Original Article:

COVID-19 Pandemic and Mental Health of Doctors: An Observational Analytical Study from a Dedicated COVID Hospital.

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Abstract

Objective:Doctors experienced unprecedented levels of workload and pressure since the outbreak of COVID-19, making them more vulnerable to adverse psychological outcomes. While frontline healthcare workers face a substantially higher risk of susceptibility to infection due to excessive COVID-19 exposure, little is known about its impact on doctors not directly posted with COVID-19 patients. Our study was focused on studying the impact of COVID-19 pandemic on mental health of this subgroup of doctors.Materials and Methods: From April 1st to July 31st, 2020, a cross sectional web-based survey was conducted at a COVID-19 dedicated tertiary care hospital. The study was conducted using standard questionnaires measuring adverse psychological outcomes including DASS-21 and WHO-5. Univariate and multivariate logistic regression were used to examine the determinants of adverse psychological outcomesResults and Discussion: 145 doctors completed the survey questionnaire with over 71% females and 29% males. The overall prevalence of anxiety, depression and stress among doctors was 38.6%, 41.37% and 32.42% respectively. The overall well-being score was found to be 52.77 $\pm$ 24.19 with a median [IQR] of 52.Conclusion: A high incidence of adverse psychological outcomes are observed amongst doctors during COVID-19 pandemic, even when they are not directly involved in the care of COVID-19 patients. Stress, anxiety and depression have an inverse relationship with age and marital status. Anxiety has an inverse relationship with religious beliefs.

Keywords: COVID-19, Coronavirus, Anxiety, Depression, Stress

International Journal of Human and Health Sciences Vol. 05 No. 02 April'21 Page : 297-306
DOI: http://dx.doi.org/10.31344/ijhhs.v5i3.279

Introduction

The repercussions of COVID -19 pandemic on mental health have been profoundly palpable, with an exponential rise in cases of anxiety, depression, suicidal attempts, relationship discord etc. This is being witnessed to different extent by the entire global community and is not restricted by boundaries of age, socio-economic status, gender, education level or profession. The adverse psychological impact gains especial relevance amongst doctors, who constitute an important component of frontline workers in the war against the novel coronavirus-19. The reasons for negative psychological consequences range from professional to personal. The former includes a high risk of contracting infection, inadequate personal protective equipment [PPE], lack of experience in management of the disease, prolonged working hours etc, whereas the latter reasons include significant lifestyle changes, concern for other family members especially young children and elderly parents, lack of family support, perceived stigma etc.

While majority of studies have focused on the mental health of persons directly involved in treating patients with COVID-19 infection, we have lack of data focusing on doctors who are not directly posted with COVID-19 patients. This study was therefore planned to assess the impact on mental health on this subgroup of doctors. The authors wanted to study the psychological effects including stress levels, anxiety and depression and examine the association with different socio-demographic variables.

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Materials and Methods

Research Design

The present study is a cross sectional, observational analytical study conducted at Era's Lucknow Medical College and Hospital, after prior approval from the institutional ethical committee. The hospital is one of the major facilities of Uttar Pradesh, designated as a dedicated COVID-19 hospital during the pandemic. It caters to patients with COVID-19 infection only. The study observation period was from 1st of April till 31st of July. It was a questionnaire-based study containing both open- and close- ended questions, using social media platform to conduct the survey. The questionnaire was derived from DASS-21 and WHO-5 questionnaires, both of which are in English language, standardized and pre-validated. The final questionnaire constructed for the study was validated on 10 study subjects.

The participants were explained the purpose of study and invited to participate in the questionnaire. Anonymity was ensured and explained to the participants. Informed consent was taken prior to the survey. Socio-demographic data was collected including age, gender, education, marital status, and occupation. Questions were included on health care variables and variables related to COVID-19 infection, perceived stress, anxiety, depression and threat due to COVID- 19 infection. Lastly, there were questions related to the general well-being of the doctors. The duration of filling up the questionnaire roughly averaged 10 minutes.

DASS-21 [The Depression, Anxiety and Stress scale-21 items] was used to measure symptoms of new onset- depression, anxiety and stress during our study. It is a set of three self-report scales designed to measure the emotional states of depression, anxiety and stress. Each of the three DASS-21 scales contains 7 items, divided into sub-scales with similar content. Scores for depression, anxiety and stress are calculated by summing the scores for the relevant items. Cut – off scores for normal, mild, moderate, severe and extremely severe were [0-9], [10-13], [14-20], [21-27] and 28+ respectively.

