PREDICTORS OF PSYCHOLOGICAL IMPACT AMONG THE HEALTHCARE WORKERS EXPOSED TO COVID-19 CASES IN A TERTIARY HOSPITAL OF BANGLADESH

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ABSTRACT

Background: The unprecedented global pandemic caused by SARS-CoV-2 creates considerable psychological problems among the health care workers (HCW). The present study aimed to determine the predictors of psychological impact (in terms of depression, anxiety and stress) among the HCWs exposed Covid-19 cases in Combined Military Hospital (CMH) Dhaka.

Methods: This cross-sectional study was conducted at CMH Dhaka among purposively selected 390 HCWs. Data were collected through face-to-face interview using a pre-tested semi-structured questionnaire with validated and reliable tools. The study was conducted in the Combined Military Hospital Dhaka from 15 July 2020 to 30 September 2020.

Results: Among the 390 respondents, 21.6%, 43.1% and 24.1% had depression, anxiety and stress symptoms, respectively. Being married (OR=0.391, 95% CI=0.160-0.953), graduate (OR=2.977; 95% CI=1.181-7.509) and attending 41-80 patients per day (OR=1.996; 95% CI=0.965-4.125) was significantly associated with depressive symptoms. In respect of anxiety, being graduate (OR=2.788, 95% CI=1.228 -6.333) and HSC qualified (OR=2.714, 95% CI=1.073-6.869), staying in family accommodation (OR=2.720, 95% CI=1.136 - 6.516), with nuclear family (OR=0.459, 95% CI=0.281-0.750), smoker (OR=1.827, 95% CI=0.987 - 3.384), doctor (OR=0.362, 95% CI=0.173-0.758), having service length <20 years (OR=2.229, 95% CI=1.158 - 4.289), service in current place of posting for <20 months (OR=0.460, 95% CI=0.241-0.880), attended 41-80 patient daily (OR=1.720, 95% CI=0.933 - 3.169) and performing overtime duty (OR=2.568, 95% CI=1.609-4.099) were significantly associated with anxiety symptoms. Being graduate (OR=2.249, 95% CI=0.866-5.844), with nuclear family type (OR=0.423, 95% CI=0.249-0.721), having duty place at emergency (OR=2.135, 95% CI=0.902-5.053), being a nurse (OR=0.364, 95% CI=0.162-0.819), having service length <10 years (OR=2.570, 95% CI=1.207-5.472) and performing overtime duty (OR=2.214, 95% CI=1.3101-3.742) were significantly associated with stress symptoms.

Conclusion: Psychological problems among the HCW found very common in our study which needs psychological crisis interventions to protect the mental health of HCWs.

Keywords: Psychological impact, Healthcare worker, Depression, Anxiety, Stress, CMH.

INTRODUCTION

Since December 2019, the world is experiencing the unprecedented global pandemic of novel coronavirus disease 2019 (COVID-19) caused by the SARS-CoV-2 virus [1]. By now the global outbreak of coronavirus has reached a toll of over 11,35,44,308 cases worldwide with over 25,19,255 cases of death [2]. As
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a consequence of global pandemic, the novel coronavirus was confirmed to have spread to Bangladesh in March 2020 and by now the number of affected people has been increasing with total number of 5,44,954 cases and death toll of 8,384 cases [3]. As a part of the total community, members of Bangladesh armed forces also suffer from this disease. On 6 April 2020, army revealed its first case of COVID-19 and so far about 12751 affected individuals treated in CMH Dhaka.

With the rapid spread of the COVID-19, infection prevention, identification and management of cases as well as ensuring effective strategies to protect public health has become a critical challenge for the global health systems. These challenges, although primarily emerging from an infectious disease with physical health implications, may also affect mental health and wellbeing profoundly which may have multiple impacts on mental health across populations, which necessitates the attention of global health researchers and practitioners [4].

Psychosocial impact is defined as the effect caused by environmental and/or biological factors on individual’s social and/or psychological aspects [5]. Health Care Workers (HCW) generally are at risk of exposure to highly infectious pathogens while they care for patients or by exposure to patient environment or biological samples which may worry them of being infected as well as transmitting the infection to others [6]. Likewise mental health and wellbeing of the frontline HCWs may be affected by the unprecedented COVID-19 pandemic. As a consequence of increasing COVID-19 cases, many of the HCWs are working beyond their regular schedules to meet the increased demand for critical care which makes those HCWs susceptible to anxiety, depression, stress and insomnia. Moreover, working without adequate personal protective equipment and other preventive measures increases the fear of contracting the infection, which is becoming a growing concern as a high prevalence of infection among healthcare providers which is already reported in China, Italy, and the USA. Furthermore, a lack of social support, working under stress, guilt about suboptimal care to the patient or leaving hospitals understaffed, or and worrying about their families may result in critical mental health challenges among HCWs amid COVID-19 [4].

