

Occupational Stress of Primary Level Health Workers in COVID-19 Pandemic in Bangladesh: a Cross-Sectional Study

Nuruzzaman M¹, and Hossain, S.²

Abstract

The study aimed to explore the level of stress of the primary-level health workers who are staying close-to-the community at Upazila-level in Bangladesh. This was a cross-sectional descriptive study with applications of both – qualitative and quantitative methods. Two upazilas were purposively selected and then stratified sampling technique was used to determine the sample size. A total of 172 health workers were selected covering a total of 11 occupational categories (doctors, nurses, midwives, pharmacists, medical assistants (SACMOs), medical technologists, health assistants, assistant health inspectors, family welfare assistants, family welfare visitor (FWV), and CHCPs). Regarding serving the COVID-19 probable cases, 57% said yes and regarding treatment to COVID-19 infected cases, 30% said yes. Regarding time spent on washing hand, about 52% said that they spent less than 30 seconds. During serving the patients, about 22% reported that they do not use PPE and 50% said that there is no arrangement of wearing PPE in their workplaces and 38% said that they do not follow standard procedures to wear. Regarding receiving COVID-19 related training, about 70% said 'No' and 73% said that they did not receive training on wearing PPE. Midwives and CHCPs were found to experience the highest level of stress at their workplaces. The most common stressors mentioned by the health workers were such as – dealing with difficult situation, sensitive to criticism, hunch for accuracy at work and inadequate resources. This study indicates that there is high prevalence (%) of stress among the primary level health workers in Bangladesh. Finally, the study recommends adopting an appropriate occupational stress management strategy at national level specific to the health workers working at the primary level as their nature of work is different to the secondary and tertiary level of care.

Key words: Occupational stress, primary-level health workers, COVID-19 pandemic, Bangladesh.

¹Md Nuruzzaman, MPH Graduate, Department of Health Promotion and Health Education Bangladesh University of Health Sciences, Bangladesh

²Sharmin Hossain, Senior Lecturer, Department of Health Promotion and Health Education, Bangladesh University of Health Sciences, Bangladesh.

Address of correspondence: Md Nuruzzaman, Bangladesh University of Health Sciences, Bangladesh.

Email: zaman.sph@gmail.com

Introduction

The 2019 Corona Virus Disease (COVID-19) has been considered as one of the greatest threats to human being since its first emergence in Wuhan, China in December 2019 [1]. Due to its severity and high contagious nature, the World Health Organization (WHO) declared COVID-19 outbreak as a public health emergency to the international community. In Bangladesh, the first case was detected on 8 March 2020 and as of 10 June 2023, a total of 20,40,203 cases have been identified as COVID-19 positive

and a total of 29,451 deaths officially recorded [2]. To fight back and to reduce ailment as well as sufferings of the people, health workers come ahead to the forefront and take all necessary healthcare measures against the virus and infected patients [3] [4]. Due to their occupational nature and professional obligation, they take all kinds of care (curative and preventive) of the COVID-19 cases as well as non-infected cases [5]. They put themselves on high risks of infection, which become a treat to their occupation as profession.

Though there is a scarcity of official data, WHO estimates indicate that, between 80,000 and 180,000 health workers could have died between the period January 2020 to May 2021 [6]. In Bangladesh, infection to health workers is not less. According to different professional bodies and daily newspaper reporting, a total of 8,149 health workers has been infected as of 24 December 2020. Out of the total infected cases, about 120 medical doctors, 18 nurses and 7 other categories of health workers died in Bangladesh due to COVID-19 complication [7]. These are the direct effect of COVID-19 on health workforce because of their occupations. This has put significant pressures on health workers especially to the frontline healthcare workers. They have long been known to experience considerable stress and are seen as a highly demanding group and were worryingly associated with higher rates of psychological distress than many other non-health workers of different sectors [8] [9].

