

PHYSICAL HEALTH PROBLEMS AMONG HEALTHCARE PROFESSIONALS DURING THE COVID-19 PANDEMIC IN BANGLADESH: A CROSS-SECTIONAL STUDY

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Abstract

The COVID-19 pandemic has placed healthcare professionals (HCPs) worldwide in an unprecedented and demanding role as frontliners in the battle against the virus. In the context of Bangladesh, this study explored the physical health problems and some related sociodemographic, familial, and social factors encountered by HCPs during the pandemic. This cross-sectional research took place in Dhaka City, Bangladesh, from June 2021 to February 2022. Various HCPs were chosen from a total of 10 government and 2 non-government hospitals dedicated to treating COVID-19 patients, utilizing a simple random sampling approach. Total 483 responses were collected. Information was gathered by conducting face-to-face interviews with the use of semi-structured questionnaires. The data collected underwent analysis employing both descriptive and inferential statistics. SPSS version 22.0 was used for conducting data analysis. The study found significant sociodemographic, habitual, organizational, and family factors associated with the respondents' COVID-19 status at a 5% level of significance and a p-value less than 0.05. Post COVID-19 complications were seen among 28.6%, the group that was found COVID-19 positive among the respondents. Personal protective equipment (PPE)-related issues and issues related to long shifts included over sweating (88.20%), discomfort (84.90%), headache (82.40%), backpain (69.20%), and dehydration (73.90%). Improving working conditions and giving support to HCPs are required to ensure their physical safety and security.

Keywords: Physical Health Problems, Healthcare Professionals, Factors, COVID-19, Pandemic, Bangladesh

Introduction

The COVID-19 pandemic, caused by the novel coronavirus SARS-CoV-2, had rapidly spread across the globe since its emergence in late 2019¹. This unprecedented health crisis had impacted virtually every aspect of human life, from public health and economies to social interactions and daily routines². It had profoundly impacted global healthcare systems, posing unprecedented challenges to healthcare professionals (HCPs) worldwide.³

As HCPs worked with COVID-19 patients, they reported several typical physical health difficulties, including exhaustion and fatigue⁴, musculoskeletal problems⁵, sleep disturbances⁶, nutritional challenges, psychological effects, and so on⁷.

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There were many risk factors as HCPs were exposed in their daily duties, including long working hours, high patient loads, and inadequate access, as well as the usage of personal protective equipment (PPE)^{8,9}. These factors, compounded by the psychological stress¹⁰ and emotional toll of witnessing the suffering and loss associated with COVID-19, contribute to the vulnerability of HCPs to various physical health ailments.

In managing COVID-19 cases, the HCPs of Bangladesh were facing no less challenges than other countries. This cross-sectional study aimed to investigate the prevalence and nature of physical health problems experienced by HCPs in Bangladesh during the COVID-19 pandemic. It also explored the association between COVID-19 status and various sociodemographic, occupational, and familial factors. Investigating the physical health problems among HCPs during the pandemic was crucial for ensuring their occupational health and safety, maintaining healthcare workforce capacity, preventing burnout, improving patient care, and addressing long-term health implications.

Methodology

Study design and setting

This study is a cross-sectional survey of physical health problems among HCPs during the COVID-19 pandemic in Dhaka, Bangladesh. Doctors, nurses, and medical technologists (lab and radiology) participated in this study from ten government and two private COVID-19-dedicated hospitals. A Simple random sampling technique was followed to collect data from the participants.

Inclusion and exclusion criteria

The selection criteria for our sample involved choosing individuals who were actively involved in providing care to COVID-19 patients across various departments, including wards, intensive care units, and emergency units. HCPs, who were not directly engaged in COVID-19 areas, were excluded from this study.

Sample Size

Considering the 70% prevalence of cough and weakness¹¹, 4% error, and a 95% confidence interval. Our study's sample size was 504.

