

What Explains the Rural-Urban Gap in the Use of Hygienic Methods of Menstrual Protection among Youth in the East Indian State of Bihar?

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Abstract

Background: Menstrual hygiene management has become a globally recognized public health issue. As evidenced by the National Family Health Survey-4 (NFHS-4), among the states in India, Bihar accounts for the lowest use of hygienic methods of menstrual protection among youth. Further, the use in rural areas of Bihar is substantially lower than in urban areas. **Objectives:** Therefore, using NFHS-4 data, this study endeavors to explore the socioeconomic and demographic factors in explaining the rural-urban gap in the use of hygienic methods of menstrual protection among youth in Bihar. **Methodology:** A logistic regression model is used to identify the socioeconomic and demographic determinants of the use of hygienic methods, and Fairlie's decomposition technique is employed to compute the rural-urban difference in the use, and then to decompose these differentials into their separate underlying factors. **Results:** Findings from logistic regression analysis reveal that women's education, household wealth, media exposure, use of toilet facility, and awareness of sexually transmitted infections (STIs) are the significant determinants influencing the use of hygienic methods of menstrual protection. Results from decomposition analysis indicate that while use of improved toilet facility and mass media exposure among youth reduce the rural-urban gap, the unequal distribution of women's educational qualification, wealth index, marital status, and awareness of STIs has tended to widen the gap. **Conclusion:** The findings suggest promotion of menstrual hygiene practices, enhancement of menstrual hygiene knowledge, opportunities for women's education, better sanitation practices, exposure of mass media, and economic incentives among youth in rural Bihar.

Keywords: Bihar, decomposition analysis, hygienic methods, menstrual protection, rural-urban gap, youth

INTRODUCTION

Menstrual hygiene is defined as the principle of maintaining cleanliness of the body during menstrual flow. Inadequate menstrual hygiene management among adolescent girls is a public health problem, mainly in low- and middle-income countries.^[1] A majority of women in rural India are more susceptible to reproductive tract infections (RTIs) as they use clothes and rags during menstruation. The findings from a community-based cross-sectional study indicate that a significant association between RTIs and the menstrual hygiene practice,^[2] particularly in rural communities menstrual hygiene, is an imperative component of RTIs.^[3] Unaddressed menstrual hygiene is also said to hamper the achievement of some of the sustainable development goals as it is closely associated with gender equality and female empowerment through its direct influence on women's reproductive health, education, and

work participation. There are many factors that affect women managing menstrual hygiene, such as the lack of information and awareness on menstruation, unaffordability of menstrual products, sanitation and hygiene infrastructure and services, lack of privacy, safety, and security.^[4] Furthermore, culture and tradition and socioeconomic and environmental constraints contribute to poor menstrual hygiene.^[5] Knowledge about menstruation plays a key role in attaining proper hygiene^[6,7] and high quality menstrual hygienic knowledge and practices

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improve the self-assurance of females in several ways.^[8,9] Females in low- and middle-income countries are generally disadvantaged to utilize the available resources, especially for menstrual hygiene issues. In this context, limited economic resources and inadequate sanitation facilities are the imperative components of poor menstrual hygiene.^[10] In rural areas, women have barely enough access to sanitary products or they are unaware of the types and method of using those or these products are unaffordable owing to high cost. Hence, the women on the whole depend on reusable cloth pads which they wash and reuse. The fact that RTIs caused due to ignorance of menstrual hygiene are less known or unknown among the women.^[11]

According to the Census 2011, women in the age group of 15–24 years constitute about 19% of the total female population of India. Hence, government’s attention is required for the monthly menstrual need and hygiene of such a huge population. By recognizing the importance of promotion of menstrual hygiene, in June 2011, the Government of India launched a new scheme to make sanitary pads available in rural areas at a subsidized cost. Nevertheless, the Government of India’s many initiatives, a major section of the adolescent girls, still do not have prior awareness about the menstrual cycle and its hygiene practices which lead to poor menstrual hygiene.^[12] Many microlevel studies evidenced that menstrual hygiene among school-going adolescent girls is very poor in rural India.^[13-15] The lack of suitability of practices of utilization and disposal of menstruation absorbents in rural India as compared to urban are attributed to the various psychosocial and economic factors that impound women to a state where they are unable to prioritize the health and hygiene needs over other issues.^[16] In India, comparative studies between urban and rural adolescent girls in Bareilly (Uttar Pradesh), Nagpur (Maharashtra), and Jaipur (Rajasthan) indicate a significantly higher usage of sanitary pads among urban adolescent girls than those living in rural areas.^[17-19] Moreover, findings from a study in West Bengal, India, portray that girls with higher socioeconomic status generally have both safer menstrual health management practices and fewer gynecological problems.^[20]