In COVID-19 pandemic, stress and stress-associated illnesses are increasing among medical and medical-associate professionals. This poses a serious problem, not only for physicians' well-being but also for the quality of patient care [10]. All health professions face many stress-related factors within their occupational practice, including emotional matters, multi-tasking, high workload, and meeting deadlines. Frequent workplace related stress can negatively impact on the physical and mental wellbeing of the health professionals and result in exhaustion and, sometimes, distressing stress-like symptoms [3]. These factors can negatively affect not only on the wellbeing of health professionals but also on their ability to practice effectively.

Bangladesh has a dearth shortage of qualified health workers such as physicians, nurses and

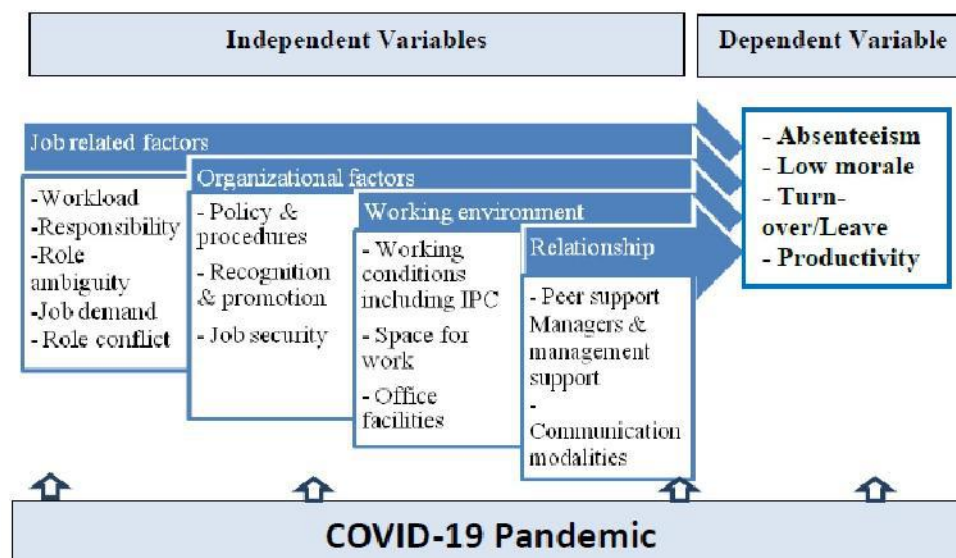
midwives as the country has only 9.9 doctors, nurses and midwives per 10,000 population against the global median 48 [11]. This shortage further exaggerated due to their mal distribution between rural and urban. Presence of qualified health workers is skewed to the urban than rural, which is not in alignment with the distribution of the population. We have more people live in rural than urban areas in Bangladesh.

The primary healthcare system, which is also known as the Upazila health system, is considered to be foundation of the total health system of Bangladesh. If occupational stress is found at higher than the normal level among the health workers based at Upazila health system, it is obvious that they would not be able to perform their job responsibilities in an effective way, hence, it may adversely affect health system's performance. If primary level healthcare systems suffer, pressure would paramount on the secondary and tertiary level healthcare facilities.

Under this circumstance, this study aims to explore the various psychosocial factors which lead to occupational stress among health care practitioners based at Upazila healthcare delivery system of Bangladesh in COVID-19 pandemic situation.

It is expected that the study enriches the knowledgebase of occupational health and health workforce domains. It also draws attention of the policy makers and health managers urging them to take necessary actions on reduction of the stress level of the health workers based at the primary or Upazila health system of the country Bangladesh.

Figure 1: Conceptual framework



Methods

Study design

The study includes a descriptive mixed method cross-sectional study design for collection of data describing the characteristics of health workers at the health facilities in primary health system in Bangladesh with specific focus on examination of occupational stress levels and their coping strategies [12]. This design is chosen because of its appropriateness for the purposes of the study.

Study Site

Two Upazilas were purposively selected for primary data collection. Two Upazilas of Thakurgaon District, situated in the northern side of Bangladesh, have been selected due to data collection conveniences of the researcher.