WHO-5 Well-being index was used to assess Quality of Life [QoL] parameters. The raw score is calculated by summing figures of five answers. The score ranges from 0-25, 0 representing the worst possible and 25 representing best possible quality of life. To obtain a percentage score ranging from 0-100, the raw score is multiplied by 4. A percentage score of 0 represents worst possible, whereas a score of 100 represents best possible quality of life.

Inclusion and Exclusion Criteria

Doctors who were not posted in COVID-19 wards were included for the study. Those with previously known mental disorders, taking self-administered medication for mental disorders or anti-depressants, those who had to face loss of any family member due to COVID-19 and those posted directly with COVID-19 patients were excluded from the study.

Analysis of Data

Normality of data was confirmed using Kolmogorov-Smirnov Test. Parametric data was used for normally distributed data and non-parametric tests applied for cases where data was not normally distributed. Categorical variables were presented as numbers and percentage whereas continuous variables were expressed as Mean +/ SD and Median values. Quantitative variables were analysed using Mann -Whitney Test [for two groups] and Kruskal Wallis Test [for more than two groups] to calculate association. Qualitative variables were assessed using Chi-Square test and Fisher's Exact Test. Univariate and Multivariate logistic regression was used to calculate Odds Ratio. Significance was calculated as a 'p value' <0.05.

Limitations of the Study

The study is limited by numbers as well as restriction of profession. A general categorisation has been done and subjects recruited from doctors not directly posted in care of COVID-19 patients. There may be differences in perceptions based on specialty also, which was not taken into account. Data collection for the study was done from April to July, which was the period of lockdown in Uttar Pradesh and was at variance with the peak of pandemic in the state. Protocols were still in the initial stages and there was a lot of uncertainty and unease with regards to how the pandemic would shape up and health facilities cope. Another subjective feature which limits the impact is that we don't really know the mental health of participants before the pandemic and can only rely on the version of participants themselves that the symptoms pertain to new onset stress, depression and anxiety.

Results

145 out of 300 doctors completed the survey questionnaire. Response rate was 48.33%. Of those 103[71%] were female and 42 [29%] male. Table 1 shows socio-demographic characteristics of the study population. Mean age of subjects was 32.65 +/- 9 years. Majority had attained a postgraduate [PG] degree [62.76%] and 50 [34.48%] were PG students. Almost half of the subjects were married [51.03%]. 61.38% were living in a nuclear family. Table 2 shows the distribution of co-existing medical disorders. More than 90% of the participants did not have any co-morbidities.

Table 3 demonstrates association of gender and age with depression, stress and anxiety using DASS-21 questionnaire. The overall prevalence of stress was found in 47 [32.42%] subjects with a mean score of 5.67 ± 4.8. The overall prevalence of anxiety was found in 38.6% and Depression in 41.37 % doctors. Participants were classified into 4 groups on the basis of age viz. 20-30 [Group A]; 31-30 [Group B]; 41-50 [Group C] and >50 years [Group D].

Stress was found in 48% subjects in Group A, 40.9% in Group B, 12.5% in Group C and 33.3% in Group D. Anxiety was found in 41.55% subjects in Group A, 45.45% in Group B, 25% in Group C and 0% in Group D. Depression was found in 49.35 % subjects in Group A, 45.45% in Group B, 6.25% in Group C and 12.5% in Group D. Observations in females and males, as examined for stress, depression and anxiety were found to be 32.03% and 33.33%; 42.7% and 28.57%; 42.7% and 38.09% respectively.

The overall well-being score was found to be 52.77 ± 24.19 with a median [IQR] as 52[32-76]. [Table 4]. No differences were observed on the basis of age or gender. [Table 4]. Univariate and Multivariate logistic regression was used to find significant risk factors of stress, anxiety and depression [Table 5].

