Sanitation status of a rural area of Mymensingh

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Abstract

In Bangladesh majority of people live in rural area. Sanitation is important for health promotion, and disease prevention. To know sanitary condition of rural people of Mymensingh, a descriptive cross-sectional study was conducted and the sampling technique was purposive. Data were collected on a pre-designed questionnaire by direct interviewing the respondents. Sanitation status was assessed by scoring on selected components of personal hygiene and environmental sanitation. Data analysis was done by SPSS version 20. A total of 514 villagers (202 male, 312 female) participated in the study. Age of respondents ranged from 10 years to 75 years; mean age was 36.23 years with a standard deviation of ±13.736 years. Females were mostly housewives (92%), males were mostly farmers (37%). Among respondents 96% had own house, 58% had cultivable land and 26% were poor. Sanitation in this study included personal hygiene and environmental sanitation. Scoring was done based on correct response on selected items of personal hygiene and environmental sanitation (80% and more: excellent, 60 to 79 percent: good, below 60 percent: bad). Personal hygiene practices included were daily bathing, hand washing with soap and water in relevant occasions, washing vegetables, fruits, covering cooked and served food. About 95% had excellent score on personal hygiene. This excellent score was more observed among respondents with increasing age, female sex, service holders, housewives and better socioeconomic condition. Environmental sanitation included safe water supply, sanitary latrine, good house, no animal in house and if present kept in cattle shed in safe distance, hygienic disposal of animal excreta and refuse. 95% had safe water supply, 75% had water seal latrine, 44% had good house and 26% had no animals. Those who kept animals only 23% kept them in cattle shed in safe distance. Hygienic disposal of animal excreta and refuse were 25% and 43.4% respectively. Environmental sanitation based on safe water supply and water seal latrine was excellent and good respectively but based on other 4 components the status was not satisfactory. Despite hardship,sanitary conditions were better thanthe results of other studies in Bangladesh and in other developing countries. Hygiene practices were praiseworthy. Improvement of socioeconomic condition and continuous health education will further improve the situation.

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Introduction

Hygiene is defined as "the science of health and embraces all factors which contribute to healthful living." Hygiene has two aspects - personal and environmental. World Health Organization defines "environmental sanitation" as the "control of all those factors in man's physical environment which exercise or may exercise a deleterious effect on his physical development, health and survival. In the past, sanitation was centered on the sanitary disposal of human excreta. Even now, to many people sanitation still means the construction of latrines.[1] In this article the term sanitation was broad which encompassed safe water supply, sanitary

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disposal of human excreta, animal excreta and refuse, housing condition and personal hygiene practices. Environmental hazards pose constant threat to human health. Much of man's ill health can be traced to adverse environmental factors such as air pollution, water pollution, food contamination, soil pollution, poor housing condition, presence of animal reservoirs, insects and rodents and work environment.[2] In 1990, more than 1 billion people in developing world lacked access to safe drinking water and nearly 2 billion people lacked an adequate system for disposing off their excreta. Diarrheal diseases were responsible for around 3 million childhood deaths in the developing world in 1993.[3] In 1990, poor water supply, sanitation, personal and domestic hygiene attributed to 5.3% of total deaths and 6.8% of total DALYs.[4] Other communicable diseases (e.g. typhoid, hepatitis A, schistosomiasis) and non-communicable (arsenicosis, fluorosis, methemo-globinemia) diseases were not considered. Despite progress, 844 million people still lacks safe water supply, 2.3 billion people lacks sanitary latrine.[5] The list of sanitation related diseases is long which plays role in the causation of respiratory diseases, allergic and parasitic diseases and diseases of fecal-oral transmission. These diseases cause sickness, low life expectancy and death but also prevent social and economic progress.[1,6]

The solution is safe water supply, sanitary latrine and personal hygiene. In 2015 globally 71 percent had safe water supply, 39 percent had sanitary latrine; 30% had data on hand washing. Coverage of hand washing with soap and water ranged from 15% to 76%.[5] In Bangladesh arsenic is of concern. Fifty million people were estimated to be at risk of exposure to arsenic through consumption of water from contaminated tubewells.[7] Mymensingh district, is a district of Mymensingh division having about 53 lakh population.[8] We have selected rural population because 63% of population of Bangladesh lives in rural areas.[9] The principal aim of this study was to know about sanitary condition of rural people based on collected data on safe water supply, sanitary latrine, housing condition, disposal of animal excreta and refuse; personal hygiene practices and the factors influencing sanitation status like age, sex, occupation and socioeconomic condition.