Like others, HCWs of CMH Dhaka are also exposed to various infectious material while serving the COVID-19 positive cases. Studies have shown that the group of HCWs who are in direct contact with the patients are exposed to highest levels of risk. HCWs are particularly vulnerable to many job-related hazards, and undergo a considerable amount of emotional pressures in relation to their jobs. This is even more important during a pandemic outbreak of an infectious disease on a global scale, and can lead to depression, anxiety and stress among the HCWs. In workplace, mental health problems are found to be associated with plenty of negative influences, such as reduction of efficiency, loss of productivity, disability and absenteeism. Given the adverse impacts, it is of great importance to investigate the potential factors and mechanisms that could enlighten the improvement of the mental health and maintenance of productivity of HCWs in the mist of the global pandemic of COVID-19.

In this study, we hypothesize that healthcare workers exposed to COVID-19 positive cases are at high risk of developing psychological problems in terms of depression, anxiety and stress. The objective of this study was to determine the risk factors of psychological problems (in terms of depression, anxiety and stress) among the HCWs exposed COVID-19 positive cases in CMH Dhaka. The study findings may be helpful for the policy makers and personnel working in the field of mental health problems.

METHODS

This cross-sectional study was conducted from July 2020 to September 2020 at the Combined Military Hospital Dhaka. Purposively selected 390 HCWs were included in this study with an objective to assess the predictors of psychological impact of COVID-19 in terms of depression, anxiety and stress. Data were collected from the HCW (Doctors, nurse and paramedics) through face to face interview using a pretested questionnaire. Prior to data collection, informed written consent were obtained from the respondents. Ethical approval for the study was granted by the ethical committee of CMH Dhaka with the number 2020/187 and neither any intervention nor invasive procedure were given. The study instrument comprised a structured questionnaire which includes demographic and job related information, including gender, age, education, monthly income, residence, length of service, among others. Respondent’s depression, anxiety and stress were assessed through 21 itemed validated Bangla version of DASS 21 scale. The 21-item Depression Anxiety Stress Scale (DASS) is a validated, simplified version of the original DASS developed by Lovibond et al. The validated Bangla version of DASS 21 includes three subscales with a total of 21 items that investigate the degree of depression (items 3, 5, 10, 13, 16, 17, and 21), anxiety (items 2, 4, 7, 9, 15, 19, and 20), and stress (1, 6, 8, 11, 12, 14, and 18). Items are scored on a 4-point scale.
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ranging from 0-3, where 0 is never, 1 is sometimes, 2 is often, and 3 is almost always or always. The sum of the item scores for each subscale multiplied by 2 is the subscale score, which ranges from 0–42 points. For the Depression subscale, a score of ≤9 points is normal, while a score of 10-13 points indicates mild depression, 14–20 points moderate depression, 21–27 points severe depression, and ≥ 28 points very serious depression. For the Anxiety subscale, a score of ≤ 7 points is normal, while 8-9 points indicates mild anxiety, 10–14 points moderate anxiety, 15–19 points severe anxiety, and ≥ 20 points very serious anxiety. For the Stress subscale, a score of ≤ 14 points is normal, while 15–18 points indicates mild stress, 19–25 points moderate stress, 26–33 points severe stress, and ≥ 34 points very serious stress. The higher the score is, the more serious the degree of depression, anxiety or stress [7][8]. Cronbach’s alpha coefficient of this questionnaire found 0.86. Data processing and analyses were done using Statistical Package for Social Sciences (SPSS) version 23. Frequencies, percentage, mean and standard deviation (SD) were used for descriptive statistics. Binary logistic regression analyses was performed to estimates the strengths of associations which were demonstrated by the odds ratio (OR) with a 95% confidence interval (CI). A two-tailed p <.05 was considered statistically significant.

RESULTS
Among the respondents, half of the respondents (49.7%) belongs to the age group <30 years, average age was 32.38 years (±8.81) years and range was 20 to 53 years, 65.6% of them were male and 79.2% were Muslim. Highest (41.0%) were HSC qualified and 67.7% were married. About half (42.6%) of the respondents had monthly income in the 30001 to 60000 taka with average of 47953.31 (±30881.99) Taka. Minimum monthly family income was 15000 and maximum was 170000 Taka. Majority (70.3%) of the respondents belonged to the nuclear family and 41.8% stayed at family accommodation [Table-1].

