International Journal of Research in Medical Sciences
Nahar L et al. Int J Res Med Sci. 2025 Sep;13(9):3672-3681
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012
DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20252774

Original Research Article

Awareness of ceramic workers on occupational health hazard and related preventive practice

Lutun Nahar[1]*, Shafiur Rahman[2], Jarjina Akter Smrity[1], Farjana Begum[3], Rushan Afroze[4], Prianka Khan[5]

[1]Department of Inspection for Factories Establishment (DIFE), Dhaka, Bangladesh
[2]National Institute of Preventive and Social Medicine (NIPSOM), Mohakhali, Dhaka, Bangladesh
[3]BRAC, Dhaka, Bangladesh
[4]The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Bangladesh
[5]United Healthcare Services Limited, Dhaka, Bangladesh

Received: 08 July 2025
Accepted: 11 August 2025

***Correspondence:**
Dr. Lutun Nahar,
E-mail: lutfun.hossain@gmail.com

ABSTRACT

Background: The ceramic industry is one of the significant manufacturing sectors in Bangladesh, where workers are often exposed to various occupational health hazards. This study aimed to assess the awareness of ceramic workers regarding these hazards and the associated preventive practices in Dhaka's Mirpur Ceramics Works Ltd., the largest structural clay products manufacturer in Bangladesh.
Methods: A cross-sectional survey was conducted from 1st January to 31st December, 2022, involving 267 workers. Data were collected through face-to-face interviews using a semi-structured questionnaire that assessed socio-demographic characteristics, work-related factors, and awareness of occupational hazards, hazard identification, and preventive practices.
Results: The study found that most workers were aware of general health hazards 88.4% and hazardous materials 95%. However, awareness regarding safety regulations and hazard management was low, with only 34% and 33.3% aware, respectively. Specific physical hazards, such as noise, heat, and poor ventilation, were recognized by a significant proportion of workers 81-82%, but awareness of chemical hazards was minimal 1.9%. Ergonomic hazards were also poorly understood, with only 43.8% aware of risks related to awkward sitting and manual product handling. The study revealed that 60.7% of workers had low awareness levels, with a statistically significant association between gender and awareness, particularly among male workers.
Conclusions: The study highlights a significant gap in the awareness of occupational health hazards among ceramic workers in Bangladesh. The findings emphasize the need for targeted occupational safety training and awareness programs, especially focusing on chemical and ergonomic risks.

Keywords: Awareness, Bangladesh, Ceramic workers, Chemical hazards, Ergonomics, Occupational health hazards, Preventive practices

INTRODUCTION

Ceramics are inorganic, nonmetallic materials that play a vital role in modern life. From household items such as tiles, plates, bricks, and sanitary ware to advanced ceramics used in electronics and healthcare, these materials are essential due to their strength, heat resistance, and durability. Ceramic bricks are typically produced by molding mixtures of clay, powders, and water, then firing them at high temperatures to enhance strength and resistance.[1] The ceramic industry in Bangladesh began in

