/or alternate means of information on hygiene. According to NFHS-5, the percentage of women who did not have regular access to media is observed to be highest in Bihar (67%) and lowest in Uttarakhand (34%). Although the use of HMMP is inversely related to the lack of regular exposure to media (Figure 9), this relationship is not found to be statistically significant as the correlation coefficient is -0.3612 with a high p-value of 0.3693 (Table 2).

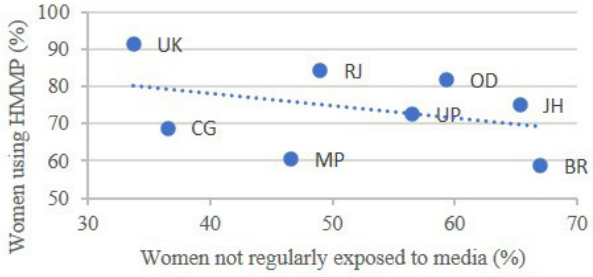

Figure 9. Women using HMMP (%) by exposure to media

Source: Authors' construction using NFHS data

Exposure to the Internet: At the all-India level, 33.3% of women have ever used the Internet in 2019-21. Among the EAG states, Bihar has the lowest percentage (20.6%) while Uttarakhand has the highest percentage of women who have ever used the internet (45%). Internet exposure has a strong positive effect on the prevalence of HMMP across EAG states as shown by the scatterplot in Figure 10 and the high correlation coefficient of 0.8086 with a low p-value of 0.0151 as seen in Table 2.

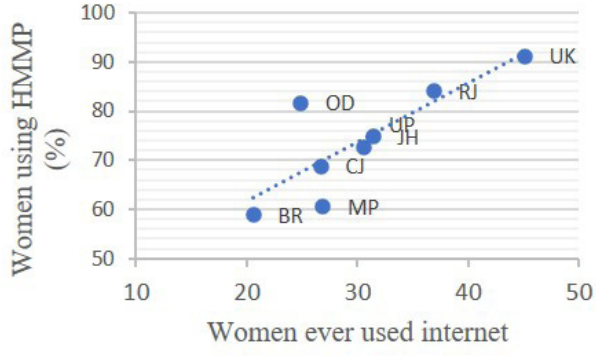

Figure 10. Women using HMMP (%) by internet use

Source: Authors' construction using NFHS data

Role of Women's Status and Empowerment

The state of Uttarakhand scores highest in the Women Empowerment Index whereas Bihar and Madhya Pradesh have the lowest score. As shown in Figure 11, states with higher scores on the women's empowerment index exhibit significantly higher usage of HMMP. The status of women as given by the Women Empowerment Index is positively and significantly correlated with the use of HMMP at the 5% level. However, the extent of participation of women in the labour market and having access to cash earnings is not associated with the level of menstrual hygiene in the states (Figure 12). This is because a higher workforce participation rate may occur due to greater economic compulsions or distress of the household and is not a reflection of the extent of women's empowerment.

