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Factors affecting Bangladeshi high school students' practices of sanitation and hygiene

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ABSTRACT

Background: Better sanitation and hygiene standards are beneficial for preventing infections, limiting the spread of pathogens, and fostering overall health in educational environments. On the other hand, not much is known about school-student's hygiene and sanitation habits. The purpose of this study is to identify and comprehend the variables that affect students' behavior related to sanitation and hygiene in classrooms. **Method:** This study was carried out at the Katiadi Government High School, a high school in a Bangladeshi upazilla town. An exploratory qualitative study design, based on the Integrated Behavioral Model for Water, Sanitation, and Hygiene (IBM-WASH) was used. Before utilizing them, the effectiveness and clarity of the semi-structured interview guides were tested, which included questions about behavior, access, and practices related to sanitation and hygiene. **Result:** The students had quite low sanitation and hygiene practices despite having a reasonable level of awareness and knowledge. Sanitation and hygiene practices were influenced by a wide range of interrelated factors, which also affected one another. Contextual factors (lack of upkeep and cleanliness, availability of sanitary products), socio-behavioral factors (norms, peer influence), and individual factors (gender awareness, perception, and sense of health benefits). **Conclusion:** To advance improved sanitation and hygiene practices among school students, multi-level interventions such as regular delivery of WASH-related materials and agents, promotion of low-cost WASH interventions, quality cleaning services improvement, close observation of cleaning activities, individual hygiene behavior promotion, and introduction of gender-sensitive WASH infrastructure and construction may be helpful.

Keywords: *Sanitation; school; hygiene; health; practice; contamination*

1. INTRODUCTION

Global sanitation improvements towards desired target are estimated to fall short by half a billion people, with 2.4 billion people expected to still lack access to improved sanitation facilities in 2015 [1]. To minimize exposure to fecal contamination, improved sanitation aims to separate human excreta from human contact [2]. Unimproved sanitation facilities comprise pit latrines without slab coverings, hanging latrines, and bucket usage, among others. Defecating in the open is also regarded as inadequate sanitation. The practice of shared sanitation exhibits significant variability, indicating that a variety of sanitation solutions may be more effective in meeting the needs of distinct populations [3].

The advantages of enhanced sanitation and hygiene practices are widely acknowledged and supported as a successful approach to preventing infections and managing the spread of pathogens [4, 5]. It is also widely acknowledged that encouraging proper hygiene and sanitation habits is an affordable, practical, achievable, and beneficial public health strategy to stop the

spread of infectious diseases and advance overall health [6, 7]. Global commitments and numerous international policy documents have supported the significance of supporting optimal sanitation and hygiene practices. Under the Sustainable Development Goals (SGD goal 6), the United Nations (UN) highlighted access to improved sanitation and appropriate hygiene practices, stating that it is likely to create sustainable economic growth and a brighter future [8]. Bangladesh's economic development has advanced significantly in recent years. Over the previous two decades, the nation's GDP remained over six percent, positioning it as the world's fastest-growing economy [9-11]. Greater access to school attainment and an increase in primary and secondary education derive from the government's increased capacity to invest in the education sector (i.e., education stipend program, gender parity, geographical coverage) [12, 13]. The government implemented policy initiatives, such as the first Private University Act in 1992 and a 20-year Strategic Plan for Higher Education 2006–2026, in a manner akin to that of the primary and secondary education sectors. Since the 1990s, the World Bank has provided technical and financial assistance to the nation in order to expand and satisfy the needs of higher education in Bangladesh [14].

Evidence suggests that sustaining excellent hygiene habits has a relatively low adoption rate in low-income nations, despite the effectiveness of better sanitation and hygiene practices in educational settings being demonstrated [15]. Studies on sanitation and hygiene practices in educational settings have predominantly concentrated on Bangladeshi schools, namely primary schools serving students aged six to twelve [16-18]. This study examines behavior and behaviors linked to sanitation and hygiene from a holistic standpoint using a qualitative research approach. This study, which uses a conceptual framework, identifies and clarifies how students' habits of sanitation and hygiene are influenced. This study will comprehensively describes the variables connected to WASH-related procedures and results in a particular setting. Furthermore, the study will provide guidance for the Water, Sanitation, and Hygiene (WASH)-related initiatives required in high schools to enhance student and public sanitation and hygiene practices.