$n = z^2 pq / d^2$, Where, n = desired sample size, $z = 1.96$ (95% confidence interval)

p = prevalence of depressive disorders (70%) = 0.70

$q = 1 - p = 1 - 0.70 = 0.30$, and $d = 4\%$

So, $n = (1.96)^2 (0.70 \times 0.30) / (0.04)^2 = 0.806736 / 0.0016 = 504.21 = 504$

Therefore, sample size, $n = 504$

However, due to practical constraints (duplication, incompleteness, etc.) data were accepted from 483 respondents.

Sampling Technique

A randomized lottery was employed to select hospitals for the study, comprising ten government and two non-government facilities. These chosen hospitals represent nearly all of Dhaka. The sample frame consisted of doctors, nurses, and medical technologists.

Research instruments and validity and reliability tests of instruments

The questionnaire was developed by reviewing relevant literature and also adding and adapting the specific conditions and scenarios observed in hospitals during the study period. This approach ensured that the questions were both evidence-based and appropriately suited to the hospital environment. The questionnaire's content was verified by the researchers themselves and ensured validity. Initially, the questionnaire was created in English and later translated into Bangla. To ensure its effectiveness, the Bangla version of the questionnaire was tested on 14 individuals in a non-sampling area. Any problems, such as unclear questions, confusing directions, or disorganized content in the questionnaire, were identified and addressed during this pre-testing phase. Thus, the reliability of the questionnaire was ensured.

Data Collection & Data Analysis

Our dependent variable was COVID-19 status of HCPs. Independent variables were socioeconomic characteristics, organizational factors, and familial factors. Information was gathered in person between June and November 2021 by conducting face-to-face interviews with the assistance of the semi-structured self-administered questionnaires. The data that was gathered underwent a meticulous process that involved thorough checking, editing, coding, and entry into a database, utilizing the statistical software IBM SPSS Version 22. The analysis of the data was carried out using descriptive and inferential statistics.

Research ethics

In accordance with ethical requirements, the research protocol was thoroughly reviewed and approved by the Research Ethics Committee (REC) of the Faculty of Allied Health Science (FAHS) at Daffodil International University (DIU) under reference number REC/FAHS/DIU/2021/1017. Before beginning data collection, participants were given a thorough description of the study's history and aims. Each participant provided written consent, and strong procedures were taken to maintain anonymity and confidentiality. Furthermore, authorization was acquired from the appropriate hospital authorities before data collection began.

Results

The burden of COVID-19 infection among HCPs

Physical health problems included the burden of COVID-19 infection among HCPs. We evaluated the frequency of COVID-19 cases among the individuals surveyed, inquiring whether they had received a positive COVID-19 test result at any time since the start of the pandemic. The proportion of healthcare workers who had tested positive for COVID-19 was 28.6%.

Association between sociodemographic and habitual factors and COVID-19 status of HCPs

From our study, we found that age group, marital status, education, designation, and monthly income were significant with COVID-19 status of HCPs (positive or negative for COVID-19) at a 5% level of significance as a p-value less than 0.05. Sex, BMI of the participants, extra care at home to avoid COVID-19, and the religion of the participants were insignificant with the COVID-19 status of HCPs (positive or negative for COVID-19). (Table 1).

Table 1: Association between sociodemographic and habitual factors and COVID-19 status of HCPs (n= 483)

