

Original Article

Comparison between Tribal and Bengali Adolescent Women on Reproductive Health, Menstrual Hygiene, WASH and Nutritional Status

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Abstract

Background:

Adolescent reproductive health, menstrual-hygiene management, WASH remains crucial but often neglected particularly among marginalized-urban populations and tribal-communities. Socio-cultural taboos, poor sanitation, and nutritional deficiencies create a cycle of vulnerability that impacts the well-being and productivity of young women, largely.

Aims/Objective:

To compare reproductive health practices, WASH status includes nutrition-profiling between Bengali and tribal adolescent-girls.

Methodology:

This cross-sectionally-designed descriptive-study was conducted among 148 (Tribal-80, Bengali-68), 10-19 years-old-adolescent-girls in Banophool Adibashi Green Heart College. Data were collected using a mixed-methods approach to assess knowledge, hygiene practices, sanitation access, and dietary habits.

Results:

Significant ethnic disparities were yielded in some health-indicators. Regarding MHM- while 75% Bengali used sanitary-napkins, only 42.5% tribal girls used it, and rely on reusable-cloth. Disposal practices also differed significantly: 65% tribal-girls wrapped-off menstrual materials before disposal, whereas 64.7% of Bengali-girls disposed those unwrapped. Nutritional-behaviour revealed: 83.8% Bengali-girls consumed 3-meals/day, while 86.3% tribal-girls consume only two. Furthermore, water-sanitation treatment methods varied sharply: 52.9% Bangalee-girls practiced boiling, while 95% tribal-girls used filters($p<0.001$).

Conclusion:

A distinct ethnic variation exists in health behaviors that underscores urgent need for culturally tailored interventions. Improving access to sanitary products, enhancing nutritional-support remain essential for tribal-girls including health-education interventions towards achieving an equitable reproductive health/menstrual-hygiene/WASH-outcomes and in urban Dhaka, Bangladesh.

Keywords: Reproductive-Health, Menstrual-Hyg, Adolescent WASH, Nutrition, Tribal, Bengali

Introduction

1.1 Definition of Reproductive Health

Reproductive health, as defined by the World Health Organization (WHO, 2020), refers to a state of complete physical, mental, and social well-being in all matters relating to the reproductive system, its functions, and processes¹.

1.2 Importance of Reproductive Health among Tribal Populations

Menstrual hygiene is a critical but often neglected aspect of reproductive health. For tribal women, cultural taboos and lack of sanitation facilities exacerbate menstrual challenges.

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Studies indicate that many women still use reusable cloths, often washed without soap or dried in hidden, unhygienic conditions, increasing the risk of infections².

1.3 Overview of Sanitation Practices in Urban Tribal Communities

Despite Dhaka being an urban center, sanitation coverage within tribal settlements is often substandard. Many families live in overcrowded housing with shared or makeshift toilets, limited water supply, and inadequate waste disposal systems³.

1.4 Nutritional Status and Common Deficiencies among Tribal Populations

Nutrition is a cornerstone of reproductive and maternal health. Tribal communities in Dhaka typically have limited dietary diversity, often consuming rice-based diets low in protein, iron, and vitamin. According to the Bangladesh Demographic and Health Survey 41% of tribal women were found to be anemic, compared to 33% of non-tribal women⁴.

1.5 Socioeconomic and Cultural Determinants of Health

Socioeconomic status, education level, and cultural beliefs are significant determinants of health among tribal populations. Low literacy and limited access to public health information reduce awareness of hygiene, contraception, and nutrition. Cultural and language differences between tribal and mainstream Bengali populations discourage them from seeking health services⁵.

1.6 Health Challenges Faced by Tribal Women in Dhaka City

Tribal women face a double burden. They experience high risks of maternal mortality, anemia, reproductive tract infections, and limited access to family planning. Social stigma and gender-based discrimination also hinder effective healthcare utilization⁶.

1.7 Access to Health Services and Barriers to Utilization

Despite the government's initiatives under the Urban Primary Health Care Services Delivery Project (UPHCSDP), many tribal residents are unaware of or hesitant to access these services⁷. Language barriers, distance from clinics, and negative past experiences with providers contribute to low utilization. NGOs such as BRAC and Marie Stopes Bangladesh provide targeted reproductive health services, yet coverage among tribal populations remains low⁸.