the late 1950s and has grown into a significant manufacturing sector. Although it largely focuses on traditional ceramics such as kitchenware, tiles, and bricks there is increasing global demand for advanced ceramics in high-tech industries. Experts, including Professor Abdul Matin from the Department of Glass and Ceramic Engineering at BUET, emphasize the need to transition toward high-value ceramic products to meet international standards.[2] The sector currently meets about 85% of domestic demand and holds strong export potential. According to the Bangladesh Ceramic Manufacturers & Exporters Association (BCMEA), the industry is poised to become the country's third-largest manufacturing sector within the next five years.[3] From its origins with Tajma Ceramic Industries in Bogura, the industry now includes more than 66 manufacturers. Investments in this sector exceed BDT 86,160 million, with over 50,000 individuals directly employed.[3] Despite this growth, the socio-economic status of workers remains underdeveloped, particularly in areas such as income, education, hygiene, sanitation, and occupational health awareness.[4] Occupational health hazards refer to risks associated with the workplace that may result in injuries or diseases, either suddenly or over time. In the ceramic industry, these risks include exposure to chemical, physical, biological, and ergonomic hazards. Workers are frequently exposed to crystalline silica dust, noise, heat, poor ventilation, and repetitive tasks. These conditions contribute to both acute injuries (e.g., burns, falls) and chronic diseases, including respiratory disorders like silicosis and heat-related illnesses.[5] Despite the industry's physical demands, there is limited awareness and adoption of occupational health and safety (OHS) practices. Workers often lack personal protective equipment (PPE), receive minimal training, and operate in poorly ventilated environments. In many cases, employers do not follow standard safety protocols.[6] The International Labour Organization (ILO) estimates that around 2.3 million people die annually from work-related accidents and diseases, emphasizing the urgent need to strengthen occupational safety measures globally.[7] While Bangladesh's ceramic industry has attracted international investors from China, the UAE, and other countries, challenges related to labor welfare and safety remain. A 2022 report by The Daily Star indicated that export growth and urbanization are driving demand for ceramic products, yet safety practices lag behind.[8] Similar findings have been reported in other countries. For instance, studies from China and India document significant exposure to silica dust and other occupational hazards among ceramic workers.[9,10] Occupational injuries and diseases are a global concern. According to the U.S. Bureau of Labor Statistics, there were approximately 2.8 million cases of workplace injuries and illnesses in 2019. These include both acute incidents such as slips, falls, and equipment-related injuries and chronic conditions like carpal tunnel syndrome, noise-induced hearing loss, and lung disease from prolonged dust exposure.[11] In Bangladesh, research on occupational health in the ceramic industry is limited. Most workers are unaware of long-term health risks, and preventive practices are poorly implemented. Hazards such as dust inhalation, noise, heat, and chemical exposure especially to silica and lead are prevalent. Silicosis, caused by inhalation of fine silica particles, is a common and often fatal condition among ceramic workers.[12] Over 2 million workers in the United States, 23 million in China, and 3 million in India are estimated to be exposed to crystalline silica.[13-15] Raising awareness and enforcing occupational safety regulations is critical for protecting workers' health and improving productivity. Proper education, regular health checkups, training on PPE usage, and strong enforcement of safety standards are essential for fostering a safe work environment in Bangladesh's ceramic industry. This study objective was to find out the state of awareness of ceramic workers on occupational health hazards and preventive practice. Additional objectives were 1) To find out the occupational health hazards awareness among ceramic workers, 2) To Identify occupational health hazards among ceramic workers, 3) To determine the occupational health hazards prevention practices among ceramic workers, 4) To find out the socio-demographic characteristics of the respondents.

METHODS

Study design

This descriptive cross-sectional study was conducted to assess the awareness of ceramic workers on occupational health hazards and related preventive practices. Ethical clearance was obtained from the Institutional Review Board (IRB) of NIPSOM. The study was carried out over a one-year period, from 1st January 2022 to 31st December 2022. The selected study site was Mirpur Ceramic Works, Mirpur-12, and Dhaka, chosen purposively for its accessibility, availability of participants, and cooperation from factory authorities. The study population included adult male and female workers from the selected ceramic factory. The research process involved protocol development, questionnaire design and revision, and subsequent data collection. This design enabled the researchers to capture a snapshot of the current level of awareness and preventive practices among the workers at the time of the study.

Sample size and sampling technique

The required sample size was calculated using the formula: $n = z^2pq/d^2$, where $z = 1.96$ (for 95% confidence level), $p = 0.5$ (assumed proportion for maximum sample size), $q = 1-p$, and $d = 0.05$ (acceptable margin of error). This yielded a required sample size of 384 participants. However, due to institutional restrictions allowing only 20 days for data collection, and considering two public holidays during that period, data collection was carried out over 18 working days. An average of 15 participants were surveyed each day, resulting in a final sample of 267 respondents. A convenient sampling technique was applied to select participants from the selected factory in Mirpur-12, Dhaka, based on availability and willingness to participate.

Inclusion criteria

Workers employed in the ceramic industry for at least one year. Male and female workers aged 18 years and above. Willing to participate and providing written informed consent.

Exclusion criteria

Workers who were severely ill or unable to communicate during the time of data collection.

Study procedure

The study was conducted at Mirpur Ceramic Works in Mirpur-12, Dhaka. The location was selected purposively due to accessibility, expected cooperation from management, and the availability of sufficient respondents. The research process included the preparation of a semi-structured questionnaire, pre-testing, modification, and finalization. Respondents were approached during their break times or at the start/end of their shifts to avoid disrupting factory operations. The questionnaire captured data on socio-demographic details, work history, awareness about occupational health hazards, and use of preventive measures.

Data collection and analysis

Data were collected through face-to-face interviews using a structured questionnaire. At the end of each day, completed forms were checked for completeness and consistency. Data entry was performed using IBM SPSS version 26. Responses were cleaned, edited, and coded for accuracy. Variables such as age, income, education, and years of work experience were categorized into groups for easier analysis: Age: <20, 20-29, 30-39, 40-49, 50-59, and ≥60 years, Monthly income: <10,000 BDT, 10,000-20,000 BDT, >20,000 BDT, Work duration: <10 years, 10–20 years, >20 years

Education level: illiterate, primary, secondary and above (secondary and higher grouped together) Awareness was assessed using four specific questions. A scoring system was applied where a score of 0-2 was categorized as "low awareness" and coded as “1”, while a score of 3-4 was considered "high awareness" and coded as “2”. Statistical analyses included frequency distributions, percentages, and cross-tabulations.