| Characteristics | COVID-19 status of HCPs, Positive for COVID-19 (%) | COVID-19 status of HCPs, Negative for COVID-19 (%) | Total n (%) | p Value |
|---|--|--|-------------|---------------|
| Age group | | | | |
| 18-40 | 126 (26.1) | 334 (62.9) | 460 (95.2) | 0.010* |
| 41-60 | 12 (2.5) | 11 (2.3) | 23 (4.8) | |
| Sex | | | | |
| Male | 39 (8.1) | 80 (16.6) | 119 (24.6) | 0.243 |
| Female | 99 (20.5) | 265 (54.9) | 364 (75.4) | |
| BMI | | | | |
| Under weight | 3 (0.6) | 16 (3.3) | 19 (3.9) | 0.120 |
| Healthy weight | 77 (15.9) | 214 (44.3) | 291 (60.2) | |
| Overweight and obese | 58 (12.0) | 115 (23.8) | 173 (35.8) | |
| Marital Status | | | | |
| Married | 116 (24.0) | 253 (52.4) | 369 (76.4) | 0.000* |
| Unmarried | 18 (3.7) | 91 (18.8) | 109 (22.6) | |
| Divorced/Widowed | 4 (0.8) | 1 (0.2) | 5 (1.0) | |
| Education | | | | |
| Diploma | 56 (11.6) | 202 (41.8) | 258 (53.4) | 0.001 |
| Graduation | 58 (12.0) | 106 (21.9) | 164 (34.0) | |
| Post graduation/Masters | 24 (5.0) | 37 (7.7) | 61 (12.6) | |
| Designations | | | | |
| Nurse | 92 (19.0) | 278 (57.6) | 370 (76.6) | 0.003 |
| Doctor | 41 (8.5) | 55 (11.4) | 96 (19.9) | |
| Medical technologists | 5 (1.0) | 12 (2.5) | 17 (3.5) | |
| Monthly Income | | | | |
| Below 50,000 | 47 (9.7) | 170 (35.2) | 217 (44.9) | 0.002 |
| Above 50,000 | 91 (18.8) | 175 (36.2) | 266 (55.1) | |
| Extra care at home to avoid COVID-19 | | | | |
| Not at all | 13 (2.7) | 24 (5.0) | 37 (7.7) | 0.588 |
| Sometimes | 65 (13.5) | 159 (32.9) | 224 (46.4) | |
| Regularly | 60 (12.4) | 162 (33.5) | 222 (46.0) | |
| Religion | | | | |
| Muslim | 112 (23.2) | 286 (59.2) | 398 (82.4) | 0.797 |
| Hindu | 19 (3.9) | 46 (9.5) | 65 (13.5) | |
| Christian | 7 (1.4) | 13 (2.7) | 20 (4.1) | |

[N.B. p-value is less than 0.05 was considered as significant.]

Post COVID-19 complications among the HCPs

Table 2 shows the percentage of post-COVID-19 complications among the HCPs who had been COVID-19 positive. Here, fatigue 10.60%, cough 8.90%, headache 8.80%, loss of smell or taste 8.20%, recurrent fever 7.80%, worsened symptoms after physical or mental activity 7.50%, concentration problem 7.00%, breathing difficulty 7.00%, muscle pain 6.40%, dizziness when standing 6.00%, depression or anxiety 5.70%, joint pain 5.60%, fast heartbeat 5.60%, chest pain 4.30%, and others 0.80% were found out. Other problems included loss of memory (1), and weight loss (2).

Table 2. Post COVID-19 complications (n= 138)

| Post-COVID-19 Complications | Percent | Post-COVID-19 Complications | Percent |
|---|---------|-----------------------------|---------|
| Fatigue | 10.60 | Breathing difficulty | 7.00 |
| Cough | 8.90 | Muscle pain | 6.40 |
| Headache | 8.80 | Dizziness when standing | 6.00 |
| Loss of smell or taste | 8.20 | Depression or anxiety | 5.70 |
| Recurrent Fever | 7.80 | Joint pain | 5.60 |
| Worsened symptoms after physical or mental activity | 7.50 | Fast heartbeat | 5.60 |
| Concentration problem | 7.00 | Chest pain | 4.30 |
| Other Problems | | | 0.80 |
| <i>[Other problems included- loss of memory (1), weight loss (2)]</i> | | | |

Problems related to PPE

Figure 1 shows the problems related to PPE. Problems related to PPE included over sweating 88.20%, discomfort 84.90%, headache 82.40%, dehydration 79.70%, difficulties to auscultate 72.90%, difficulties to communicate 54.90%, skin damage 51.30%, skin rash 37.50%, blister 34.00%. raised BP 28.40%.

