

Generalized Anxiety Disorder and Associated Factors among Indian Pediatricians during the Coronavirus Disease 2019 Outbreak: A Web-based Cross-sectional Survey

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ABSTRACT

Background: Healthcare workers (HCW) are at risk of developing anxiety and other mental health symptoms while rendering health services during Coronavirus Disease 2019 (COVID 19) pandemic. Current study is probably first of its kind to quantify the anxiety levels among pediatricians along with its potential risk factors. **Aim:** The aim of the study was to find the prevalence of anxiety using the generalized anxiety disorder (GAD-7) score among pediatricians during COVID-19 pandemic. **Design:** This was a cross-sectional web-based survey. **Materials and Methods:** Data were collected from 702 pediatricians over a period of 10 days using online Electronic “Survey Monkey” questionnaire as the survey tool. **Statistical Analysis:** Categorical variables are expressed as ratios and proportions. Numerical variables are expressed as median (range). Analysis was performed using non-parametric tests as applicable. **Results:** 702 pediatricians responded to the survey. Mean GAD score was 8.48 ± 5.64 and prevalence of anxiety was 72.65%. Significant anxiety was seen in 281 (40.03%). Mean GAD score was significantly high in female gender, age between 25 and 40 years, married pediatricians and among front line workers. **Conclusion:** This study is first of its kind from India assessing anxiety among pediatricians reflecting mental health among HCW. Female pediatricians and pediatricians who are married are at risk of having significant anxiety. We recommend formation of social support circles to maintain optimal mental health of all HCW.

KEY WORDS: Corona, healthcare worker, mental health, questionnaire.

Introduction

In December 2019, China's Wuhan city had reported a novel Coronavirus infection which was later termed as Coronavirus Disease 2019 (COVID-19). The World Health Organization (WHO) on March 11, 2020, declared the COVID-19 outbreak a global pandemic.^[1]

Facing this critical situation, healthcare workers (HCW) who are directly or indirectly involved in the diagnosis, treatment, and care of patients with

COVID-19 are at risk of developing psychological distress and other mental health symptoms.

Many studies regarding mental health, psychological adjustments, and recovery of infected HCW involved in caring for patients with COVID-19 have been conducted.^[2-9] In a recent meta-analysis they found high prevalence of depression, anxiety, and insomnia in health-care professionals.^[10] Apart from physical exhaustion while managing the COVID 19 patients HCW are dealing with lack of infrastructure, frequently changing guidelines, stigmatization which has adverse affect on their mental health. However, there is lack of data on mental health among HCW from India leading to underestimation and also under implementation of health measures promoting mental well-being among HCW.^[8]

Children and adolescents (<18 years) constitute about 1–5% of active COVID-19 cases. Although

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pediatric COVID-19 patients are less, still pediatricians are regularly exposed to children in their daily practice mimicking similar presentation of flu like illness which come under category of suspect cases of COVID-19.^[11] Pediatricians, thus, have a fear of contagion, and also spread of infection to friends and family unknowingly which adds to the psychological stress. To address this issue, the current study which is probably the first of its kind was done to quantify the anxiety levels among pediatricians along with analyzing potential risk factors associated with it. This study can serve as an important evidence for promotion of mental well-being not only among pediatricians but also all HCW in India dealing with COVID-19 pandemic.

Materials and Methods

It was a cross-sectional survey designed to assess anxiety level among pediatricians during COVID-19 pandemic. Data were collected over a period of 10 days (June 1, 2020,–June 10, 2020) using an online questionnaire. As the Indian Government had imposed nationwide lockdown, we used the Electronic “Survey Monkey” as the survey tool. “Survey Monkey” is a professional online survey tool. Compared with traditional survey methods, “Survey Monkey” has the obvious advantage of being fast, low cost, easy to learn, and use. Information was collected through professional circle forwarding (convenience sampling) and WhatsApp group promotion (snowball sampling). Expedited ethical approval was taken from the institutional ethics committee of Sanjay Gandhi Post Graduate Institute (IEC 2020-120-IP-EXP-18). The target sample size was calculated on the basis of proportion of anxiety which was 44.6% among HCW’s in a study from China.^[5] The sample size came out to be 525 for our study.