Materials and Methods:

The study was descriptive cross-sectional study carried out on 514 villagers of Churkhai and Winnerpar villages of Bhavokhali union of Mymensingh, which were purposively selected due to convenience (in proximity to medical college campus). The study was done carried out as a part of residential field site training of 3rd year students from October 2015 to March 2016 to know about sanitary condition which included personal hygiene and environmental sanitation. Scoring was done based on correct response on selected items of personal hygiene and environmental sanitation (80% and more: excellent, 60 to 79 percent: good, below 60 percent: bad). Data were collected on a predesigned questionnaire by face to face interviewing the respondents. Informed consent was taken. Data were analyzed by SPSS version 20. Data were presented by tables, graph and chart.

Results

514 villagers participated in the study. Age of respondents ranged from 10 to 75 years; mean age 36.23 years and SD ± 13.736 years. There were 202 males and 312 females (Table I).

Table I: Age & Sex distribution of respondents (n= 514)

Age Group	Male	Female	Total
10-19 yrs	13 (2.53%)	19 (3.70%)	32 (6.23%)
20-29 yrs	43 (8.37%)	113 (21.98%)	156 (30.35%)
30-39 yrs	38 (7.39%)	73 (14.20%)	111 (21.60%)
40-49 yrs	42 (8.17%)	63 (12.26%)	105 (20.43%)
50-59 yrs	35 (6.81%)	31 (6.03%)	66 (12.84%)
60 yrs and above	31 (6.03%)	13 (2.53%)	44 (8.56%)
Total	202 (39.30%)	312 (60.70%)	514 (100.00%)

As per age-sex distribution age group 20 to 29 yrs was predominant (30.35%) and females predominant (Male: Female ratio = 64.74: 100). Involvement in agriculture work was 19.26%. Most of the male respondents were farmer (36.63%), followed by businessman (22.28%). Most of the female respondents were housewife (91.99%), followed by student (3.53%) (Table II).

Table II: Occupation of respondents (n=514)

Occupation	Male	Female	Total
Agriculture worker	23 (4.47%)	0 (0.00%)	23 (4.47%)
Farmer	74 (14.40%)	2 (0.39%)	76 (14.79%)
Business	45(8.75%)	6 (1.17%)	51 (9.92%)
Service holder	7 (1.36%)	0 (0.00%)	7 (1.36%)
Manual worker	33(6.42%)	6 (1.17%)	39 (7.59%)
Student	15(2.92%)	11 (2.14%)	26 (5.06%)
Dependent	5 (0.97%)	0 (0.00%)	5 (0.97%)
Housewife	0 (0.00%)	287 (55.84%)	287 (55.84%)
Total	202(39.30%)	312 (60.70%)	514 (100.00%)

Housewife was predominant (287/514) 55.84% as because most of the respondents were female. Most of the respondents had their own house (95.72%), majority had cultivable land (57.59%) and minority had own business (29.96%). Most of the respondents (70.23%) had monthly income within the range of 8,000 taka to 20,000 taka (Table II).

Table III: Socioeconomic condition of respondents (n=514)

Socioeconomic status	Frequency	Percentage
Poor	136	26.46
Middle	361	70.23
Rich	17	3.31
Total	514	100.00

Sanitation included personal hygiene practices and environmental sanitation. Personal hygiene practices were daily bathing, hand washing with soap and water in relevant occasions, washing vegetables, fruits, covering cooked and served food.

Table IV: Personal hygiene practices (n-514)*

Personal hygiene practices	Frequency	Percentage
Daily bathing	416	80.93
Hand washing after defecation	498	96.89
Hand washing after cleaning child	486	94.55
Hand washing before taking meal	502	97.67
Hand washing before preparing food	492	95.72
Hand washing before serving food	486	94.55
Hand washing with tube well water	472	91.83
Washing vegetables/fruits before eating	502	97.66
Covering cooked food	504	98.05
Covering served food	504	98.05
Above mentioned 8 items and more	487	94.75
6 to 7 items	23	4.47
Less than 6 items	4	0.78

*Multiple responses

All the personal hygiene practices were excellent (above 80%). Most of the respondents 487 (94.75%) had excellent score on personal hygiene followed by good score 23(4.47%). Respondents having bad score 4 was only (0.78%) (Table IV).

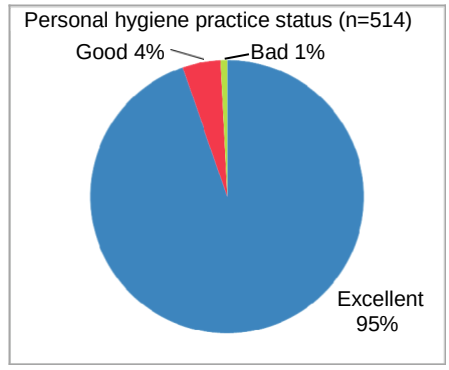

Figure 1: Status of personal hygiene practice (n=514)

Excellent personal hygiene score was more observed among respondents with increasing age, female sex, service holders, housewives and better socioeconomic condition (Table V).

