



Article

Occupational risk/safety of pharmacists working in Bangladesh during COVID-19 pandemic: a cross-sectional survey study

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Abstract

In spite of the COVID-19 panic among the people of Bangladesh, Pharmacists are working relentlessly to provide medications and providing healthcare services to the people. In such conditions, occupational safety is the prime concern. This cross-sectional study was designed to evaluate the risk factors and safety aspects associated with the Pharmacy profession in Bangladesh during the COVID-19 pandemic. A questionnaire-based cross-sectional survey study was carried out using google form as well as sending printed questionnaires from 01 August 2020 to 30 May 2021 through Facebook, WhatsApp, e-mails, messenger, and personal communication among 400 Pharmacists working during COVID-19. Our investigation resulted that Pharmacists worked for more than 8 hours/day (44.40%) in 6 days/ week (47.4%) during the COVID-19 pandemic. Organizations are moderately concerned about the safety issues but most of them (57.90%) provided support to COVID 19 infected employees, working guidelines (51.10%), PPEs to employees. Organizations were found to take moderate precautionary steps, and 42.10% of participants were moderately satisfied with their working environment. Pharmacists were found to be stressed in work during COVID-19 because of infection possibilities to family members (63.90%), personal infection (54.90%), and losing jobs (27.80%), and salary reduction (23.30%). Few respondents (24.1%) received incentives for working in COVID-19 pandemic while 14.3% of respondents' salary was deducted. The working pharmacists are at risk of getting an infection, psychological stress, loss of jobs, reduction of salary, and lack of proper logistic support and working environment during COVID-19.

Keywords: COVID-19, Occupational safety, Pharmacist, Pharmaceutical company, Bangladesh, Hygiene, Job security, Salary deduction, Psychological stress; Occupational stress; Personal protective equipment, Pharmacy profession in Bangladesh

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Introduction

COVID 19, a global pandemic has been creating turmoil among people of different nations and different class all over the world since its inception. The virus, popularly known as SARS-CoV-2 or 2019-nCov; a mutated species of the Coronavirus family has already become a global health crisis (Lima, 2020; Cucinotta and Vanelli, 2020; Yuki et al., 2020; Velavan and Meyer, 2020; Sakib et al., 2020; Sheppard and Thomas, 2021). The outbreak of the enveloped RNA virus first came to the fore in the Wuhan city of China at the end of December 2019 (Siddell et al., 2010; Channappanavar et al., 2014; Israfil et al., 2020).

COVID-19 made its appearance in Bangladesh on 8th March 2020 in Narayanganj which was reported by IEDCR (Institute of Epidemiology Disease Control and Research) and it is the second most affected country in South Asia (Haque, 2020; IEDCR, 2020; Satu et al., 2020). The epidemiology institute IEDCR of the country has been working actively in providing hotline numbers, online consultation service, email addresses to help the people of the country in controlling infection. Government use to impose lockdown rule to the country whenever required to prevent the spread of the disease and constructed isolation areas for COVID-19 infected people (Haque, 2020). Despite of taking all the necessary precautionary measures to combat the spread of the infection there are a certain class of people who are at higher risk of getting exposed to the infection. The health workers have been relentlessly working to control the situation by continuously getting exposed to the vicious virus.

During this global health crisis, the significance of the role of Pharmacists is unparalleled even if they are not often seen in the limelight. COVID-19 caused a dire need of treatment and medication to improve the deteriorating health conditions of the infected people. In this circumstance, Pharmacists in Bangladesh are dedicatedly working in different sectors for the production, distribution, dispensing, etc., strenuously providing their services to control the aggravating situation. Even though the entire country was undergoing lockdown rules imposed by the government still the Pharmacists were working in Pharmaceutical industries for Product Management, Medical Services and marketing and distribution of pharmaceuticals; in model pharmacies and community pharmacies, in hospital, drug administrations, academia, and in different other areas of healthcare services to serve the nation with the supply of quality medicines to ensure better healthcare management. In order to perform their duties and responsibilities at the COVID-19 pandemic, the Pharmacists have to face

several challenges including the risk of getting infections by SARS-CoV-2. However, their occupational risks and other challenges during this COVID-19 pandemic have not yet been identified. No research has been conducted on the occupational risks and/or safety of working Pharmacists during COVID-19. That's why we have aimed to investigate the occupational risk, personal and family stresses, stress from employers, and other aspects relating to the occupational health of Pharmacists working during COVID-19 pandemic.

Materials and Methods

Ethical approval

An ethical approval for the protocol to conduct the proposed cross sectional study was obtained from the Institutional Ethical Review Committee of State University of Bangladesh (SUB-IERC), Dhaka, Bangladesh (Approval No. 2020-04-20/SUB/H-ERC/0006).

Study design

This was a questionnaire based cross-sectional survey study conducted among the Pharmacists working in different areas of Pharmaceutical fields in Bangladesh. The study was designed to conduct this cross-sectional questionnaire based survey study was carried out using google form as well as sending the printed questionnaires through Facebook, WhatsApp, E-mails, Messenger and personal communication among the Pharmacists working in Bangladesh during COVID-19 pandemic.