| Characteristics                        | Frequency | Percentage |
|----------------------------------------|-----------|------------|
| **Age of the Respondents (Years)**     |           |            |
| <30                                    | 194       | 49.7       |
| 31-40                                  | 121       | 31.0       |
| >41                                    | 75        | 19.2       |
| Mean (±SD)                             | 32.38 (±8.81) |          |
| Range                                  | 20-53     |            |
| **Sex**                                |           |            |
| Male                                   | 256       | 65.6       |
| Female                                 | 134       | 34.4       |
| **Religion**                           |           |            |
| Muslim                                 | 309       | 79.2       |
| Hindu                                  | 68        | 17.4       |
| Christianity                           | 13        | 3.3        |
| **Educational Qualification**          |           |            |
| SSC                                    | 63        | 16.2       |
| HSC                                    | 160       | 41.0       |
| Graduate                               | 105       | 26.9       |
| Post-Graduate                          | 62        | 15.9       |
| **Marital Status**                     |           |            |
| Married                                | 264       | 67.7       |
| Single                                 | 126       | 32.3       |
| **Monthly income**                     |           |            |
| <30000                                 | 139       | 35.6       |
| 30001-60000                            | 166       | 42.6       |
| >600001                                | 85        | 21.8       |
| Mean (±SD)                             | 47953.31 (±30881.99) |          |
| Range                                  | 150000-170000 |          |
| **Place of Residence**                 |           |            |
| Family Accommodation                   | 163       | 41.8       |
| Sainik Line                            | 136       | 34.9       |

Table – 1: Socio-demographic characteristics of the respondents
Majority (54.6%) were paramedics which was followed by nurse (25.6%) and physicians (19.7%). More than half (54.4%) of the respondents had the length of service <10 years. The average length of service was 11.67 years with SD ±8.93 years. Highest (38.7%) of the respondents attended <40 COVID-19 patients daily and 52.6% of them did their duty at the Corona ward with more than half (51.8%) of them perform their duty <9 hours in a day. More than half (53.8%) of the respondents performed overtime duty with the COVID-19 patients. Majority of the respondent perform their duty as a matter of profession i.e. professionally motivated [Table 2].

Table 2: Occupational history of the respondents (n=390)

| Attributes                              | Frequency | Percent |
|-----------------------------------------|-----------|---------|
| Profession of the respondents           |           |         |
| Doctor                                  | 77        | 19.7    |
| Nurse                                   | 100       | 25.6    |
| Paramedics                              | 164       | 42.1    |
| ICA/OTA                                 | 49        | 12.6    |
| Length of service (in years)            |           |         |
| <10                                     | 212       | 54.4    |
| 11-20                                   | 101       | 25.9    |
| >21                                     | 77        | 19.7    |
| Mean (±SD)                              | 11.67 (±8.93) |         |
| Range                                   | 1 – 34    |         |
| Length of service in current place (in month) |         |         |
| <20                                     | 152       | 39.0    |
| 21-40                                   | 165       | 42.3    |
| >41                                     | 73        | 18.7    |
| Mean (±SD)                              | 26.67 (±19.482) |       |
| Range                                   | 2-99      |         |
| Number of patients attended (per days)  |           |         |
| <40                                     | 151       | 38.7    |
| 41-80                                   | 128       | 32.8    |
| >81                                     | 111       | 28.5    |
| Mean (±SD)                              | 67.46 (±34.719) |        |
| Range                                   | 30 – 170  |         |
| Place of duty                           |           |         |
| E and C Dept                            | 44        | 11.3    |
| Fever Clinic                            | 49        | 12.6    |
| Corona Ward                             | 205       | 52.6    |
| Corona ICU/HDU                          | 92        | 23.6    |
| Duration of duty with the corona patients (in hours) |         |         |
| <9                                      | 202       | 51.8    |
| >10                                     | 188       | 48.2    |
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Among the 390 respondents, 21.6%, 43.1% and 24.1% were above the cutoff point for the depression, anxiety and stress subscale of DASS-21 respectively indicating the presence of mild to severe/extremely severe depression, anxiety and stress symptoms. The mean score for depression, anxiety and stress were 5.32 (±5.26), 7.29 (±6.01) and 10.09 (±7.20) respectively. The DASS-21 scale showed a mean score of 22.70±16.170 (Table-3).