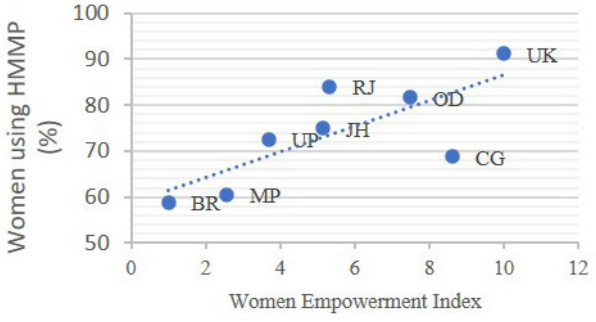

Figure 11. Women using HMMP (%) by Women Empowerment Index

Source: Authors' construction using NFHS data

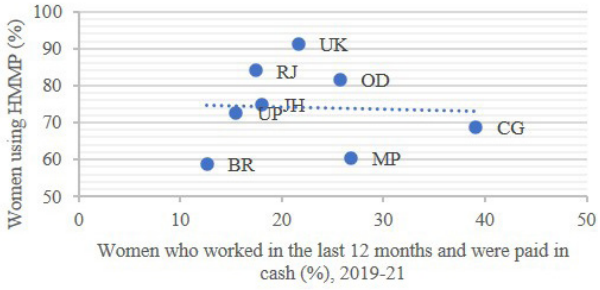

Figure 12. Women using HMMP (%) by workforce characteristic

Source: Authors' construction using NFHS data

Role of State and Governance

Table 3 presents eleven indicators of governance at the state level that are used to compute the Governance Index. Bihar scores the lowest on the index, followed by Uttar Pradesh (4.16) and Madhya Pradesh (5.87). Odisha, Chhattisgarh, and Uttarakhand are the top performers with index scores of 10, 9.8, and 9.1 respectively. Jharkhand and Rajasthan's governance index score lies in the range of 6-7 on a scale of 1 to 10. The percentage of women using HMMP is observed to be significantly positively correlated with the Governance Index (Figure 13), with a correlation coefficient of 0.6279 and a corresponding p-value of 0.0955 as given in Table 2.

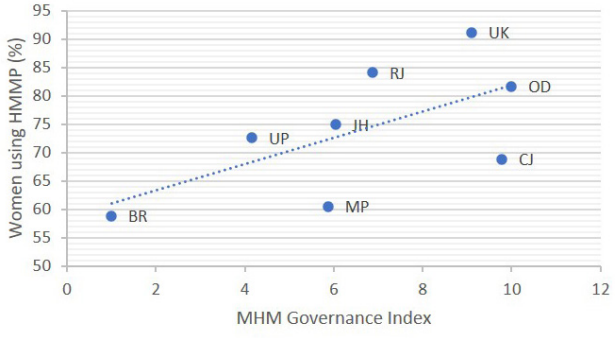

Figure 13. Women using HMMP (%) by Governance Index

Source: Authors' construction using NFHS data

Table 2. Correlation coefficients between the use of HMMP and its covariates, 2019-20

S.No	Covariate	Correlation coefficient	p-value
1.	Percentage of population in top two wealth quantiles	0.6700	0.0691*
2.	Percentage of general caste population	0.6192	0.1016*
3.	Percentage of Muslim population	0.1103	0.7948
4.	Percentage of Muslim population, excluding Uttarakhand	-0.1905	0.6824
5.	Women's literacy rate	0.6629	0.0732*
6.	Women with 10 or more years of schooling	0.7013	0.0526*
7.	Women not regularly exposed to media	-0.3612	0.3693
8.	Women ever used the internet	0.8086	0.01518**
9.	Women Empowerment index	0.7575	0.0295**
10.	Women who worked in the last 12 months and were paid in cash	-0.0452	0.9153

Source: Authors' calculations

**indicates significance at 10%, ** Indicates significance at 5%*

Table 3. Governance indicators for EAG states									
S.no	Statistic	BR	CJ	JH	MP	OD	RJ	UP	UK
	Statistics related to ASHA								
1	Density per ASHA	1241	319	718	945	779	1218	1141	697
2	ASHA Training in Modules 6&7 (%) –Rural	47	87	100	85	97	85	84	99
3	ASHA Training in Modules 6&7 (%)- Urban	0	98	0	80	100	73	0	100
4	Training on Village Health Sanitation and Nutrition Committees Handbook	12	96	61	30	100	44	22	47
	Other Statistics related to MHM								
5	Number of adolescent girls (10-19 years) provided with Sanitary Napkins under the Menstrual Hygiene Schemes (2019-20)	152	0	395291	172075	5844591	2186	237964	31539
6	Adolescent Friendly Health Clinics (AFHCs)– Coverage of Registration per lakh population, 2020-21	24	387	212	238	138	1271	210	486
7	State Programme Implementation Plan (SPIP) Approvals under Menstrual Hygiene Scheme (Rs Lakhs), 2019-20	789.64	0	0	0	375.41	1500	0	261.57
8	Sales of Suvidha sanitary napkins 2019-20	15240	23840	1000	28280	79400	23040	291116	54000
	WASH Facilities in rural schools								
9	Girls' toilet- Separate provision, unlocked and useable	63.8	60.0	72.8	55.1	76.5	84.4	78	58.6
10	Handwash facilities	86.4	98.2	91.5	93	96.7	96.8	91.8	95.9
11	Tap water for drinking water facility	24.9	34.5	23.8	24.9	44.3	55.1	35.4	85.1