Target Population & Sample Population

A Upazila health system is constituted of the health facilities and health posts established in a Upazila, which are expanded up to the community or household level.

Table 1: Major health facilities and health workforce in a Upazila health system of Bangladesh

Health facilities	Controlling authority	Major categories of health workforce	Total # of sanctioned posts
Upazila Health Complex	DGHS and DGNM	Doctors, Nurses, Midwives, Dentists, Medical Technologists, Medical Assistant/SACMO, and Pharmacists.	82
Union Health and Family Welfare Center	DGFP	Family Welfare Visitors, Medical Assistant/SACMO, and Pharmacists	5
Union Sub Center	DGHS	Doctor, Medical Assistant/SACMO, Pharmacist	5

Community Clinic	DGHS	Community Health Care Provider (CHCP), Health Assistant, Family Welfare Assistant	3
Household/Domiciliary level	DGHS and DGFP	Health Assistant, Family Welfare Assistant	2

In a Upazila, five types of health facilities and service provisions are found – Upazila Health Complex (UpHC) which consists a total of 82 sanctioned posts for both technical and non-technical workforces, Union Health and Family Welfare Center (UHFWC), and Union

Sub Center (USC) - each consists of five type of health workforces; Community Clinic consists three type of health workforces and two type of health workforces work at household levels.

Table 2: Target population

Upazila	UpHC	UHFWC	USC	CC	Household level	Total workforce sanction posts	Total filled positions
Baliadangi, Thakurgoan	1	7	8	22	7	164	141
Pirgonj, Thakurgoan	1	8	11	27	8	200	162
Total workforce						364	303
Target population of this study							303

Sample Size

Through using the “openepi online platform” and the formula of sample size calculation: $n = \frac{z^2 \alpha p q}{d^2}$, we get an estimated sample size between **172-180**. Here population (N) is 303, hypothesized % frequency of outcome in the population is 50% +/- 5, confidence limit as % of 100 (d): 5%= 0.05. Design effect: 1 and at 95% confidence level.

Sampling Technique

A probability sampling technique was used to reach out the targeted respondents. In order to represent each category of health workforce in this survey, a detailed sampling frame was prepared, and then proportionate sampling method was applied.

Data Collection Tools

A self-administered questionnaire developed for collection of data for this study. This was developed and finalized based on pertinent literature supported by a qualitative an expert consultation. A list of experts was consulted for finalization of the questionnaire. The data collection tool consists of mainly five parts: *Socio-demographic Data, Occupational risk related information, Occupational distress and frustration, Source of occupational Stress (Weimen Scale) and Stress Management or Reduction Strategies.*

The Weiman Occupational Stress Scale was developed in 1977 and it has been widely used to measure occupational stress [13]. It aims determining the level of occupational stress in workers working at those two Upazilas.

Data Management & Analysis Plan

Collected data were processed through editing, cleaning and validation. Data entry and analysis were carried out using the Statistical Package for Social Science (SPSS) Version 16, a computer-based tool. For qualitative variables, data were presented using descriptive statistics such as frequencies and percentages. For quantitative variables ranges, means and standard deviations were used. The scores obtained by the scale in Part I of the questionnaire for this study was compared to baseline scores achieved by Weiman and other researchers in their application of the Weiman Occupational Stress Scale (WOSS) to subjects from a variety of occupations.

Quality assurance of the primary data

To ensure quality of the collected data, researcher herself/himself went to the field and conduct the data collection. Each and every questionnaire was filled up by respective respondents. If there was any instant questions or clarification needed, the researcher responded or addressed those on the spot. However, the researcher took assistance from other person for ensuring data collection on timely basis. Everyday each and every filled-up questionnaire were checked. Editing and cleaning were done every day so that quality assurance is maintained instantly.

Ethical considerations

Ethical clearance was obtained at two levels – institutional level and individual level.

Institutional level ethical clearance was obtained from the Ethical Review Committee (ERC) of the Bangladesh University of Health Sciences (BUHS) and informed consent was obtained beforehand from each and every respondent.