Questionnaire development

A questionnaire prepared in Google form was circulated through social media platform to different Pharmacists working in different areas of the Pharmaceutical fields. The survey questionnaire was developed with the parameters which could evaluate the occupational risks and safety of the Pharmacists during this COVID-19 pandemic. The questionnaire was segmented in 6 parts containing "Likert scale". The major parameters include socio-demographic information, information about job position and job area, organization/company support for working environment of Pharmacists, protective equipment in the workplace, relationship of overall stress and workplace stress with workplace policy and concerns and suggestions regarding workplace safety. The questionnaire includes information of the participants on gender, age, accommodation, family members, educational qualification, presence of chronic illness and hygiene practice to elicit socio-demographic information. Questions related to job category, job area, job designation, job tenure, working days and hours, number of employees and satisfaction regarding

job work environment data are used to draw out work related information. Data regarding the supportive policies and protective equipment provided by the organizations was also included in the questionnaire. A set of questions were included to elicit information regarding the stress faced by Pharmacists for working during this pandemic. Lastly, suggestions from the respondents regarding their workplace safety were taken.

Consent of participants

Consent of the Pharmacists was taken before their participation and the objectives of the study were explained to them prior to responding to the questionnaire. The identity and information provided by the participants were kept confidential and they were allowed to terminate the survey at any stage of the study as per their wish.

Determination of sample size

The number of participants (sample size) has been calculated based on the following formula:

$$n = \frac{z^2 pq}{d^2}$$

Where,

n = desired sample size

z = standard normal deviate; usually set at 1.96 which correspond to 95% Confidence Interval (CI)

So far reviewed no studies have been found on the study. Therefore, the value of p is considered to be 0.5

q = (1 – p) = (1 – 0.5) = 0.5

d = degree of accuracy desire, usually set at 0.05

Then, z=1.96, p=0.5, q=0.5 and d=0.05

So, according to the equation, $n = \frac{z^2 pq}{d^2}$ =

$$\frac{(1.96)^2 \times 0.5 \times 0.5}{(0.05)^2} = \frac{3.84 \times 0.5 \times 0.5}{0.0025} = \frac{0.96}{0.0025} = 384$$

So, the minimum number of respondents was calculated to be = 384.

Though, the estimated sample size is 384, we have collected data on a total of 400 respondents.

Study procedure and collection of data

This was a questionnaire based cross-sectional survey study, conducted on a sample of 400 Pharmacists working in different sectors of Pharmaceutical field in Bangladesh. The data was collected from 1st August 2020 to 30th September 2020 by using google form questionnaire through Facebook, WhatsApp, Email and personal contact. All the Pharmacists working in different sectors of the Pharmacy professions in the country volunteered.

Data analysis

All the data received were presented in pie chart, histogram and bar graph and the results were calculated in percentages in Microsoft Excel. The results obtained were stored in Microsoft PowerPoint Microsoft Excel to construct graphs and tables.

Results

Socio-demographic characteristics of the respondents

Our study resulted that of the 400 Pharmacists, 78.9% were male and only 21.1% were female; 63.2% of them belonged to the age group of 20-30 years, 31.6% participants were in 31-40 years and only 5.3% were in the 41-50 years' age group. The accommodation types were 65.4% respondents were living with their family, 4.5% respondents stayed in dorm, 30.1% respondents stayed alone. It was observed that most of the Pharmacists that is 28.6% had 5 family members, 7.5% respondents had 2 members, 20.3% had 3, 21.1% had 4 and 22.6% had more than 6 members in their family. The highest level of education of the Pharmacists was reported for M. Pharm. which is 78.2% followed by B. Pharm. (Hons.) 20.3% and PhD 1.5%. Although majority (75.2%) of the respondents didn't have any chronic illness but the 15% of them who reported of having chronic illness were mostly suffering from respiratory disease (21.4%) followed by cardiovascular disease (9.5%), diabetes mellitus 4.8% and the rest 64.3% disease type were not specified. Pharmacists who participated in the survey were mostly living with their spouses (41.4%) and with parents (40.6%), the rest of the respondents lived with their kids (33.8%), 4.5% lived with patients having chronic illness and 3.8% lived with pregnant woman and 28.6% stayed alone (Figure 1). The personal hygiene practice of the responding Pharmacists was satisfactory. It was reported that 85% participants always maintained personal hygiene practice, 3% participants maintained at office only and 12% maintained occasionally.

Figure 1

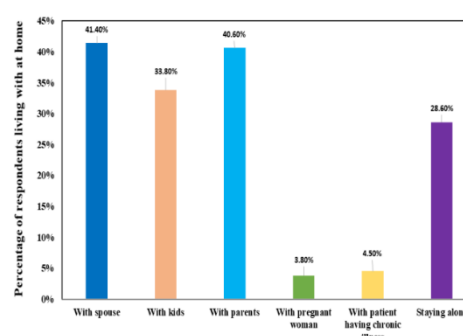


Fig. 1. Status of the percentage of respondents living with different family members at their residents. The results obtained from 400 respondent Pharmacists working in different job positions in Bangladesh during COVID-19.