2. METHOD

2.1 Study framework & design

This study was guided by the Integrated Behavioral Model for Water, Sanitation, and Hygiene (IBM-WASH) [19]. With limited resources, this model provides an analytical and conceptual tool to investigate and comprehend a variety of issues that affect the dynamic use of water, sanitation, and hygiene [20]. According to this model, a wide range of variables at different levels impact on sanitation and hygiene habits. Individual-level influences include past exposure and knowledge of the need for hygiene maintenance. The existence of infrastructure or its lack are considered as physical environmental issues. The psychological and social influences, such as norms, beliefs, habits, and self-efficacy, that impact the adoption of sanitation and hygiene practices are known as socio-behavioral factors.

Figure 1. Diagram of research process

2.2 Study population & sampling

Students who met the eligibility requirements, which included finishing at least six grades of study and voluntary participation, were included. In-depth interview was done with 24 students, including 14 male and 10 female students, and opinion and focus group discussions were done for 35 participants. Students enrolling who lacked the capacity to give informed permission were not included in our sample. Participants were picked based on the goals of the study, and the Bangladeshi background was used in qualitative research [21, 22]. Initially, the interviewers approached up to prospective students and explained the goals, expectations, and research questions of the study. The interviewee was invited to participate if they satisfied all the requirements. All procedures were outlined in the consent form throughout this process, including those pertaining to the study's topic, participants' rights, potential risks and benefits, the freedom to end the interview at any moment, confidentiality, anonymity, and additional sources of information. The process diagram shown in (figure 1). Prior to conducting the interview, we got the participants' signed consent. The interviews were captured on audio. The concept of data saturation—a moment in time at which no new information, dimension, or topic emerged—was used to calculate the number of interviews [23]. The interviews was terminated upon reaching sufficiency in the data for thematic reviews. The following two fundamental criteria were followed, when choosing research participants: (i) maximum variation; (ii) reflexivity.

2.3 Study area and time

The study was conducted at Katiadi Government High School in Kishoreganj, a town in northeastern Bangladesh, which is around 125 kilometers away from Dhaka, the country's capital. This study carried out between November and December in 2022.

2.4 Data collection

The mother tongue of both the interviewers and the respondents Bangla, was used for the interviews. A different educational institution examined the suitability and intelligibility of the semi-structured interview guidelines and questionnaires that were created. The availability of facilities for sanitation and hygiene, as well as factors such as infrastructure, supply, maintenance, habits, facilitators, and/or barriers, were all covered in these question guides. In an initial effort to establish a positive rapport, the interviewers inquired about the participants' daily routines, inclinations, and ways of life.

2.5 Data analysis

Utilizing the thematic method, a theme-based study was performed [24]. In order to report the results, we distinguished four main themes. Uncategorized themes were created using a thematic analysis approach, which helps investigate and identify related elements that affect students' practices around sanitation and hygiene.

3. RESULTS AND DISCUSSIONS

The information acquired from all sources showed that although students are generally aware of the need for better sanitation and hygiene, their behaviors can be affected by institutional and contextual variables. It was observed that the contextual factors, influencing students' sanitation and hygiene habits are individual, socio-behavioral, contextual and institution-related factors. The participants' sociodemographic details are displayed in Table 1 and Figure 2 & 3. The ninth grade students made up the largest group of participants in the in-depth interview session. There were ten female students and fourteen male students. Among the participants majority were from rural area and Islamic religion background. Here, 14 in depth interview were clarified in the result section using thematic process.

Table 1: Socio-demographic properties of students (In depth interviewee)

Variable	Variable	Number	Total
Academic study of year	6^{th} grade	2	24
	7^{th} grade	2	
	8^{th} grade	3	
	9^{th} grade	10	
	10^{th} grade	7	
Gender	Male	14	24
	Female	10	
Residence Background	Rural area	15	24
	Town area	9	
Religion	Islam	22	24
	Hindu	2	
	Christian	0	
	Buddhism	0	