Discussion

This study collates psychological impact of COVID-19 infection amongst doctors who are not directly involved in management of patients of COVID-19 infection. We observed that majority of subjects did not have high levels of stress, anxiety and depression.Salari et al conducted a systematic review and meta-analysis in the general population studying the same parameters and found the prevalence of stress, anxiety and depression as 29.6, 31.9 and 33.7% respectively.[1] In another study, Temsah et al showed that HCWs were more anxious about transmitting COVID-19 to a family member rather than acquiring the infection themselves [2.71/5 [1.22] versus 2.57/5 [1.10]. Anxiety levels were as follows: Mild in 68.25%, moderate in 20.8%, high moderate in 8.1% and very high in 2.9% .[2]

We observed higher prevalence of anxiety, stress and depression in women during the COVID-19 pandemic as compared to men. [Figure 1] This is in concordance with observations of other authors on the subject. [3,4,5,6] Epidemiological studies have shown that women are more vulnerable than men with respect to psychological stress, anxiety, depression and post-traumatic stress disorder. There could be several reasons for this observation including the obvious one pertaining to inherent predisposition to psychological problems seen with gender. Another important reason, unique to the pandemic could be non-availability of house helps due to the long period of lockdown imposed to combat the spread of infection. Another corollary of the lockdown was closing of schools, entertainment or recreation places and social distancing measures, confining children to houses. This was associated with psychological stresses of varying degrees in majority of children which was a major factor of concern especially for mothers.

Although no differences were noted on the basis of type of religion, we did have an interesting observation wherein two subjects who declared themselves as agnostic, were found to have highly significant parameters on DASS-21 [AOR 24.20 (1.0-51 To 557.256)]Although the number is too small to draw any conclusion from the result, it does give food for thought and consideration. It is a well-known fact that social support in the form of family and relatives, religion and meditation all serve to provide a sense of mental well-being to individuals. Kowalczyk et al found that 64% of study subjects believed faith would protect them from COVID-19 infection. Faith levels were found to be higher in elderly.[7]

We found that the age group of 41-50 years showed the best profile for psychological strength during the pandemic. [Figure 2] The worst affected was the age group of 20-30 years. This corresponds to the seniority level of doctors, with Group A comprising of mostly resident doctors, and those who are or would constitute the first tier of care. Group C was best protected in terms of duty profile

as well as succumbing to complications of the infection. Group D fared best in terms of anxiety, however depression and stress were considerably higher than Group C. This group comprises of doctors at a higher risk of contracting infection and suffering complications of the same. The observations of this group are limited by the fact that we did not impose an upper limit for the age bracket. So, Group D includes individuals with wider variations in age.

Conclusion

Doctors who were not directly involved in the care of COVID-19 patients showed adverse psychological reactions such as stress, anxiety and depression.

Suggestions for Implementation

Mental health of doctors should be given its due importance and tailored psychological support be advanced to them. This would serve to ensure that they themselves are in a position to tackle the extreme challenges of the pandemic. Specific psychological interventions for medical staff have been instituted by many hospitals to empower health care workers [HCWs] and strengthen them mentally. These include support teams, counselling, providing adequate breaks and time offs, providing a place to rest and sleep, leisure activities such as yoga, exercise, meditation and motivational sessions. These measures will ensure increase in QoL and well being of HCWs.[8]

We need to develop similar interventions on an urgent basis, with a view to empower doctors by provision of interventions to enhance their psychological resilience such as counseling, periodic screening for mental health, appropriate treatment of relevant conditions and helping develop and innovate positive coping strategies of self-help. This should be an immediate as well as an ongoing process, applicable to other disaster situations as well.

Source of fund: None

Conflict of Interest: None

Ethical Clearance: The study was duly approved by the hospital ethical committee.

Authors' contribution:

Dr. Fareha Khatoon: Concept, Design, Definition of Intellectual Content, creation of Google Form,

Submission of project for ethical clearance Dr. Amrita Singh: Proof reading, review and editing of the Manuscript

Dr. Abdul Qadir Jilani: Definition of Intellectual

content, Proof reading of Manuscript Dr. Ayesha Ahmad: Concept, Research question, Manuscript writing, Data Interpretation, Submission of Manuscript