Work related information of the Pharmacists

Figure 2 displays the job categories of the Pharmacists. The highest percentage of respondents was from Pharmaceutical companies (72.2%) and the lowest percentages observed were from research organization (0.8%), raw material supplier (0.8%) and scientific laboratory (0.8%) categories. The participants who worked in Pharmaceutical companies were mostly from the Quality control/ Quality assurance, production and PMD (Pharmaceutical Marketers Directory) department. The rest few percentage of respondents were from sales and promotion (9.50%), R&D (7.80%), Warehouse (0.90%), Supply chain/ Procurement (3.40%), MSD (Medical Services Department) (1.70%) and IMD (International Marketing Department) (0.90%) (Figure 3). Since majority of the respondents were from Pharmaceutical companies so the highest percentage of designation was seen for Officer executive (49.6%) followed by senior executive/senior officer (10.7%), assistant manager (7.4%), manager (5%), junior executives (4.1%), managing directors (2.5%), general manager (1.7%), Plant manager (1.7%), Research scientists/ Research officer (1.7%) and Deputy general manager (0.8%). Only 2.5% Pharmacists were working as an Associate professor, 1.7% as Assistant professor, 0.8% as Director and Pharmacy council secretary/ Officer.

The highest job tenure was recorded to be 1-5 years by 46.6% of the respondents followed by 6-10 years (21.8%), few months (20.3%), 11-15 years (9%), 21-25 years (1.5%) and 16-20 years (0.8%). Information regarding the working hour and days of Pharmacists are given in Figures 4 and 5. As shown in the figures the highest working hour was 8 (44.40%) and working days were 6 (47.40%). The more the exposure higher the chance of spreading of infection and getting infected. For this reason, data regarding the number of employees in the working place of the Pharmacists were shown in Figure 6. It was observed that the predominant responses were for companies with more than 500 (27.80%) and 1-25 employees (23.3%). The rest were for 26-50 (8.3%), 50-100 (13.5%), 100-200 (12%), 200-300 (17.5%), 300-400 (4.5%) and 400-500 (3%). Out of 400 respondents, 23.3% were strongly satisfied, 42.1% were moderately satisfied and 20.3% were not satisfied at all with the working environment during this pandemic of COVID 19 (Figure 7).

Organization/company support for working environment of Pharmacists

Data regarding the option provided to the Pharmacists for working at home and going to the station were collected. Majority (57.9%) of the respondents had to go to the work station during this pandemic and only few (11.8%) were able to work from home. The rest 30.8%

participants had the option to sometimes work from the station and sometimes from home. The data provided in Figure 8 represents the information regarding the transport used by the Pharmacists to go to their respective work places. A portion of the participants who were going to the work station were provided with office transport (37.6%) and rest were using public transport (23.30%), private car (5.30%) and some had to make personal arrangement (26.30%) during this pandemic.

It was observed in Figure 9 that almost half of the respondents claimed that their organization's safety concern was moderate (42.90%) and 51.1% strongly disagreed about the guidelines provided by their organization (Figure 10). More than half of the organizations provided support to COVID 19 infected employees (57.90%) and 27.10% didn't provide any aid (Figure 11).

Protective equipment in the work place

The organizations in which the Pharmacists were working, almost half of the respondent 49.6% claimed that their organization provided them with protective equipment but 37.6% participants claimed that they had to make arrangement for their own personal protective equipment, 5.3% participants claimed that only few people were provided with PPE, 4.5% claimed that PPEs were given to those employees who asked for them and the rest 3% didn't bother about the fact whether their organization provided them with PPEs or not (Figure 12). Mask and gloves were the most common type of PPEs those were provided by the organizations. Apart from this, apron, gown, goggles, face shield are also provided. But 20.3% organizations didn't provide any PPE to their employees (Figure 13).

Most organization provided with hand sanitizing (76.7%) and hand washing area (54.9%), infrared forehead thermometer (52.6%), disinfectant booth (50.4%) as precautionary measures and few provided with oximeter (7.5%) and facilities of sweeping floor with bleaching powder (38.3%) (Figure 14). Likert scale was used to evaluate the rank of precautionary measures taken by the organizations for the employees during COVID-19 pandemic. In the scale 10 represented highest precautionary measures and 1 represented lowest precautionary measures taken by the organizations (Figure 15).

Assessment of working and stress conditions of Pharmacists

COVID-19 had already created fear and stresses among the working Pharmacists and so it was significant to collect data regarding this issue. The highest stress was for family members getting infected by corona virus (63.9%), stress for personal infection was 54.9%, stress

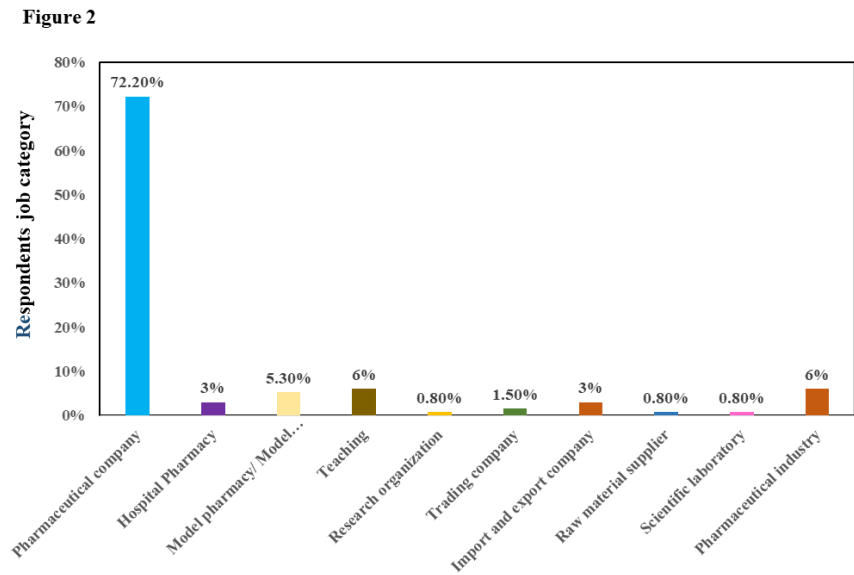


Figure 2. The job category of the Pharmacists in different sectors.

