



Research article

Compliance on existing WASH facilities in community clinics of Bangladesh: A comparative study



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ABSTRACT

Provisions of water sanitation and hygiene (WASH) facilities are essential to make accessible and sustainable through Community Clinics (CCs) to control infection in primary health care service. However, there is scarcity of literature to observe the scenario. This cross-sectional study with mix-method approach conducted a comparative analysis with a focus on compliance with WASH facilities between two categories of CCs in Meherpur and Kustia District in Bangladesh. There were total 420 respondents out of which 400 were selected purposively from the 20 renovated and non-renovated CCs for quantitative approach and 20 respondents for qualitative approach. Data were collected using face-to-face interview method. The study revealed that all of the renovated CCs had safe drinking water source, functioning toilet, hand washing and dust bin facilities except for a few cases with technical problem in water supply. But the reverse scenario was observed in non-renovated CCs. Compliance on WASH facilities in renovated CCs was two times higher than the non-renovated CCs. Clients aged ≤ 40 years (AOR = 0.41, renovated CCs), and married (AOR = 4.03, non-renovated CCs) did not comply the use of safe drinking water in CCs. Noncompliance of toilet use (AOR = 12.15, renovated CCs and AOR = 8.96, non-renovated CCs) and hand washing facility use (AOR = 8.46, renovated CCs and AOR = 16.8, non-renovated CCs) significantly found higher among respondents who had no formal education. Non-renovated CCs need to develop their WASH facilities as well as ensure maintenance whereas the renovated CCs need dedicated human resource as well as effective policies to maintain the sustainability.

1. Introduction

Improved water, sanitation and hygiene (WASH) facility highly contributes in preventing and controlling infection within the health care facilities (HCFs) [1, 2, 3]. Due to poor WASH provision at HCFs in many low and middle-income countries, health care associated infections are becoming an emerging issue [4]. In Bangladesh, HCFs are known as 'community clinics' (CCs). Ministry of Health and Family Welfare have built over 13,000 community clinics through the program 'Revitalization of Community Health Care Initiative in Bangladesh (RCHCIB)—Community Clinic Project' which aims to provide basic health care to every 6000-community people by each Community Clinic [5]. They serve over 60 percent of total population in Bangladesh. A study entitled "An Assessment of Water, Sanitation and Hygiene Access in Bangladesh's Community Health Clinics" was conducted to assess the WASH access in

Community Clinics using data of Community Based Health Care (CBHC) and supported by World Bank and WaterAid Bangladesh (WAB). The study found a disappointing snapshot of the status of WASH in CCs throughout the country which lacks in quality of WASH practice are higher among the communities at Upazila level [6]. WASH facilities were modernized and renovated in several selected community clinics with the support from Water Aid Bangladesh (WAB). Study conducted by Water-Aid Bangladesh displayed the poor WASH facilities in slum and hard to reach areas by external evaluation [7]. Another study revealed persistence gap between perception and practice of proper hand washing in Bangladesh considering water availability and access to media [7, 8]. Educational intervention which promotes standard water sanitation behavior reduces the chances of incurring infectious diseases such as diarrhea, etc. In addition, hygiene behavior can be facilitating by improved knowledge and awareness of health and WASH related issues

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[9, 10]. Furthermore, water, sanitation and hygiene progress acceleration can be improved by advocacy, regulation and promotion of WASH; so that health sectors are, the crucial area establishment of WASH practices [9, 10, 11]. There are some constraints for WASH practice on an individual level which can be overcome by facilitating WASH through interventions, implementation, regulation, persistent practice at the CCs. Few articles exist to find out the comparative determinants related to WASH facilities and compliance (set by Ministry of Health & Family Welfare) by the clients at the grass root level of health care facilities like CCs in Bangladesh [12, 13]. That is why we conducted this study focused on the comparative situation and compliance of the different components of WASH among clients of two categories of CCs renovated by WaterAid Bangladesh and WASH non-renovated CCs.

