Original Article

Prevalence of Post-traumatic stress disorder among Physicians during the COVID-19 Pandemic

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Abstract

The healthcare professionals endured a major physical as well as psychological burden against the coronavirus disease (COVID-19) global catastrophe. Owing to their role in the frontline, they were the most exposed group who faced the deadly virus head-on which increased their mental health problems during this pandemic. The study was designed as a cross-sectional study to assess the prevalence of PTSD among 314 working physicians from the purposively selected government and private hospitals during the COVID-19 pandemic in Dhaka city. 'Impact of Event Scale-Revised' (IES-R) was used to construct the questionnaire. The mean age of the physician was 32.2±4.7 years. One-fifth of them (21.0%) diagnosed COVID-19 positive by the rt-PCR test. The most prevalent co-morbidities were found bronchial asthma (74.2%), hypertension (32.3%) and diabetes mellitus (19.4%). About half of the physicians (48.6%) had mild PTSD. The test of significance denotes the significant associations of the prevalence of mild PTSD level with physician's age, gender, marital state, work settings, results of COVID-19 positive and had co-morbidities in physicians (p<0.05). The prevalence of mild PTSD was higher in the age group of 25-35 years (49.1%), in females (49.8%), unmarried (50.0%), work in private settings (51.5%), ever been COVID-19 positive (59.1%) and had co-morbidities (51.6%). This study reveals that about half the physicians are suffering from mild PTSD. A high encumbrance of COVID-19 related mental disorders and fear among frontline physicians' entreaties to government and policymakers' prompt regard for taking appropriate preventive measures.

Keywords: *COVID-19, prevalence, IES-R, PTSD levels, physicians, Bangladesh.*

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INTRODUCTION

At the end of December 2019, the Chinese city of Wuhan was notified regarding some cases of pneumonia of unknown etiology.[1]China, was caused by a novel betacoronavirus, the 2019 novel coronavirus (2019-nCoV It was termed COVID-19, and later this rapid global spread of disease led to its declaration as a pandemic by the WHO.[2] Worldwide, this pandemic is highly shattering with more than 92.51 million confirmed cases and around 2 million fatalities to date.[3] Bangladesh also beheld nearly fifteen thousand five hundred deaths among more than 0.5 million confirmed cases to date.[4] The current pandemic has upraised uncertainty over the economic stability, employment, savings, and relationships as well as over physical and mental health.

Healthcare professionals are at the frontline in the pandemic, a profession that has proved to be correlated with heightened mental health disorders amid pandemic emergencies.[5,6] Precisely, these workers are more susceptible to developing PTSD. It is a psychological condition of individuals who have been subject to possibly traumatic experiences. Health professionals are subject to a heightened risk of infection, loss of patience, liability for complex medication retention decisions, and alteration of usual supportive structures.[7] Estimates of PTSD effects in healthcare staff are higher than in the general public and vary from 6-10% in a recent COVID-19 study conducted in Singapore[8], 18% from hospital nurses in general[9], and 20% from the SARS outbreak.[10] Thus, during pandemics, PTSD effects incline to be higher compared to times

without unusual conditions. As documented in earlier pandemics, like SARS and MERS, interacting closely with infectious individuals was correlated with high levels of PTSD symptoms.[11–13]

In Bangladesh, healthcare professionals face extreme resource shortages. Because of a lack of PPE's as well as a heavy workload and apprehension of illness, physical fatigue, caseload, responsibilities, and active participation in the epidemic predisposes them to be anxious, stressed, and insomniac. Studies found that half of the healthcare staff had stress, anxiety, and sleep disorder.[14] The possibility of infection and professional burden is speculated to have steadily exacerbated doctors' mental health status in Bangladesh as they face stigma, fear of conveying the infection to family members, and fear of alienation.

MATERIALS AND METHODS

Study design and settings

This was a cross-sectional study conducted to assess the prevalence of PTSD among physicians working in the different government and private hospitals during the COVID-19 pandemic in Dhaka city, Bangladesh.

Study population

The study was conducted among 314 physicians working in the purposively selected three government hospitals (Dhaka Medical College Hospital, Bangladesh Kuwait Moitree Hospital and Mugda Medical College Hospital) and three private hospitals (Anwer Khan Modern Medical College Hospital, Universal Medical College Hospital and United Hospital Limited), within the last 11 months of the COVID-19 pandemic situation were included. The non-working doctor in the COVID unit was excluded from this study.