| Variables                              | Frequency | Percent |
|----------------------------------------|-----------|---------|
| **Having depression**                  |           |         |
| Level of depression                    |           |         |
| Normal                                 | 306       | 78.5    |
| Mild                                   | 51        | 13.1    |
| Moderate                               | 26        | 6.7     |
| Severe                                 | 7         | 1.8     |
| Mean (±SD)                             | 5.32 (±5.26) |       |
| Range                                  | 0-26      |         |
| **Having anxiety**                     |           |         |
| Level of anxiety                       |           |         |
| Normal                                 | 222       | 56.9    |
| Mild                                   | 43        | 11.0    |
| Moderate                               | 88        | 22.6    |
| Severe                                 | 20        | 5.1     |
| Extremely Severe                       | 17        | 4.4     |
| Mean (±SD)                             | 7.29 (±6.01) |       |
| Range                                  | 0-36      |         |
| **Having stress**                      |           |         |
| Level of stress                        |           |         |
| Normal                                 | 296       | 75.9    |
| Mild                                   | 57        | 14.6    |
| Moderate                               | 27        | 6.9     |
| Severe                                 | 8         | 2.1     |
| Extremely Severe                       | 2         | 0.5     |
| Mean (±SD)                             | 10.09 (±7.20) |       |
| Range                                  | 0-36      |         |

Table 3: Distribution of DASS-21 Scale Sub items
Results of binary logistic regression analysis of factors associated with depression among the HCWs during COVID-19 are presented in table 4 (a). It was revealed that, odds for depressive symptoms were 2.977 (95% CI: 1.181-7.509) times significantly higher for graduate respondents compared to post-graduate respondents. Married respondents, in contrast to the unmarried respondents was protective factor for depression (OR: 0.391, 95% CI: 0.160 – 0.953). Performing overtime duty was a risk factor for depression (OR: 1.891; 95% CI: 1.087 – 3.291).

Table – 4 (a): Logistic regression results for the factors associated with depression

| Attribute               | Depression |             | OR      | 95% C.I. for OR | Lower | Upper |
|-------------------------|------------|-------------|---------|-----------------|-------|-------|
| Age group               |            |             |         |                 |       |       |
| <30                     | -.267      | .570        | .639    | .765            | .250  | 2.341 |
| 31-40                   | .325       | .411        | .429    | 1.384           | .618  | 3.099 |
| >41 (RC)                |            |             |         |                 |       |       |
| Sex                     |            |             |         |                 |       |       |
| Male                    | .178       | .332        | .592    | 1.195           | .623  | 2.290 |
| Female (RC)             |            |             |         |                 |       |       |
| Education               |            |             |         |                 |       |       |
| SSC                     | .454       | .726        | .532    | 1.574           | .379  | 6.528 |
| HSC                     | .862       | .540        | .111    | 2.367           | .821  | 6.827 |
| Graduate                | 1.091      | .472        | .021    | 2.977           | 1.181 | 7.509 |
| Post-grad (RC)          |            |             |         |                 |       |       |
| Religion                |            |             |         |                 |       |       |
| Islam                   | .305       | .808        | .706    | 1.357           | .279  | 6.606 |
| Shanatan                | .567       | .847        | .504    | 1.762           | .335  | 9.270 |
| Christian (RC)          |            |             |         |                 |       |       |
| Marital status          |            |             |         |                 |       |       |
| Married                 | -.940      | .455        | .039    | .391            | .160  | .953  |
| Unmarried (RC)          |            |             |         |                 |       |       |
| Monthly income          |            |             |         |                 |       |       |
| <30000                  | -.223      | .600        | .710    | .800            | .247  | 2.592 |
| 30001-60000             | -.382      | .375        | .308    | .682            | .328  | 1.422 |
| >60001 (RC)             |            |             |         |                 |       |       |
| Residence               |            |             |         |                 |       |       |
| Family house            | .278       | .498        | .577    | 1.321           | .497  | 3.506 |
| Sainik line             | -.664      | .608        | .275    | .515            | .156  | 1.696 |
| Mess (RC)               |            |             |         |                 |       |       |
| Type of family          |            |             |         |                 |       |       |
| Nuclear                 | -.141      | .289        | .625    | .868            | .492  | 1.531 |
| Joint (RC)              |            |             |         |                 |       |       |
| Smoking habit           |            |             |         |                 |       |       |
| Yes                     | -.127      | .370        | .732    | .881            | .427  | 1.818 |
| No (RC)                 |            |             |         |                 |       |       |
| Place of Duty at the Hospital |     |            |         |                 |       |       |
| E and C Dept            | .408       | .474        | .389    | 1.504           | .594  | 3.806 |
| Fever Clinic            | -.618      | .507        | .223    | .539            | .199  | 1.457 |
| Corona Ward             | -.395      | .379        | .298    | .674            | .320  | 1.417 |
| ICU/HDU (RC)            |            |             |         |                 |       |       |
| Profession of the Respondent |       |            |         |                 |       |       |
| Doctor                  | .323       | .425        | .447    | 1.382           | .600  | 3.180 |
| Nurse                   | -.026      | .419        | .951    | .974            | .429  | 2.215 |
| Medical Assistant       | -.298      | .399        | .455    | .742            | .340  | 1.622 |