2. Methods

2.1. Study design & sites

The study was a descriptive type of cross-sectional study with both qualitative and quantitative (a mix-method) approach. The study was conducted in 20 renovated and non-renovated CCs of two adjacent Upazila Gangni & Mirpur. For the comparative analysis geographically two adjacent study sites were selected, as they are neighboring Upazila (sub-district) (Figure 1). The geographical, socioeconomically and cultural context were same for the Upazilas (sub-district) thus confounding bias might be minimized in making better comparisons. 20 CCs comprising of renovated (10) in Gangni Upazila (sub-district) and non-renovated (10) in Mirpur Upazila (sub-district) were selected randomly for the comparative study. Selected renovated CCs in Gangni upazila were Shaharbari, Kosba, Gopalnagar, Terail, Noapara, Voladanga, Kodaikati, Sholotaka, Elangi & Chitla CC whereas renovated CCs in Mirpur upazila were Ashannagar, Katlamari, Kamirhat, Anjangachhi, Fulbaria, Aburi, Kakiladaho, Nowdaazampur, Laxmidhardia & Khayerpur CC. Renovated CCs were upgraded by WaterAid Bangladesh with WASH components keeping the relevant compliances.

2.2. Study period

The study was conducted from November 2019 to February 2020 under the 'Young Researcher's Fellowship Program' with the grant provided from WaterAid Bangladesh. WASH comparison assessed according to the renovations done by WaterAid Bangladesh in Meherpur District [14].

2.3. Study population

The study population comprised of attending clients and Community Health Care Providers (CHCPs) in the CCs of Gangni and Mirpur upazila. The CHCPs contribute to help communities improve access to basic health services.

2.4. Inclusion criteria

- Clients who took services from the selected CCs.
- Clients aged 18–65 years.
- Clients who has willingness to participate in the study.

2.5. Exclusion criteria

- Clients who were not willing to participate in the study.
- Participants who were severely ill (Physically unfit/severely injured to participate in the study, mentally retarded etc).

2.6. Sample size

In this study, a total number of 420 respondents (400 clients for quantitative study and 20 Community Health Care Providers for qualitative study) were selected to conduct the mixed method approach. The final sample size for quantitative approach had been obtained using Rao soft sample size calculator. Primarily sample size calculated as 384 by considering population size 629722 (Gangni = 299607 & Mirpur = 330115) and 5% marginal error at 95% confidence level. Then 5% non-response error was added with the calculated number and the final sample size gained 400. Response distribution was done as 200 were selected from 10 renovated CCs and the rest 200 was selected from 10 non-renovated CCs conveniently. For the qualitative approach, 20 CHCPs were assigned from the randomly selected 20 CCs in two Upazilas.

2.7. Sampling

To conduct the study CCs were selected randomly from Gangni and Mirpur Upazila. Study participants were selected purposively to collect the quantitative data. For the qualitative approach, data were collected from the CHCPs in selected CCs. Since, each CCs had one CHCP, 20 CHCPs were selected from 20 CCs to collect qualitative data.

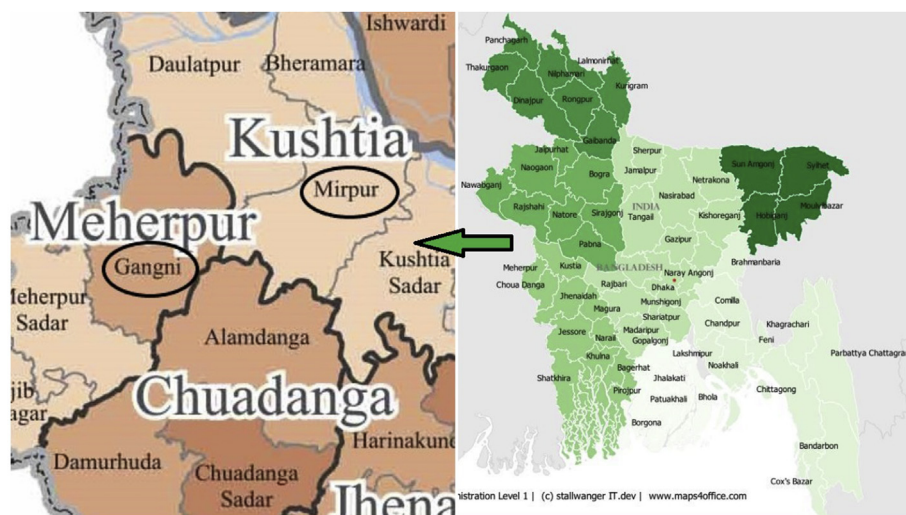


Figure 1. Geographical map of the two adjacent study places i.e. Gangni in Meherpur district and Mirpur in Kushtia District.

