Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Factors associated with COVID-19 fear among healthcare professionals in Bangladesh

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ABSTRACT

To determine the factors associated with the COVID-19 fear, we conducted an online survey among healthcare professionals in Bangladesh. The "fear of COVID-19 scale" was used to measure the fear. The predicting factors were identified by deploying a multiple linear regression model. Structural equation modelling was used to explore the relationship between mental health symptoms and COVID-19 fear. The overall fear score was 19.39 ± 5.26 (M ± SD) out of 28. Multiple linear regression identified financial constraints, self-employment, and general duties as the independent predictors of COVID-19 fear. However, structural equation modelling found a strong positive relationship between anxiety, insomnia, and fear. Results might be helpful for the policymakers and mental healthcare professionals to identify and manage maladaptive levels of fear and worry because of the coronavirus outbreak.

1. Background

Coronavirus disease-2019 (COVID-19) pandemic unfolded unprecedented events of health, social, and economic problems over the world [56]. People suffer from both the active and passive impact of the pandemic and the disease itself [6,7]. The high contractibility of the virus and the significantly high death rate for this novel disease imposes enormous mental pressure on the world population [41,58]. Pandemic time prevalence of anxiety, depression, stress, and insomnia (common mental health symptoms) among the general population reached as high as 50% [50]. However, unlike the general population, healthcare professionals (HCPs) who work in hospital settings are at the highest risk of contracting the virus. Unsurprisingly, the prevalence of common mental health symptoms (CMHSs) is much higher (up to 70%) among HCPs [11,13,44].

Among other psychological responses to the current COVID-19 pandemic, fear is common and potentially distressful [10,37]. We can define fear as an adaptive emotion fundamental for survival, which distributes to prepare the individual for behavioural responses to potential danger [24]. Fear may appear in response to a specific animation in the present circumstances, or in the ignition of future or suppositional events that exert an impedance to an individual. Fear can turn to be disastrous when it is overwhelmed, leading to a serious level of distress and irrational behaviour at the personal and social level [46]. For the individuals, fear of coronavirus-19 may be influenced or co-created by existing or simultaneous mental health conditions such as anxiety, depression, and insomnia symptoms [26]. Evidence suggested that fear may lead to suicidal behaviour [19,43,52]. Along with the general population, the breakneck and treacherous nature of COVID-19 has instilled fears among doctors worldwide and especially in Asian healthcare professionals [35].

Along with socio-demographics, previous research unfolded a new chapter that contains elements of the evidence regarding the association between preexisting or COVID-19-related CMHSs and fear of coronavirus-19. For example, Harper et al., and Satici et al., suggested that there is a positive association between anxiety, depression, and coronavirus-19 fear [25,51]. Other studies found a positive mediating role between CMHSs and fear of coronavirus-19 [14,38]. Considering the unprecedented time with sped-up infection and transmission rate of coronavirus-19, the co-existence, and association between CMHSs and fear are not startling. Citing the aforementioned shreds of evidence in the literature, we hypothesized that there is an association between CMHSs (i.e., anxiety, depression and insomnia) and fear of coronavirus-19.

Bangladesh, especially the capital Dhaka, observes moderate to severe attacks of COVID-19 [22]. About two million COVID-19 cases and 29 thousand deaths have been recorded so far in Bangladesh [55]. Among the professional cohort, the number of confirmed COVID-19 cases and death was one of the highest among HCPs who currently adhered to hospital duties. Thus, the study aimed to (1) measure the differences in COVID-19 fear between groups and (2) explore the factors predicting fear faced by HCPs who were working in the hospital setting during the pandemic time in Dhaka city, Bangladesh.

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2. Methods

2.1. Design and participants

A web-based cross-sectional study was conducted among healthcare professionals in Dhaka, Bangladesh between June 6 to July 6, 2020. This study strictly followed the CHERRIES checklist for online surveys [20]. The Google form was used to originate the digital questionnaire. Considering the social distancing formula amidst the COVID-19 pandemic, the participants were invited through digital platforms, such as email, WhatsApp, LinkedIn, and Facebook. Studies in Asia and other parts of the world during the COVID-19 pandemic have found this invitation technique suitable [9,47,57].