Limitations and strengths

Despite adoption of careful planning and diligent implementation of the study, there were some challenges and limitations. Only public or government health workers were counted and considered for data collection in this study. Therefore, the findings may be applicable to public sector primary level health workforce only not to the private sector providers.

Findings

Based on the primary data collection from the two Upazilas i.e. Baliadangi and Pirgonj under the District Thakurgoan, following key findings are generated through application of the SPSS version 16. A total of 11 categories of health workers have been identified and studied in this research. Health Assistants are the maximum in number as they present about 24% of the total (Figure-2). CHCPs are next to the Health Assistants as CHCPs represent about 17%. Medical Doctors represent about 9% and nurses are about 13%. The domiciliary health workers (Health Assistant, AHI, FWA, and FWV) collectively represent about more than 50% of the total respondents, which is very significant.

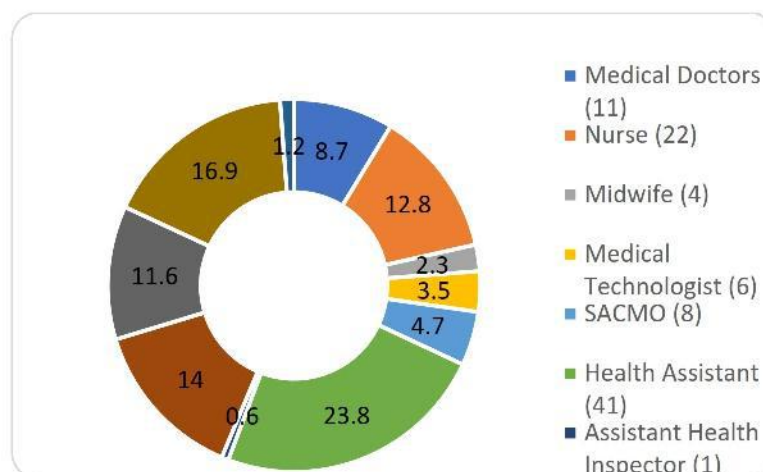


Figure 2: Occupational categories of the respondents (in %)

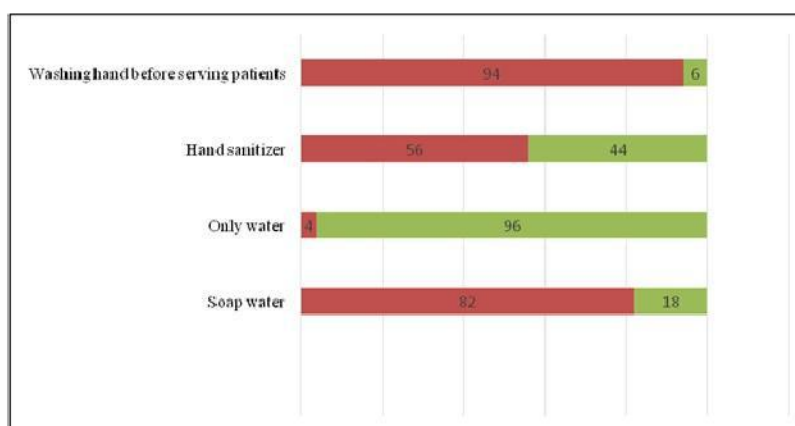
Table 3: Frequency of the respondents serving the probable COVID-19 cases

Response	Valid Percent	Cumulative Percent
Yes	57.0	57.0
No	43.0	100.0
Total	100.0	

More than half (57%) of the total respondents have mentioned that they serve probable COVID-19 infected cases (Table 3). Since

they serve the probable COVID19 cases, there is high chance of transmission of the disease.