Source: Rows 1-4: National Health Systems Resource Centre. Annual ASHA Update 2020-21, Ministry of Health and Family Welfare, Govt of India.
Rows 5-6: Health Management Information System HMIS 2020-21 & 2021-22 (An Analytical Report), Ministry of Health and Family Welfare, Statistics Division
Rows 7: Lok Sabha Unstarred Question No. 2986 To Be Answered On 17th March 2023
Row 8: Lok Sabha Unstarred Question No. 515 To Be Answered On 25th June, 2019
Rows 9-11: Annual Status of Education Report (Rural) 2022

Discussion

The lagging performance of the EAG states contributes to lowering the all-India average in the use of HMMP, with the average for the EAG states and non-EAG states being 74.3% and 87% respectively. Table 4 gives the percentage of women using HMMP in the six regions as per NFHS classification. The eight EAG states cover the entire Central region, most of the East region except West Bengal, and part of the North region. Clearly, the Central region comprising the three EAG states - Chhattisgarh, Madhya Pradesh and Uttar Pradesh- is the worst performer.

Table 4. Percentage of women using HMMP by the six NFHS regions, NFHS-5	
Region	Percentage of women age 15-24 using HMMP
North	88.9
Central	67.6
East	74.9
Northeast	79.3
West	85.8
South	93.9
All-India	77.6

Source: Authors' compilation

Most existing studies have either primarily focused on household and women-related characteristics[6,7,8,9,11,13] or issues related to governance.[15,17,18] This study contributes to the literature by investigating the role of all three levels of correlates in the prevalence of menstrual hygiene and how differential outcomes across EAG states can be understood in the context of state-level efforts and performance in menstrual hygiene schemes.

The analysis for the eight EAG states in India shows that the adoption of HMMP practices is positively correlated with household characteristics namely household wealth and general caste; women's characteristics namely women's education, empowerment, and exposure to the internet; and governance factors at the state-level in the EAG states. The study also shows the diversity in the performance across the eight EAG states in the prevalence of HMMP among women. The state of Uttarakhand performs well on all indicators, namely education, wealth, exposure to media/internet, and status of women, and also performs well in the adoption of menstrual hygiene practices by women. In contrast, the states of Bihar and Madhya Pradesh exhibit the worst performance on most indicators including menstrual hygiene indicating the nexus between lack of overall socio-economic development and prevalence of poor menstrual hygiene practices. The performance of the states of Odisha and Rajasthan

suggests that the presence of factors like government initiatives other than social and economic factors also play an important role in improving the levels of menstrual hygiene among young women since these states exhibit mediocre performance on socio-economic covariates.

On comparing results with the existing literature, a noteworthy contrast that emerges is that this study does not find religion to exhibit a significant relationship with menstrual hygiene while several household-level studies find religion to be a significant determinant of hygienic menstrual practices.[6,7,8] An important insight that emerges from the study comes from the experience of Uttarakhand which shows that the common perception regarding the drag on performance on account of community factors associated with the presence of a large Muslim population can be overcome with an overall favourable enabling environment facilitated by improved socio-economic conditions.

The success of states in being able to provide the basic necessity of menstrual hygiene to its female population is determined to a large extent by the political will and action at the grassroots level. The union government has launched various programmes and schemes since the 2000s through its departments and ministries, namely inclusion of adolescent health under National Rural Health Mission (NRHM) in 2005, Adolescent Reproductive and Sexual Health (ARSH) Strategy in 2006, the Scheme for Promotion of Menstrual Hygiene among adolescent girls in the age group of 10-19 years in 2011, Rashtriya Kishor Swasthya Karyakram (RKSK) in 2014. WASH facilities, an essential component of MHM, are being emphasized under Swachh Bharat Abhiyan. The 'Samagra Shiksha' scheme promotes the installation of sanitary pad vending machines and incinerators in schools. Since 2015-16, the Menstrual Hygiene Scheme under 'National Health Mission' facilitates the procurement of sanitary napkins by states that are distributed through the network of ASHA workers and Janaushidhi Kendras. ASHA workers also play a role in community awareness about MHM.