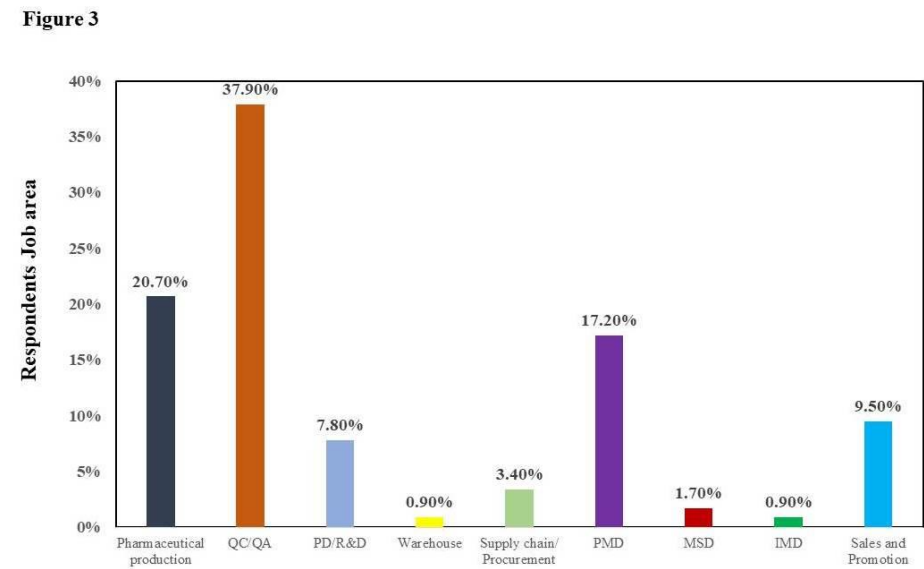


Figure 3. The job areas of Pharmacists working in Pharmaceutical companies.

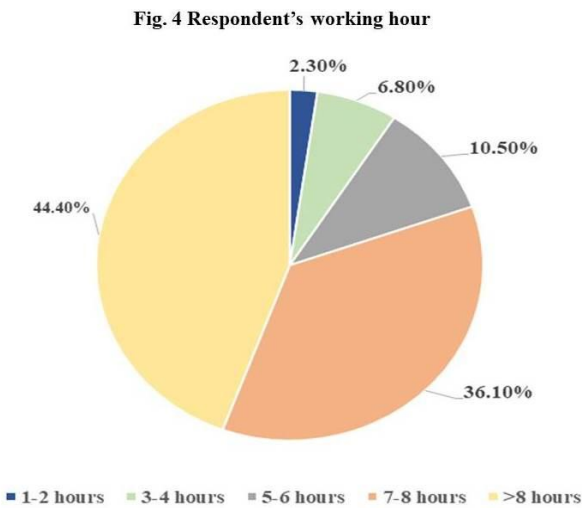


Figure 4. The time spent by the respondents in their respective working place during COVID-19 pandemic.

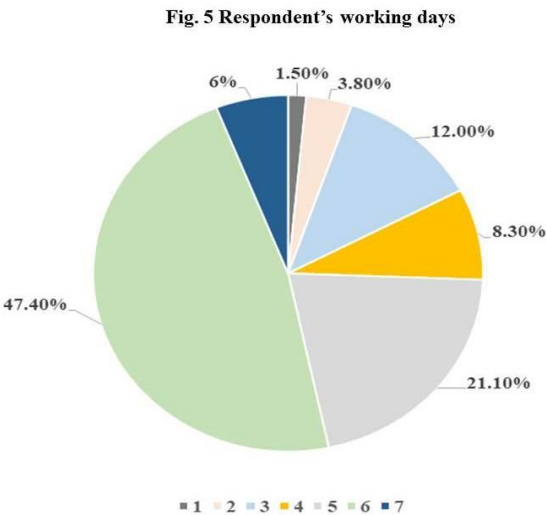


Figure 5. The number of working days of the respondents per week in their respective organizations.