Various initiatives have been taken at the grass root level on usage of menstrual absorbents and menstrual hygiene management. Regardless of the usefulness of the interventions, governance challenges successful employment of the usage of menstrual absorbents and menstrual hygiene management across the country.^[16] Needs and requirements of the adolescent girls and women are ignored despite major developments in the area of water and sanitation.^[11] According to the National Family Health Survey-4 (NFHS-4), 58% of young women in India use hygienic methods of menstrual protection; however, more than two-fifth (42%) of women uses other methods. Among all the states, Bihar accounts for the lowest use of hygienic methods of menstrual protection among youth and the use in urban Bihar is substantially higher than the rural. Bihar is one of the Empowered Action Group states which stand lowest in Human Development Index (0.576) than the

other states.^[21] In Bihar, not only the poverty level is high, its progress is also slow. Therefore, this study endeavors to *explore the socioeconomic and demographic factors in explaining the rural-urban gap in use of hygienic methods of menstrual protection among youth in Bihar*. The findings may be an alarm to take prompt action, as the pitfall of deficient menstrual hygiene practices in a state has a significant effect on the socioeconomic development of the nation.

The proposed hypotheses of the study are:

1. Socioeconomic and demographic factors do not have any effect on use of hygienic methods of menstrual protection
2. Socioeconomic and demographic covariates are invariant for rural-urban difference in use of hygienic methods of menstrual protection.

Data and methodology

Data

The NFHS is a nationally representative large-scale, multi-round survey conducted throughout India. The survey provides prerequisite estimates of fertility, mortality, family planning, maternal and child health, reproductive health, household environment, and sanitation over the period. This study uses unit level data from NFHS-4 (2015–2016) pertaining to 17, 985 youth (15–24 years) women’s socioeconomic and demographic background in Bihar.

METHODOLOGY

Using hygienic methods of menstrual protection is important for women’s health and personal hygiene. In NFHS-4, young women aged 15–24 years are asked for the first time about the use of hygienic method/methods of protection during their menstrual period, which includes use of locally prepared napkins, sanitary napkins, and tampons. The response variable is “use of hygienic methods of menstrual protection” and coded as 1 for using the methods and 0 for not using hygienic method. Respondent’s age, place of residence, marital status, religion, caste, household wealth, media exposure, sanitation facility, and awareness about sexually transmitted infections (STIs) are the covariates considered in this study. In the first step of analysis, a logistic regression model is employed to identify the significant socioeconomic and demographic predictors of the likelihood of use of hygienic methods after controlling the predictors using the following formula:

$$\text{logit}p = \ln\left(\frac{p}{1-p}\right) \\ = b_0 + b_1x_1 + b_2x_2 + b_3x_3 + \dots + b_ix_i + e$$

Where $b_1, b_2, b_3, \dots, b_i$ represents the coefficient of each predictor variables included in the model and ‘e’ is the error term.

In the second part of the analysis, the rural-urban difference in use of hygienic methods is computed, and then these differentials are decomposed into their separate underlying factors. Fairlie’s (1999, 2005)^[22,23] decomposition technique is

employed for the decomposition analysis, as it is particularly suited to calculating gaps for binary outcomes, that is, use of hygienic methods in the present study.

$$\bar{y}^R - \bar{y}^U = \left[\sum_{i=1}^{N^R} \frac{F(X_i^R \beta^R)}{N^R} - \sum_{i=1}^{N^U} \frac{F(X_i^U \beta^U)}{N^U} \right] + \left[\sum_{i=1}^{N^U} \frac{F(X_i^U \beta^R)}{N^U} - \sum_{i=1}^{N^U} \frac{F(X_i^U \beta^U)}{N^U} \right]$$

Where, N^R and N^U is the sample size for rural and urban youth (women age 15–24) of Bihar, F is the cumulative distribution function of logistic distribution and \bar{y}^R and \bar{y}^U is the average probability of the binary outcome of interest for youth of rural and urban areas. In the above equation, the first term in brackets represents the part of the gap between rural and urban areas that is due to group differences in distributions of characteristics of the independent variables X'_S also known as the “explained part,” whereas the second term represents the portion of rural-urban differences due to differences in the coefficients or “returns” to the exogenous covariates. The second term also captures the proportion of the rural-urban gap due to group differences in unmeasurable or unobserved endowments. Similar to most previous studies applying the decomposition technique, this “unexplained” portion of the gap is not focused because of the difficulty in interpreting results (Cain, 1986; Jones, 1983).^[24,25]