1.8 Government and NGO Initiatives Related to Reproductive and Nutritional Health

The Ministry of Health and Family Welfare (MoHFW) has incorporated reproductive health within its National Health

Policy, emphasizing women's health and sanitation. However, these programs rarely reach micro-communities like urban tribes⁹. Yet, sustainability remains a challenge due to resource constraints and limited community¹⁰.

1.9 Knowledge, Attitudes, and Practices regarding Menstrual Hygiene

Existing evidence indicates a substantial knowledge gap among tribal adolescent girls. Many perceive menstruation as a shameful event rather than a natural process. Community-based awareness programs have shown some success in improving MHM practices, highlighting the need for culturally tailored health education campaigns¹¹.

1.10 Role of Education and Awareness Programs

Education plays a pivotal role in shaping health behaviors. Schools and community centers can act as effective platforms for disseminating reproductive and hygiene knowledge¹². Empowering tribal women through peer-led education improves awareness, autonomy, and hygiene practices¹³. Globally, indigenous populations experience higher morbidity rates and poorer access to healthcare¹⁴. Studies from India and Nepal show similar trends tribal women have lower reproductive health literacy and limited access to menstrual products¹⁵. This underscores the need for intersectional approaches that integrate cultural sensitivity with public health interventions¹⁶.

1.10 Current Situation of Tribal Communities in Dhaka City

Dhaka's tribal residents are mostly concentrated in areas such as Moghbazar, Mohammadpur, and Uttara, living in clustered settlements¹⁷. They maintain distinct cultural practices while facing economic and infrastructural marginalization¹⁸. Despite proximity to healthcare centers, most families depend on informal or community-based health solutions¹⁹.

1.11 Relationship between Sanitation, Nutrition, and Reproductive Health

The intersection between sanitation, nutrition, and reproductive health is critical. Poor sanitation nutrition, and reproductive health is critical. Poor sanitation contributes to infections, while inadequate nutrition weakens immunity and maternal outcomes. Together, these factors form a vicious cycle that perpetuates poor health outcomes among tribal women and children²⁰.

1.12 Summary of Key Issues

In summary, reproductive health among tribal populations is influenced by a combination of socioeconomic deprivation, poor sanitation, inadequate nutrition, and cultural marginalization. Addressing these interconnected factors requires an integrated, culturally sensitive approach.

Methodology

The study adopts a **cross-sectional descriptive design** using both **qualitative and quantitative approaches** to assess the interrelationship between reproductive health, menstrual hygiene, sanitation, and nutrition among Dhaka's tribal population. This mixed-method design facilitates comprehensive understanding by combining measurable indicators with narrative insights.

The study was conducted in urban settlements of Dhaka city, where both Bengali and Tribal communities reside. Key

areas included Moghbazar, Mohammadpur, and Uttara, which are home to small clusters of tribal populations such as the Garo, Chakma, Marma, and Tripura communities. These settlements are characterized by dense housing, limited access to improved sanitation, and varying levels of water and waste management facilities.

The study was conducted among adolescent girls aged 10–19 years from Bengali and Tribal communities living in urban settlements of Dhaka city. A total of 148 respondents participated, comprising 68 Bengali girls and 80 Tribal girls.

Ethnicity	Home Bathroom	Shared Toilet	Total	Significance Test (Chi-Sq: χ^2 &/or, Fisher's Exact: FET)
Bengali (n=68)	48 (70.6%)	20 (29.4%)	68 (100%)	χ^2 : p=0.81
Tribal (n=80)	55 (68.8%)	25 (31.3%)	80 (100%)	
Total	103 (69.6%)	45 (30.4%)	148 (100%)	

Table 1.2 shows most respondents from both ethnic groups used to prefer changing their menstrual materials at their own residential bathroom rather than a shared toilet outside yielding no significant differences ($p = 0.809$), indicating similar practices across groups.