Fig. 6 No. of employees in respondents organization

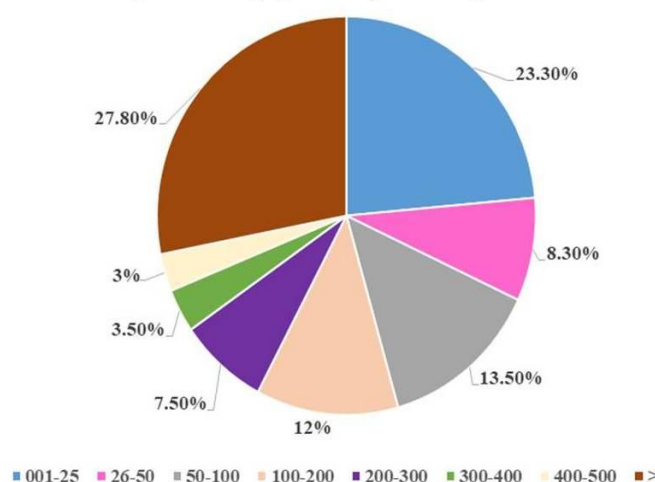
**Figure 6.** No. of employees working in the organizations where the respondent Pharmacists are working.

Fig. 7 Satisfaction of employees with working environment

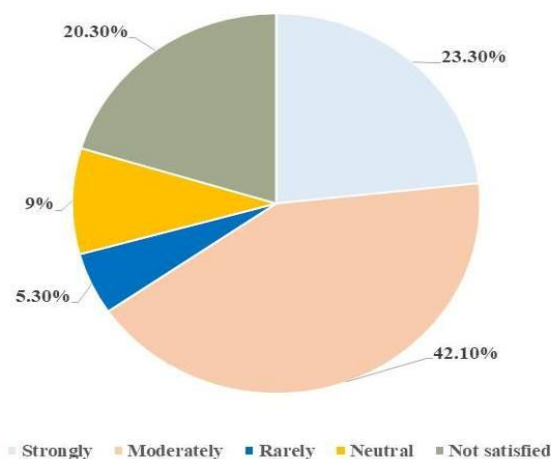
**Figure 7.** Satisfaction level of the respondents to their working environment during this COVID-19 pandemic.

Fig. 8 Respondents' transport facility

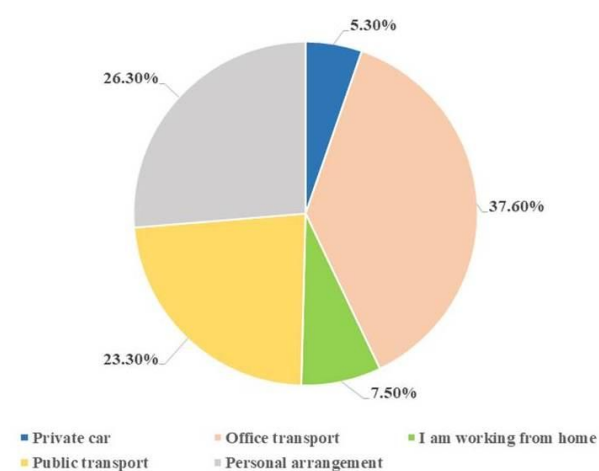
**Figure 8.** Transport facilities provided by the organizations to the respondents at COVID-19 pandemic.

Fig. 9 Safety concern of the organization

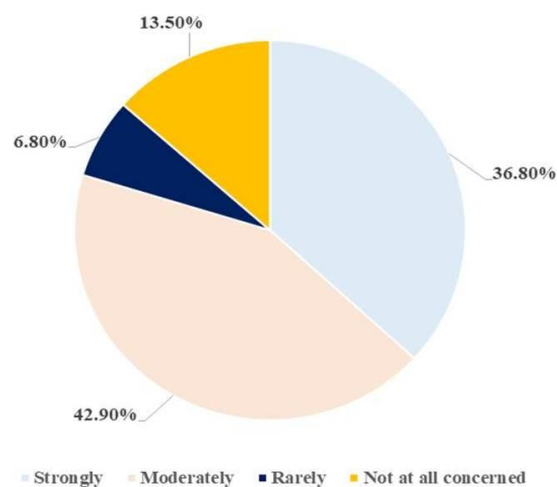
**Figure 9.** The status of the organizations regarding the safety issues towards working environment of Pharmacists.

Fig. 10 Guidelines provided in the workplace

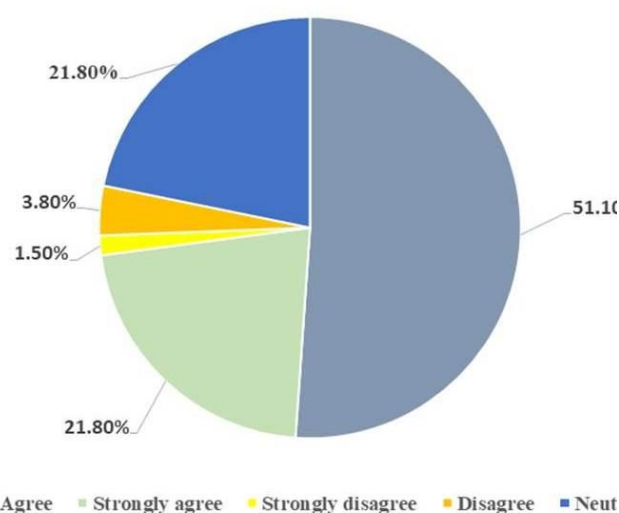
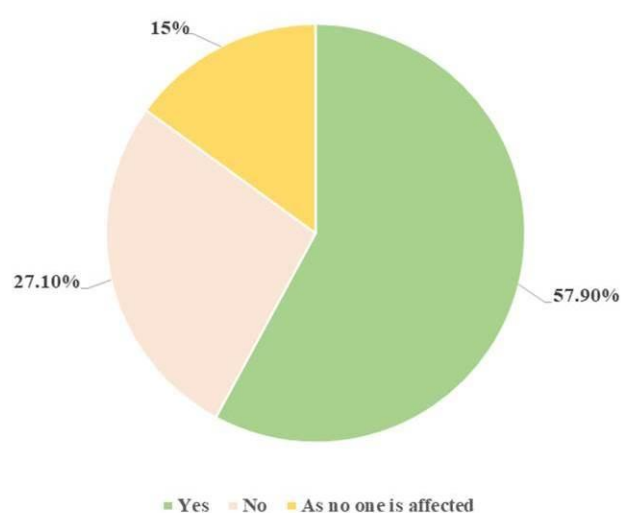
**Figure 10.** Status of organizations regarding COVID-19 guidelines provided by the organization for the employees during COVID-19 pandemic.