Ethical considerations

Ethical approval for the study was obtained from the Institutional Review Board (IRB) of NIPSOM, Mohakhali, Dhaka. Permission was also acquired from the management of the selected ceramic factory. All participants were informed about the study's objectives, procedures, and their right to refuse or withdraw at any time without consequence. Written informed consent was obtained from each respondent. Privacy, confidentiality, and anonymity of participants were maintained throughout the study. No biological samples, invasive procedures, or medications were involved, and participants were assured that the study posed no harm to their health or employment.

RESULTS

This cross-sectional study was conducted about 267 ceramic workers to find out their state of awareness on occupational health hazards and preventive practice. The participants of this study who are selected purposively and each participant was provided with written consent form. All of the participants worked 48 hours per week and all of them got break time during their work schedule as well as sometimes they perform overtime. Sociodemographic characteristics of respondents are age, gender, marital status, religion, educational qualification, monthly income, family type, smoking habit, duration of working time, working experience, etc.

Table 1 illustrates the socio-demographic and occupational characteristics of 267 ceramic workers. The majority were males (74.2%) and Muslims (81%), with most aged between 40-49 years (24.7%), and a mean age of 39.09 years. Over half (54.7%) had primary education, while 22.8% were illiterate. Most respondents (68.5%) were married and lived in nuclear families (69.3%). A significant portion (70%) earned less than BDT 10,000 per month, and 86.5% performed overtime. The majority (61%) held permanent jobs, 70.8% had worked less than 10 years, and 77.2% had no prior working experience. Additionally, 72.7% had not received occupational training. The largest group (36%) worked in the processing section, followed by 28.1% in the dry press kiln.

Table 2 presents the distribution of awareness among 267 ceramic workers regarding occupational health hazards. The majority were aware of occupational health hazards (88.4%) and the importance of hazardous materials (95.1%). However, only 34.5% were aware of safety regulations, and 33.3% knew how to handle such hazards. Overall, 60.7% of the workers demonstrated a low level of awareness, while only 39.3% showed a high level.

Table 3 summarizes ceramic workers’ responses on various physical hazards in the workplace. Among 267 respondents, the majority recognized noise (81.3%) and heat (82.8%) as significant hazards. However, awareness was lower for inadequate lighting (44.9%), ventilation (37.8%), humidity (37.5%), and floor conditions (21%). Only 18.7% identified poor housekeeping as a hazard. Just over half (53.9%) were aware of risks from inadequate electrical fittings. Overall, 95.1% acknowledged at least one form of physical hazard in their work environment, while only 4.9% reported no awareness.

Table 1: Socio-demographic and occupational characteristics of ceramic workers (n=267).

Variable	Category	Frequency (N)	Percentage (%)
Age category (years)	Less than 20	22	8.2
	20-29	50	18.7
	30-39	64	24.0
	40-49	66	24.7
	50-59	51	19.1
	More than 59	14	5.2
	Mean±SD	39.09±12.34	
	Min-Max	18-71 years	
Gender	Male	198	74.2
	Female	69	25.8
Religion	Muslim	216	81.0
	Hindu	51	19.0
Marital status	Unmarried/single	84	31.5
	Married	183	68.5
Educational status	Illiterate	61	22.8
	Primary	146	54.7
	Secondary	52	19.5
	More than secondary	8	3.0
Monthly income (BDT)	Less than 10,000	187	70.0
	10,000-20,000	73	27.3
	More than 20,000	7	2.6
	Min-Max	4,000-40,000	
Family type	Nuclear	185	69.3
	Joint	82	30.7
Smoking habit	Yes	63	23.6
	No	204	76.4
Type of employment	Temporary	104	39.0
	Permanent	163	61.0
Work duration	Less than 10 years	189	70.8
	10-20 years	37	13.9
	More than 20 years	41	15.4
	Min-Max	1-50 years	
Working experience	Yes	61	22.8
	No	206	77.2
Occupational training	Yes	73	27.3
	No	194	72.7
Overtime work	Yes	231	86.5
	No	36	13.5
Working section	Processing of ceramic body	96	36.0
	Firing	34	12.7
	Dry press kiln	75	28.1
	Maintenance and delivery	58	21.7
	Workshop and others	4	1.5

Figure 1 shows ceramic workers' awareness regarding mechanical hazards. While 46.4% of workers were aware of machine-related risks, only 16.1% recognized hazards associated with specific machinery parts. Overall, 48.3% of respondents reported awareness of mechanical hazards, whereas 51.7% lacked such awareness.