Table 1.3: Method of Disposal

Ethnicity	Unwrap and throw	Wrap and throw	Total	Significance Test (Chi-Sq: χ^2 &/or, Fisher's Exact: FET)
Bengali (n=68)	44 (64.7%)	24 (35.3%)	68 (100%)	χ^2 : p<0.01
Tribal (n=80)	28 (35.0%)	52 (65.0%)	80 (100%)	
Total	72 (48.6%)	76 (51.4%)	148 (100%)	

Table 1.3 shows the difference in the practice of disposing off menstrual materials between Bengali and Tribal respondents: While Bengalees dispose-off menstrual materials unwrapped by 64.7% and 35.3% were wrapped before disposing those off into bins. In contrast, 65.0% of Tribal respondents wrap menstrual materials before disposal, and 35.0% as unwrapped. 51.4% of respondents wrap materials before disposal and 48.6% dispose of them unwrapped, indicating variation in disposal behavior between the two ethnic groups ($p<0.01$).

Table 1.4: Source of Reproductive Health Related Information

Ethnicity	Family	School/ Friends	Health Worker/ NGO	Total	Significance Test (Chi-Sq: χ^2 &/or, Fisher's Exact: FET)
Bengali (n=68)	38 (55.9%)	14 (20.6%)	16 (23.5%)	68 (100%)	χ^2 : p<0.01
Tribal (n=80)	42 (52.5%)	2 (2.5%)	36 (45.0%)	80 (100%)	
Total	80 (54.1%)	16 (10.8%)	52 (35.1%)	148 (100%)	

The table shows the sources of menstrual knowledge among Bengali and Tribal respondents. Among Bengali respondents, the majority 38 (55.9%) received menstrual knowledge from family members, followed by 16 (23.5%) from health workers or NGOs, and 14 (20.6%) from school or friends. Similarly, among Tribal respondents, 42 (52.5%) reported family as their main source of information. However, a larger proportion of Tribal respondents 36 (45.0%) learned from health workers or NGOs, while only 2 (2.5%) obtained information from school or friends.

It shows that family is the primary source of menstrual knowledge for most respondents, while health workers and NGOs play a significant role particularly among Tribal communities, and schools or friends contribute comparatively less to menstrual education.

Table 1.5: Awareness of Reproductive Health Related Services

Ethnicity	Aware of Services	Not Aware of Services	Total	Significance Test (Chi-Sq: χ^2 &/or, Fisher's Exact: FET)
Bengali (n=68)	20 (29.4%)	48 (70.6%)	68	χ^2 : p=0.47
Tribal (n=80)	28 (35.0%)	52 (65.0%)	80	
Total (n=148)	48 (32.4%)	100 (67.6%)	148	

The table shows respondents' awareness of available menstrual-related services. Among Bengali respondents (n=68), 48 (70.6%) reported no awareness of such services, while 20 (29.4%) were aware. Among Tribal respondents (n=80), 52 (65.0%) reported no awareness, and 28 (35.0%) were aware.

Table 1.6: Availability of Separate Toilets for Women

Ethnicity	Separate Toilet – Yes	Separate Toilet – No	Total	Significance Test (Chi-Sq: χ^2 &/or, Fisher's Exact: FET)
Bengali (n=68)	30 (44.1%)	38 (55.9%)	68	χ^2 : p>0.05
Tribal (n=80)	35 (43.8%)	45 (56.3%)	80	
Total (n=148)	65 (43.9%)	83 (56.1%)	148	

The table shows the availability of separate toilets for women among Bengali and Tribal respondents. Among Bengali respondents (n=68), 30 (44.1%) reported having a separate toilet, while 38 (55.9%) did not. Similarly, among Tribal respondents (n=80), 35 (43.8%) had a separate toilet, and 45 (56.3%) did not.

Table 1.7: Water Treatment Method Before Drinking

Ethnicity	Boiling	Filtering	Total	Significance Test (Chi-Sq: χ^2 &/or, Fisher's Exact: FET)
Bengali (n=68)	36 (52.9%)	32 (47.1%)	68	χ^2 : p<0.01
Tribal (n=80)	4 (5.0%)	76 (95.0%)	80	
Total (n=148)	40 (27.0%)	108 (73.0%)	148	

Table 1.7 shows Bengali respondents primarily use boiling (52.9%) and filtering (47.1%), whereas Tribal respondents overwhelmingly prefer filtering (95.0%). Bengali respondents predominantly use boiling, while Tribal respondents overwhelmingly prefer filtering before drinking. This shows a highly significant association between ethnicity and water treatment method (p < 0.001).