RESULTS

It is evident from NFHS-4 (2015–2016) that use of hygienic methods of menstrual protection among youth is the lowest (31%) in Bihar among the states in India and is below the national average (57.6%). Further, a substantial rural-urban gap exists in use of hygienic methods of menstrual protection in Bihar. While 55.6% of youth use hygienic methods of menstrual protection in urban Bihar, the use is considerably low (27.3%) in rural areas of the state [Figure 1]. The findings from NFHS-5 depict that in both the rural and urban Bihar, the use of hygienic methods has increased over the period; however, there exists a significant rural-urban gap (19%).

Findings from logistic regression analysis

The results are shown in Table 1 in terms of odds ratios (ORs) of use of hygienic methods of menstrual protection for specified categories of covariates in comparison to specified categories for the respective covariates included in this study. Findings of regression analysis are related to the first hypothesis set up for testing in this study. In this analysis, place of residence is considered as a predictor variable. The findings reveal that youth in rural Bihar (OR = 0.95 $P < 0.05$) are significantly less likely to use hygienic methods of menstrual protection than the youth in urban areas. As educational qualification is significantly associated with the use of hygienic

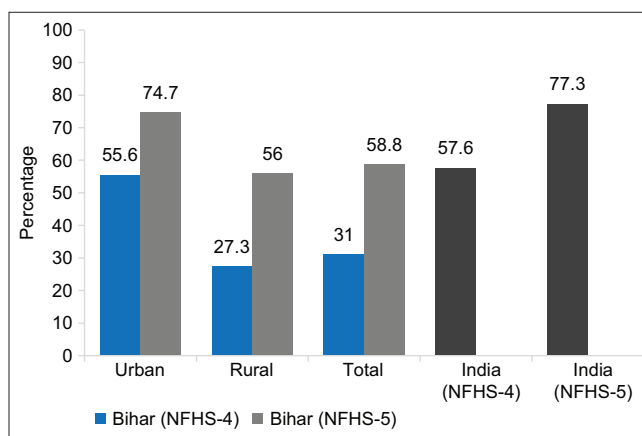


Figure 1: Percentage of women age 15–24 years who use hygienic methods of menstrual protection, Bihar, National Family Health Survey-4 (2015–2016) and National Family Health Survey-5 (2019–2020)

method, youth who have completed primary education are 2.05 times ($P < 0.01$) more likely to use hygienic methods than the uneducated. Youth with secondary (OR = 3.45 $P < 0.01$) and higher (OR = 6.51 $P < 0.01$) education are significantly more likely to use hygienic method. The results indicate that wealth index is the most imperative component contributing to the use of hygienic methods in Bihar, as with the improvement in wealth index, there is a substantial increase in the odds of use of hygienic method. Poorer (OR = 1.65 $P < 0.01$), middle (OR = 2.71 $P < 0.01$), richer (OR = 4.38 $P < 0.01$), and richest (OR = 10.45 $P < 0.01$) are more likely to use hygienic methods than the poorest. Awareness significantly contributes to the increase in use of hygienic method. Youth exposed to mass media and ever heard of STIs are 1.98 times ($P < 0.01$) and 1.32 times ($P < 0.01$) more likely to use hygienic methods than their counterparts, respectively. The findings from logistic regression analysis suggest the significant association of use of hygienic method of menstrual protection with place of residence, educational qualification, household wealth, exposure to mass media, and awareness of STIs of the youth in Bihar.

Findings from Fairlie’s decomposition analysis

Most interesting findings are related to the second hypothesis set up for testing in this study. Findings from decomposition analysis reveal that in Bihar, the rural-urban gap in the use of hygienic methods of menstrual protection is 0.279, that is, the use is 27.9% higher in urban Bihar than the rural [Figure 2]. The set of socioeconomic and demographic covariates are able to explain 84% of the overall gap (i.e., the explained part or due to differences in the distribution of characteristics). The contribution of exposure to mass media in reducing rural-urban gap in use of hygienic methods of menstrual protection is overwhelming. Exposure to mass media among rural youth reduces the rural-urban gap in use of hygienic methods of menstrual protection by 9.4%. Use of improved toilet facility in rural Bihar has contributed significantly (4.6%) in reducing the rural-urban gap in use of hygienic method. On the contrary, household wealth index,

Table 1: Estimated odds ratio of use of hygienic methods of menstrual protection among youth age 15-24 years, Bihar, (National Family Health Survey-4) 2015-2016