Data sources and tools

Participants were interviewed face-to-face and over the phone according to their convenience from January 2021 to June 2021. Data were collected through a pretested semi-structured questionnaire. This questionnaire was developed through-

A. A semi-structured questionnaire was used to evaluate the sociodemographic characteristics.

B. The 'Impact of Event Scale-Revised' (IES-R) was used to diagnose PTSD among physicians.

A. **Semi-structured questionnaire for sociodemo-graphic characteristics:**

The questionnaire had sociodemographic variables such as age, gender, marital status, education level, monthly income, family history and COVID-19 infection state.

B. **The 'Impact of Event Scale- Revised' (IES-R):**

The IES-R has 22 items and a cut-off score of 33 or above. It is recommended that the provisional diagnosis of PTSD. Patients select numbers from 0=not at all, 1=a little bit or mild and 2=severely to indicate how frequently particular comments have been true during the past seven days. The total scores, which range from 0 to 44, provide a measure of the severity of PTSD. As well as providing total scores, the IES-R also contains sub-scales for avoidance, intrusions and hyperarousal.

Statistical analysis

Data were coded, entered, edited, and cleaned cautiously and then exported into SPSS v25. Exploratory analysis was carried out to describe the study population and categorical variables will be summarized using frequency tables. Continuous variables were summarized using measures of central tendency and dispersion such as mean, percentile, and standard deviation. For significance, both Chi-square ($\chi2$) test and Fisher exact test were used to see the associations with a 95% confidence level computed and the p-value <0.05 was considered as having a significant association. The results were presented in tables and chart.

Ethical aspects

The study was approved by the department of the ethical committee of North-South University. Informed written consent was obtained from the participating doctors and data were collected anonymously. Confidentiality of data was ensured and unauthorized access to data was not allowed.

RESULTS

Table I state that among 314 doctors; 88.2% were in the 25-35 years of age group with mean age of 32.2±4.7 years. Here females were 64.0% and married 63.4%. Among the physician 57.0% had consisting of family size less than 4 members others 29.0% of physicians were post-graduate and 66.3% were working in private settings; where 71.0% didn't disclose their monthly household income and 12.1% had earned more than 1,00,000 BDT each month.

Table I: Socio-demographic characteristics of the physicians (n=314)

| Characteristics	N (%)
Age group (years)	
25-35	277(88.2)
36-50	37(11.8)
Mean±SD	32.2±4.7
Gender	
Female	201(64.0)
Male	113(36.0)
Marital status	
Married	199(63.4)
Unmarried	110(35.0)
Divorced	5(1.6)
Education	
Graduation	223(71.0)
Post-graduation	91(29.0)
Family member	
≤4	179(57.0)
>4	135(43.0)
Work settings	
Government	112(35.7)
Private	202(66.3)
Monthly household income (BDT)	
Didn't said	223(71.0)
≤1,00,000	53(16.9)
>1,00,000	38(12.1)
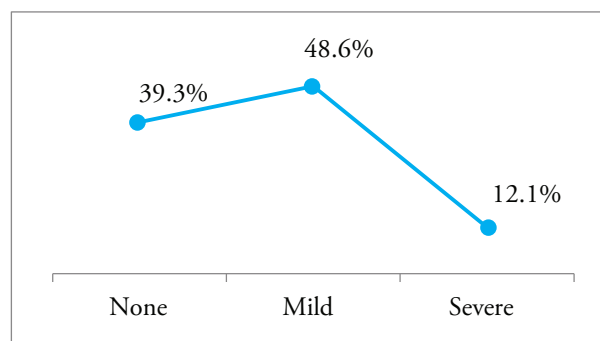
Figure 1: *Prevalence of PTSD levels among physicians by IES-R scores*

Figure 1 portrays the prevalence of PTSD levels among the physicians by IES-R scores. About half (48.6%) of physicians had mild PTSD and 12.1% of physicians had severe PTSD.

Table II demonstrates the prevalence of COVID-19 infection among physicians. Here 21.0% were diagnosed as COVID-19 positive by the rt-PCR test and 19.7% had any sort of co-morbidity and among them. Bronchial asthma (74.2%), hypertension (32.3%) and diabetes mellitus (19.4%) were found in study population.