Table 4 reflects very low awareness among ceramic workers regarding chemical hazards. Only 1.9% were aware of chemical dust risks, and less than 2% recognized proper labeling and storage practices. Awareness about personal hygiene after chemical use was slightly higher (7.1%). Overall, just 8.6% of respondents demonstrated any awareness of chemical hazards in the workplace, indicating a significant gap in occupational health education and training.

Table 2: Distribution of ceramic workers' awareness regarding occupational health hazards (n=267).

Awareness variables	Response	Frequency	Percentage (%)
Aware about occupational health hazards	Yes	236	88.4
	No	31	11.6
Awareness of importance of hazardous materials	Yes	254	95.1
	No	13	4.9
Aware of regulations on safety precautions	Yes	92	34.5
	No	175	65.5
Aware how to deal with occupational health hazards	Yes	89	33.3
	No	178	66.7
Overall awareness level	Low	162	60.7
	High	105	39.3

Table 3: Distribution of respondents' response regarding physical hazard.

Physical hazards	Frequency	Percentage (%)
Noise		
Yes	217	81.3
No	50	18.7
Heat		
Yes	221	82.8
No	46	17.2
Inadequate light		
Yes	120	44.9
No	147	55.1
Inadequate ventilation		
Yes	101	37.8
No	166	62.2
Physical hazards of humidity		
Yes	100	37.5
No	167	62.5
Inadequate electrical fittings		
Yes	144	53.9
No	123	46.1
Physical hazards of floor		
Yes	56	21
No	211	79
Housekeeping		
Yes	50	18.7
No	217	81.3
Total physical hazards response		
Yes	254	95.1
No	13	4.9

Table 4: Awareness of chemical hazards among ceramic workers (n=267).

Chemical hazard aspect	Response	Frequency	Percentage (%)
Chemical dust exposure	Yes	5	1.9
	No	262	98.1
Labelling of chemical substances	Yes	2	0.7
	No	265	99.3
Storage of chemical substances	Yes	4	1.5
	No	263	98.5
Personal hygiene after chemical use	Yes	19	7.1
	No	248	92.9

Continued.

Chemical hazard aspect	Response	Frequency	Percentage (%)
Overall awareness of chemical hazards	Yes	23	8.6
	No	244	91.4

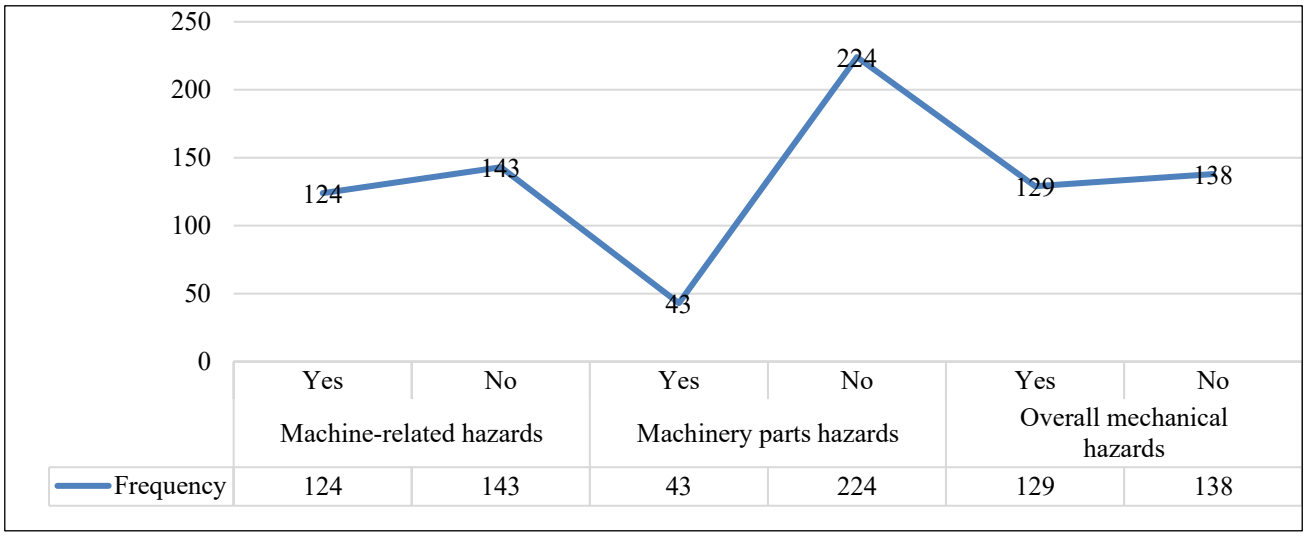

Figure 1: Awareness of mechanical hazards among ceramic workers (n=267).