Background variables	OR	SE	P>Z	CI
Age				
15-19				
20-24	1.09	0.137	0.472	0.856-1.400
Place of residence				
Urban				
Rural	0.95	0.136	0.047	0.722-1.263
Educational qualification				
No education				
Primary	2.05	0.467	0.002	1.314-3.206
Secondary	3.45	0.579	0.000	2.482-4.794
Higher	6.51	1.546	0.000	4.091-10.373
Marital status				
Never married				
Currently married	0.93	0.117	0.579	0.730-1.192
Gauna not performed/divorced/separated/others	0.41	0.178	0.040	0.176-0.959
Religion				
Hindu				
Muslims	1.29	0.170	0.055	0.995-1.668
Others	3.37	3.174	0.197	0.533-21.338
Caste				
Scheduled caste				
Scheduled tribe	1.09	0.348	0.797	0.580-2.034
OBC	1.08	0.151	0.560	0.825-1.426
Others	1.16	0.198	0.386	0.830-1.621
Wealth index				
Poorest				
Poorer	1.65	0.216	0.000	1.275-2.130
Middle	2.71	0.438	0.000	1.977-3.721
Richer	4.38	0.900	0.000	2.928-6.553
Richest	10.45	3.920	0.000	5.012-21.800
Exposure to mass media				
No				
Yes	1.98	0.214	0.000	1.598-2.442
Toilet facility				
Improved				
Unimproved	1.07	0.223	0.740	0.713-1.611
No facility	0.83	0.106	0.135	0.641-1.062
Ever heard of a sexually transmitted infection				
No				
Yes	1.32	0.133	0.006	1.082-1.607
Constant	0.05	0.014	0.000	0.032-0.091

OR: Odds ratio, SE: Standard error, CI: Confidence interval

respondent's educational qualification, marital status, and the information on STIs have widened the rural-urban gap in use of hygienic methods of menstrual protection. Contribution of education and wealth index has increased the rural-urban gap by 19.2% and 79.4%, respectively. Married youth contributes 4.1% to the rural-urban gap. Similarly, information on STIs contributes 10.4% in increasing the rural-urban gap in use of hygienic methods of menstrual protection.

Decomposition results clearly point out the factors affecting the rural-urban gap in use of hygienic methods of menstrual

protection. While media exposure and improved toilet facility have helped in reducing the rural-urban gap in use of hygienic methods of menstrual protection, the distribution of respondent's educational qualification, household wealth, marital status, and information on STIs contribute to widening the gap.

DISCUSSION AND CONCLUSION

Menstrual health is addressed as a public health issue by the prime minister of India. The Rashtriya Kishor Swasthya

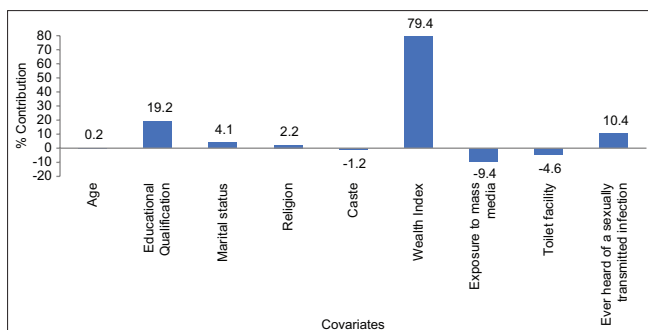


Figure 2: Percentage contribution of each covariate to the rural-urban gap in use of hygienic methods of menstrual protection among women age 15–24 years, Bihar, National Family Health Survey-4 (2015–2016)

Karyakram was launched in 2014 to increase awareness of and access to sanitary pads among adolescent girls in rural areas. Under the Kishori Swasthya Yojana (2000), state governments distribute sanitary pads in schools. According to the NFHS-4, use of hygienic methods of menstrual protection is very low among rural youth of Bihar, and there exists a substantial rural-urban difference in the use. The policy implications of the empirical findings are to reiterate the importance of intervention strategies for promotion of menstrual hygiene among youth in rural areas of Bihar by enhancing menstrual hygiene knowledge, improving hygiene practices, providing subsidized sanitary absorbents, and endorsing awareness of menstrual hygiene at school as well as in communities. In addition, to address this public health issue, focus is needed on women's education, use of improved toilet facility, media exposure, and awareness on STIs for the promotion of the use of hygienic methods of menstrual protection among youth in rural Bihar.

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Conflicts of interest

There are no conflicts of interest.

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