Table II: Prevalence of COVID-19 infection (n=314)

Traits	N (%)
Ever COVID-19 positive by the rt-PCR	
Yes	66(21.0)
No	248(79.0)
Co-morbidities among physicians	
Yes	62(19.7)
No	252(80.3)
Co-morbidities conditions (n=62)	
Bronchial asthma	46(74.2)
Cardiac diseases	7(11.9)
Hypertension	20(32.3)
Diabetes mellitus	12(19.4)

*Multiple responses

Table III interprets significant associations were found in the prevalence of mild PTSD level among the physicians with their age (p=0.010), gender (p=0.025), marital state (p=0.006), work settings (p=0.005), results of COVID-19 positive by the rt-PCR (p=0.027) and had co-morbidities in physicians (p=0.020). The prevalence of mild PTSD was 49.1% in the age group of 25-35 years, in females 49.8%, unmarried 50.0%, work in private settings 51.5%, ever been COVID-19 positive 59.1% and co-morbidities was 51.6%.

Table III: Association of different variables with the prevalence of PTSD levels among physicians

Variables	PTSD levels among physicians				χ2	p-
	None	**Mild**	**Severe**	**Total**	value	value
	N (%)	N (%)	N (%)	N (%)		
Age group (years)						
25-35	107(38.6)	136(49.1)	34(12.3)	277(100)	66.870	*0.010
36-50	16(43.2)	17(46.0)	4(10.8)	37(100)		
Gender						
Female	78(38.8)	100(49.8)	23(11.4)	201(100)	49.321	*0.025
Male	46(40.7)	53(47.0)	14(12.3)	113(100)		
Marital state						
Married	81(40.7)	95(47.7)	23(11.6)	199(100)	†74.822	*0.006
Unmarried	39(35.5)	55(50.0)	16(14.5)	110(100)		
Divorced	1(20.0)	2(40.0)	2(40.0)	5(100)		
Education						
Graduation	88(39.5)	107(48.0)	28(12.6)	223(100)	87.154	0.761
Post-graduation	36(39.6)	46(50.5)	9(9.9)	91(100)		
Family members						
≤4	71(39.7)	89(49.7)	19(10.6)	179(100)	76.586	0.924
>4	53(39.3)	64(47.4)	18(13.3)	135(100)		
Work settings						
Government	38(33.9)	54(48.2)	20(17.9)	112(100)	27.211	*0.005
Private	78(38.6)	104(51.5)	20(9.9)	202(100)		
Ever COVID-19 positive by the rt-PCR						
Yes	18(27.3)	39(59.1)	9(13.6)	66(100)	18.530	*0.027
No	118(47.6)	102(41.1)	28(11.3)	248(100)		
Co-morbidities among physicians						
Yes	22(35.5)	32(51.6)	8(12.9)	62(100)	21.164	*0.020
No	110(43.7)	103(40.9)	39(15.5)	252(100)		
Co-morbidities conditions (n=62)						
Bronchial asthma	7(15.2)	20(43.5)	19(41.3)	46(100)	†28.561	0.062
Cardiac diseases	1(14.3)	3(42.9)	3(42.9)	7(100)		
Hypertension	3(15.0)	8(40.0)	9(45.0)	20(100)		
Diabetes mellitus	1(8.3)	6(50.0)	5(41.7)	12(100)		

*Statistically significant value   †Fisher exact test

DISCUSSION

Most of the research on PTSD reports lifespan prevalence, which provides higher figures for the number of individuals with PTSD. In these researches performed on American and Canadian populations, the lifespan prevalence ranged from 6.1 to 9.2%.[15-19] The level is undoubtedly underestimated and attributable to under-reporting. However, based on the WHO data, it is estimated that in upper to lower-middle-income countries, the lifetime incidence of PTSD is about 2.3% to 2.1%.[19,20]

The present study reveals that the prevalence of PTSD among physicians in the age group of 25-35 years, physicians suffered from mild PTSD (49.1%) which was higher than the age group of 36-50 years who suffered from mild PTSD (46.0%). According to gender, females were suffering from PTSD at 49.8% which was higher than males 47.0%. An epidemiological study was conducted in Canada to assess PTSD and related comorbid conditions; there the prevalence of PTSD in the age group of 18-35 is 40.3% than the age group of 35-60 is 42.8% and females are more affected by PTSD 51.7% than in males 48.3%, which is consistent with this study.[16]