2.8. Data-collection instruments

- > Under the quantitative study design, data were collected with the help of a pretested and semi-structured and modified questionnaire followed the validated questionnaire addressed in the other relevant studies [6, 15]. Questionnaire for the quantitative approach comprised of several sections: (i) socio-demographic information: age; religion; education; marital status; occupation; family type; monthly family income; (ii) existing facilities: safe drinking water source and supply, toilet and hygiene provisions, waste management facilities, (iii) comparative situation of WASH facilities, (iv) compliance to WASH facilities by the clients and CHCPs as well as reasons for non-compliance.
- > On the other hand, qualitative data were taken from CHCPs of the selected CCs, using a pretested, modified and semi-structured topic guide questionnaire. Questionnaire for qualitative approach included (i) socio-demography of the CHCPs, and CCs, (ii) setting approach of the CCs, (iii) existing supports (water supply, hygiene facilities, educational wall postings for directions and other supportive elements or miserable conditions regarding WASH provisions, compliance by the clients from the perspective of CHCPs, and their recommendations.
- > All the instruments were developed as draft followed by pretest in two CCs and in the catchment areas other than the study site. For pretest, two CCs were selected from Meherpur Upazilla. The data-collection instruments were finalized by necessary corrections and modifications following the findings from the pretest.

2.9. Data-collection procedure

- > Client's survey: Quantitative data from the clients were taken by face-to-face exit interview method.
- > Health Care Provider's survey: Qualitative data from CHCPs were collected through Key informant interviews (KIIs) method. Observations of existing WASH facilities were done during this time and cross checked with the information given from CHCPs.

2.10. Measures

A scoring system was used to measure the compliances on each component of WASH provisions. Each correct answer was given a score of one as mark and zero for wrong answers or no answer [16]. For multiple answers, score of 1 was divided by total number of answers given by the respondents. Then the total obtained marks were converted into percentage.

2.11. Data processing & data analysis

The collected data were checked, verified, categorized, coded, and then entered into the computer for analysis with the help of SPSS (Statistical Package for Social Sciences) version 21 software. Any inconsistency and irrelevance with data especially during transcription of qualitative data were checked care-fully and corrected accordingly. Non-response from any patient was excluded from the final analysis. The data analysis and data gathering were done simultaneously. Respondent's characteristics, level of compliance was described as percentage and presented with 95% confidence intervals (CI). A logistic regression was used to identify predictors related to non-compliance with WASH facilities. All independent variables were tested individually by Chi-square (χ^2) and entered into the first model since they were associated with adherence <0.05 level of significance. Comparison was analyzed using t-test. A backward step-by-step binary logistic regression (simple and multiple) was used and only statistically significant variables ($p < 0.05$) were kept in the final model. The odds ratios (ORs) of simple binary results were considered as unadjusted ORs (Crude ORs), whereas ORs of multiple binary logistic regressions were used as adjusted ORs (AORs).

2.12. Ethical consideration

The study complied with the Declaration of Helsinki and was approved by the Ethical Review Committee, Department of Public Health, Northern University Bangladesh, Dhaka, Bangladesh (memo no: NUB/DPH/EC/2019/02).

3. Results

3.1. Demographic description of the clients in selected CCs

An overview of socio-demographic characteristics of the study respondents were: 60% of the respondents were aged ≤ 40 (Mean \pm SD = 38.50 ± 11.61); majority (97%) were Muslim and female (86.5%). More than half (54.8%) of the respondents did not have any formal education. Most of the respondents (91.5%) were married and housewife (78.8%).

3.2. Existing WASH facilities in CCs of both types (Qualitative approach)

The qualitative approach to identify the existing situation of WASH in different types of CCs. Based on observation of CHCPs showed that all the CCs (100%) had available safe water source (Tube well/Motor) as the respondents stated that drinking water has been examined through government programs, proper functioning toilet, handwashing stations and dustbins in WASH renovated CCs. In the contrary, for 80% of the non-renovated CCs, CHCPs carried safe water from home, only 20% had tube wells, 90% had unimproved toilet and did not have any handwashing station. However, all the non-renovated CCs had dustbins for waste management. CHCPs and the clients of non-renovated CCs were not satisfied about the existing WASH facilities (Table 1).

CHCP of Ajangachhi CC stated:

"There is no pure water system here. There is a problem with water in the tube well. The water is not suitable for drinking. Examiners tested the water and they stated that the water contains lots of germs and dusts. Both toilets are nonfunctioning here. Once inaccessible therefore we have to go to the toilet at home nearby. Patients also cannot use."

