

Hygiene behavior among Female Garment Workers: a Pre-COVID-19 Cross-Sectional Study in Bangladesh

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Abstract

This cross-sectional study was undertaken to delineate the hygiene behavior among the female garment workers in Bangladesh during pre-COVID-19 period. 500 female garments workers were selected for the study. Data were collected by face-to-face interview method using semi-structured questionnaire which include the information on socio-demography, different components of personal hygiene such as bathing, brushing teeth, washing feet, washing/ changing cloth, washing hair by soap/ shampoo, trimming nail and washing hand. The majority of the participants (>75%) had ideal knowledge and practice on every considered hygiene behavior. Regarding hand-washing behavior, only 3% had appropriate knowledge and ideally practiced by 60.2%. Knowledge of the respondents was significantly associated with ideal practice of all components ($p=0.01$). Predictors identified according to age, BMI, education and marital status of respondents, were significantly associated with hygiene related to bathing, washing feet, clothing, hair and hand.

Keywords: Hygiene behavior, COVID-19, pre-existing context, female garments workers

Background

The Readymade Garment (RMG) industry drives the economic growth of Bangladesh in terms of employment, production and foreign exchange earnings¹ and contributing to an impressive 6 percent growth rate for nearly a decade.² Bangladesh is now one of the world's leading clothing exporters, second only to China.³ Garment industry has become placed the largest export earning sector of Bangladesh where more than 5000 garment factories are running, employing over 4 million workers.⁴ Women represent 85 percent of the total 2.4 million employees in the RMG industry.⁵

Garment factories in Bangladesh has been expanded mainly on the easy availability of labor especially of the female labor accessibility.⁶ Young women often start work at the age of 18 and usually continue until they are 30-35 years old. Female workers in Bangladesh tend to have very little education as they drop out of school early to help, support their families; some are illiterate, and poor, their health also poses significant challenges.⁷

The workers in this sector are living from hand to mouth and they are unable to maintain their basic needs in their income for minimum health care, medical services, hygienic accommodation.⁸ Paul-Majumder conducted a study on the physical and mental health

status of garment workers and how problem affect labor productivity, competitiveness of the garment industry in the world market and the working life of the workers, particularly of female workers.⁹

In developing countries, the major causes for morbidity are communicable diseases and malnutrition.¹⁰ The Cleanzine reported that WHO found RMG workers in Bangladesh significantly suffering from diarrhea, dysentery, skin diseases, lung diseases and other health conditions, many of which are contagious and spreads through hands from one to others. As a solution the report showed the findings of UNICEF, hand washing with soap at critical times including before eating and preparing food and after using the toilet – can reduce the rates of diarrhea rates by more than 40% and reduce the incidence of acute respiratory infections by around 23%.¹¹ The pandemic situation of Coronavirus Disease 2019 (COVID -19) is considered as the most crucial global health calamity of the century and the greatest challenge for Bangladesh.¹² This state might pose significant impact on Bangladesh garment industry if female workers would have poor hygiene behavior.¹³ Bangladesh has gradually rolled back the lockdown restrictions despite an escalating coronavirus outbreak, allowing garment factories to reopen on a limited scale since April 25, 2020 subject to their compliance with health and safety guidelines to reduce the risk of contagion among workers.¹⁴ Nevertheless, the health and hygiene protocols sets out by apparel exporters' lobby BGMEA and others owners' associations were not implemented in most of the cases initially. "We went through the media reports and found that more than one hundred workers have been infected with COVID-19 till May 12, 2020. Afterwards, the factories were decided to run again in the pandemic situation which had chances to increase infections in manifolds.¹⁵