Dr. Mariyam Haq: Literature Search, Statistical Analysis

Dr. Sonakshi Pandey: Creation of Google form, Data Acquisition

Table 1: Distribution of socio-demographic characteristics of study subjects

Variable		Frequency n [%]
Age [in years]		
20-30		77 [53.1]
31-40		44 [30.34]
41-50		16 [11.03]
>50		8 [5.52]
	Mean ± Stdev	32.65 ± 9
	Median[IQR]	30[26-38]
	Range	20-72
Gender		
Female		103 [71.03]
Male		42 [28.97]
Education		
Group I		50 [34.48]

Variable		Frequency n [%]
Age [in years]		
	Group II	91 [62.76]
	Group III	4 [2.76]
Religion		
	Hindu	92 [63.45]
	Muslim	43 [29.66]
	Christian	6 [4.14]
	Sikh	3 [2.07]
	Others	1 [0.69]
Marital Status		
	Married	74 [51.03]
	Unmarried	68 [46.9]
	Other	3 [2.07]
Type of family		
	Joint	51 [35.17]
	Nuclear	89 [61.38]
	Others	5 [3.45]
Domicile		
	Rural	17 [11.72]
	Urban	128 [88.28]

Table 2: Distribution of co-morbidities of tudy subjects

Co-morbidities	Frequency n [%]
Cardiac illness	
No	144 [99.31]
>5 Year	1 [0.69]
Diabetes	
No	143 [98.62]
Upto 2 Year	1 [0.69]
>5 Year	1 [0.69]
Respiratory disorders	
No	136 [93.79]
Upto 2 Year	1 [0.69]
2-5 Year	3 [2.07]
>5 Year	3 [2.07]
>10 Year	2 [1.38]
Mental illness	
No	144 [99.31]
2-5 Year	1 [0.69%]

Co-morbidities	Frequency n [%]
Neurological Illness	
No	144 [99.31]
Upto 2 Year	1 [0.69]
Any other Illness	
No	136 [93.79]

Table 3: Association of DASS 21 with age and gender

DASS-21		Variables					
	Overall	Age [in years] n[%]				Gender n[%]	
	n[%]	20-30	31-40	41-50	>50	Female	Male
Stress							
Normal	98 [67.59]	52[67.53]	26 [59.09]	14 [87.50]	6 [75]	70 [67.96%]	28 [66.67%]
Mild	22 [15.17]	11[14.29]	9[20.4]	2[12.5]	0[0]	17 [16.50%]	5 [11.90%]
Moderate	11 [7.59]	4[5.19]	5[11.36]	0 [0]	2[25]	6 [5.83%]	5 [11.90%]
Severe	9 [6.21]	6[7.79]	3[6.82]	0[0]	0[0]	6 [5.83%]	3 [7.14%]
Extremely severe	5 [3.45]	4[5.19]	1[2.27]	0[0]	0[0]	4 [3.88%]	1 [2.38%]
Mean ± Stdev	5.67 ± 4.8	5.69±5.08	6.61±4.69	3.81 ± 2.9	4 ± 4.81	5.78 ± 4.7	5.4 ± 5.08
Median[IQR]	5[2-8]	4[2-8]	7[3-8.25]	4[1.75- 6]	2[0.75-5.75]	6[2-8]	3.5[2-9]
Range	0-21	0-21	0-20	0-9	0-12	0-20	0-21
Statistical Analysis		p = 0.13 [Kruskal Wallis; Chi sq= 5.624]				p = 0.707 [Chi sq= 2.156]	
Anxiety							
Normal	89 [61.38%]	45[58.44]	24[54.55]	12[75]	8[100]	59 [57.28%]	30 [71.43%]
Mild	20 [13.79]	11[14.29]	6[13.64]	3[18.75]	0[0]	17 [16.50%]	3 [7.14%]
Moderate	15 [10.34]	11[14.29]	3[6.82]	1[6.25]	0[0]	13 [12.62%]	2 [4.76%]
Severe	13 [8.97]	6[7.79]	7[15.91]	0[0]	0[0]	8 [7.77%]	5 [11.90%]
Extremely severe	8 [5.52]	4[5.19]	4[9.09]	0[0]	0[0]	6 [5.83%]	2 [4.76%]
Mean ± Stdev	3.47 ± 3.62	3.61 ± 3.39	4.27 ± 4.38	1.88 ± 1.89	0.88 ± 0.99	3.62 ± 3.42	3.1 ± 4.09