Table V: Factors influencing practice of excellent personal hygiene

Excellent personal hygiene	Frequency	Sample Population	Percentage
Sample population	487	514	94.75
30 to 49 yrs	207	216	95.83
50 yrs and above	106	110	96.36
Female	303	312	97.12
Service holder	7	7	100.00
Manual work	38	39	97.44
Housewife	279	287	97.21
Middle class	343	361	95.01
Rich	17	17	100.00

Environmental sanitation included safe water supply, sanitary latrine, good house, no animal in house and if present kept in cattle shed in safe distance, hygienic disposal of animal excreta and refuse. Majority (about 95%) had safe water supply, 75% had water seal sanitary latrine. About 44% had good house and 26% had no animals. Those who kept animals' only about 23% kept them in cattle shed in safe distance. Hygienic disposal of animal excreta and refuse were 24.54% and 43.39% respectively (Table VI).

Table VI: Environmental sanitation of respondents

Environmental sanitation	Frequency	Sample Population	Percentage
Safe water supply	489	514	95.14
Water seal sanitary latrine	386	514	75.10
Good house	226	514	43.97
Animals in cattle shed in safe distance	86	379	22.69
Hygienic disposal of animal excreta	93	379	24.54
Hygienic disposal of refuse	223	514	43.39

Environmental sanitation based on safe water supply and water seal latrine was excellent and good respectively but based on other 4 components the status was not satisfactory. Only 137 (26.65%) had excellent environmental sanitation score. 102 (19.84%) had good score and majority 275 (53.50%) had bad score. Excellent environmental sanitation score was more observed among respondents with female sex, students, service holders and better socioeconomic condition (Table VII).

Table VII: Factors contributing to excellent environmental sanitation

Excellent personal hygiene	Frequency	Sample Population	Percentage
Sample population	137	514	26.65
Female	88	312	28.21
Student	13	26	50.00
Service holder	3	7	42.86
Middle class	104	361	28.81
Rich	9	17	52.94

Discussion

Five hundred fourteen (514) villagers of Churkhai and Winnerpar of Bhavokhali union participated in the study. Churkhai has 1889 households with population of 8791. Winnerpar has 883 households with 4694 population.[7]

In this study, age of respondents ranged from 10 to 75 years; mean age 36.23 years and SD ± 13.736 years. Respondents were mostly young. Females were more (Male: Female ratio = 64.74: 100). Most of the male respondents were farmer (36.63%), followed by businessman (22.28%). Most of the female respondents were housewife (91.99%), followed by student (3.53%). About 96% had own house, 57.59% had cultivable land and about 30% had business. Landless population is 42.41%. Most of the respondents (70.23%) had monthly income within the range of 8,000 taka to 20,000 taka. Population below poverty line was 26.46%. Age distribution corresponds to BBS data.[10, 11] Females were more because of unavailability of male respondents who were in workplace. Sex ratio of Bangladesh is 99.68:100.[12] Occupation corresponds to national rural scenario. In Bangladesh 80% own house (rural 88%, urban 49.2%);[13] landless people in 2018 was 15.63%.[14, 15] In Bangladesh, population below poverty line in 2019 was 21.8%.[16] Housing was better but ownership of cultivable land and socioeconomic condition was worse.

In this study, sanitation status was assessed by scoring on selected components of personal hygiene and environmental sanitation. Personal hygiene practices included were daily bathing 80.93%, hand washing with soap and water after defecation (96.89%), after cleaning

child (94.55%), before taking meal (97.67%), before preparing food (95.72%),before serving food (94.55%), hand washing with tube well water (91.83%), washing vegetables, fruits before eating (97.66%), covering cooked (98.05%) and served food (98.05%) i.e. all the personal hygiene practices were excellent (above 80%). Most of the respondents (about 95%) had excellent score on personal hygiene.

Excellent personal hygiene score was more observed among respondents with increasing age, female sex, service holders, housewives and better socioeconomic condition. In 2015 globally 30% had data on hand washing. Coverage of hand washing with soap and water ranged from 15% to 76%.[5]

In 1982-83 Gopalganj study, daily bathing 100%, hand washing after defecation, after cleaning child (not mentioned), wash right hand only before taking meal, before preparing food, before serving food almost cent percent, wash hand, wash vegetables/fruits before eating with surface water (pond, canal), covering cooked and served food (not mentioned); washing cooking pots and utensils by surface water and collected rain water. The use of soap is linked with purchasing capacity.[17] Batbaria, Comilla study 2005 found 76% of respondents wash their hands before meals and after defecation.[18] Dhaka slum study 2014 found that 81% subjects took bath regularly, 67% regularly practiced hand washing before taking meal and 59.2% respondents used soap after defecation.[19]