Personal hygiene can help preventing the COVID -19 and flatten the epidemic curve.¹⁶ Institute of Epidemiology Disease Control Research (IEDCR) of Bangladesh declared "there is nothing to be panicked about but we must be alert about maintaining personal hygiene to prevent deadly disease" through different mass media.¹⁷ Frequent and proper hand hygiene with

soap–water or alcohol based (minimum 70 percent) hand sanitizer is one of the most important measures that can be used to prevent infection with COVID-19.¹⁷ Experts said daily showers essential to prevent spread of corona virus.¹⁸ Taking shower every day or every other day is necessary to prevent any kind of communicable diseases include COVID-19.¹⁹ Brushing teeth, Hand, nail, foot, hair cleaning is essential in protection against disease.²⁰

In the current COVID-19 pandemic condition, it is essential to have sustainable hygiene behavior among female workers to maintain the growth in export of RMG. Research finding related to knowledge and behavior on personal hygiene among female garment workers in Bangladesh conducted during pre-COVID-19 period is scarce. This information is essential, especially during COVID-19 era and beyond, to identify the gap between knowledge and practice of personal hygiene as well as to plan and implement sustainable, comprehensive health programs to tackle the situation. Therefore, this study was aimed to delineate the hygiene behavior among the female garment workers in Bangladesh during pre-COVID-19 period.

Methods

Study setting:

The study was conducted in four different garment industries directed by two different owners, such as: Enayet Garments, Matrix Dresses, Probashi Knitwear and Auto-tex Fabrics Limited located in Dhaka city of Bangladesh. These garment industries were selected by considering research convenience because accessing the workers of RMG as interviewees was a big challenge as RMG contributes in national earning and occupies a unique position in the Bangladesh economy.

Study design and Sampling design:

This cross-sectional study was carried out from April to July 2019 under the research project entitled 'Empowerment of Female Garment Workers'. In this study, a total number of 500 female garment workers were selected from the four garment factories. The total sample were calculated by using the formula " $n = \frac{Z^2pq}{d^2}$ " where, $z = 1.96$, $p = 0.50$ (as there is no reasonable

estimate of any prevalence rate, 50% was considered), $q = 1-p$, and d was considered as 0.05. In addition, 30% of the calculated number was added to consider non-response and questionnaire error factors. The inclusion criteria to select the study subjects were: (i) female workers working in the selected garment factories, and (ii) willingness to participate in the study.

Data collection:

Data were gathered by four trained data collectors through face-to-face interview method, using a pre-tested and semi-structured questionnaire. Knowledge and practices of different components of hygiene behavior were recorded by 7 days-recall method. Weight and height were measured by using tools.

Questionnaire:

The questionnaire comprised of several sections: (i) socio-demographic information: age, religion, education, parental education, marital status, parity, living arrangement, family type, monthly family income, family size, (ii) nutritional status: weight, height, body mass index (BMI), (iii) knowledge on hygiene behavior: taking bath, brushing teeth, washing feet, washing/ changing cloth, washing hair by soap/ shampoo, trimming nail, hand washing (importance, appropriate timing, materials, techniques), and (iv) practice on hygiene behavior: taking bath, brushing teeth, washing feet, washing/ changing cloth, washing hair by soap/ shampoo, trimming nail and hand washing.

Measures:

Knowledge and practice: Knowledge and practices of hygiene behavior were categorized in this study by considering the standards of different components. The standard was for taking bath: once a day; for brushing teeth: twice a day; for washing feet: when necessary; for washing/ changing cloth: once a day; for washing hair by soap/ shampoo: thrice a week; trimming nail: once a week and for washing hand: when necessary.²¹

Socio-economic status: Socio-economic classifications were made according to the per capita Gross National Income and World Bank Calculations.

The income groups were: Low: BDT ≤ 5360 ; Lower-middle: BDT (5362-21270); Upper-middle: BDT (21271-65761); high: BDT ≥ 65762 .²²

Nutritional status: BMI was classified according to the World Health Organization (WHO) and the classification of nutritional status was as followed- Underweight: <18.5 ; Normal weight: 18.5-24.9; Overweight: 25-29.9; Obesity: >30 .²³

Data analysis:

Data were entered, checked for quality and analyzed using the SPSS (Statistical Package for Social Sciences) version 20. Respondent characteristics, level of knowledge and practice classification were described as percentage and presented with 95% confidence intervals (CI). A logistic regression was used to identify predictors related to practice to hygiene behavior. All independent variables were tested individually by Chi-square (X^2) and entered into the first model since they were associated with adherence <0.25 level of significance. 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). In some cases, after backward elimination, some logical variables showed highly significant association with the dependent variables which were added later in the model.