Fig. 11 Support to COVID-19 infected employees

**Figure 11.** The information about the organization/company support to COVID-19 infected employees

from society was 35.3%, colleagues was 27.1%, employees was 20.3%, new death cases was 30.1%, remuneration stress was 11.3%, salary deduction 23.3%, losing the job 27.8% were also pivotal factors for causing distress among the pharmacists during this pandemic (Figure 16). Since Pharmacists are health care professionals so there are chances of them getting coming in close contact with Corona virus infected people. Majority of the respondents 30.8% were not exposed and 30.1% were unsure of being exposed to corona infected people for the sake of their occupation (Figure 17).

Concerns and suggestions regarding workplace safety

The Pharmacists participated in the survey provided some suggestions to reduce the occupational risk of infection by COVID-19 where the most common suggestions were: to maintain social distance, wearing the masks and following and implementing the guidelines provided by the organization and WHO as well as being self-conscious and maintaining personal hygiene. Some of the pharmacists suggested that working from home would be a better option to reduce the risk of infection and before entering the working station temperature should be measured and PPE should be worn and provided by the organization. Few of the respondents suggested for maintaining a roster duty in the organization and also reducing the working hour. To provide facilities for office transport to the employers during this pandemic and stopping food service in the office were also suggested. Some respondents suggested for maintaining of hygiene in every sector of the working place as well as keeping the laboratory apron clean daily. The respondents also suggested that COVID-19 testing facility should be provided within the working premises.

Discussion

Since the cross sectional study was divided in to 6 segments so we could clearly interpret the information about the occupational risk and safety of Pharmacists during the pandemic from the figures. The socio-demographic section provided information about the gender where most of the participants in the survey were male and mostly around the age group of 20-30 years. Males are usually more strong in terms of their immune system than that of female (Conti and Younes, 2020). The people with increased age are more vulnerable to the in a study (Promislow and DPhil, 2020). But it was seen from the survey virus than the younger ones was observed results that most Pharmacists were living with their family, with spouse, kids, parents and few other are staying with

patient having chronic illness and pregnant woman. In such case the risk of spreading of infection increases from the working Pharmacists to his/ her family members (Ciacci and Siniscalchi, 2020). The educational qualification of the participants was M. Pharm, B. Pharm graduate as well as some were PhD holder, which infers that they are quite aware and have rigorous knowledge about the current situation. The presence of chronic illness was only reported by few respondents (15%) and they were mostly suffering from diabetes mellitus, cardiovascular and respiratory diseases. Such people with chronic conditions should be allowed by the organization to work from home because they are more vulnerable to catching infections than others.

Ensuring occupational safety of Pharmacists is crucial in all times and this needs to be considered with great importance whether they are in the risk of developing multi drug resistance (MDR) or working during an epidemic (Sarker et al, 2014). The work related questions provided information about job category and area of the participants. Majority of the Pharmacists were working in the Pharmaceutical company and they mostly belong from QC/ QA, Production, PMD, R&D and Sales and promotion. Many of them were working 6 days a week, some for 5 days and few worked for 7 days a week. The pandemic caused an increased demand for essential and emergency medicines for the people which augmented the work load in Pharmaceutical companies (Elbeddini et al., 2022). In order to meet the current demand of the country Pharmacists are burdened with extra work pressure which can induce additional stress in them (Garcia-Castrillo et al., 2020). Moreover, the working areas had many employees working at a time and this can be a reason for increased risk of spread of the infection. Since most respondents are from Pharmaceutical company so it is clearly evident that they have to be present in the working place to supervise every work. Although working in the station is necessary for those who are working in the Pharmaceutical industry, Hospital and Model Pharmacy, raw material supplying, scientific laboratory but those who can work away from the work station, should be given the support of working from home. In this way work related stress and risk of getting infected can be reduced.