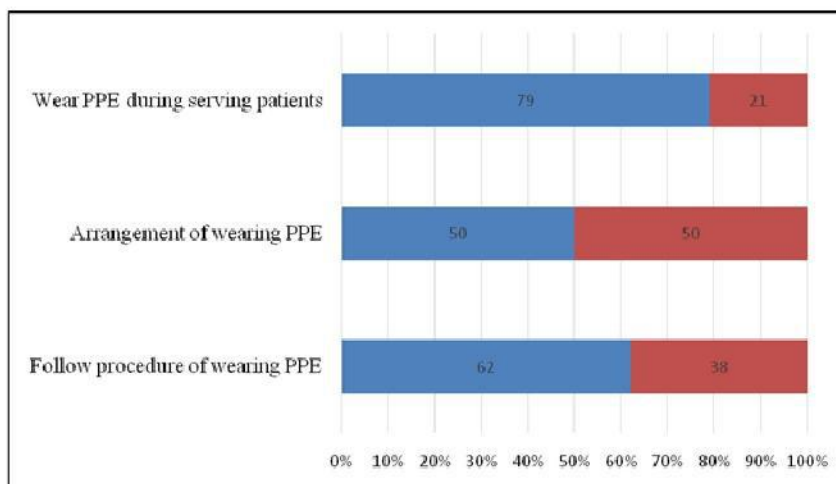
Figure 3: Washing hand before serving the patients (in %)



About 94% of the total respondents have mentioned that they wash hand before they serve any patient (Figure 3). However, 6% have indicated that they do not wash hand for

the same purpose. More than 80% of the total respondents have said that they use soap water to wash their hand. Only 4% opined that they use only water.

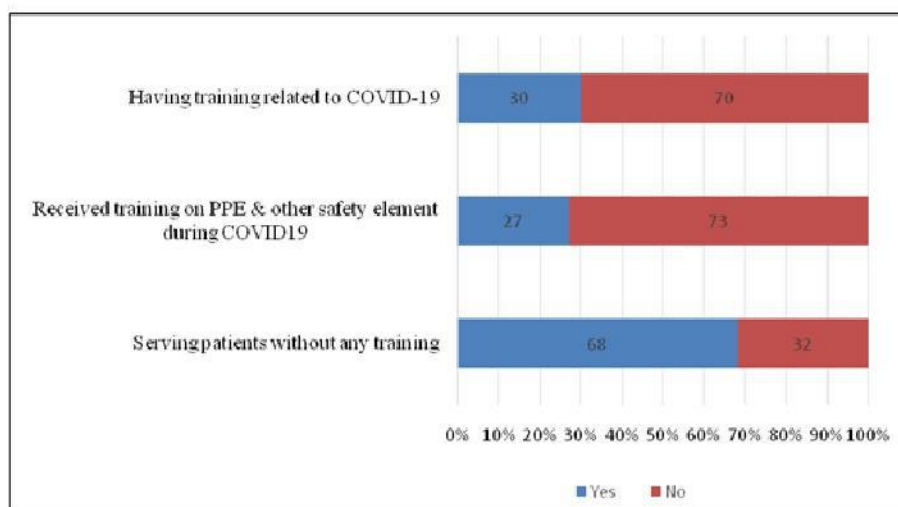
Figure 4: Responses about wearing PPE for serving patients



According to the Figure 4, about 50% of the total respondents have mentioned that they do not have arrangement of wearing PPE for donning and doffing. Regarding wearing PPE

as per procedure, about 38% respondents stated that they do not follow the standard procedure.

Figure 5: Training on PPE, COVID-19 and serving patients with training



About 70% of the total respondents have indicated that they did not receive any training on COVID-19 or did not receive COVID-19 related training (Figure 5). Regarding training on PPE and other safety elements during COVID-19, about 70% indicated that they did

not receive such training (Figure 4). It also indicates that about 68% of the total respondents have been serving patients without taking any training on COVID-19 and wearing PPE and other safety measures

Occupational stress level among the health workers

Reliability test was done for the Occupational Stress Scale in the questionnaire. The test results show a Cronbach's Alpha coefficient of 0.73 indicating acceptable internal

consistency. Even though this coefficient is not as excellent as the 0.90 of the Weiman Occupational Stress Scale (WOSS), it reveals statistically acceptable scores (Table 4). The total score obtained from the data collection for all 172 participants was 7940 points (Table 5).