3.3. Existing WASH facilities in renovated and non-renovated CCs (Quantitative approach)

On the other hand, the quantitative approach revealed, majority of the respondents (82%) narrated safe water was available in renovated CCs, however the situation was completely opposite in non-renovated CCs. In renovated CCs, most (71.5%) of the respondents found available toilet whereas in non-renovated CCs, more than half (57%) did not find any toilet. A bulk (74.5%) of the respondents observed handwashing provisions in renovated CCs but almost all of the respondents (96%) did not find any handwashing facilities at non-renovated CCs. Moreover, more than half of the respondents in both the types of CCs found available dustbins to dispose of waste products (Table 2).

In addition, all of the respondents found improved toilets (renovation done by WaterAid or government: clean and functioning condition, access of water supply and hygiene support) and majority (98.2%) found safe drinking water from tube well (98.2%) at the renovated CCs. In non-renovated CCs, more than half of the respondents traced unimproved toilet (57.1%). Among them only 14 used toilet and only a few (18.3%) could access safe water, which was carried from home by the CHCPs (Table 3).

3.4. Compliance with WASH facilities by the clients in both types of CCs

The compliance on each component of WASH by the clients attended in different types of CCs identified that nearly half (39.5%) of the respondents used safe water, 16.5% used toilet and 28% used hand washing station at the

Table 1. Existing situation of WASH responded by CHCPs (Qualitative Approach) (n = 20).*

Existing situation of WASH		Renovated CCs (n = 10)	Non-renovated CCs (n = 10)
		n (%)	n (%)
Availability of safe water source	Tube well/Motor	10 (100)	2 (20)
	Other sources (carried from home)	0 (0)	8 (80)
Availability of toilet	Improved	10 (100)	1 (10)
	Unimproved	0 (0)	9 (90)
Availability of hand washing station		10 (100)	1 (10)
Availability of dust bin		10 (100)	10 (100)

* n = frequency, % = percentage, WASH= (Water Sanitation & Hygiene), CCs= (Community Clinics), CHCPs = Community Health Care Providers.

Table 2. Distribution of the respondents by existing situation of WASH in CCs by their observation (Quantitative Approach) (n = 400).*

Existing situation of WASH	Renovated CCs (n = 200)	Non-renovated CCs (n = 200)	Total (n = 400)
	n (%)	n (%)	n (%)
Availability of safe drinking water	164 (82)	60 (30)	224 (56)
Availability of toilet	143 (71.5)	86 (43)	229 (57.2)
Availability of hand washing station	149 (74.5)	8 (4)	157 (39.2)
Availability of dust bin	118 (59)	119 (59.5)	237 (59.2)

* n = frequency, % = percentage, WASH= (Water Sanitation & Hygiene), CCs= (Community Clinics).

Table 3. Distribution of the respondents by safe water source and toilet provisions in CCs (Quantitative Approach) (n = 39).*

Type of safe drinking water provisions	Renovated CCs (n = 164)		Non-renovated CCs (n = 60)	
	n	%	n	%
Tube well/Motor	161	98.2	49	81.7
Other sources (carried from home)	3	1.8	11	18.3
Type of toilet provisions	Renovated CCs (n = 33)		Non-renovated CCs (n = 14)	
	n	%	n	%
Improved	33	100	6	42.9
Unimproved	0	0	8	57.1

* n = frequency, % = percentage, WASH= (Water Sanitation & Hygiene), CCs= (Community Clinics).

Table 4. Distribution of the respondents by the compliance to WASH in CCs (n = 400).*

Compliance to WASH facilities		Renovated CCs (n = 200)	Non-renovated CCs (n = 200)
		n (%)	n (%)
Compliance to safe water use	Complied	79 (39.5)	29 (14.5)
	Non-Complied	121 (60.5)	171 (85.5)
Compliance to toilet use	Complied	33 (16.5)	14 (7.0)
	Non-Complied	167 (83.5)	186 (93.0)
Compliance to hand washing station use	Complied	56 (28.0)	8 (4.0)
	Non-Complied	144 (72.0)	192 (96.0)

* n = frequency, % = percentage, WASH= (Water Sanitation & Hygiene), CCs= (Community Clinics).

renovated CCs. In non-renovated CCs, respondents used WASH facilities nearly half times lower than the respondents of renovated CCs (Table 4).