Ethical clearance:

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/2020/01).

Results

Demographics of the respondents

A total of 500 respondents were included in this study with a mean (\pm SD) age of 22.09 (± 6.58) years. Most respondents (87.2%) were aged >18 years. Majority

of the respondents were Muslim (97%), completed <class VIII (90.2%), more than half (56.6%) married/separated/divorced/widowed, and belonged the Low: BDT ≤5360 income group (52.6%). Most of study subjects (58.2%) had Normal weight: 18.5-24.9 calculated by Body Mass Index (BMI). (Table 1)

Knowledge and Practice

Out of 500 respondents, majority (88%) had ideal knowledge and practice of taking bath as well as knowledge significantly influenced the practice of taking bath ($p=0.01$). Whereas 97% respondent had correct knowledge of teeth brushing technique and surprisingly all of them practiced it. Washing feet, washing/ changing cloth and trimming nail were three important parameters in which more than 400 respondents had proper knowledge and practice ideally. Furthermore, these three hygiene practices significantly associated with having adequate knowledge respectively ($p=0.01$). Seventy five percent of respondents had no knowledge on washing hair by soap/ shampoo, although like other hygiene behaviors study observed knowledge of washing hair also significantly dominant on the practice of it ($p=0.01$).

With respect to hand-washing behavior, only 3% had appropriate knowledge and ideally practiced by 60.2% ($p=0.01$) Knowledge on hand washing was assessed through measuring four components²⁴ i.e. importance, timing, materials used and technique. The study subjects (99.6%) were found to have knowledge on materials (water & soap), 80% had knowledge on importance of hand washing as prevent germ spreading, nearly half (46.2%) knew the appropriate timing of hand washing as when hand is dirty, before/after meal and after toilet use. Likewise, they also knew that hand washing can prevent worm, Diarrhea, Jaundice, Typhoid and Dysentery. Hand-washing practice was assessed through the measurement of three components as timing, used materials and technique. Study observed, more than half (60.2%) maintained appropriate timing of hand washing and all of them used proper materials however, none of them practiced ideal hand washing technique. Therefore, it is clear that although study subjects had

been practicing the use of proper hand washing materials as socio-demographically or culturally, they did not have exact knowledge and practice on ideal hand washing technique. (Table 2)

Predictors for not taking bath ideally

Study delineated that; ideally taking bath was less practiced among unmarried women (AOR= 0.37; $p= 0.002$). Whereas, respondents of age group >18 and educational qualification with class 9 and above had a well practice of ideal bathing compared to younger (AOR= 1.32; $p= 0.460$) and lower educated subjects (AOR= 2.07; $p= 0.24$). In addition, underweight respondents did not take bath ideally (AOR= 1.16; $p= 0.75$).

Predictors for not ideally washing feet

Study also revealed that among unmarried non-Muslim respondents' ideal practice of washing was significantly lower than Muslim (AOR= 0.34; $p= 0.18$) and married workers (AOR= 0.27; $p= 0.01$). Similarly, age group of <18 years (AOR= 1.22; $p= 0.68$) and educational qualification up to class VIII (AOR= 1.89; $p= 0.41$) also showed lower level of practicing ideal feet washing.

Predictors for not ideally washing/ changing cloth

Respondents from low income group (BDT ≤5360) found less likely (AOR=1.22; $p=0.42$) to follow ideal way of washing /changing clothes. On the other hand; ideally practice of washing /changing clothes was observed higher (AOR= 0.57; $p= 0.02$) among married/separated/divorced/widowed respondents. In addition, underweight (AOR=1.72; $p=0.16$) and up to class VIII education level (AOR= 2.18; $p= 0.12$) showed significantly lower compliance with ideally washing / changing clothes.