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Results of binary logistic regression analysis of factors associated with anxiety among the HCWs during COVID-19 are presented in table 4 (b). It was revealed that, odds for anxiety symptoms were 2.714 (95% CI: 1.073 – 6.869) and 2.788 (95% CI: 1.228 – 6.333) times higher for HSC and graduate respondents respectively, compared to the post-graduate respondents. Residing in the family accommodation (OR: 2.720; 95% CI: 1.136 – 6.516), having smoking habit (OR: 1.827; 95% CI: 0.987 – 3.384), having length of service <10 years (OR: 2.089; 95% CI: 1.123 – 3.886) and 11-20 (OR: 2.229; 95% CI: 1.158 – 4.289), everyday attending 41-80 patients (OR: 1.720; 95% CI: 0.933 – 3.169), performing overtime duty (OR: 2.568; 95% CI: 1.609 – 4.099) were risk factors for anxiety whereas being a doctor (OR: 0.362; 95% CI: 0.173 – 0.758) and nurse (OR: 0.326; 95% CI: 0.161 – 0.662), staying in nuclear family (OR: 0.459; 95% CI: 0.281 – 0.751), and service duration in current place of posting for <20 months (OR: 0.460; 95% CI: 0.241 – 0.880) found protective for anxiety.

Table – 4 (b): Logistic regression results for the factors associated with anxiety

| Attribute               | Anxiety | B   | S.E. | Sig. | OR   | 95% C.I. for OR |
|-------------------------|---------|-----|------|------|------|----------------|
|                         |         |     |      |      |      | Lower  | Upper  |
| Age group               |         |     |      |      |      |        |        |
| <30                     |         | .744| .472 | .115 | 2.104| .834  | 5.310  |
| 31-40                   |         | .095| .355 | .788 | 1.100| .549  | 2.205  |
| >41 (RC)                |         | .339| .282 | .229 | .712 | .410  | 1.238  |
| Sex                     |         |     |      |      |      |        |        |
| Male                    |         | -.339| .282 | .229 | .712 | .410  | 1.238  |
| Female (RC)             |         |     |      |      |      |        |        |
| Education               |         |     |      |      |      |        |        |
| SSC                     |         | .717| .601 | .233 | 2.049| .630  | 6.656  |
| HSC                     |         | .999| .474 | .035 | 2.714| 1.073 | 6.869  |
| Graduate                |         | 1.025| .419 | .014 | 2.788| 1.228 | 6.333  |
| Post-grad (RC)          |         |     |      |      |      |        |        |
| Religion                |         |     |      |      |      |        |        |
| Islam                   |         | -.776| .600 | .196 | .460 | .142  | 1.491  |
| Shanatan                |         | -1.09| .645 | .090 | .335 | .095  | 1.185  |
| Christian (RC)          |         |     |      |      |      |        |        |
| Marital status          |         |     |      |      |      |        |        |
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| Married                              | .575 | .352 | .103 | 1.777 | .891 | 3.542 |
|--------------------------------------|------|------|------|-------|------|-------|
| Unmarried (RC)                       |      |      |      |       |      |       |
| Monthly income                       |      |      |      |       |      |       |
| <30000                               | -.196| .534 | .713 | .822  | .289 | 2.339 |
| 30001-60000                          | -.425| .347 | .221 | .654  | .331 | 1.291 |
| >60000 (RC)                          |      |      |      |       |      |       |
| Residence                            |      |      |      |       |      |       |
| Family house                         | 1.001| .446 | .025 | 2.720 | 1.136| 6.516 |
| Sainik line                          | .810 | .524 | .123 | 2.247 | .804 | 6.279 |
| Mess (RC)                            |      |      |      |       |      |       |
| Type of family                       |      |      |      |       |      |       |
| Nuclear                              | -.778| .250 | .002 | .459  | .281 | .750  |
| Joint (RC)                           |      |      |      |       |      |       |
| Smoking habit                        |      |      |      |       |      |       |
| Yes                                  | .603 | .314 | .050 | 1.827 | .987 | 3.384 |
| No (RC)                              |      |      |      |       |      |       |
| Place of Duty at the Hospital        |      |      |      |       |      |       |
| E and C Dept.                        | .639 | .419 | .128 | 1.895 | .833 | 4.312 |
| Fever Clinic                         | -.245| .422 | .561 | .782  | .342 | 1.789 |
| Corona Ward                          | -.020| .303 | .947 | .980  | .542 | 1.773 |
| ICU/HDU (RC)                         |      |      |      |       |      |       |
| Profession of the Respondent         |      |      |      |       |      |       |
| Doctor                               | -1.01| .377 | .007 | .362  | .173 | .758  |
| Nurse                                | -1.12| .361 | .002 | .326  | .163 | .662  |
| Medical Assistant                    | -.603| .332 | .069 | .547  | .285 | 1.049 |
| ICA/OTA (RC)                         |      |      |      |       |      |       |
| Length of service                    |      |      |      |       |      |       |
| <10                                  | .737 | .317 | .020 | 2.089 | 1.123| 3.886 |
| 11-20                                | .802 | .334 | .016 | 2.229 | 1.158| 4.289 |
| >21 (RC)                             |      |      |      |       |      |       |
| Service in current place             |      |      |      |       |      |       |
| <20                                  | -.777| .331 | .019 | .460  | .241 | .880  |
| 21-40                                | .068 | .304 | .823 | 1.070 | .590 | 1.941 |
| >41 (RC)                             |      |      |      |       |      |       |
| Number of patient attended           |      |      |      |       |      |       |
| <40                                  | .398 | .313 | .203 | 1.489 | .807 | 2.749 |
| 41-80                                | .542 | .312 | .049 | 1.720 | .933 | 3.169 |
| >81 (RC)                             |      |      |      |       |      |       |
| Over Time duty                       |      |      |      |       |      |       |
| Yes                                  | .943 | .239 | .000 | 2.568 | 1.609| 4.099 |
| No (RC)                              |      |      |      |       |      |       |
| Affected by Corona                   |      |      |      |       |      |       |
| Yes                                  | .399 | .252 | .112 | 1.491 | .911 | 2.441 |
| No (RC)                              |      |      |      |       |      |       |