3.5. Statistical comparison of compliance with WASH facilities in two types of CCs

Most importantly, total score of compliance on WASH in renovated CCs was significantly higher than the non-renovated CCs. The study revealed that the clients of renovated CCs complied significantly ($p =$

0.01) with the use of each components of WASH facilities than the clients of non-renovated CCs (28 ± 36.52). (Table 5).

Although compliance on WASH in renovated CCs was significantly higher than the non-renovated CCs, the CHCPs from the non-renovated CCs stated that they were advising as a part of their duties to use WASH facilities. CHCP of Elangi CC (renovated CC) stated.

“We advise patients to wash their hands through health education. For example, wash your hands with soap before meals and after using the toilet.”

Table 5. Distribution of the respondents by comparison between the levels of compliance on WASH by the clients attending in two different types of CCs (n = 400).*

CC type	Compliance with WASH provisions		Mean	St. Deviation	t	p	95% CI	
	Complied (n/%)	Non-complied (n/%)					Lower	Upper
Renovated	90 (45)	110 (55)	28	36.52	6.515	<0.001	13.616	25.384
Non-renovated	35 (17.5)	165 (82.5)	8.5	21.39				

* St. Deviation = Standard Deviation, CI = Confidence Interval, WASH= (Water Sanitation & Hygiene), CCs= (Community Clinics).

3.6. Predictors identified for the non-compliance of use of the existing WASH provisions in both types of CCs

Three components (safe drinking water, toilet and hand washing facility) of WASH were studied for revealing the significant indicators encountered for the non-compliance of use of such facilities. Predictors significantly identified for the non-compliance of using safe water use in renovated CCs were aged ≤ 40 years (COR = 0.31 and AOR = 0.41, $p = 0.01$) and being married (COR = 5.44 and AOR = 4.03, $p = 0.02$). For the non-renovated CCs, being married is the significant predictor for the non-compliance on safe drinking water use (COR = 3.96 and AOR = 4.56, $p = 0.01$).

For the non-compliance on second component of WASH (Toilet use), having no formal education has been identified as the significant predictor for the both renovated CCs (COR = 13.56 and AOR = 12.15, $p < 0.01$) and non-renovated CCs (COR = 6.34, AOR = 8.96, $p < 0.01$).

Lastly, no formal education was identified as a significant predictor for the compliance of using hand washing facility for both the types of the CCs (Renovated: OR = 9.17, AOR = 8.46, $p < 0.01$, Non-renovated: OR = 11.4, AOR = 16.18, $p = 0.01$). (Table 6).

4. Discussion

In this study, the comparison has been made considering WASH renovated CCs by WaterAid Bangladesh as standard [4]. For the

Table 6. Predictor identified associated with non-compliance of wash facilities by the clients in different types of CCs. (Quantitative approach).*

Predictors	p-value	Crude OR	Adj. OR	p-value	95% CI	
					Upper	Lower
Non-compliance to safe drinking water use (Dependent variable)						
Renovated CC						
Age ≤40 (years)	<0.01 ^s	0.31	0.41	0.01 ^s	0.82	0.20
Age>40 (years)	Reference category					
Married	<0.01 ^s	5.44	4.03	0.02 ^s	13.03	1.25
Unmarried	Reference category					
Non-renovated CCs						
Married	0.01 ^s	3.96	4.56	0.01 ^s	13.43	1.55
Unmarried	Reference category					
Non-compliance to toilet use (Dependent variable)						
Renovated CCs						
No formal education	<0.01 ^s	13.56	12.15	<0.01 ^s	46.08	3.21
Primary	0.03 ^s	4.52	4.60	0.03 ^s	17.63	1.20
Secondary	0.03 ^s	4.32	4.41	0.03 ^s	16.19	1.20
HSC or above	Reference category					
Non-renovated CCs						
No formal education	0.05	6.34	8.96	0.03s	6.46	1.26
Primary	0.12	4.70	6.30	0.08	49.02	0.81
Secondary	0.09	9.2	11.72	0.07	168.64	0.82
HSC or above	Reference category					
Non-compliance to hand washing station use (Dependent variable)						
Renovated CCs						
No formal education	<0.01 ^s	9.17	8.46	<0.01 ^s	29.94	2.39
Primary	0.11	2.86	2.89	0.11	10.56	0.79
Secondary	0.18	2.36	2.39	0.18	8.44	0.68
HSC or above	Reference category					
Non-renovated CC						
No formal education	0.01 ^s	11.4	16.18	0.01 ^s	127.18	2.06
Primary	0.02 ^s	20.0	24.81	0.02 ^s	351.56	1.75
Secondary	0.09	9.2	8.42	0.11	117.59	0.60
HSC or above	Reference category					