The states that have exhibited better performance in menstrual protection are those where state governments initiated early efforts and have shown good governance. Tamil Nadu, which has the highest percentage of women using HMMP (98%) in 2019-21, began its MHM initiatives as early as 1998, much before the issue of MHM got national recognition. Among EAG states, Uttarakhand started an adolescent health programme called UDAAN in 2009 which resulted in a sharp increase in the usage of sanitary pads from 30.6% in 2009 to 52.7% by 2011 in select districts.[16] In 2016, Odisha's RKSK Menstrual Hygiene Scheme ensured the distribution of sanitary napkins at subsidized rates to adolescent girls in rural areas. Other schemes include the Khushi programme of the Odisha government launched in 2018 and the Udaan programme of the Rajasthan government launched in 2021 which benefited nearly 26 lakh girls. However, MHM has not been prioritized by the states of Bihar and Madhya Pradesh. Low awareness about schemes and ineffective implementation is observed in both these states.[17,18]

The prevalence of traditional cultural and social beliefs is also a barrier to good menstrual health and hygiene.[13] Cultural beliefs and social and religious norms shape perceptions about menstruation. Menstruation is still considered a taboo across various cultures, and menstruating women are considered impure with many communities restricting women from various activities such as cooking; participating in family events, and religious ceremonies; being with family members; and even bathing or washing their hair. Qualitative studies have shown the cultural restrictions such as sitting outside the house during menstruation and restricting play of young adolescent girls to be more prevalent in rural as against urban areas and that communication about menstrual matters continues to be influenced by social and cultural practices.[19,20] Such taboos, that lead to the exclusion of girls and women from various aspects of social and cultural life, impact their emotional, and mental well-being, besides adversely affecting their health.[20, 21] In many developing countries, girls drop out of school when they begin menstruating. Inadequate school infrastructure, which lacks clean, safe, and private sanitation facilities and low adoption of MHM protection also affects school attendance adversely.[8,9] Improving the education status of women, community outreach through ASHA workers, and primary-caregivers to address menstruation myths and promote hygienic menstrual practices, provision of safe, private sanitation facilities, and provision of sanitary napkins etc., are essential elements of a multi-pronged approach needed to improve menstrual health outcomes for girls and women.

There also exist large inter-district disparities within the states, with the percentage of adolescent women practicing hygienic methods of menstrual protection to be less than 30% in rural districts of EAG states of Uttar Pradesh, Madhya Pradesh, Bihar and Chhattisgarh and some districts even having less than 10% women using HMMP compared to the southern states of Tamil Nadu, Telangana, and Puducherry which have over 80% adoption of HMMP.[22] The suggested future scope of study in this field includes using qualitative methods to gain insights into the role of traditional social and cultural norms as barriers in adoption of menstrual hygiene practices, and examining the district-level as well as rural-urban differences within the EAG states.

Conclusions

The present study shows that the use of hygienic methods of protection during menstruation is positively correlated with household characteristics namely household wealth and general caste; women's characteristics namely women's education, empowerment, and exposure to the internet; and governance factors at the state-level in the EAG states. The study, however, does not find religion and exposure to mass media as exhibiting a statistically significant relationship with menstrual hygiene. This is in contrast with several household-level studies that find religion to be a significant determinant of hygienic menstrual practices.[6,7,8] We observe uneven progress among the eight EAG states. The interplay of household, women's characteristics and governance contributes to the poor performance of EAG states of Uttar Pradesh, Madhya Pradesh, Bihar and Chhattisgarh as compared to other states, with Bihar and Madhya Pradesh exhibiting the worst performance on most social, economic, and governance indicators. Uttarakhand is an outlier among the EAG states with its performance comparable to the better-performing non-EAG states in the country. The states of Odisha and Rajasthan, despite exhibiting mediocre performance in some of the socio-economic characteristics, show considerable improvements in menstrual hygiene largely due to successful government initiatives.

The experience of EAG states highlights the importance of targeted state interventions and governance along with a supportive socio-economic environment in achieving the menstrual health goals for girls and women. In addition to ensuring adequate income for all, reducing social disparities, empowering women, community outreach raising awareness about menstrual health and hygiene, dispelling myths and taboos associated with menstruation, allocation of adequate funds and trained personnel are needed to effectively implement government schemes to bring about improvements in menstrual hygiene. While these efforts will boost the demand for hygienic menstrual products, the states must endeavour to ensure adequate production and supply of affordable sanitary napkins. The local production of menstrual hygiene materials also has the potential to emerge as a means of livelihood for women through employment opportunities created via Self Help Groups involved in the supply and distribution of MHM materials.

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