Results of binary logistic regression analysis of factors associated with stress among the HCWs during COVID-19 are presented in table 4(c). It was revealed that, odds for stress symptoms were 2.249 (95% CI: 0.866 – 5.844) times higher for graduate respondents, compared to the post-graduate respondents. Reside in the sainik line (OR: 3.012; 95% CI: 0.928 – 9.780), performing duty at the emergency department (OR: 2.135; 95% CI: 0.902 – 5.053), length of service for < 10 years (OR: 2.570; 95% CI: 1.207 – 5.472) and 11-20 years (OR: 3.039; 95% CI: 1.378 – 6.705) and performing overtime duty (OR: 2.214; 95% CI: 1.310 – 3.742) were significant risk factors whereas staying with the nuclear family (OR: 0.423; 95% CI: 0.249 – 0.721), being a nurse (OR: 0.364; 95% CI: 0.162 – 2.121).
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0.819) were protective for stress among the respondents.

| Attribute                        | Stress | B    | S.E. | Sig.  | OR   | 95% C.I. for OR  |
|----------------------------------|--------|------|------|-------|------|-----------------|
|                                  |        |      |      |       |      | Lower          |
|                                  |        |      |      |       |      | Upper          |
| Age group                        |        |      |      |       |      |                 |
| <30                              |        | .166 | .546 | .761  | 1.181| .405           |
| 31-40                            |        | .194 | .421 | .644  | 1.215| .533           |
| >41 (RC)                         |        |      |      |       |      |                 |
| Sex                              |        |      |      |       |      |                 |
| Male                             |        | -.030| .319 | .925  | .970 | .520           |
| Female (RC)                      |        |      |      |       |      | 1.813          |
| Education                        |        |      |      |       |      |                 |
| SSC                              |        | .512 | .692 | .459  | 1.669| .430           |
| HSC                              |        | -.107| .573 | .852  | .899 | .292           |
| Graduate                         |        | .811 | .487 | .050  | 2.249| .866           |
| Post-grad (RC)                   |        |      |      |       |      | 5.844          |
| Religion                         |        |      |      |       |      |                 |
| Islam                            |        | .122 | .703 | .862  | 1.130| .285           |
| Shanatan                         |        | -.488| .762 | .522  | .614 | .138           |
| Christian (RC)                   |        |      |      |       |      | 2.735          |
| Marital status                   |        |      |      |       |      |                 |
| Married                          |        | .493 | .394 | .210  | 1.637| .757           |
| Unmarried (RC)                   |        |      |      |       |      | 3.542          |
| Monthly income                   |        |      |      |       |      |                 |
| <30000                           |        | .078 | .608 | .898  | 1.081| .328           |
| 30001-60000                      |        | -.283| .401 | .480  | .754 | .344           |
| >60001 (RC)                      |        |      |      |       |      | 1.652          |
| Residence                        |        |      |      |       |      |                 |
| Family house                     |        | .647 | .497 | .192  | 1.910| .722           |
| Sainik line                      |        | 1.103| .601 | .049  | 3.012| .928           |
| Mess (RC)                        |        |      |      |       |      | 9.780          |
| Type of family                   |        |      |      |       |      |                 |
| Nuclear                          |        | -.859| .272 | .002  | .423 | .249           |
| Joint (RC)                       |        |      |      |       |      | .721           |
| Smoking habit                    |        |      |      |       |      |                 |
| Yes                              |        | .335 | .355 | .345  | 1.397| .697           |
| No (RC)                          |        |      |      |       |      | 2.800          |
| Place of Duty at the Hospital    |        |      |      |       |      |                 |
| E and C Dept                     |        | .759 | .440 | .050  | 2.135| .902           |
| Fever Clinic                     |        | .171 | .484 | .723  | 1.187| .459           |
| Corona Ward                      |        | .135 | .345 | .695  | 1.145| .582           |
| ICU/HDU (RC)                     |        |      |      |       |      | 2.252          |
| Profession of the Respondent     |        |      |      |       |      |                 |
| Doctor                           |        | -.257| .398 | .518  | .773 | .355           |
| Nurse                            |        | -1.011| .414 | .015  | .364 | .162           |
| Medical Assistant                |        | -.342| .353 | .332  | .710 | .355           |
| ICA/OTA (RC)                     |        |      |      |       |      | 1.419          |
| Length of service                |        |      |      |       |      |                 |
| <10                              |        | .944 | .386 | .014  | 2.570| 1.207          |