* s = Significant, OR = Odds Ratio, CI = Confidence Interval, Binary Regression, WASH= (Water Sanitation & Hygiene), CCs= (Community Clinics).

renovated CCs, qualitative data shows that all of them had available WASH facilities. Furthermore, the quantitative findings represent the same scenario. Qualitative data showed the actual observation on existing situation of WASH provisions in all the selected CCs. However, quantitative data presented somewhat fluctuation from the qualitative data, because the few respondents of quantitative approach were first time service seeker who they did not know whether there were any WASH facilities in CCs or not.

The miserable condition of the non-renovated CCs was quite similar to a study which was conducted with 13,394 CCs in the Bangladesh and found majority of the CCs had limited WASH facilities [6].

Another survey conducted by WHO and UNICEF in 54 low and middle-income countries found that 38% of healthcare facilities did not have an improved water source, 19% did not have improved sanitation and 35% did not have water and soap for hand washing. The Study showed that the lowest WASH facilities in health care services were found in countries like Bangladesh [4]. The study further revealed the critical situation of all the community clinics in Bangladesh.

The compliance on each component of WASH by the clients attended at the renovated CCs was two folds more than the compliance at non-renovated CCs. Although, during the health education session CHCPs of each CC stated that, they advised all the clients to use all the components of the WASH in a perfect manner.

A significant number of respondents did not comply with the WASH facilities. Nearly half of the respondents for both the types of the CCs were nearby inhabitants and did not need to use the WASH facilities. Clients of the renovated CCs stated, CHCPs were not providing enough support to comply with the WASH facilities as the toilet and hand washing station were in poor unusable condition. However, there was an existing system of collecting Tk. two from every client to support the regular maintenance of the WASH components. According to the statements from CHCPs, the financial gain was not enough to carry out the maintenance operation.

Non-compliance to the safe water use was significant among aged ≤ 40 and married people for the renovated CCs whereas in non-renovated CCs, being married was the significant predictor for the non-compliance. In addition, people did not have any formal education were less likely to comply on toilet and hand-washing facilities use. Similar findings were found for a cross-sectional follow-up survey which was conducted in 1992. The survey found majority adult respondents used latrines in interventional area [9].

Another cross-sectional comparative study showed a strong association between education of the respondents and hand washing practice [7]. Similarly, this study also found that people who had no formal education complied less on hand washing facility use. Another study conducted by BRAC found different findings on behavior that was associated with improved knowledge. The differences to the findings were due to different design, context, area and study type (qualitative study) [10].

5. Conclusion

This study revealed a gloomy scenario of existing WASH facilities in Non-renovated CCs according to the statement of the CHCPs while the improved condition of the renovated CCs satisfied both CHCPs and clients. As a consequence, study found two folds better compliance on use of WASH facilities among the clients of renovated CCs rather than non-renovated CCs especially non educated respondents found as more reluctant to comply the facilities. The result of this study will guide the policymakers for sustainable and comprehensive program for the development of WASH in CCs. Clients' knowledge improvement and attraction (symbolic or pictorial messages) might establish the WASH practice leading to prevention of infectious diseases, achieving good health and wellbeing, which is the goal of establishing community clinics at Union level of Bangladesh.

5.1. Limitations of the study

As the study was conducted in only two Upazilas due to shortage of time and money constraints, the study was carried out in a certain segment of community in Bangladesh, which did not represent the country. We hope that such limitations and other aspects that could have been missed in this study will be included in future work.

Declarations

Author contribution statement

Nasrin Akter: Conceived and designed the experiments; Analyzed and interpreted the data; Performed the experiments; Wrote the paper.

Bilkis Banu: Conceived and designed the experiments; Analyzed and interpreted the data; Wrote the paper.

Sader Mahmud Hossain: Performed the experiments; Wrote the paper.

Shaminul Haque Shakib, A.S. Nurullah Awal: Contributed reagents, materials, analysis tools or data; Wrote the paper.

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Data availability statement

Data included in article.

Declaration of interests statement

The authors declare no conflict of interest.

Additional information

No additional information is available for this paper.

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