A theme containing details regarding the demographic announcement was added in the first section of the questionnaire. By ticking the "Yes, I agree and give my informed consent" box on the digital form before taking part in the main questionnaire, informed consent for participation and collection and analysis of given data were taken from all the participants. Giving an 80% response rate, 409 HCPs fill up and submitted the form from approximately 500 conveniently invited subjects. The "Requires sign-in" option was used when adjusting the settings of Google Form to prevent more than one response from a participant. HCPs who were assigned to hospital settings in the Dhaka city corporation area were included, and HCPs not adhere to hospital settings were excluded from the study. Given these inclusion and exclusion criteria, data from 294 HCPs were selected for the analysis in a password-protected personal computer with a fresh unidentifiable cryptogram after eliminating participants' names and registration numbers to secure confidentiality.

2.2. Ethical issues

The Ethics Review Committee of Uttara Adhunik Medical College and Hospital has approved all the ethical issues for this study. We followed the Committee on Publication Ethics guidelines in the designs, data presentations, and citations of this study [16].

2.3. Independent variables

The independent variables were selected after reviewing previous studies with similar aims.

2.3.1. Socio-demographic and clinical factors

In the first part of the questionnaire, data on age, gender, living status, family size, family member aged above 50 years, resident type, history of chronic disease, and maintaining isolation were recorded. Furthermore, data regarding occupation, technical job title, service category, and current working position were also included in this study. Information regarding observing financial difficulties because of the COVID-19 impact was asked through a dichotomous answer (yes/no).

2.3.2. Generalized anxiety

To measure anxiety problems, the two-item Generalized Anxiety Disorder (GAD-2) was employed. In the screening of generalized anxiety, GAD-2 is a valid and often used scale. The recommended cut-off point for this frequently used scale is ≥ 3 [31,34]. Cronbach's alpha value in the current study recorded 0.70. This questionnaire was previously used and validated for Bangladeshi adults [17].

2.3.3. Depression

Previously used and validated Patient Health Questionnaire 9-item depression module (PHQ-9) to measure the depression of the participants [42]. The point ranging from 0 to 3 was utilized to score each of the nine items. The cumulative score varied from 0 to 27. Similar to the other studies, the cut-off point ≥ 10 was adjusted to segregate participants as having depressive symptoms for the current study [29,33]. Cronbach's alpha value of this study recorded 0.80.

2.3.4. Insomnia

Finally, to measure the severity of insomnia, the Insomnia Severity Index (ISI) was utilized. Each item is wreathed on the 0 to 4 scale, and the total score varied from 0 to 28. A cumulative score of ≥ 8 is having symptoms of insomnia [40,59]. Cronbach's alpha value for this study was found 0.90. This scale was validated in Bangladesh [36].

2.4. Fear of COVID-19

A validated and previously employed "Fear of COVID-19 Scale" (FCV) was utilized to measure fear of coronavirus-19 [10,49]. This questionnaire is a single-dimensional seven-item, 5-point Likert scale, produced by Ahorsu et al. [4]. Factor loadings (0.66–0.74) and corrected item-total correlation (0.47–0.56) of the FCV were found to be admissible. The internal consistency ($\alpha = 0.82$) and the test-retest reliability (ICC = 0.72) of FCV also found acceptable. Furthermore, the FCV was positively correlated with perceived vulnerability and CMHSs [4]. The higher the score shows the greater the fear of coronavirus-19. Cronbach's alpha value for this study was found 0.86 which denoted excellent internal consistency.