Predictors for not ideally washing hair

Study identified that married (AOR= 1.54; $p= 0.09$) from low-income group (BDT ≤5360) (AOR= 1.67; $p= 0.03$) were less concern about washing their hair ideally. Similarly, respondents with educational qualification up to class VIII and above express less (AOR= 1.77; $p= 0.21$) concern about ideal hair washing technique. Whereas age group of >18 showed more concern

regarding washing their hair regularly.

Predictors for not ideally trimming nail

Trimming nail regularly was one of the essentials for a clean hand, but unfortunately ideal practice of this component was less among non-Muslim workers compared to Muslims (AOR= 0.37; p= 0.22). Additionally, age group <18 (AOR= 3.61; p= 0.01) with up to class VIII education (AOR= 3.62; p= 0.22) were also reluctant to this health behavior compared to others. Similarly, practice of trimming nail properly was significantly less (AOR= 1.77; p= 0.14) among low socio-economic group.

Predictors for not ideally washing hand

Washing hand regularly is a vital preventive practice for the health wellbeing and survival against the communicable diseases. However, this study found a depressive scenario regarding hand washing knowledge and practice among the study subjects. Ideal hand washing practice was more significantly maintained among the age group more than 18 years than the younger (AOR= 0.57; p= 0.04). Furthermore, Lower middle-income group (AOR= 0.62; p= 0.01) who were suffering from overweight/obesity (AOR= 0.71; p= 0.24 for Normal weight, AOR=0.76; p=0.39 for Underweight) found significantly concerned about ideal hand-washing practice. (Table 3)

DISCUSSION:

This study examined the hygiene behavior among the female garment workers in Bangladesh during pre-COVID-19 period. The main findings of this study includes the following: (i) majority of the participants (>75%) had ideal knowledge and practice of hygiene behavior i.e. taking bath, brushing technique, washing feet, washing/changing cloth, trimming nail, and washing hair by soap/shampoo; (ii) regarding hand-washing behavior, only 3% had appropriate knowledge and ideally practiced by 60.2%, and (iii) predictors identified according to age, BMI, education and marital status of respondents were significantly associated with taking bath, washing feet, cloth, hair and hand.

It was impressive that majority of the respondents of this study had ideal knowledge on taking bathing (88%) and washing feet (94%) which pose significant impact on their ideal practice. However, bath-taking and feet-washing were significantly less practiced among unmarried and under aged (<18 years) workers compared to the other group (p<0.01). A similar study conducted among slum dwellers in Dhaka city, Bangladesh showed that (81%) of the slum dwellers take bath regularly for personal cleanliness.²⁵ These findings are in concurrence with a similar study conducted among Secondary School Students of Mymensingh Sadar Upazilla, Bangladesh showing 97.7% of respondents to took bath daily.²⁶ In an Ethiopian study, approximately 34% of the respondents reported poor bathing practices.³⁴

The present study depicted that all workers are habituated to brush their teeth regularly which found significantly associated with ideal knowledge. Similar impressive findings were identified for the component washing/ changing cloth and trimming nail where large proportion of workers had ideal knowledge (84%, 82% respectively) which significantly influenced ideal practice (82%, 93% respectively). However, underweight, unmarried and lower educated (<class VIII) workers belonged to lower monthly income remained significantly less concerned for ideally practice of washing/ changing cloth compared to the other groups. Another study showed higher monthly household expenditure was associated with better practice of covering coughs and sneezes.^{32,33} Likewise, under aged female workers with lower income were more reluctant to trimming nail than the other group.