Table 1.8: Number of Meals Eaten per Day

Ethnicity	2 Meals	3 Meals	More than 3 Meals	Total	Significance Test (Chi-Sq: χ^2 &/or, Fisher's Exact: FET)
Bengali (n=68)	11 (16.2%)	36 (52.9%)	21 (30.9%)	68	χ^2 : $p < 0.01$
Tribal (n=80)	69 (86.3%)	8 (10.0%)	3 (3.8%)	80	
Total (n=148)	80 (54.1%)	44 (29.7%)	24 (16.2%)	148	

Bengali respondents generally consume 3 or more meals per day (83.8%), whereas most Tribal respondents (86.3%) consume only 2 meals per day, indicating a notable difference in dietary patterns between the two groups. This shows a highly significant association between ethnicity and the number of meals eaten per day ($p < 0.001$). Bengali respondents mostly consume 3 or more meals, whereas Tribal respondents predominantly eat only 2 meals per day, indicating a substantial difference in dietary patterns between the two groups.

Table 1.9: Packaged Food Consumption

Ethnicity	Daily	2–3 times/week	Total	Significance Test: (Chi-Sq: χ^2 &/or, Fisher's Exact: FET)
Bengali (n=68)	6 (8.8%)	62 (91.2%)	68 (100%)	χ^2 : $p < 0.01$
Tribal (n=80)	34 (42.5%)	46 (57.5%)	80 (100%)	
Total	40 (27.0%)	108 (73.0%)	148 (100%)	

The table shows the frequency of daily habit among Bengali and Tribal respondents. Among Bengali respondents ($n=68$), only 6 (8.8%) reported performing the habit daily, while the majority 62 (91.2%) practiced it 2–3 times per week. In contrast, among Tribal respondents ($n=80$), a substantial proportion 34 (42.5%) performed the habit daily, and 46 (57.5%) practiced it 2–3 times per week.

Table 1.10: Green Leafy Vegetables

Ethnicity	Daily – No	Daily – Yes	Total	Significance Test: (Chi-Sq: χ^2 &/or, Fisher's Exact: FET)
Bengali (n=68)	23 (33.8%)	45 (66.2%)	68 (100%)	χ^2 : $p = 0.08$
Tribal (n=80)	17 (21.2%)	63 (78.8%)	80 (100%)	
Total	40 (27.0%)	108 (72.9%)	148 (100%)	

The table shows most respondents consume green leafy vegetables daily, with Tribal respondents slightly more likely to do so. No significant association exists between ethnicity and daily consumption of green leafy vegetables ($p = 0.086$).

Discussion

Socio-Demographic Characteristic

The study included 148 adolescent girls: 68 Bengali and 80 Tribal. Most were aged 13–16 years and came from low- to middle-income households' dietary patterns differed: most

Bengali girls (83.8%) ate three or more meals daily, while 86.3% of Tribal girls ate only two meals. Green leafy vegetable consumption was high in both groups (Bengali 66.2%, Tribal 78.8%), and packaged food consumption was higher among Tribal girls (42.5% daily) than Bengali girls (8.8% daily).

Menstrual hygiene varied by ethnicity: Bengali girls mainly used sanitary pads (75%), while Tribal girls relied more on cloth (57.5%). Disposal practices differed, with Bengalis mostly unwrapping materials (64.7%) and Tribals mostly wrapping (65%). Sanitation and health awareness were limited: only 43.9% had separate toilets, most changed menstrual materials at home (70%), and 67.6% were unaware of reproductive health services. Water treatment also varied as Bengalis mostly boiled water (52.9%), while Tribals used filtering (95%).