DASS-21		Variables					
	Overall	Age [in years] n[%]				Gender n[%]	
	n[%]	20-30	31-40	41-50	>50	Female	Male
Median[IQR]	2[0-5]	3[1-6]	3[0-6.5]	2[0-3.25]	0.5[0-2]	3[1-6]	2[0-4]
Range	0-17	0-17	0-16	0-6	0-2	0-16	0-17
Statistical Analysis		p = 0.02 [Kruskal Wallis; Chi sq = 9.655]				p = 0.26 [Chi sq= 5.281]	
Depression							
Normal	85 [58.62]	39[50.65]	24[54.55]	15[93.75]	7[87.50]	59 [57.28%]	26 [61.90%]
Mild	16 [11.03]	14[18.18]	1[2.27]	0[0]	1[12.5]	11 [10.68%]	5 [11.90%]
Moderate	27 [18.62]	13[16.88]	13[29.55]	1[6.25]	0[0]	23 [22.33%]	4 [9.52%]
Severe	6 [4.14]	5[6.49]	1[2.27]	0[0]	0[0]	3 [2.91%]	3 [7.14%]
Extremely severe	11 [7.59]	6[7.79]	5[11.36]	0[0]	0[0]	7 [6.80%]	4 [9.52%]
Mean ± Stdev	4.71 ± 4.72	5.13 ± 5.05	5.45 ± 4.7	2.19 ± 2.04	1.62 ± 2.26	4.76 ± 4.51	4.6 ± 5.23
Median[IQR]	3[1-7]	4[1-7]	4[2-8]	2[0.75-3]	0.5[0-2.5]	4[2-7]	2[1-6.75]
Range	0-21	0-21	0-17	0-8	0-6	0-20	0-21
Statistical Analysis		p = 0.01 [Kruskal Wallis;Chi Sq= 11.11]				p = 0.359 [Chi sq= 4.36]	

Table 4: Association of Well Being [WHO-5] with Age and Gender

Variable			Well being Score		
			Mean ±Stdev	Median [IQR]	Range
Age [in years]		N			
	20-30	77	51.32 ± 24.66	52[32-72]	0-100
	31-40	44	49.55 ± 24.11	44[31-72]	12-100
	41-50	16	62 ± 17.63	70[42-80]	20-92
	>50	8	66 ± 17.63	72[58-76]	32-88
	p value	0.124[Kruskal Wallis Test ;Chi Square=5.752]			
Gender					
	Male	42	55.33 ± 26.87	62[32-80]	0-96
	Female	103	51.73 ± 23.06	48[32-74]	0-100
	p value	0.311[Mann Whitney test ; 1931]			

Table 5: Logistic regression to find out significant risk factors of stress, anxiety and depression.

	Stress	Anxiety	Depression
Variable	**R^2**	**R^2**	**R^2**
Age	7.20%	9.46%	17.88%
Female	6.54%	8.65%	6.67%
Male			
Education			
Group I	10.26%	11.50%	9.87%
Group II			
Group III			
Religion			
Hindu	18.20%	24.27%	17.97%
Agnostic			
Muslim			
Others			
Sikh			
Marital Status			
Married	11.13%	15.51%	16.98%
Other			
Unmarried			
Joint family	9.82%	10.43%	9.90%
Nuclear family			
Others			
Rural	8.11%	8.00%	8.58%
Urban			
Cardiac Illness			
No	7.90%	6.62%	6.67%
>5 Year			
Diabetes			

	Stress	Anxiety	Depression
Variable	**R^2**	**R^2**	**R^2**
No	12.38%	10.67%	10.57%
Upto 2 Year			
>5 Year			
Respiratory Illness			
No	21.17%	20.44%	18.91%
Upto 2 Year			
2-5 Year			
>5 Year			
>10 Year			
Mental illness			
No	7.90%	7.44%	7.28%
2-5 Year			
Neurological illness			
No	6.56%	6.62%	6.67%
Upto 2 Year			
Any other illness			
No	18.89%	16.58%	15.99%
2-5 Year			
>5 Year			
>10 Year			

R^2 is the proportion of variance in the dependent variable that is predictable from the independent variable. Range = 0 to 100%. An R^2 of 100% means that all movements of a security (or other dependent variable) are completely explained by movements in the index (or the independent variable(s).[9]

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