During this pandemic situation Pharmacists require some support from their organization so they can maintain safety for both themselves and their family. Most of the respondents were given the facility of using the office transport but there are some Pharmacists who are using public transport and making personal arrangements to reach to their workplace. Public transports can lead to increased risk

Fig. 12 Organization providing PPEs to the employees

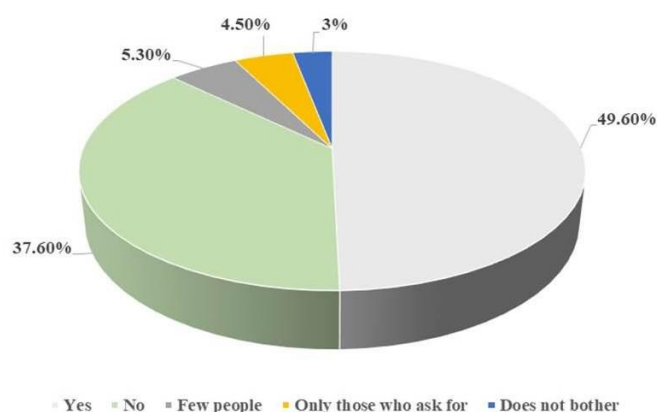


Figure 12. Status of organizations providing personal protective equipments (PPEs) to the working Pharmacists and other employees working during COVID-19 pandemic.

Figure 13

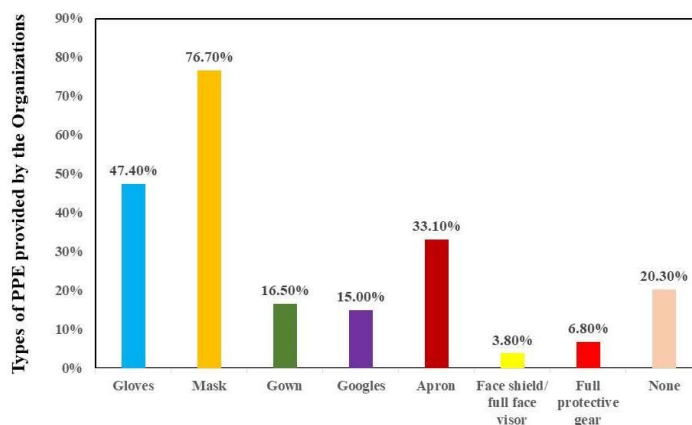


Figure 13. The types of PPEs provided by the organizations to the Pharmacists for curtailing the risk for COVID-19 infections during this pandemic.

Fig. 14 Precautionary measures taken within the workplace

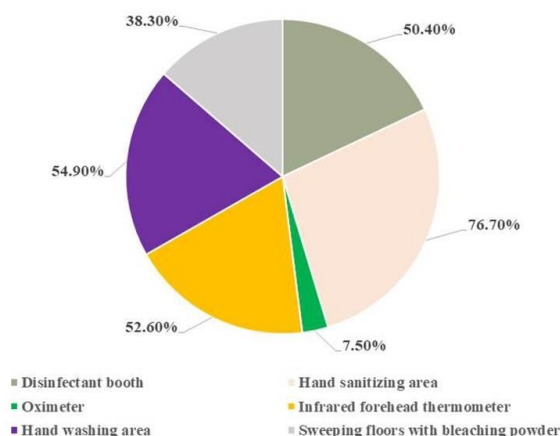


Figure 14. The status about the precautionary measures within the work place and the facilities provided for the working Pharmacists.

Figure 15

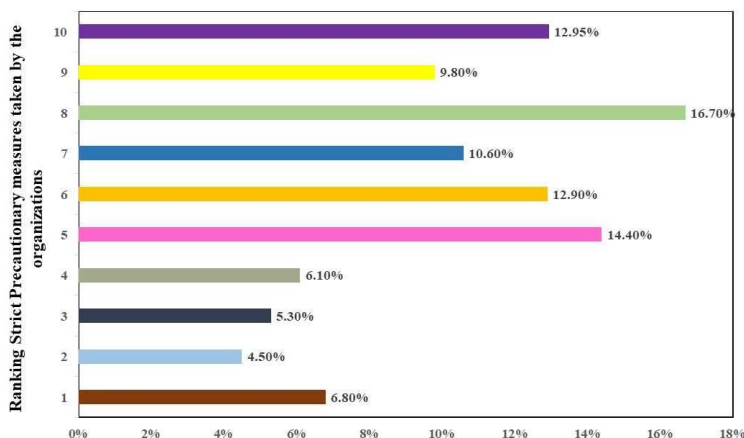


Figure 15. The rank of strictness in maintaining precautionary measures by the organizations of the respondents

Figure 16

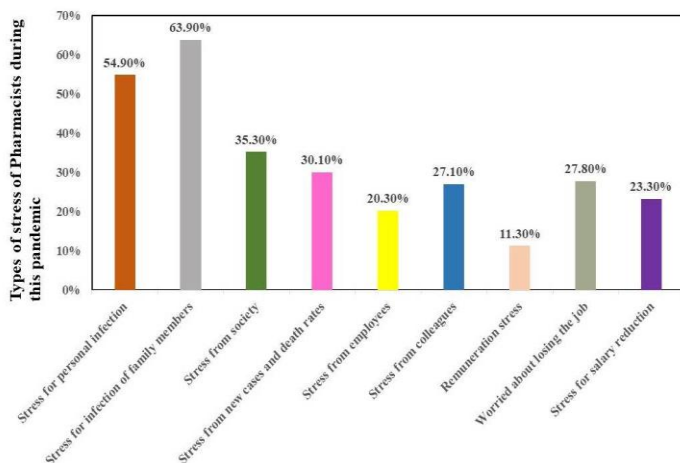


Figure 16. The category of stresses faced by the respondents at work during the COVID-19 pandemic.