According to marital status, married persons had 47.7% PTSD unmarried persons had 50.0% and divorced had 40.0% PTSD levels. These findings are similar to the studies.[21,22] Lack of marital and other types of social support might result in negative consequences. The relationship between marital status and PTSD had a significant association. It was found that single persons had the largest number of referrals, followed closely by married persons, which is similar to these study findings.[8,12,21]

The study demonstrates that one-fifth of physicians (19.7%) had co-morbidities like bronchial asthma (74.2%), hypertension (32.3%) and diabetes mellitus (19.4%). A study found that about (24.8%) of doctors had been suffering from at least one chronic disease. The most commonly reported chronic disease was chronic bronchial asthma.[22]

In both settings, about half (48.6%) were suffering from mild PTSD and 12.1% were suffering from severe PTSD. The test of significance denotes the significant associations of physician's age, gender, marital state, work settings, results of COVID-19 positive by the rt-PCR and had co-morbidities in physicians (p<0.05). The prevalence of mild PTSD was higher in the age group of 25-35 years (49.1%), in females (49.8%), unmarried (50.0%), work in private settings (51.5%), ever been COVID-19 positive (59.1%) and had co-morbidities (51.6%).

CONCLUSION

Our study reveals that nearly half the physicians are suffering from mild PTSD, which is a concerning health issue for our country in pandemic situation. An appropriate risk reduction technique should be bent and carried out to condense the risk of getting mental disorders. The supply of sufficient PPE's and the advancement of a trained workforce with contamination control abilities also should be considered to reduce the mental effects.

Abbreviations: BDT: Bangladeshi taka, COVID-19: Coronavirus disease, MERS: Middle-east respiratory syndrome, PTSD: Post-traumatic stress disorder, SARS: Severe acute respiratory symptoms, SPSS: Statistical Package for the Social Sciences and WHO: World Health Organization,

REFERENCES

1. Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, Zhang L, Fan G, Xu J, Gu X, Cheng Z. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. The Lancet. 2020;395 (10223): 497-506. https://doi.org/10. 1016/S0140-6736(20) 30183-5

2. Rolling updates on coronavirus disease (COVID-19). [Internet]. WHO: 2020. Available from: https://www.who.int/emergencies/diseases/novel-coro navirus-2019/events-as-they-happen (Accessed on November 10, 2020)

3. Weekly operational update on COVID-19, 6 November 2020. [Internet]. WHO: 2020. Available from: https://www.who.int/publications/m/ item/ weekly-operational-update-on-covid-19---6-novembe r-2020 (Accessed on November 10, 2020)

4. Coronavirus disease (COVID-19) update: Bangladesh. [Internet]. WHO: 2021. Available from: https://www.who.int/bangladesh/emergencies/corona virus-disease-(covid-19)-update (Accessed on February 02, 2021)

5. Wu P, Fang Y, Guan Z, Fan B, Kong J, Yao Z, Liu X, Fuller CJ, Susser E, Lu J, Hoven CW. The psychological impact of the SARS epidemic on hospital employees in China: exposure, risk perception, and altruistic acceptance of risk. The Canadian Journal of Psychiatry. 2009;54(5):302-11. https://doi.org/10.1177/070674370905400504

6. Nickell LA, Crighton EJ, Tracy CS, Al-Enazy H, Bolaji Y, Hanjrah S, Hussain A, Makhlouf S, Upshur RE. Psychosocial effects of SARS on hospital staff: survey of a large tertiary care institution. Canadian Medical Association Journal. 2004;170(5):793-8. https://doi.org/10.1503/cmaj.1031077

7. Johnson SU, Ebrahimi OV, Hoffart A. PTSD symptoms among health workers and public service providers during the COVID-19 outbreak. PloS One. 2020;15(10):e0241032. https://doi.org/10.1371 /journal.pone.0241032

8. Tan BY, Chew NW, Lee GK, Jing M, Goh Y, Yeo LL, Zhang K, Chin HK, Ahmad A, Khan FA, Shanmugam GN. Psychological impact of the COVID-19 pandemic on health care workers in Singapore. Annals of Internal Medicine. 2020;173(4):317-20. https://doi.org/10.7326/M20 -1083

9. Mealer M, Burnham EL, Goode CJ, Rothbaum B, Moss M. The prevalence and impact of post-traumatic stress disorder and burnout syndrome in nurses. Depression and Anxiety. 2009;26(12):1118-26. https://doi.org/10.1002/da.20631