Table 4: Reliability statistics of the scale adapted from the Weiman scale

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	Number of Items
.735	.740	15

This computes into a mean score of 46.16 per participant which translates into an individual average score of 3.21 on the five-point scale (Table 5). Now what level of stress do 3.21

represent? Comparing it to the mean score of 33.75 and individual average of 2.25 established by the WOSS, helps answering this question.

Table 5: Occupational stress scores among the respondents (N= 172)

Category	Total Number	Professional group-wise total score	Professional group-wise average score	Individual Average Score
Medical Doctors	15	628	42	2.80
Nurse	22	963	44	2.93
Midwife	4	310	78	5.20
Medical Technologist	6	271	45	3.00
SACMO	8	350	44	2.93
Health Assistant	41	1859	45	3.00
AHI	1	47	47	3.13
FWA	24	1129	47	3.13
FWV	20	890	45	3.00
CHCP	29	1403	48	3.20
Pharmacist	2	90	45	3.00
Total	172	7940	530	35.33
Average score per respondent		46.16	48	3.21
WOSS baseline			33.75	2.25

The mean score and individual average score are 46.16 and 3.21 based on the responses provided by the participants, which is overall 37% higher than the established Weiman Occupational Stress Scale mean score of

33.75 and individual average of 2.25. Interpreting these results within the framework of the WOSS, it appears that there is a strong indication of occupational stress among the health workers based at the

primary level of the health system. According to the WOSS framework, the higher the score is, the greater the stress is in the subject. The study results reveal that there is significant level of stress among all occupational categories (11) with reference to the WOSS benchmark. Among all the 11 occupational groups, Midwife is found to have the highest level of stress as their average scores stand at 78, which is 131% higher than the WOSS reference value (33.75).

Community Health Care providers (CHCP) are having the second highest level of stress as they denote average scores of 48, which is 42% higher than the WOSS reference value (Table 3). In addition, Family Welfare Assistant (FWA) and Assistant Health Inspector (AHI) are having the third highest level of stress in the study. Medical doctors are having lower level of stress compared to any other occupational categories as their average score stands at 42. Nurses and Sub-Assistant Community Medical Officers (SACMOs) are having slightly higher level of stress (both acquired 44 scores) compared to the medical doctors. Medical Technologists, Health Assistants, Family Welfare Visitors (FWVs) and Pharmacists are having equal level of stress as they have scored at 45 respectively.

It is important to note that the domiciliary health workers (FWV, FWA, HA and AHI) are combinedly having significant level of stress as their average score is 46, which is 37% higher than the WOSS benchmark and 10% higher than the doctor's score. These health workers provide healthcare and family

planning services at household or community level, and they stay and live close-to-the community.

The major occupational stressors

In a pandemic situation like COVID-19, which is denoted as the most infectious disease in the human history, health workers are the frontline fighters against the pandemic of the disease. Due to nature of the profession, health workers need to face the COVID-19 infected patients and provide both preventive and curative care. Therefore, they are on high risks of infection, and this creates unprecedented pressures on them. Maintaining the health and safety of this group is important not only to save the lives of the patients but also to control the disease [14]. Health workers especially who provide primary care to patients with COVID-19 are not only at higher risk of infection but also more vulnerable to mental health. They often feel afraid of spreading the virus to others, including their loved ones. In the past, the prevalence of SARS provided an important lesson to us and it highlighted the need for adequate psychological support to the health care professionals [15].

From the analysis of all scores of the respective questions (Weiman Scale items), answered by the respondents (total 11 categories), it was found that six items appeared to be the most common sources of stress because they had the highest total scores. Dividing their respective total scores by the total number of participants for the question resulted in above-average score means.