Fig. 17 Close contact with COVID-19 infected people

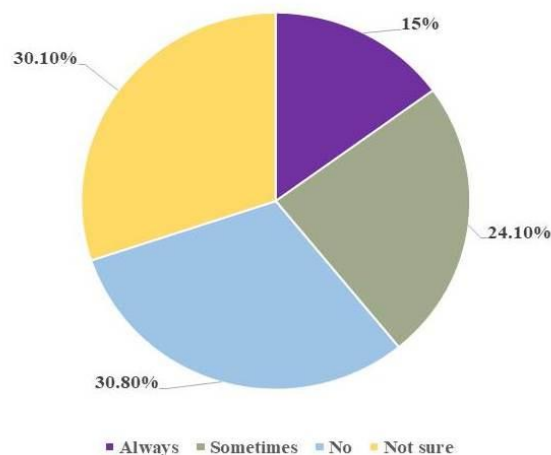


Figure 17. The chances of the respondents to be in close contact with COVID-19 infected patients at work during the pandemic.

of getting infected and the chain of infection can pave a long way. And those who were making personal arrangements to travel to their work station had to make additional expenses which can give rise to further stress. It is imperative for Pharmaceutical companies to have proper safety concerns in all times of the year and the results showed that most organizations were abiding by the rules. But some anomalies were reported by the respondents in this regard where they were not at all concerned regarding the safety measures. Although the percentage was less but the lenient behavior of those organizations can cause an increased spread of the disease if immediately safety measures are not taken. The study gave us information that different protective gears like masks, gloves, gowns, googles were provided to the Pharmacists which was an essential preventive measure to combat the spread of infection. But the participants being educated and a member of health profession should always wear their protective gears whether its provided by the organization or not.

Majority of the participants were enjoying full salary and some got incentives as well. But there were still few percentages of Pharmacists who were facing remuneration related stress since their salary was deducted by 40% or 50% and for some it was more than 50%. And 11.5% organizations were reducing the number of employees in this situation. During this pandemic there are already stress regarding the fear of getting infected, stress of losing loved ones, stress of spread of the virus, fear of unemployment, loss of income etc. are a reason for mental affliction like anxiety, depression, trauma and insomnia (Ahorsu et al., 2020; Hossain et al., 2020; Pakpour and Griffiths, 2020; Tasnim et al., 2020; Pakpour et al., 2020). The fear of losing job as well as remuneration stress can hinder the work progress since there is already multiple stresses regarding the virus, spreading infection to family members, society, new death cases etc. COVID-19 already produced a negative impact on the mental health of the working Pharmacists and these psychological stresses can lead to a disturbance in immunological stability (Naser et al., 2020; Salman et al., 2020). It is not possible to completely ensure the safety of the working area of the Pharmacists considering their type of work in this pandemic but proper precautionary measures, following the guidelines can be effective in reducing the occupational risks.

Limitations of the Study

Even though we were able to elicit a lot of information from this survey but this study had limitations too.

There was a risk of overestimation of a result if multiple respondents participated from the same organization. In such case the results might not represent the entire nation's situation. Despite the limitation this study provided with new information regarding the occupational safety and risks of Pharmacists working in different sectors in Bangladesh.

Conclusion

Our study found that the companies/organizations are moderately concerned about the safety issues of the Pharmacists and other employees, and they have taken only moderate precautionary steps at this COVID-19 pandemic. Although most of the companies provided support to COVID-19 infected employees, guidelines within the work place, and PPEs to employees in work, a significant number of companies did not found to provide such kind of supports and precautionary activities. Although few pharmacists received incentives for working in COVID-19 pandemic, we found several cases of the respondents whose salary was deducted due to COVID-19 crisis. Most of the respondents were found to be stressed to work during COVID-19 because of the possibilities of personal and family infection, losing job positions, and salary reduction. Considering the overall working environment, company/organization support and job security, the occupational safety of Pharmacists working in different pharmaceutical companies and other related organizations are moderately satisfactory and Pharmacists are working in Bangladesh in spite of psychological stress of getting infection as well as losing job during the COVID-19 pandemic. The Pharmaceutical companies and other healthcare related organizations should ensure the occupational safety as well as job security of the Pharmacists working in Bangladesh at COVID-19 pandemic considering their contributions for the development of healthcare sector.

Data Availability Statement

Data relevant to the study is already included to the article or attached in the supplements. Raw data will be provided on reasonable request upon contacting with the corresponding author.

Ethical Statement

The study was conducted according to the guidelines of the Declaration of Helsinki, and approved by the Human Ethics Committee of State University of Bangladesh (protocol code: 2020-04-20/SUB/H-ERC/0006 and date of approval: 20 April 2020).

Authors Contributions

Conceptualization: MMRS; Methodology: MMRS; Investigation: RJA; Data analysis: RJA, MIS, MA; Manuscript writing: RJA; Manuscript review and editing: MMRS, MIS, MA; Project supervision: MMRS. All authors have read and agreed to the published version of the manuscript.

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Conflicts of Interest

The authors declare that they don't have any conflict of interest.

Funding Information

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