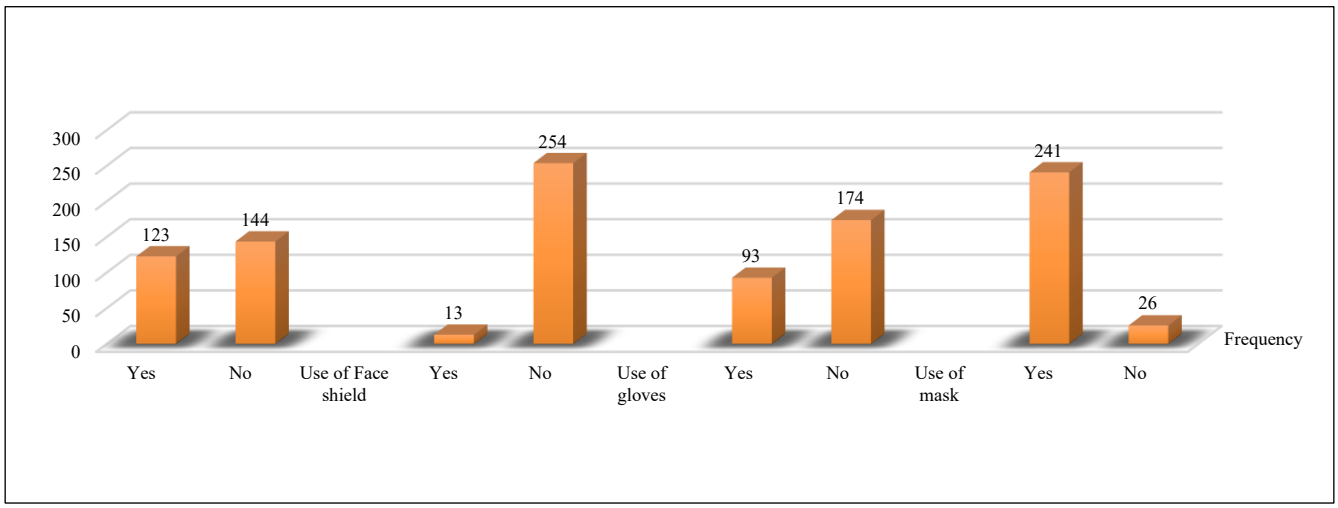

Figure 2: Distribution of workers response regarding use of PPE.

Table 5: Awareness of ergonomical hazards among ceramic workers (n=267).

Ergonomical hazard aspect	Response	Frequency	Percentage (%)
Awkward sitting position	Yes	117	43.8
	No	150	56.2
Awkward standing position	Yes	137	51.3
	No	130	48.7
Inappropriate table position	Yes	7	2.6
	No	260	97.4
Inappropriate chair position	Yes	79	29.6
	No	188	70.4
Carrying factory products manually	Yes	85	31.8
	No	182	68.2
Overall awareness of ergonomical hazards	Yes	227	85.0
	No	40	15.0

Table 5 highlights workers' awareness of ergonomical hazards in ceramic factories. A majority (85.0%) reported at least one ergonomical issue. Awkward standing (51.3%) and sitting positions (43.8%) were the most commonly recognized hazards. However, awareness was much lower for specific workstation factors like inappropriate tables (2.6%) and chairs (29.6%). Overall, the findings emphasize the widespread presence of ergonomical risk perceptions, although detailed knowledge appears inconsistent.

Figure 2 illustrates the distribution of ceramic workers' responses regarding the use of various personal protective equipment (PPE) during working hours. Among 267 respondents, 46.1% reported using helmets, while 53.9% did not. Only 4.9% used face shields, and a significant majority (95.1%) did not. Regarding gloves, 34.8% reported using them, whereas 65.2% did not. The use of masks was notably high, with 90.3% of workers reporting usage, and only 9.7% not using them.

Table 6: Association of respondents' awareness level with socio-demographic and work-related variables (n=267).