Dhamrai study found 98.2% take bath daily, 60.9% take bath with soap and water daily.[20] In national hygiene survey 57% of mothers/female caregivers and 51% of male caregivers wash both hands with soap; 86% of households stored ready/cooked food, 73% stored ready/cooked food that have been covered.[21] In a Bangladeshi study, 87.34% practiced hand washing before eating, 95.34% practiced hand washing after defecation.[22] In a Bangladeshi study there were 85 opportunities to wash hands with soap and water during food preparation. Participants washed hands with soap on 2 opportunities, rinsed with water alone on 11 opportunities, hand came into contact with bowl on 34 opportunities and they did not wash hands on 38 opportunities. Food preparation was sometimes interrupted by other events or tasks during which contamination was likely, including their own defecation, cleaning child or adding cow dung fuel sticks or firewood to the stove.[23]

In Dhaka slum study, 8% of families used to wash their hands with soap before eating which improved to 54% after intervention. The interventions were continuous community hygiene education along with physical access to water supply and sanitation.[24] In an Indian study, >90% practiced hand washing after defecation though the hand washing was not methodical before intervention. Significant improvement was observed in all aspects of hand washing after intervention.[25] In a Nepali study, 76.92% used soap water for hand washing before meal, 66% washed their hands after defecation with soap water.[26] Personal hygiene practices in this study were better than the scenario of our country and neighboring countries.

In this study, environmental sanitation included safe water supply, sanitary latrine, good house, no animal in house and if present kept in cattle shed in safe distance, hygienic disposal of animal excreta and refuse. Majority (about 95%) had safe water supply, 75% had water seal sanitary latrine. About 44% had good house and 26% had no animals. Those who kept animals' only about 23% kept them in cattle shed in safe distance. Hygienic disposal of animal excreta and refuse were 24.54% and 43.39% respectively. Only about 27% had excellent environmental sanitation score. Excellent environmental sanitation score was more observed among respondents with female sex, students, service holders and better socioeconomic condition. Globally improved water coverage 88%; in South East Asia region coverage of

improved drinking water exceeds 50% in both urban and rural area. Excellent status (>90%) was prevalent in Bangladesh, Bhutan, DPRK, Maldives, Sri Lanka and Thailand; good status (75 to 90%) in India, Indonesia and Nepal. Improved water does not mean safe water because 22% of piped water and 38% of protected water are contaminated.[27]

In 2015 globally 71 percent had safe water supply, 39 percent had sanitary latrine.[5] In Bangladesh according to 2016 BBS survey tube well water 85.18%, supply water 12.01% and others 2.81%.[28]

In 2016, Dhaka, Dhamrai study safe water supply was about 85% (32.73%tube well water and 52.73% supply tap water).[20] In an Indian study 35% used tube well water, 62% public supply tap and 3% can water for drinking; for cooking, ablution, washing, washing and cleaning 35% used tube well and 65% used public supply tap. Indian researchers do not consider any source to be safe except subject to domestic treatment (boiling or domestic filter).[29] In a Nepali study 30.05% boiled water and 25.12% used domestic filter.26In Bangladesh, 1980-90 prevalence of sanitary latrine was 23%.[30]

In 2002, in rural Mymensingh, 67% had latrines and among those who had latrines 39% was sanitary.[31] In 2014 sanitary latrine prevalence was 47%.[32] In 2016, according to Ministry of Local Government data of Bangladesh 70.9% had sanitary latrine; [21] whereas according to 2016 BBS survey sanitary latrine prevalence was 25.61% (rural 19.32% and urban 41.73%).

The discrepancy with the national data they explained by the fact that though the latrines were water seal sanitary latrine as per construction but they cannot be considered due either to close proximity to surface water source or the septic tanks connected with public drain contaminating canals and rivers.[28]

In 2011 in rural Bangladesh, 5% of houses were pucca, 16% semi-pucca, 76% kutcha and 3% jhupri.[13] In an Indian study, 25% of the participants did not have access to toilets, 47% reported that they discharge their waste in open drainage.[29] In a Nepali study 53.20% had no latrine, 25.12% had pit latrine and 21.67% had water seal latrine.[26] In Pakistan, sanitation facilities are available to only 42% of population (65%in urban areas and 30% in rural settlements.[33] Environmental sanitation was better than the scenario of our country and neighboring countries. However housing condition, animal keeping in safe distance, hygienic disposal of animal excreta and refuse was not satisfactory.

Conclusion

Continuous community health education along with improvement of safe water supply, water seal sanitary latrine, better housing condition, keeping animals in cattle shed in safe distance, hygienic disposal of animal excreta can improve sanitary status in rural areas. For overall improvement poverty needs to be alleviated. Animal keeping needs special attention.

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