Concerning the component of washing-hair, respondents had poor knowledge (25%) in comparison to good practice (81%). Present study found that married female garment workers from low-income group were significantly (p<0.01) less concerned about washing their hair by soap/ shampoo ideally. A study in Ethiopia showed that approximately 21% respondents reported poor hair washing practices.³⁹ Another study showed that approximately 70% female garment workers in Bangladesh were not maintaining personal hygiene properly during menstruation and more than

85% were not satisfied about their washing facilities in their factories.³⁴

These findings reflected improved knowledge and practice among garment workers and creating hygiene culture could significantly help to mitigate COVID-19 situation in Bangladesh. Hygiene behavior during the current COVID-19 pandemic includes covering cough and sneezes with a tissue or sleeve, avoiding close contact with affected people, wearing a face covering, cleaning and disinfecting commonly used objects like mobile phone, wallet etc. Poor hygiene knowledge and practices play vital roles in increasing the spread of communicable diseases in developing countries.

Our study revealed that only 3% respondents had knowledge about hand washing. But interestingly 60% respondents mentioned to do hand washing. Study presented that ideal hand washing practice were significantly less common in lower middle-income group with the under aged (<18 years) workers compared to low income group and the elders.

These findings demonstrated that verbal response about hand washing behavior did not merge with the real scenario of practices. The maximum number of respondents didn't have idea about the proper technique of hand washing, but more than half of the respondents used to follow the appropriate timing and materials of hand washing by inheriting this habit from their family.

A similar study conducted among slum dwellers in Bangladesh showed that 67% of the respondents were habituated to washing hand by soap before taking meal.²⁵ Another similar study revealed that majority (90%) of respondents had knowledge about hand washing with soap before eating and after defecation, but only 21% and 88% respondents reported to do so respectively.²⁷ A study conducted in China among hospitalized patients showed that majority (94.2%)

of the participants believed that handwashing was important for disease recovery, and almost the same percentage (93.2%) of them believed that handwashing could prevent infection spread among patients.²⁸

Some research demonstrated that hand washing practice declined respiratory infections by around 15% to 20%. A study found only 5% of Americans wash their hands properly.²⁹ Although the Communicable Disease Control (CDC) Unit recommends spending 20 seconds for hand-washing to prevent diseases, but people averagely spend only six second to wash their hands.³⁰

From many COVID-19 investigative reports from international media and WHO situation analysis reported that hospitalized patients of China were more conscious regarding hand washing compared to the American peoples.³¹

In this study, we found that comparatively more educational qualification had positive influence on the indicators of personal hygiene behavior among female garment workers. A similar study among university students showed that the level of higher-grade education of participants had also played a significant impact on handwashing practices compared to that of lower grade education.³⁵

Various studies revealed that the majority of the female workers in the garment sector in Bangladesh suffer from the physical and mental health diseases.^{8,36-38} In the context of Bangladesh, personal hygiene seeking behaviors and hygiene education might play advantageous role to mitigate and controls of COVID-19 and others communicable diseases. The policy makers and other concern organizations should take necessary steps to maintain good health status of the garment workers in Bangladesh.

Characteristics		Frequency (n)	Percent (%)
Age	≤18	64	12.8
	>18	436	87.2
Religion	Muslim	485	97
	Non-Muslim	15	3
Education	Up to class 8	451	90.2
	Class 9 or above	49	9.8
Marital Status	Married/separated/divorced/widowed	283	56.6
	Unmarried	217	43.4
Socio-economic Status	Low: BDT ≤5360	263	52.6
	Lower-middle: BDT (5362-21270)	237	47.4
BMI (Body Mass Indexed)	Underweight: <18.5	141	28.2
	Normal weight: 18.5-24.9	291	58.2
	Overweight: 25-29.9	55	11
	Obesity: >30	13	2.6