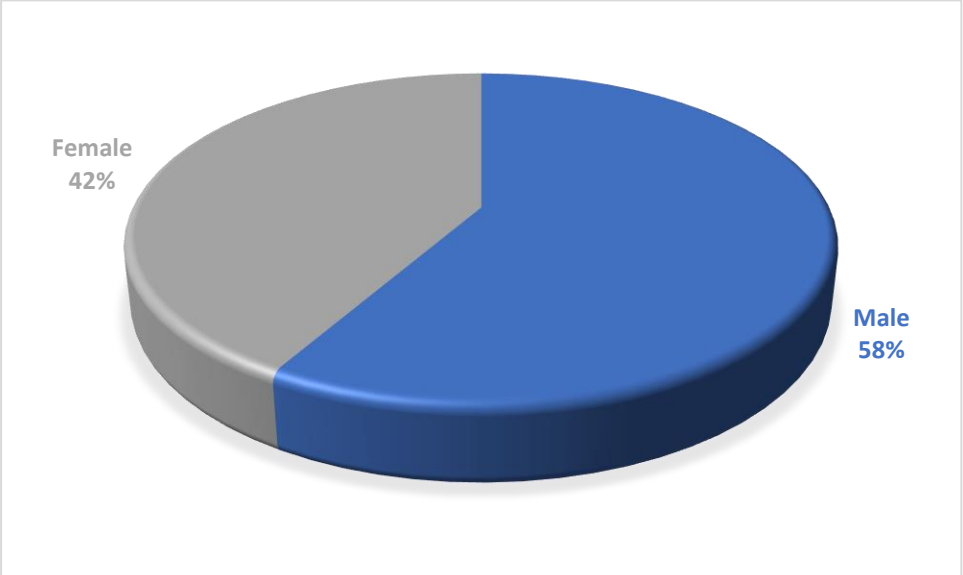

Figure 2: Gender distribution by percentage

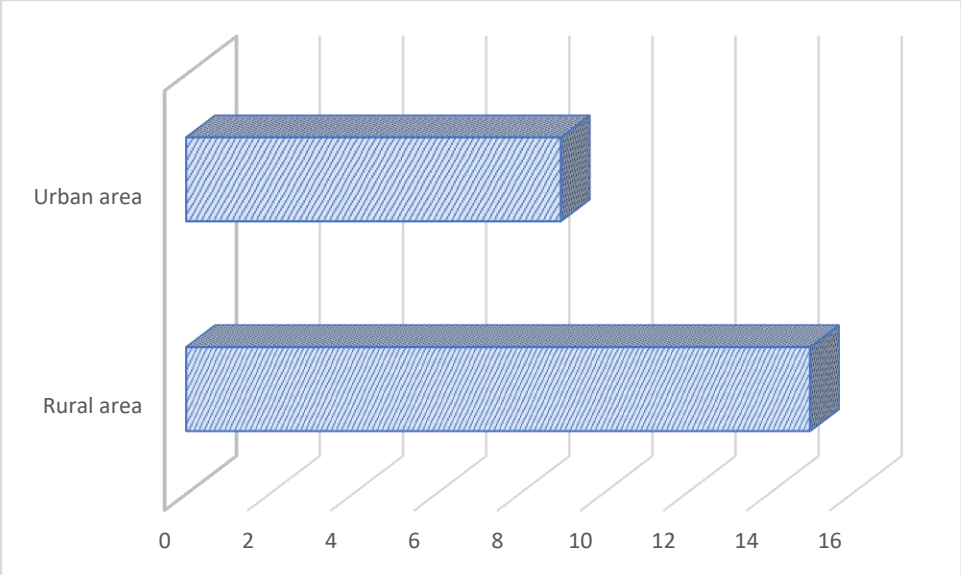

Figure 3: Residence of respondents

Theme 1: Personal thinking and opinion

According to the theme, a significant percentage of many participants understood the value of practicing personal hygiene and using hygienic toilets. Most participants stated that they learned much from their families and kindergarten, including how to wash their hands with soap before and after eating, after defecating, and from growing up around dirt. One stated that:

"Families most importantly the source of many conventions that we learn, like "hand wash behavior." Naturally, my mother and father used to wash my hands before I ate and after using

the restroom when I was kid. I got used to doing my hand washing in this manner" (Female student).

A parallel view was shared by another respondents, who was from female group:

"My father taught me how to wash my hands when I was a little child. She gave me advice on good hygiene practices. As a result, I've started practicing hygiene and sanitation" (Female student).

Another respondent from discussion group came from a rural area told that:

"My family and relatives had encouraged excellent cleanliness, hand washing, and toilet use in me since I was a young child. That was, I believe, the base. I'm used to doing this now" (Male student).

More than three fourths of participants stated that they believed one's ability to retain privacy had a significant impact on one's ability to use sanitary facilities and practice good personal hygiene while on campus. Pupils believed that restrooms and laundry rooms in school buildings, such as academic buildings, libraries, and sports buildings, were secure locations to use. Nonetheless, female students voiced their worries about the lack of a rigorous privacy policy. They so underlined the necessity of enhancing privacy. Participants noted that there are not enough restrooms or other sanitary amenities in school buildings and area, which puts students' improved hygienic and sanitary practices at risk, particularly female students. One student stated that:

"When someone is in the toilet already and you have an emergency, what should you do? There are instances when you are in a bathroom and all of a sudden realize that there is no water. We know these kinds of things happen, yet we still have to use these filthy and dangerous latrines. Occasionally, you will notice that there is no soap and not sufficient amount of water, so that the toilets are left dirty and uncleaned" (Female student).