Variable	Category	Low awareness, N (%)	High awareness, N (%)	Total, N (%)	P value
Age group (years)	<20	12 (7.4)	9 (8.6)	21 (7.9)	0.115
	20–29	23 (14.2)	27 (25.7)	50 (18.7)	
	30–39	46 (28.4)	19 (18.1)	65 (24.3)	
	40–49	38 (23.5)	28 (26.7)	66 (24.7)	
	50–59	36 (22.2)	17 (16.2)	53 (19.9)	
	>59	7 (4.3)	5 (4.8)	12 (4.5)	
Gender	Male	103 (63.6)	95 (90.5)	198 (74.2)	0.000
	Female	59 (36.4)	10 (9.5)	69 (25.8)	
Occupational training	Received training	36 (22.2)	36 (34.3)	72 (27.0)	0.030
	No training	126 (77.8)	69 (65.7)	195 (73.0)	
Educational status	Illiterate	42 (25.9)	19 (18.1)	61 (22.8)	0.031
	Primary education	92 (56.8)	54 (51.4)	146 (54.7)	
	Other education	28 (17.3)	32 (30.5)	60 (22.5)	
Marital status	Unmarried/single	53 (32.7)	31 (29.5)	84 (31.5)	0.583
	Married	109 (67.3)	74 (70.5)	183 (68.5)	
Working experience	Yes	28 (17.3)	33 (31.4)	61 (22.8)	0.007
	No	134 (82.7)	72 (68.6)	206 (77.2)	
Working section	Ceramic body processing	43 (26.5)	53 (55.5)	96 (35.9)	0.000
	Firing	11 (6.8)	23 (21.9)	34 (12.7)	
	Dry press kiln	64 (39.5)	11 (10.5)	75 (28.1)	
	Maintenance and delivery	41 (25.3)	17 (16.2)	58 (21.7)	
	Workshop and others	3 (1.9)	1 (1.0)	4 (1.5)	

Table 6 reveals significant factors influencing awareness of occupational health hazards among ceramic industry workers. Gender played a key role, with male workers showing higher awareness compared to females (p=0.000). Occupational training and higher education were associated with increased awareness (p=0.030 and p=0.031, respectively). Experience also contributed, as workers with prior experience showed greater awareness (p=0.007). The work section significantly impacted awareness, with those in ceramic body processing exhibiting the highest awareness (p=0.000). No significant differences were found for age group (p = 0.115) or marital status (p=0.583). These findings highlight that training, education, experience, and work environment are crucial in shaping workers' awareness of health hazards.

DISCUSSION

This study was conducted at Mirpur Ceramics Works Ltd., the largest structural clay products manufacturer in Bangladesh, located in Dhaka city and established in 1958. The primary objective of the study was to assess the awareness level of ceramic workers regarding occupational health hazards and their related preventive practices.

A cross-sectional survey was carried out from January 01 to December 31, 2022, involving 267 conveniently selected respondents. Data were collected through face-to-face interviews using a semi-structured questionnaire that covered socio-demographic characteristics, work-related information, and awareness of occupational health hazards, hazard identification, and preventive practices.

The age of participants ranged from 18 to more than 59 years, with a mean age of 39.09±12.34 years. The majority (25%) belonged to the 40-49 age group, followed by 30-39 years (24%), and both the 20-29 and 50-59 years groups each accounting for 19%. Notably, 8% were under 18 years, and 5% were above 59 years. In comparison, a similar study by Osinubi et al in Nigeria found that the majority (36.4%) were aged 60-69 years, with a mean age of 51±19.36 years, showing a relatively older workforce than in the current study.[16] In terms of gender, 74.2% of the respondents in this study were male, and 25.8% were female. This differs from Osinubi's study, where females dominated (86.4%). Another study by Bassam et al found a more balanced gender distribution: 45.9% male and 54.1% female.[17]