2.5. Data analysis

The SPSS software version 22.0 (SPSS Inc., Chicago, IL, USA) and AMOS version 23.0 were employed for analyzing the data of this research. To compute the statistics of the socio-demographic, clinical, economic, and occupation-related factors of the subjects, a descriptive analysis was conducted. The categorical variables have been presented in numbers and percentages; however, continuous variables have been exhibited as mean and standard deviation. To determine the relationship between socio-demographic factors and fear scores, an independent sampling *t*-test, and one-way ANOVA were employed. Afterwards, a multivariable linear regression model has been deployed to adjust the confounders. For this study, *p*-values ≤ 0.05 were considered statistically significant. To test the relationship between erratic and non-problematic scores of anxiety, depression, and stress with scores on the fear scale, a Structural Equation Modelling (SEM) analysis was administered. Root-mean-square residuals and standardized root-mean residuals lower than 0.08 and 0.05 show sufficient and good fit, respectively for the SEM [28]. The comparative fit index higher than 0.90 and the goodness of fit index above 0.95 show adequate and good fit. For calculating the standardized beta coefficients between predictor and dependent variables, the bootstrapping method with 95% bias-corrected confidence intervals (CI) and 5000 bootstrap samples was performed.

3. Results

3.1. Participants' characteristics

The mean ± standard deviation age of the subjects was 28.86 ± 5.5 years. 43.5% of females took part in this study. Among 294 HCPs, 37.4% were physicians, 9.5% were dental surgeons, 27.9% were rehabilitation professionals (physiotherapists, occupational therapists, and speech therapists), 9.5% were nurses, and 15.7% were medical technologists. Thirty per cent of total maintain isolation from the family, while 55% reported financial problems, and 56% were private service holders. About 21%, 27%, and 44% of the participants reported anxiety, depression, and insomnia symptoms respectively. Table 1 displays the full result.

3.2. Factors associated with fear

Out of 28, the mean ± standard deviation (sd) overall fear score was 19.39 ± 5.26. Table 1 also displays the results from the independent *t*-test and one-way ANOVA. We found fear score was higher among the HCPs of the younger age group (mean ± sd = 20.48 ± 6.16, $p = 0.017$). Participants who maintain isolation from the family also showed a higher fear score (mean ± sd = 20.46 ± 6.08, $p = 0.050$). HCPs who were facing financial

Table 1
Participants' characteristics and association with the fear score.

Factors	N (%)	Mean	Standard deviation	P-value
Total	294 (100)	19.39	5.26	–
Age group				**0.017**
18–25	89 (30.3)	20.48	6.16	
26–30	129 (43.9)	19.47	4.93	
31–40	62 (21.0)	17.73	3.82	
>40	14 (4.8)	19.00	6.15	
Gender				0.092
Female	164 (55.8)	19.97	5.25	
Male	130 (44.2)	18.93	5.23	
Marital status				0.384
Single	154 (52.4)	19.64	5.62	
Married	140 (47.6)	19.11	4.84	
Family size				0.500
Small	42 (14.3)	20.24	5.61	
Medium	197 (67.0)	19.19	5.24	
Large	55 (18.7)	19.45	5.10	
Family members age over 50 years				0.647
Yes	183 (62.2)	19.50	5.28	
No	111 (37.8)	19.21	5.24	
Resident type				0.947
Rented	128 (43.5)	19.49	5.62	
Own	132 (44.9)	19.37	5.03	
Government/free quarter	12 (4.1)	19.58	5.45	
Hostel/Mess	22 (7.5)	18.77	4.63	
Chronic disease				0.823
Yes	50 (17.0)	19.36	5.15	
No	244 (83.0)	19.54	5.83	
Isolation from family members				**0.050**
Yes	89 (30.3)	20.46	6.08	
No	205 (69.7)	19.01	4.83	
Facing financial problem				**<0.001**
Yes	168 (55.8)	20.45	5.47	
No	130 (44.2)	18.05	4.67	
Occupation				0.187
Medicine	110 (37.4)	20.05	5.14	
Dental	28 (9.5)	20.43	4.89	
Rehabilitation	82 (27.9)	18.89	5.47	
Nursing	28 (9.5)	17.89	5.05	
Medical Technology	46 (15.7)	18.96	5.36	
Technical title				0.602
Senior	87 (19.6)	19.65	5.23	
Intermediate	172 (58.5)	18.98	4.88	
Junior	35 (11.9)	19.14	6.28	
Employer				0.739
Medical College	69 (23.5)	19.74	5.57	
General Hospital	29 (9.9)	18.86	4.99	
Clinic	56 (19.0)	19.07	5.49	
Private chamber	66 (22.4)	18.94	4.46	
Others	74 (25.2)	19.91	5.60	
Service categories				**0.005**
Government	48 (16.3)	17.48	5.91	
Private	167 (56.8)	19.36	4.80	
Self-employed and others	79 (26.9)	20.61	5.48	
Current working position				0.176
Frontline	12 (4.1)	20.50	6.30	
Second-line	31 (10.5)	17.48	5.82	
General duties	138 (46.9)	19.53	5.05	
Working from home	113 (38.4)	19.62	5.20	
Anxiety				**<0.001**
No	233 (79.3)	18.79	5.09	
Yes	61 (20.7)	21.69	5.31	
Depression				**<0.001**
No	216 (73.5)	18.56	4.81	
Yes	78 (26.5)	21.69	5.77	
Insomnia				**<0.001**
No	164 (55.8)	17.84	4.67	
Yes	130 (44.2)	21.35	5.33	