A significant proportion of participants, over three fourth, stated that very few students bring personal hygiene products to class. One student stated that:

"Carrying personal hygiene material has become a good strategy for coping with the situation, especially where the resources are limited and occasionally not found at shop. However, this is a recent trend and thus has not been widely practiced. Some maintain its necessity, it's quite new in our country and lifestyle" (Female student).

Almost all male students stated that they don't carry any hand sanitizer or other hygienic supplies. One individual stated:

"Perhaps girls have better arrangements for carrying any things and are more sensitive. They typically carry a big purse in which they can conveniently store these items. However, it is quite difficult to fit this in the school bags for men. Sometimes bags of male student checked by fellow students to make fun, it was often awful" (Male student).

Theme 2: Social-behavioral elements: Beliefs and perceptions

Regarding the impact of friends and peers in encouraging better sanitation and hygiene practices, conflicting opinions have been expressed. Most of the men who took part admitted that their friends and peers didn't encourage or deter them from adopting hygienic and sanitary habits. On the other hand, female participants said that they occasionally imitated or adopted the practices of others. One individual said:

"It caught my attention that a few of our colleagues and friends were carrying personal hygiene supplies. It is helpful to include hand sanitizer or toilet paper in your bag, I've discovered. If it suits me, I can use it" (Female student).

According to some participants, male students were primarily observed urinating in local streets and at the sides of roadways. It is practically impossible for females to urinate at roadside or alleyway locations in Bangladesh, when males frequently do so. Male students appeared less concerned with personal hygiene maintenance than female students. One male student stated that:

"I believe that male students give sanitation and hygiene issues little thought and they are careless about this issue. They are impacted by their environment, thus they might continue to be worried about cleanliness and hygiene" (Male student).

Theme 3: Factors related to school

During the working day, regular lessons and administrative services are offered; however, students spend more time on school property on off days for a variety of activities, including social gatherings, group projects, library work, and so forth. They felt ashamed because the restrooms and hand washing stations were still off-limits during this time. For female students, this becomes a major issue because they have to visit the adjacent official halls or markets. On the other hand, a male student pointed out that it is common for male students to urinate in an open area close to a building corner or bushes. One student reported that:

"A male student can use the roadside restroom and toilets to satisfy his urge. However, it poses a challenge for female pupils. It is embarrassing that they either travel to the adjacent hallways or put off taking care of their needs for a lengthy time" (Male student).

Because there are very few male and female toilets, students avoid using the these. The following individuals provided an explanation of the circumstances.

"There is only one student common area, four toilets, and two sinks in our academic school building, however one sink was broken. Recently, two new restrooms were constructed on outside of the building. However, I'm not sure if everyone can use these new restrooms. Male's restrooms number two, while female restrooms are on the same side" (Male student).

Some attendees mentioned that the toilets frequently fail to flush or stop correctly, which results in the waterlogging of the toilet pans. Some participants said that the authorities talk to students about the state of the restrooms but don't really care about them. One participant reported:

"I've never heard of any official speaking with kids to make sure the cleaning operations are being carried out correctly. More often they are absent in those issues and pay less attention" (Male student).

Theme 4: Contextual factors studied

Adopting improved hygiene practices was primarily hindered by supply-side factors, such as inadequate maintenance of toilets, poorly managed services, a lack of cleanliness, unpleasant odors, and a shortage of sanitary products (such as soap, hand wash agents, sanitizers). The majority of students reported that the cleaning service was insufficient. One student reported from discussion group:

"It is rare to clean toilets using the right chemicals and cleaning agents. Their methods are sometimes limited to using water and/or a tiny amount of bleaching agent, which may not be effective in eliminating bad odor, dirt, bacteria, or obstructions" (Female student).

A similar view was expressed by another participant:

"The need of maintaining proper hygiene is understood by the many students. However, the supply side is usually the key reason why they are unable to maintain it. In the washrooms, handwashing supplies are hardly ever available. How can a student continue to wash their hands properly after using the restroom?" (Male student).

One female participant stated:

"Bad odor is very common in the toilets because excreta are not properly flushed out. It is created when the toilet holes are not properly flushed out. Very often the reason is either a lack of stable water supply or a problem with the low quality flushing system" (Female student).