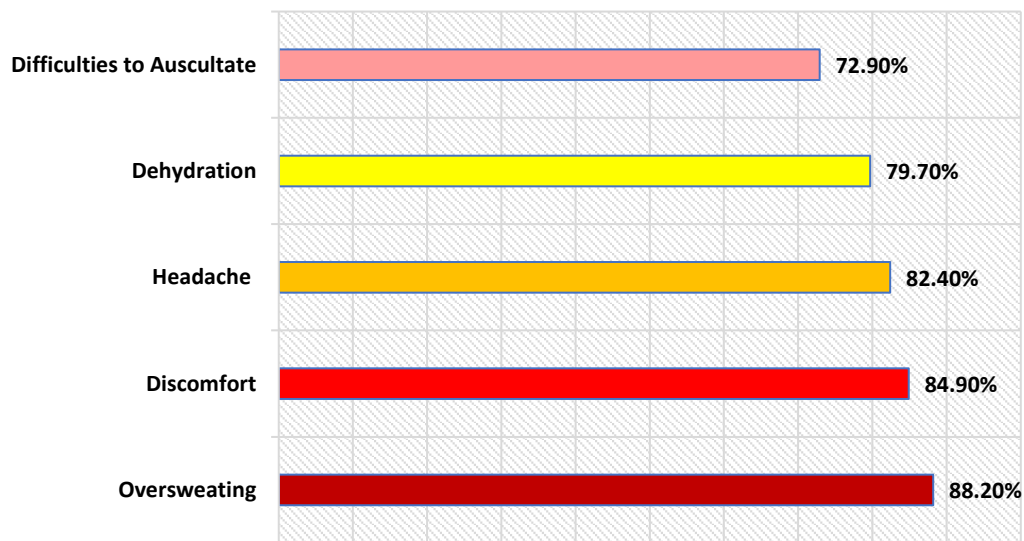


Figure 1: Physical Health Problems related to PPE

Physical Health Problems related to long shift

Physical health problems related to long shift were Back pain 69.20%, dehydration 73.90%, reduced concentration 64.00%, UTI 47.30%, sleep disturbance 62.20%, and others 6.50%. (Figure 2).

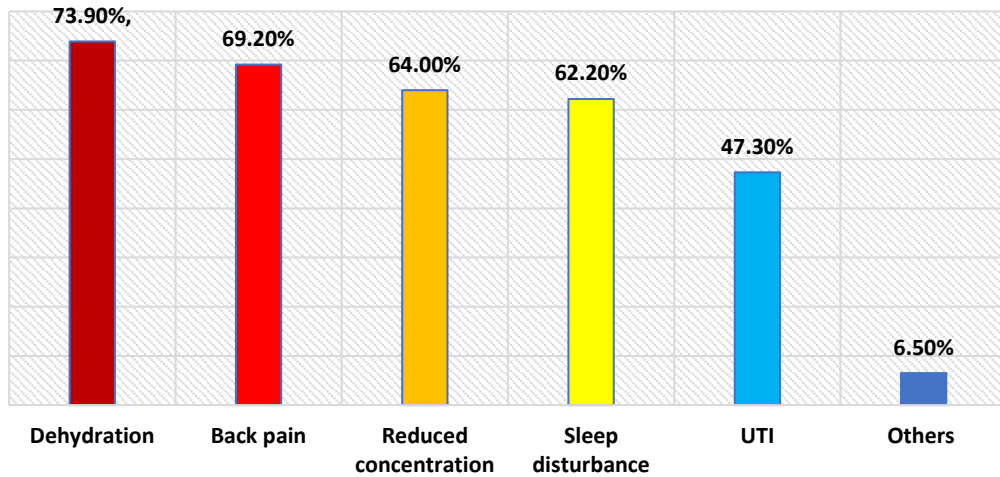


Figure 2: Physical Health Problems related to long shift

In our study, the safety of the working environment, availability of PPE, monitoring for family-related responsibilities, HCPs notified about up-to-date information on COVID-19, getting adequate health support from the organization, financial support, family members taking special care of HCPs as they work for COVID-19 patients, and a family member who tested COVID-19 positive were all significant with the COVID-19 status of HCPs (positive or negative for COVID-19) at a 5% level of significance as a p-value less than 0.05. (Table 3).