Table 6: Top five occupational stress management strategies adopted by the health workers

Technique	Average Score	Top five (in ranking order)
I reorganize my work	4.98	1
I set priorities and deal with problems accordingly	4.81	2
I effectively manage my time	4.78	3

I use rules and regulations	4.77	4
I plan ahead	4.76	5

The respondents scored highest to “I recognized my work” (4.98), which shows high level of commitment of the health workers (Table 6). They like their work and show dedication to it, which is critical for achieving client’s satisfaction and health facility’s outcomes. “I set priority and deal with problems accordingly” has got 2nd highest score (4.81). This is regarded as a good management strategy of time and resources management. “I effectively use my time” is another strategy the health workers adopt at the primary level of the health system (4.78). “I use rules and regulation” has got significant scores from the respondents (4.77). Since the health workers are government staff, they need to follow rules and regulations. The provided score indicates that the health workers comply and practice this at workplace. The fifth strategy that is used by the respondents is “I plan ahead” (4.76). ‘Planning ahead’ is also regarded as a good management approach. It helps to keep control over the work and helps to reduce or eliminate unforeseen stress during implementation.

Discussion

The main objective of this study was to examine the overall occupational stress level among the health workers serving at the Upazila health systems. Stress has been regarded as an occupational hazard since the mid-1950s [16]. Meaning of stress to one person may be different to another depending on the type of personality exposed to the stressor [17]. However, Psychologists as well as researchers have cited occupational stress as a significant health problem [18] [19]. Several studies revealed that the healthcare profession, like many other occupations experience above average levels of job stress. Occupational stress generates detrimental effects to the organization. It contributes to develop a situation of

disorganization, disruption in normal operations, lowered productivity, and lower margins [20].

According to the study results, the health workers of the two Upazilas have been experiencing a significant level of occupational stress that is above the average standardized by the Weiman Occupational Stress Scale. Midwives and CHCPs were found to experience the highest level of stress at their workplaces. FWA, Nurses and SACMOs were also having significant level of stress. Medical doctors were found to have less stress compared to any other professionals studied.

All those factors might have linkages with the existing occupational health and safety management initiatives at the workplaces. Findings indicate that more than 70% of the respondents did not receive any COVID-19 management or related training and how to wear PPE as per standard procedure. About 82% stated that there was no arrangement of occupational risk assessment in their workplaces. Regarding arrangement of wearing PPE, about 50% mentioned that there is no such in their workplaces.

Health workers also apply a variety of coping strategies against their stress. The five most common stress management strategies reported were recognizing the work or job, setting priority at work, effective management of time and planning ahead. Coping strategies are critical to lead their normal work and serving the patients in this COVID-19 pandemic situation. The more the health workers apply those strategies, the more they can keep themselves away from the stress, which is not only beneficial for them but also for the organization and above all, people’s satisfaction is ensured.

Conclusion and recommendations

Primary level health workers stay close-to-the community and mix them with the common people. Local people highly depend on them for any healthcare advice and suggestions. If they (the frontline workers) fall in stress due to the nature of their occupation, they may not be able to render care and medical treatment to the healthcare seekers. Therefore, the health workers need to know how to manage stress and keep control over the stress producing factors (stressors). Employers (both government and non-Government) should adopt appropriate strategies cum interventions and implement them in the respective workplaces. Dedicated effort is needed not only from the local level but also from the central level. Since there is gap in this area in Bangladesh, a national level occupational stress management strategy should be developed and translated into operational level so that the field level or Upazila level health workers can follow this and implement in their own workplaces, which might have an indirect reflection on their performance and organizational outcomes.

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Author's Contributions

Md Nuruzzaman (MN) conceived and designed the study. MN conducted data collection, compiled and analyzed the data and wrote the first draft of the manuscript. Ms Sharmin Hossain (SH) reviewed the draft and provided her comments. Both authors approved the final manuscript.

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Availability of data and materials

The datasets generated and/or analysed during this study are not publicly available due to joint ownership of the data, but they are available from the corresponding author on reasonable request.

Competing interests

Authors declare no conflict of interest.

Patient consent for publication

Not required.

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