Bold faces are significant at the 5% significance level.

constraints (mean ± sd = 20.45 ± 5.47, $p \leq 0.001$) and self-employed (mean ± sd = 20.61 ± 5.48, $p = 0.005$) reported high fear score. Depressed (mean ± sd = 21.69 ± 5.77, $p \leq 0.001$), anxious (mean ± sd = 21.69 ± 5.31, $p \leq 0.001$) and insomniac (mean ± sd = 21.35 ± 5.33, $p \leq 0.001$) participants were overwhelmed by coronavirus-19 fear.

3.3. Results from structural equation modelling

To determine the relationships between anxiety, depression, and stress with fear of COVID-19 after adjusting for age; structural equation modelling was performed. Goodness of fit values showed mostly good fit to the data in total sample ($\chi^2 = 3.31$, df = 1, $p = 0.069$ $\chi 2/df = 3.31$, RMSEA = 0.079 [90% CI (0.00, 0.20)], SRMR = 0.00, CFI = 0.99, GFI = 0.99).

In this model, generalized anxiety ($\beta = 0.21, p = 0.007$), and insomnia ($\beta = 0.31, p < 0.001$), were positively associated with fear of COVID-19. However, we did not find a statistically significant association between depression and fear of COVID-19. Details can be found in Table 2 and Fig. 1.

3.4. Risk factors for fear

Multivariable linear regression analysis revealed the significant risk factors predicting the fear of COVID-19 scores. We found significantly lower odds of fear among those have no financial constraints (slope = −1.673, CI = −2.969 to −0.377; $p = 0.012$), a government employees (slope = −2.479, CI = −4.594 to −0.364; $p = 0.022$). and higher odd among those dealing with general duties (slope = 1.829, CI = 0.270 t0 3.388; p = 0.022). Furthermore, anxiety (slope = −2.108, CI = −3.855 to −0.362; $p = 0.018$) and insomnia (slope = −2.363, CI = −3678 to −1.047; $p \leq 0.001$) were predicting fear independently. Table 3 displays full results from multiple linear regression.

4. Discussion

The current study measured different levels of fear of COVID-19 among healthcare professionals attending hospital settings in Dhaka city, Bangladesh. This study also identified the factors that statistically significantly predict COVID-19 fear. Results displayed that the elevated fear level was associated with age, maintaining isolation, service category, and common mental health symptoms. However, COVID-19 fear was significantly predicted by financial constraints, self-employment, general duties, anxiety, and insomnia. The findings might be helpful for policymakers and public healthcare professionals to understand who is more prone to respond fearfully toward the COVID-19 outbreak, and for journalists to be sentient of the efficient impact of their work.