Table 3: Association between organizational, familial, and social factors and COVID-19 status of HCPs (n=483)

| Characteristics | COVID-19 status of HCPs, Positive for COVID-19 (%) | COVID-19 status of HCPs, Negative for COVID-19 (%) | Total n (%) | p Value |
|--|--|--|-------------|--------------|
| The safety of the working environment | | | | |
| Not safe | 50 (11.1) | 10 (30.3) | 60 (12.4) | 0.005 |
| Moderately safe | 171 (38.0) | 11 (33.3) | 182 (37.7) | |
| Highly safe | 229 (50.9) | 12 (36.4) | 241 (49.9) | |
| Availability of PPE | | | | |
| A small amount | 174 (38.7) | 19 (57.6) | 193 (40.0) | 0.032 |
| Adequate amount | 276 (61.3) | 14 (42.4) | 290 (60.0) | |
| Monitoring for mental stress | | | | |
| Not at all | 84 (60.9) | 209 (60.6) | 293 (60.7) | 0.953 |
| Occasionally | 54 (39.1) | 136 (39.4) | 153 (31.7) | |
| Monitoring for family-related responsibilities | | | | |
| Not at all/sometimes | 353 (78.4) | 31 (93.9) | 384 (79.5) | 0.033 |
| Regularly | 97 (21.6) | 2 (6.1) | 99 (20.5) | |
| HCPs notified about up-to-date information on COVID-19 | | | | |
| Not at all/sometimes | 286 (63.6) | 27 (81.8) | 313 (64.8) | 0.034 |
| Regularly | 164 (36.4) | 6 (18.2) | 170 (35.2) | |
| Getting adequate health support from the organization | | | | |
| Not at all | 64 (14.2) | 12 (36.4) | 76 (15.7) | 0.003 |
| Sometimes | 223 (49.6) | 12 (36.4) | 235 (48.7) | |
| regularly | 163 (36.2) | 9 (27.3) | 172 (35.6) | |
| Financial support | | | | |
| Not satisfactory | 156 (34.7) | 20 (60.6) | 176 (36.4) | 0.003 |
| Satisfactory | 294 (65.3) | 13 (39.4) | 307 (63.6) | |
| Training for Infection Prevention and Control | | | | |
| No | 256 (56.9) | 20 (60.6) | 276 (57.1) | 0.677 |
| Yes | 194 (43.1) | 13 (39.4) | 207 (42.9) | |
| Family members taking special care of HCPs as they work for COVID-19 patients | | | | |
| Not always | 168 (37.3) | 21 (63.6) | 189 (39.1) | 0.003 |
| Always | 282 (62.7) | 12 (36.4) | 294 (60.9) | |
| A family member who tested COVID-19 positive | | | | |
| No | 324 (72.0) | 17 (51.5) | 341 (70.6) | 0.013 |
| Yes | 126 (28.0) | 16 (48.5) | 142 (29.4) | |

[N.B. p-value is less than 0.05 was considered as significant.]

Discussion:

The findings of this cross-sectional study provide valuable insights into the physical health challenges faced by HCPs in Bangladesh during the COVID-19 pandemic. The discussion highlights the implications of these findings, explores potential contributing factors, and suggests strategies for addressing the identified issues.