Regarding marital status, 68% of participants were married, and 32% were unmarried. Osinubi et al reported 36% married, 22% unmarried, 27% widowed, and 7.6% divorced. No respondents in the current study reported being widowed or divorced.[16] Religiously, 81% of respondents identified as Muslim and 19% as Hindu. No Christians or Buddhists were found among the sample. Osinubi et al found a higher percentage of Muslims (90.4%) and 9.6% Christians in his study.[16] Educationally, 54.7% had primary education, 22.8% were illiterate, 19.5% had secondary education, and a few had education beyond the secondary level. Osinubi et al found that 68.4% had no formal education, 19.2% had primary education, and only 2.8% had tertiary education.[16] Income-wise, respondents' monthly earnings ranged from BDT 4,000 to BDT 40,000, with a mean of 10,610.04±4,187.18 BDT. A majority (70%) earned less than BDT 10,000, 27.3% earned BDT 10,000-20,000, and only 2.6% earned more than BDT 20,000. In contrast, et al reported a mean income of #14,464±2,155, with 36.4% earning >#10,000.[16] Regarding family structure, 69.3% lived in nuclear families, and 30.7% in joint families. Of the 267 workers, 61% were permanent employees, and 39% were temporary. In terms of work experience, 77.2% had no prior working experience before joining the ceramic industry. Most respondents (70.8%) had been working for less than 10 years, 13.9% for 10-20 years, and 15.4% for more than 20 years. Osinubi et al found that 28% of respondents had over 50 years of experience, suggesting longer tenure in the Nigerian context.[16] The study found that 76% of the workers were non-smokers and 24% were smokers. In comparison, Bassam et al reported a higher smoking rate (52%).[17] Overtime work was common: 86.5% worked beyond regular hours. All respondents received a one-hour lunch and prayer break. Only 27.3% of workers received occupational safety training, while 72.7% did not. In contrast, Osinubi et al found that most respondents received training through apprenticeships.[16] Workers were distributed across six sections: 36% in ceramic body processing, 28.1% in the dry press kiln, 12.7% in firing, 21.7% in maintenance and delivery, and only 1.5% in workshop and other areas. In Osinubi's study, 98.4% worked in clay mixing and moulding, followed by firing, drying, packing, and soaking sections.[16]

Concerning occupational health hazards, 88.4% of workers were aware of general hazards, and 95% recognized hazardous materials. However, only 34% were aware of safety regulations, and just 33.3% knew how to manage such hazards. In Osinubi's study, only 10% were aware of safety laws, and 46.6% considered pottery hazardous.[16] Specific physical hazards identified included noise (81%), heat (82%), inadequate lighting (82%), ventilation (37.8%), humidity (37%), poor electrical fittings (46%), unsafe flooring (21%), and poor housekeeping (18.7%). About 95.1% of respondents considered these physical factors harmful, showing considerable recognition of environmental risks.[18] Awareness of mechanical hazards was mixed: 46.4% were aware of machinery risks, 48.3% recognized mechanical hazards in occupational settings, and 16.1% acknowledged risks from machinery parts.[19] Chemical hazards were the least understood. Only 1.9% were aware of chemical risks, 0.7% knew about chemical labeling, 1.5% about chemical storage, and 7.1% about personal hygiene practices after handling chemicals. Overall, just 8.6% demonstrated any awareness of chemical hazards.[20] Regarding ergonomic risks, 43.8% were aware of hazards from awkward sitting, 2.6% from inappropriate table positions, 29.6% from poor chair positions, and 31.8% from carrying products manually indicating generally low ergonomic awareness.[21]

Overall, awareness levels were low in 60.7% of workers and high in only 39.3%. A statistically significant association was found between gender and awareness levels, with high awareness observed in 90.5% of a particular gender group.[22] Additionally, prior studies have shown that occupational health training and safety perceptions vary significantly across different sectors and regions. Gender also plays a crucial role in shaping how workers perceive and respond to occupational health risks. According to Talukder & Hossain et al awareness of occupational health hazards can often be influenced by cultural and educational backgrounds.[23] Moreover, previous studies have reported that workers in ceramic industries show limited knowledge of chemical risks and ergonomic hazards, which corresponds with our findings.[24,25]

Limitations

The study was designed aiming to identify the state of awareness of ceramic workers on occupational health hazards and preventive practice. A total 267 respondents from Mirpur Ceramics Works, Ltd at Dhaka city were interviewed. Some limitations in this study are followings: The study was conducted only one ceramics industry at Dhaka city, which may not reflect the actual scenario of ceramic workers awareness on occupational health hazards and preventive practice all over the ceramic workers of Bangladesh. As convenient sampling technique was used for the selection of the study participants rather than simple random sampling, which may lead to show some deviation of result of the study from which actual exist.

Due to COVID-19 pandemic and dengue situation, movement was so much restricted. Therefore, data collection procedure was so much challenging.

CONCLUSION

Ceramics sector in Bangladesh has opened a new era of producing and exporting products. This sector has a great potential to earn export money from fifty different countries over the world. The quality of Bangladeshi ceramic products fascinated the international customers. Ceramic industry had a variety occupational hazard like physical, mechanical, ergonomical, chemical etc. Occupational health is important because work plays a central role in people's lives, since most workers spend at least eight hours a day in the workplace. That's why awareness of ceramic workers on occupational health hazards and safety practice at working place is very essential. This study revealed; majority of the workers awareness level was low about hazardous works at factory. Hazardous condition is potentially risk of health and safety for the ceramic workers and they did not use personal protective equipment properly. The study concluded that Initiatives should be taken to increase occupational health awareness and use of Personal protective device.