Our previous work described the detailed distribution of mental health problems in HCPs assigned in a hospitalized setting in Dhaka city [8]. The study results suggested the CMHSs were more prevalent among females, the younger age group, and those who were facing economic constraints. In agreement with those findings, the current work also found higher fear scores among younger and those who were facing economic constraints. Another study suggested that economic stressors were strongly associated with anxiety, depression, and stress among Bangladeshi rehabilitation professionals [11]. Thus, it can be said that in a low-income and middle-income country that is Bangladesh, the pandemic induces economic constraints playing a crucial role when predicting all mental health symptoms, including COVID-19 fear. Understandably, those who were falling under economic constraints in the pandemic time are forced to go to work for a living despite the risk of contracting coronavirus-19, which explains elevated CMHSs and fear. In this study, we found self-employed HCPs showed increased fear of COVID-19 compared to the participant who were government service holder. In agreement with the findings, another study found that compared to the counterparts, government service holder was in better

Table 2
Standardized estimates of effects on anxiety, depression, and insomnia.

Variables	Adjusted effect	Standard error	p-value
Anxiety ➔Fear of COVID-19	0.209	0.265	**0.007****
Depression ➔Fear of COVID-19	−0.013	0.089	0.881
Insomnia ➔Fear of COVID-19	0.309	0.057	**0.000*****
Age ➔Fear of COVID-19	−0.073	0.051	0.169

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

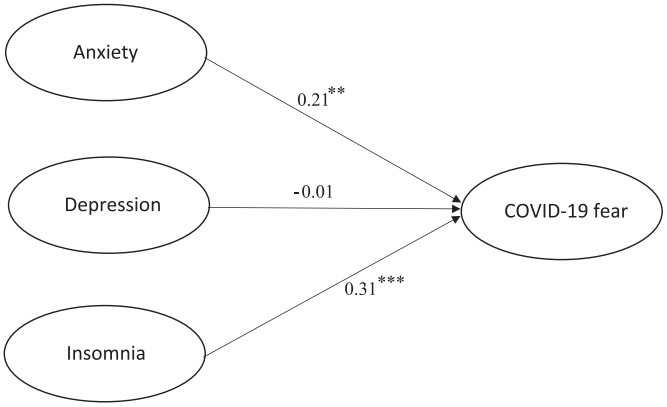

Fig. 1. The final model of the relationships among fear of COVID-19 scales and anxiety, depression and insomnia.

mental well-being during the rapid surge of COVID-19 in Bangladesh [5]. Additional study is required to find in-depth relation between pandemic-induced economic constraints and mental health problems, especially in low-income and middle-income countries during COVID-19.

The interrelationships between CMHSs, for example, anxiety, depression, and stress have long been recorded in empirical studies. The conceptual models, supported by scientific documentation suggested that the pathogenesis of depression can be driven by the link between socio-environmental stress and internal biological processes [45,53]. More study also suggests that stress can predict depression [2]. People suffering from stressful conditions for example a natural disaster-related post-traumatic stress disorder shown a closer link between anxiety, depression, and fear [18,23,32]. Anxiety and depression are positively related and can predict each other [21,27,30]. Our study found a statistically significantly higher level of COVID-19 fear among anxious, depressed, and insomniac subjects, while multivariable linear regression analysis identified anxiety and insomnia as independent predictors of COVID-19 fear. Structural equation modelling revealed a significant positive relationship between anxiety and insomnia with fear scores. Though the complicated and vice-versa relationship between CMHSs and fear of COVID-19 has not been explained with elaboration, a former study conducted among the Bangladeshi general population and HCPs has denoted that depression is associated with COVID-19 fear [48]. In agreement with our study, a stronger link between COVID-19 fear and anxiety [39,54] and a weaker link between depression and fear of COVID-19 [3,12] has been found from the previous empirical studies. Our study found a very strong relation between insomnia and fear of COVID-19. From the previous evidence, very little is known about this relation. Additional study is warranted to validate our findings.