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Predictors of psychological impact

| Service in current place | 11-20 | 21-40 | >41 (RC) |
|-------------------------|-------|-------|---------|
| <20                     | 1.112 | .356  | .619    |
| 21-40                   | .404  | .344  | .382    |
| >41 (RC)                |       |       | .105    |

| Number of patient attended | 11-20 | 21-40 | >41 (RC) |
|----------------------------|-------|-------|---------|
| <40                        | .635  | .401  | .363    |
| 41-80                      | .363  | .363  | .270    |
| >81 (RC)                   |       |       | .270    |

| Over Time duty | 11-20 | 21-40 | >41 (RC) |
|----------------|-------|-------|---------|
| Yes            | .795  | .268  | .003    |
| No (RC)        |       |       |         |

| Affected by Corona | 11-20 | 21-40 | >41 (RC) |
|--------------------|-------|-------|---------|
| Yes                | -.103 | .291  | .723    |
| No (RC)            |       |       | .902    |

DISCUSSION

Combined Military Hospital Dhaka rendered treatment facilities to the entitled serving and retired armed forces personnel including their families who received the first case of COVID-19 on 7 April 2020. Since than the number of infected cases among the entitled personnel were increases gradually. To control the epidemic or slows down the spread of the disease and to treat the COVID-19 infected patients, the HCWs have been extremely busy doing tremendous hard work for 24/7. In doing so, they had to face several hurdles including high occupational risk, heavy work load, scarcities/difficulties in logistic supply, long working hours which pose them under tremendous psychological pressure like anxiety, depression, stress or post-traumatic stress disorder symptoms.

The study was conducted in a tertiary level military hospital and for that the sociodemographic characteristics among the HCWs were similar to the existing rules and regulation of armed forces but somehow different from the national average in many cases.

Our study revealed that 21.6% of the respondents had mild to severe depressive symptoms, 43.1% of the respondents had mild to extremely severe anxiety symptoms and 24.1% of the respondents had mild to extremely severe stress symptoms. After the onset of COVID-19, several study conducted on HCWs to assess their mental state. A study conducted at Bangladesh by Hasan MT et al. revealed that about 67.72% physician suffers from anxiety and 48.5% of them found depressive. The result is not similar to our study may be due to the selection of sample and study design [9]. Similarly, many study have already been taken place in Bangladesh using validated Bangla version of DASS-21 scale and greater difference in the prevalence of depression, anxiety and stress among the respondents have been documented which is not similar to our study in terms of prevalence but HCWs who were fighting against the COVID-19 epidemic had higher depression, anxiety and stress because of the highest risk of infection with COVID-19 [10] [11] [12] [13] [14]. Compared the prevalence of depression, anxiety and stress due to Covid-19 using DASS-21 globally, the prevalence of depression, anxiety and stress is not similar than the study conducted in China (14.81% depression, 18.3% anxiety and 9.98% stress) and (13.6% depression, 13.9% anxiety and 8.6% stress) [15] [16], Italy (17.3% depression, 20.8% anxiety and 21.8% stress) [15], Portugal (3.7% depression, 2.6% anxiety and 6.1% stress) [17], Australia (62% depression, 50 anxiety and 64% stress) [18], Singapore (5.3% depression, 8.7% anxiety and 2.2% stress) [19], India (26% depression, 31.5% anxiety and 19% stress) [20], Iran (26.18% depression, 26.15% anxiety and 26.23% stress) [21]. All the dissimilarities with the national, regional and global findings may be either due to the study design or due to the selection of sample for the study or due to the presence of pre-existing mental health condition among the respondent.