10. Chan AO, Huak CY. Psychological impact of the 2003 severe acute respiratory syndrome outbreak on health care workers in a medium size regional general hospital in Singapore. Occupational Medicine. 2004;54(3):190-6. https://doi.org/10.1093/ occmed/ kqh027

11. Maunder RG, Lancee WJ, Rourke S, Hunter JJ, Goldbloom D, Balderson K, Petryshen P, Steinberg R, Wasylenki D, Koh D, Fones CS. Factors associated with the psychological impact of severe acute respiratory syndrome on nurses and other hospital workers in Toronto. Psychosomatic Medicine. 2004;66(6):938-42. https://doi.org/10.1097/ 01.psy. 0000145673.84698.18

12. Lee SM, Kang WS, Cho AR, Kim T, Park JK. Psychological impact of the 2015 MERS outbreak on hospital workers and quarantined hemodialysis patients. Comprehensive Psychiatry. 20181;87:123-7. https://doi.org/10.1016/j.comppsych.2018.10.003

13. Jung H, Jung SY, Lee MH, Kim MS. Assessing the presence of post-traumatic stress and turnover intention among nurses post–Middle East respiratory syndrome outbreak: the importance of supervisor support. Workplace Health and Safety. 2020; 68(7): 337-45. https://doi.org/10.1177 /2165079919897693

14. Hossain KA, Roy S, Ullah MM, Kabir R, Arafat SY. COVID-19 and mental health challenges in Bangladesh. Advances in Medical, Dental and Health Sciences. 2020;3(2):31-3. https://doi.org/10.5530/ amdhs.2020.2.8

15. Kessler RC, Berglund P, Demler O, Jin R, Merikangas KR, Walters EE. Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. Archives of General Psychiatry. 2005;62(6):593-602. https://doi.org/10. 1001/archpsyc.62.6.593

16. Van Ameringen M, Mancini C, Patterson B, Boyle MH. Post-traumatic stress disorder in Canada. CNS Neuroscience and Therapeutics. 2008;14(3):171-81. https://doi.org/10.1111/j.1755-5949.2008.00049.x

17. Goldstein RB, Smith SM, Chou SP, Saha TD, Jung J, Zhang H, Pickering RP, Ruan W, Huang B, Grant BF. The epidemiology of DSM-5 posttraumatic stress disorder in the United States: results from the National Epidemiologic Survey on Alcohol and Related Conditions-III. Social psychiatry and psychiatric epidemiology. 2016;51(8):1137-48. https://doi.org/10.1007/s00127-016-1208-5

18. Marco CA, Larkin GL, Feeser VR, Monti JE, Vearrier L, ACEP Ethics Committee. Post-traumatic stress and stress disorders during the COVID-19 pandemic: Survey of emergency physicians. Journal of the

American College of Emergency Physicians Open. 2020;1(6):1594-601. https://doi.org/10.1002/ emp2. 12305

19. Koenen KC, Ratanatharathorn A, Ng L, McLaughlin KA, Bromet EJ, Stein DJ, Karam EG, Ruscio AM, Benjet C, Scott K, Atwoli L. Posttraumatic stress disorder in the world mental health surveys. Psychological Medicine. 2017;47(13):2260-74. https://doi.org/10.1017/S0033291717000708Gold JA. Covid-19: adverse mental health outcomes for healthcare workers. The British Medical Journal. 2020;369. https://doi.org/10.1136/bmj.m1815

20. Abir T, Kalimullah NA, Osuagwu UL, Yazdani DM, Husain T, Goson PC, Basak P, Rahman MA, Al Mamun A, Permarupan PY, Khan MY. Prevalence and factors associated with mental health impact of COVID-19 pandemic in Bangladesh: A survey-based cross-sectional study. Annals of Global Health. 2021;87(1). https://doi.org/10.1101/ 2021.01.05. 21249216

21. Lai J, Ma S, Wang Y, Cai Z, Hu J, Wei N, Wu J, Du H, Chen T, Li R, Tan H. Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. JAMA Network Open. 2020;3(3):e203976. https://doi.org/10.1001/ jamanetworkopen.2020.3976

22. Barua L, Zaman MS, Omi FR, Faruque M. Psychological burden of the COVID-19 pandemic and its associated factors among frontline doctors of Bangladesh: a cross-sectional study. F1000 Research. 2020;9:1304. https://doi.org/10.12688/ f1000 research. 27189.3