4.1. Study limitations

Our study has a few limitations that must be admitted. First, the cross-sectional study nature did not allow us to infer a causal relationship between independent and dependent variables. Second, we did not take data regarding the previous history of mental health symptoms to differentiate the relationship between preexisting and current CMHSs and fear of COVID-19 which might confound the result of the current study. There are some possibilities of the introduction of selection bias, as healthcare professionals are deprived of internet access, and those who might have been engaged with higher workloads might not have taken part in the study. Finally, fear of a specific situation or element is subject to be change over time [1,15]. A longitudinal study is warranted to determine the adaptive or long-reactive nature of COVID-19 fear among sufferers.

Table 3
Result from a multivariable linear regression model with the fear score as an outcome (the positive slope means more fear).

Factors	Slope	95% Confidence interval		*p*-value
		Lower bound	Upper bound	
Age group				
18–25	2.364	−1.089	5.816	0.179
26–30	1.431	−1.760	4.622	0.378
31–40	0.244	−2.968	3.457	0.881
>40	Reference			
Gender				
Female	0.921	−0.456	2.297	0.189
Male	Reference			
Marital status				
Single	−1.408	−2.895	0.079	0.063
Married	Reference			
Family size				
Small	0.447	−1.849	2.743	0.702
Medium	0.101	−1.516	1.718	0.903
Large	Reference			
Family members aged over 50 years				
Yes	Reference			
No	0.197	−1.216	1.610	0.784
Resident type				
Rented	0.450	−1.906	2.805	0.707
Own	0.980	−1.480	3.439	0.434
Government/free quarter	1.153	−2.528	4.833	0.538
Hostel/Mess	Reference			
Chronic disease				
Yes	Reference			
No	−0.060	−1.745	1.624	0.944
Isolation from the family member(s)				
Yes	Reference			
No	−1.077	−2.449	0.296	0.124
Facing financial problem				
Yes	Reference			
No	−1.673	−2.969	−0.377	**0.012**
Occupation				
Medicine	0.475	−1.379	2.329	0.614
Dental	0.890	−1.662	3.442	0.493
Rehabilitation	0.227	−1.878	2.331	0.832
Nursing	−1.508	−4.281	1.266	0.285
Medical Technology	Reference			
Technical title				
Senior	0.443	−1.558	2.443	0.663
Intermediate	0.697	−1.513	2.907	0.535
Junior	Reference			
Employer				
Medical College	0.200	−1.745	2.144	0.840
General Hospital	−0.641	−3.063	1.782	0.603
Clinic	−0.711	−2.758	1.337	0.495
Private chamber	−1.629	−3.423	0.165	0.075
Others	Reference			
Service categories				
Private	−0.812	−2.302	0.679	0.285
Government	−2.479	−4.594	−0.364	**0.022**
Self-employed and others	Reference			
Current working position				
Frontline	2.283	−1.046	5.613	0.178
Second-line	−0.017	−2.348	2.315	0.989
General Duties	1.829	0.270	3.388	**0.022**
Working from home	Reference			
Anxiety				
No	−2.108	−3.855	−0.362	**0.018**
Yes	Reference			
Depression				
No	−0.646	−2.302	1.010	0.443
Yes	Reference			
Insomnia				
No	−2.363	−3.678	−1.047	**<0.001**
Yes	Reference			

Bold faces are significant at the 5% significance level.

5. Conclusion

Our study identified financial constraints, self-employment, and general duties that can predict COVID-19 fear independently. This study also explained the relationship between common mental health symptoms and fear of COVID-19 among healthcare professionals. These study findings provided additional data that would be helpful when discussing the in-depth and complicated relationship between anxiety, depression, insomnia, and fear of COVID-19. Our study results may help policymakers and mental health and public healthcare professionals to identify and manage maladaptive levels of fear and mental health symptoms because of the coronavirus outbreak.

Author contribution statement

Mohammad Ali:Conceptualization, Methodology, Software, Data curation, Writing- Original draft preparation,Visualization, Investigation, Supervision, Software, Validation, Writing- Reviewing and Editing.

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Data availability statement

The data sets used and analyzed during the current study are available from the corresponding author on reasonable request.

Additional information

No additional information is available for this paper.

Declaration of Competing Interest

The author declared no conflict of interest.

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