Reproductive Health Findings

Menstrual Hygiene: Sanitary pads were most used (57.4%), especially by Bengali girls (75%), while Tribal girls relied more on cloth (57.5%). Most changed materials at home bathrooms (~70%). Disposal: Bengali girls mostly unwrapped materials (64.7%), Tribal girls mostly wrapped (65%) ($p < 0.001$). Information Sources: Family was the main source (~54%), with Tribal girls relying more on health workers/NGOs (45%). Awareness & Sanitation: Only 32.4% were aware of reproductive health services; 43.9% had separate toilets. Water Treatment: Bengalis mainly boiled water (52.9%), Tribals filtered (95%) ($p < 0.001$). Overall, significant ethnic differences exist in menstrual practices, disposal, information sources, and water treatment, while sanitation access and service awareness remain low.

Menstrual Hygiene Practices

Materials Used: Sanitary pads were the most common overall (57.4%). Among Bengali girls, 75% used pads, while 22.1% used washed cloth and 2.9% used disposable cloth. Among Tribal girls, 42.5% used pads, 42.5% used washed cloth, and 15% used disposable cloth, showing a significant ethnic difference ($\chi^2 = 17.049$, $p < 0.001$). Place of Changing: Most girls from both groups changed menstrual materials in home bathrooms (Bengali 70.6%, Tribal 68.8%), with no significant difference between ethnicities ($p = 0.809$). Disposal Practices: Disposal methods differed significantly by ethnicity (Bengali girls mostly disposed unwrapped (64.7%), while Tribal girls predominantly wrapped materials before disposal (65%). Sources of Information: Family was the main source (~54%), but Tribal girls relied more on health workers/NGOs (45%), whereas Bengali girls used them less (23.5%). School/friends contributed minimally (Bengali 20.6%, Tribal 2.5%), with a significant ethnic association ($\chi^2 = 16.025$, $p < 0.001$).

Sanitation and Hygiene

Around 44% of respondents reported having separate toilets, with no significant difference between Bengali (44.1%) and Tribal girls (43.8%). Most girls (~70%) preferred changing menstrual materials in home

bathrooms, while shared toilets were used less frequently. Water treatment practices differed significantly: Bengali girls primarily boiled water (52.9%), whereas Tribal girls mostly filtered water (95%) before drinking. Disposal practices also varied by ethnicity. Bengali girls mainly disposed of menstrual materials unwrapped (64.7%), while Tribal girls predominantly wrapped materials before disposal (65%). These findings indicate limited sanitation access, ethnic differences in hygiene behaviors, and a need for improved facilities and health education tailored to both groups.

Nutritional Status

Most respondents consumed vegetables daily (72.9%), with Tribal girls slightly more likely to do so (78.8%) than Bengali girls (66.2%). Meal frequency differed notably between ethnic groups: 83.8% of Bengali girls ate three or more meals per day, while the majority of Tribal girls (86.3%) ate only two meals daily, indicating significant disparities in dietary patterns. Packaged food consumption also varied: a higher proportion of Tribal adolescents (42.5%) consumed packaged foods daily, compared to only 8.8% of Bengali girls. These findings suggest that Tribal girls have more frequent daily consumption of packaged foods, while Bengali girls have more balanced meal patterns with higher overall meal frequency. Overall, while daily vegetable intake was generally good, ethnic differences in meal frequency and packaged food consumption highlight disparities in nutritional habits, which may influence overall health and reproductive well-being.

Conclusion

This study reveals reflective disparities in reproductive health, menstrual hygiene, and nutritional behaviors between Bengali and Tribal adolescent girls in Dhaka city. While both groups share a common vulnerability regarding low awareness of reproductive health services (32.4%) and inadequate access to private sanitation facilities, their specific hygiene and dietary practices vary significantly. Bengali adolescents demonstrate an advanced use of modern sanitary products (75%) and more frequent daily meal consumption. Besides Tribal adolescents remain more reliant on traditional reusable cloths and experience prominent nutritional gaps, with 86.3% consuming only two meals per day. These findings emphasize that a "one-size-fits-all" public health strategy is inadequate for marginalized urban populations. The results of this article confirm that reproductive health outcomes are closely connected with sanitation, hygiene practices and nutritional status.

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