SI No	Item Topic	Knowledge		Practice		χ ² /P
		Yes (%)	No (%)	Yes (%)	No (%)	
1	Taking bath	439 (88)	61 (12)	442 (88)	58 (12)	95.68/0.01s
2	Brushing teeth	485 (97)	15 (3)	500 (100)	0	-
3	Washing feet	469 (94)	31 (6)	468 (94)	32 (6)	1.47/0.01s
4	Washing/changing cloth	424 (84)	76 (15)	409 (82)	91 (18)	88.67/0.01s
5	Washing hair by soap/shampoo	126 (25)	374 (75)	405 (81)	95 (19)	22.20/0.01s
6	Trimming nail	412 (82)	88 (18)	467 (93)	33 (7)	8.58/0.01s
7	Hand washing	15 (3)	485 (97)	301 (60)	199 (40)	10.22/0.01s

*P value was generated through Chi-square analysis, s=significant

Table 3: Predictors identified for personal hygiene behaviours by the study respondents (n=500)

Variables		Items of Personal hygiene behavior Ideally practiced n (%)	Level of Practice		COR	P value	AOR	P value Lower	95% CI					
			Non-ideally practiced n (%)						Upper					
Age	<18	Taking bath	51 (79.7)	13 (20.3)	2.22	0.02 ^s	1.32	0.46	0.63	2.75				
	>18		391 (89.7)	45 (10.3)	Reference category									
Marital status	Married/ separated/ Divorced/ Widowed		264 (93.3)	19 (6.7)	0.32	0.01 ^s	0.37	0.01 ^s	0.19	0.69				
	Unmarried		178 (82)	39 (18)	Reference category									
Marital status	Married/ separated/ Divorced/ Widowed		Washing feet	274 (96.8)	9 (3.2)	0.28	0.01 ^s	0.27	0.01 ^s	0.12	0.6			
	Unmarried			194 (89.4)	23 (10.6)	Reference category								
Marital status	Married/ separated/ Divorced/ Widowed			Washing/ changing cloth	244 (86.2)	39 (13.8)	0.51	0.01 ^s	0.57	0.02 ^s	0.35	0.92		
	Unmarried				165 (76)	52 (24)	Reference category							
Monthly income	Low income				washing hair by soap/ shampoo	204 (77.6)	59 (22.4)	1.62	0.04 ^s	1.67	0.03 ^s	1.05	2.65	
	Lower middle income					201 (84.8)	36 (15.2)	Reference category						
Age	<18	Cutting nail				55 (85.9)	9 (14.1)	3.61	0.01 ^s	3.61	0.01 ^s	1.36	9.6	
	>18					412 (94.5)	24 (5.5)	Reference category						
Age	<18					Washing hand	34 (53.1)	30 (46.9)	0.53	0.02 ^s	0.57	0.04 ^s	0.33	0.98
	>18						165 (37.8)	271 (62.2)	Reference category					
Monthly income	Low income		120 (45.6)				143 (54.4)	0.6	0.01 ^s	0.62	0.01 ^s	0.43	0.9	
	Lower middle income		79 (33.3)				158 (66.7)	Reference category						

*Binary Regression, s=significant

Conclusions

It is encouraging that a large proportion of female garment workers were identified in this study with good knowledge on different personal hygiene behavior, which had a significant impact on their practice. Very least number of respondents in the study were depicted with poor personal hygiene behavior and the significant predictors behind this were mostly underneath the having proper knowledge and socio-demographic situation such as under age (<18 years), unmarried status, low education (<class 8) and low-income level of the workers. These crucial factors need to be addressed by the employers of the garment industries of Bangladesh.

Most important upshot of this study was least knowledge and practice of technique-based hand washing among the female workers which is alarming in this COVID-19 pandemic situation. Successful implementation of comprehensive health and hygiene intervention programs is required to substantially attenuate the transmissible disease borne by female workers in Bangladesh.

Footnote:

Limitations of the study:

The present study has several limitations. This cross-sectional study involved only 4 garment factories with a small sample size; therefore, caution needs to be taken to generalize the data to the wider settings. Lastly, our survey looked at only garment factories at capital city Dhaka; therefore, does not represent the knowledge and practices of garment workers outside Dhaka city.

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Conflict of Interest: None declared.

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