It was revealed from our study that, risk of developing psychological problem (depression, anxiety and stress) among the graduate were 2.977 (95% CI: 1.181-7.509) time higher for depression, 2.788 (95% CI: 1.228-6.333) times higher for anxiety and 2.249 (95% CI: 0.866- 5.844) times higher for stress than the post-graduate respondents. It indicates that the lower the level of education the higher the chance of developing psychological problems among the HCWs. Similar finding revealed by Zhou SJ et al. [22] and Wang Y et al. [23]. At the same time opposite findings
noted by the study conducted by Liang L et al. [24] and Lei L et al. [25].

Married respondents, in contrast to the unmarried respondents was protective factor for depression (OR: 0.391; 95% CI: 0.160 – 0.953). A study conducted by Tan et al. reported that the severity of psychiatric symptoms in the workforce returning to the workplace was significantly associated with marital status [26]. We revealed that performing overtime duty was a risk factor for depression (OR: 1.891; 95% CI: 1.087 – 3.291), anxiety (OR: 2.568; 95% CI: 1.609 – 4.099) and stress (OR: 2.214; 95% CI: 1.310 – 3.742). This finding was similar to a study conducted by Kikuchi H et al. [27]. Kim, W et al., Alfonso P et al. and Virtanen M et al. found the similar findings [28, 29]. We found that residing in the family accommodation (OR: 2.720; 95% CI: 1.136 – 6.516) was a risk factors for anxiety among the HCWs which is similar to the report by a literature [30]. We revealed that smoking habit (OR: 1.827; 95% CI: 0.987 – 3.384) among the HCWs were a risk factors for anxiety. In a study conducted by Rondina RD et al. revealed that smokers are usually anxious which is similar to our study [31]. Our study revealed that having length of service <10 years (OR: 2.089; 95% CI: 1.123 – 3.886) and 11-20 (OR: 2.229; 95% CI: 1.158 – 4.289) were a significant risk factors for anxiety among the HCWs which was similar to a study conducted by Zhu Z et al. [32]. It was also evident that attending >40 patients in a day (OR: 1.720; 95% CI: 0.933 – 3.169) were risk factors for anxiety which means that due to fear of being infected by the COVID-19, the healthcare workers became anxious as they had to stay with the patients almost all the time in a day.

We found that being a doctor (OR: 0.362; 95% CI: 0.173 – 0.758) and nurse (OR: 0.326; 95% CI: 0.161 – 0.662) were significant risk factors whereas staying with the nuclear family (OR: 0.423; 95% CI: 0.249 – 0.721). We also revealed that the frontline health workers were more prone to developed anxiety and stress symptoms (for doctors OR: 0.362; 95% CI: 0.173 – 0.758 and for nurse OR: 0.326; 95% CI: 0.161 – 0.662) because of their exposure to the highest risk of infection for their close, frequent contact with patients as well as working longer hours than usual. Similar findings revealed from a study conducted by Si MY et al. [33] and Lai J et al. [34]. Our study also revealed that performing duties at the emergency and casualty department were a significant risk factors for stress among the HCWs (OR: 2.135; 95% CI: 0.902 – 5.053). Similar findings revealed by a study conducted by Vizheh M et al. [35]

This study has several strengths. It was the first systemic study among the HCW in CMH Dhaka to determine the psychological impact in terms of depression, anxiety and stress during the Covid-19 pandemic. Another strength of this study was good quality control, data were collected by the researcher using a pre-tested questionnaire to conduct face-to-face interviews from the HCW, large sample size and the coverage of all the groups of HCW. Despite this, our study has several limitations that should be mentioned. First, the data were collected from HCW of a military hospital which did not guarantee the representativeness of the entire population i.e. the results cannot be generalized to all HCW. Second, as a cross-sectional study, this study could only evaluate the psychological impact of HCW involved in managing Covid-19 cases without the longitudinal observations of the respondents. Third, due to time constrain, we only conducted a questionnaire interview with the respondents without any intervention. Forth, simple random sampling would be preferable in selecting the sample which was not appropriate in this particular instance. Fifth, in addition to the factors concerned in this study there may be other factors (preexisting psychological problem) that affect the psychological impact among the HCW. Finally, the possibility of selection bias may exist as the respondents were selected purposively for the study.

CONCLUSION

Psychological problems among the HCW should be focused in any public health emergencies as because they are very much under psychological and physical pressure in managing the COVID-19 patients. In our study we investigated the psychological impact among the HCWs who are engaged actively in the management of COVID-19 infection and analyzed the
influencing factors which can guide us to develop psychological intervention programs for the HCW that are tailored to address the different psychological symptoms and needs of the HCW.

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