Recommendations

On the basis of study findings following recommendations will be helpful to establish Awareness of Occupational Health Hazards and Preventive Practice of Ceramic Workers. Occupational health related hazards identification and occupational accident should be documented. Occupational training facilities should be expanded in regular basis and this will help to improve awareness among ceramic workers. Personal protective equipment should be used properly and ensure safety practice at workplace. Further extensive research should be conducted involving the more ceramic industries and more ceramic workers to improve awareness on occupational health hazards and use of safety equipment.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Richerson DW. Modern Ceramic Engineering. 3rd ed. CRC Press; 2005.
2. Matin A. BUET Glass and Ceramic Engineering Dept. Expert Opinion on Industry Trends.
3. Bangladesh Ceramic Manufacturers & Exporters Association (BCMEA). Industry Report 2020.
4. Mahmood M. Occupational hazards and socioeconomic conditions of ceramic workers. J Bangladesh Soc Physiol. 2013;8(1):56–60.
5. Gul H. Occupational exposure to silica dust and the development of silicosis in ceramic workers. Pak J Med Sci. 2017;33(3):563–7.
6. Kiradoo GB, Mathur N. Evaluation of health hazards in ceramic industry workers in India. Int J Environ Health Res. 2021;31(2):123–31.
7. International Labour Organization (ILO). Safety and health at work. Geneva: ILO; 2021. Available at: https://www.ilo.org/topics-and-sectors/safety-and-health-work. Accessed 01 July 2025.
8. The Daily Star. Ceramic industry eyes export growth, 2022. Available at: https://www.thedailystar.net. Accessed 01 July 2025.
9. Li X. Occupational health risk assessment in Chinese ceramic industry. J Occup Health. 2021;63(1):e12205.
10. Sharma A. Silica dust exposure and lung disease among Indian ceramic workers. Indian J Occup Environ Med. 2020;24(1):22–7.
11. Bureau of Labor Statistics. Employer-Reported Workplace Injuries and Illnesses. Washington (DC): BLS; 2019. Available at: https://www.bls.gov/news.release/archives/osh_11042020.pdf. Accessed 01 July 2025.
12. Hossain MS. Prevalence of respiratory symptoms among ceramic workers in Bangladesh. Bangladesh Med J. 2018;47(2):15–9.
13. Occupational Safety and Health Administration (OSHA). Controlling silica exposure. Washington (DC): OSHA; 2003.
14. Zhang T. Silica exposure in Chinese manufacturing industries. Environ Health Perspect. 2019;127(2):27001.
15. Rathi SK. Occupational health hazards in Indian ceramic tile industry. Indian J Occup Health. 2018;43(3):215–20.
16. Osinubi MO. Occupational Health and Safety in the Ceramic Industry: A Study of Nigerian Workers. Occupat Med. 2017;67(5):337-41.
17. Bassam N. Gender-Based Health and Safety Perception in the Ceramic Industry. J Occupational Health. 2015;57(4):350-6.
18. Alim MA, Biswas MK, Biswas G, Hossain MA, Ahmad SA. Respiratory health problems among the ceramic workers in Dhaka. Faridpur Medical College J. 2014;9(1):19-23.
19. Hasan MS, Islam R, Ahmed M. Risks Associated with Machinery in the Ceramic Industry: A Bangladesh Perspective. J Industrial Safety Health. 2018;56(4):230-8.
20. Khan R, Chowdhury S. Chemical Hazards in the Manufacturing Industry: A Review of Awareness Among Workers. Environmental Health Perspectives, 2019;127(7):078003.
21. Ali Z, Rahman M. Ergonomic Risks in the Workplace: The Case of the Ceramic Industry. Int J Occupational Health Safety. 2017;23(3):121-7.

22. Ahmed S, Ali N. Occupational Safety Awareness and Its Impact on Worker Health: A Gender-Based Study. J Occupational Safety Health. 2020;63(2):88-97.
23. Khan F, Hossain T. Socio-Demographic Influences on Health and Safety Perceptions in Manufacturing Industries. Int J Public Health, 2022;67(1):112-9.
24. Rahman M, Rahman A. The Role of Work Experience and Occupational Safety Training on Workplace Health Hazards. Safety Sci. 2021;142:105410.
25. Talukder M, Hossain Z. Awareness of Occupational Health Hazards among Workers in the Bangladesh Textile Industry. Asian J Environment Sci. 2016;9(4):207-15.

Cite this article as: Nahar L, Rahman S, Smrity JA, Begum F, Afroze R, Khan P. Awareness of ceramic workers on occupational health hazard and related preventive practice. Int J Res Med Sci 2025;13:3672-81.