From our study, we found that age, marital status, education, designation, and monthly income were significant with the COVID-19 status of HCPs (positive or negative for COVID-19). Sex, BMI of the participants, extra care at home to avoid COVID-19, and the religion of the participants were insignificant with the COVID-19 status of HCPs (positive or negative for

COVID-19). A study, done by Monita Karmakar and others in the US, shows an association of social and demographic factors with COVID-19 incidence and death rates in the US¹². Their study shows relation of socio-economic condition to COVID-19 infection. Housing, transportation, and food are also related to the COVID-19 infection, which is different from our study. Their study was done on general people, while our study was done on HCPs. So, some difference is present in the results. Another study in Canada also asserted neighbourhoods with high proportions of residents with less than a high school education, low income, and unaffordable housing were also associated with COVID-19 incidence¹³.

Our study found HCPs, who had COVID-19, were suffering from fatigue 10.60%, cough 8.90%, headache 8.80%, loss of smell or taste 8.20%, recurrent fever 7.80%, worsened symptoms after physical or mental activity 7.50%, concentration problem 7.00%, breathing difficulty 7.00%, muscle pain 6.40%, dizziness when standing 6.00%, depression or anxiety 5.70%, joint pain 5.60%, fast heartbeat 5.60%, chest pain 4.30%, and others 0.80%. A review article held up complications that arise as long-term complications of COVID-19, including cardiovascular, neurological and psychological, haematological, pulmonary, dermatological, and other injuries¹⁴. A separate review of 65 full-text articles identified 10 potential long-term complications of COVID-19. The studies pointed to lung injuries (n=31), venous or arterial thrombosis (n=28), heart damage (n=26), cardiac or cerebral stroke (n=23), and neurological injuries (n=20) as the most frequently reported late complications¹⁵. So, these were common complications that people encountered due to COVID-19.

Our study shows that HCPs experienced sweating 88.20%, discomfort 84.90%, headache 82.40%, dehydration 79.70%, difficulties to auscultate 72.90%, difficulties to communicate 54.90%, skin damage 51.30%, skin rash 37.50%, blister 34.00%. raised BP 28.40%. due to PPE. A similar study⁹ shows that 97% reported discomfort, including labored breathing (20%), fatigue (16%), device-related pressure injuries (13%), anxiety (12%), face acne (10%), insomnia (8%), depression (6%), allergic dermatitis (4%), and hand maceration or foot erosion (4%), trunk or limbs heat rash (3%), conjunctivitis or keratitis (2%), and perineal maceration or tinea corporis (2%). Both the studies show that HCPs suffered a lot due to PPE.

Another aspect of our study shows that physical health issues associated with long shifts included back pain (69.2%), dehydration (73.9%), reduced concentration (64.0%), urinary tract infections (47.3%), sleep disturbances (62.2%), and other concerns (6.5%). A study done in 2020 by the researchers of India says long-term complications affecting the heart and lungs, glucose metabolism, and mental health have been reported following these infections¹⁶.

Strengths and limitations of the study

The study, conducted during the pandemic time of 2021, highlighted healthcare workers' physical health challenges and its related factors. Investigating HCPs' physical health issues during the pandemic was vital for their safety, workforce sustainability, burnout prevention, patient care, and long-term health.

With its strength, it faced limitations like difficulty gathering accurate data and sampling delays. Random sampling was practical but less representative, while excluding support staff and minority subgroups like nutritionists and biomedical engineers narrowed the study's scope.

Conclusion:

This cross-sectional study provides valuable insights into the physical health challenges faced by HCPs in Bangladesh amidst the COVID-19 pandemic. The prevalence of COVID-19 among the HCPs, physical health problems due to PPE and long shifts, and significantly associated

sociodemographic, habitual, organizational, and familial factors with the COVID-19 status of HCPs underscore the serious burden placed on them as they combat the virus.

The findings highlight the need for targeted interventions to address the physical health needs of HCPs in Bangladesh. Based on the findings of our study, policymakers should emphasize ensuring access to adequate PPE, optimizing work schedules along with organizational support, strong healthcare infrastructure, and improved working condition- all are crucial steps to mitigate their physical hazards and promote their well-being.

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