4. DISCUSSION

This study used the IBM-WASH model to investigate and identify the factors that affect hygienic and sanitary practices in Bangladeshi educational institutions. This research showed that students were aware of and had sufficient knowledge about diseases and health issues connected to sanitation and hygiene. This is in contrast to a number of foreign research conducted in Turkey and other countries [25, 26]. The study's conclusions showed that, in spite of institutional obstacles, students had favorable attitudes toward upholding proper hygiene habits and were aware of the significance of handwashing.

A recent investigation was carried out at Bangladesh's biggest public university. According to that study, there are significant differences in the hygiene and sanitation practices of students based on gender and socioeconomic status. Specifically, students from nuclear families and female students had better hygiene and sanitation practices than students from joint families, which are households with three or more generations living together [27]. This is in line with increased access to communication media being linked to economic expansion over the past 20 years, improving people's quality of life, especially for those in the middle and upper classes. These points of view supported adopting better personal and family hygiene and sanitation practices. Adopting improved hygienic habits started to be seen as a sign of normal etiquette or politeness.

Data from this study, indicated that although these positive habits are associated with individual-level WASH behaviors, a barrier that prevents people from maintaining and fostering these positive habits at the individual level is the absence of contextual and socio-behavioral dimensions of WASH practices in educational institutions. According to the report, students notably failed to uphold improved hygienic and sanitary behavior at their educational institutions. The school authorities lacked adequate support to monitor and supervise the management of cleaning activities at different levels, which might result in poor outcomes. The results of this study also demonstrated that the timely maintenance of sanitation facilities' quality was hampered by a lack of cleaning supplies (soap, sanitizer, or other items). Similar findings have been reported in cross-sectional studies conducted in a number of foreign contexts, systematic reviews, and control trials [28-31]. One of the study's important conclusions is that participants had a limited urge of what sanitation and hygiene meant. When it came to providing resources linked to sanitation, the institution mainly neglected gender and sex issues. An obstacle to promoting and enhancing personal hygiene and sanitation practices

is the absence of gender sensitivity at the contextual level. According to the current study, in order to encourage better hygiene and sanitation practices in schools, educational institutions should pay special attention to WASH-related facilities and activities.

Importance of sanitation

Public health issues pertaining to clean drinking water, sewage treatment, and human excreta disposal are collectively referred to as sanitation [32]. Many more diseases, including cholera, hepatitis, polio, schistosomiasis, trachoma, and ascariasis (an intestinal worm infection or helminthiasis), are also easily spread in areas with poor sanitation standards. Providing a healthy living environment for everybody, safeguarding natural resources (soil, groundwater, and surface water), and granting individuals safety, security, and dignity when they urinate or defecate are the overarching goals of sanitation. In order to interrupt the cycle of disease transmission, effective sanitation systems create barriers between excreta and humans (for example in the case of fecal-borne infections).

The F-diagram illustrates this feature, in which the letters F stand for feces, fingers, flies, fields, fluids, and food, the key pathways of fecal-oral disease transmission [33]. The "sanitation chain" includes the user's experience, pathogenesis [34], techniques for collecting excreta and wastewater, waste transportation and treatment, and disposal or reuse [35], all must be carefully thought out. Environmental sanitation encompasses the control of environmental factors that are connected to disease transmission, sport and other physical activist should recall from sanitation importance. One of the primary function of environmental sanitation is to protect public health. Sanitation icon set are presented as a part of indication for recalling is presented in (Figure 4).

Figure 4: Sanitation icon set

Limitations of study

This research is constrained since we were unable to speak with senior administrators or policymakers for interviews. During the data collecting period, the high-level policy makers and administrators participated in certain pre-existing activities that may have been related to the management and provision of sanitation services within the institution. This study was

carried out in a single institution, and it was done only with interview not engaged in direct/practical observation for long period of time.

5. CONCLUSION

This study showed that supply-side reactions are to blame for the shockingly low standards of cleanliness and hygiene in educational institutions. The year-over-year expansion in the number of schools and the distribution of resources has not kept up with the promotion of better hygienic and safety facilities. We attempted to bring attention to the long-standing problems with student health and sanitation in this study. Thus, in order to develop a better, need-oriented, and effective sanitary and hygiene system that may encourage improved hygiene and sanitary behaviors among school learners, a multi-level promotional intervention centered on provider responses is required.

Disclosure of conflict of interest

There is no conflict of interest regarding this paper.

Ethical consideration

Participants actively participated, knowing that any personal information they contributed would be kept private and that the data they provided would be utilized responsibly.

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