We focused on symptoms of anxiety among all participants, using the seven-item generalized anxiety disorder-7 (GAD-7) scale (range, 0–21). GAD-7 is a valid, standardized, and most widely used measure of anxiety in clinical practice and research with excellent diagnostic reliability and efficiency.^[12]

The total score of this measurement tool was interpreted as follows: Normal (0–4), mild (5–9), moderate (10–14), and severe (15–21) anxiety. The score for detecting symptoms of significant anxiety was ten and above. These cutoffs were based on values established in the literature.^[4,13] Demographic

data were self-reported by the participants, including gender, age, marital status, designation (junior resident, consultant, or retired professional), place of residence (urban or rural), and type of practice (Government setup [primary, secondary or tertiary level], Private medical college, Corporate hospital, and Private practice with or without IPD). Participants directly engaged in clinical activities of managing suspected or confirmed COVID-19 patients were defined as frontline workers and remaining were defined as second line workers.

In addition, to assess the anxiety levels among non-health-care professionals, we administered the same GAD 7 questionnaire among school teachers. Teachers group was chosen as surrogate for general population.

Statistical analysis

Categorical variables are expressed as ratios and proportions. Numerical variables are expressed as median (range). The categorical variables, between the groups, are compared using non-parametric tests of significance, that is, Wilcoxon’s rank – sum test for two group comparison and Kruskal–Wallis H test for three or more group comparison. Similarly, numerical variables are compared using *t*-test and ANOVA. The level of significance was at $P < 0.05$.

Results

Out of the 1150 pediatricians who were administered the survey 702 (61.04%) completed it. Of the 702 pediatricians, 72.9% were males. About 90% of them were more than 30 years of age. About 91% were married, 89% lived in urban area, and 86% were consultants. 199 of study participants, 28.35% were working as frontline physicians.

Out of 415 teachers who were given the questionnaire 203 (48.9%) completed the survey. About 85% were females and nearly 70% were above 30 years of age and married [Table 1].

Using the 7-item GAD-7 scale, the mean score was 8.48 ± 5.64 and the prevalence of anxiety was 72.65%. Mild, moderate, and severe anxiety was seen in 32.62; 22.08%; and 17.95% of pediatricians, respectively. Taking a cutoff value of 10 or more, significant anxiety was seen in 281 (40.03%) pediatricians.

In the teachers group, the mean GAD Score was 5.49 ± 4.46 and the prevalence of anxiety was 50.25%.

Table 1: Baseline demographic data of pediatricians and teachers

Characteristic	Doctors (n=703)	Characteristic	Teachers (n=202)
Sex		Sex	
Male	512 (72.93)	Male	30 (14.78)
Female	190 (27.07)	Female	173 (85.22)
Age		Age	
18–25	5 (0.72)	18–25	34 (16.74)
26–30	63 (8.97)	26–30	26 (12.80)
31–40	217 (30.91)	31–40	77 (37.93)
>40	417 (59.40)	>40	66 (32.51)
Marriage status		Marriage status	
Married	639 (91.02)	Married	143 (70.44)
Unmarried	63 (8.93)	Unmarried	60 (29.56)
Place of residence		Place of residence	
Rural	71 (10.11)	Rural	20 (9.85)
Urban	631 (89.89)	Urban	183 (90.15)
Designation		Teach	
Junior Resident	73 (10.4)	Pre School	19 (9.36)
Consultant	604 (86.04)	Class Nursery/KG	14 (6.90)
Retired	25 (3.56)	Class 1–5	58 (28.57)
Place of working		Class 6–12	104 (51.23)
Tertiary Government Setup	119 (16.95)	UG	3 (1.48)
Primary/Secondary Government Setup	68 (9.69)	PG	5 (2.46)
Private Medical College	79 (11.25)	Place of working	
Corporate Hospital	93 (13.25)	Play School	18 (9.36)
Private (with IPD)	218 (31.05)	Government School	129 (63.55)
Private (Only OPD)	125 (17.81)	Private School	53 (26.11)
Working Position		University/Degree	3 (1.48)
Front Line	199 (28.35)		
Second Line	503 (71.65)		

Categorical variables are displayed as *n* (%)

Significant anxiety was seen in 35 (17.24%) teachers only. The difference between the two groups was statistically significant [Table 2].

On sub group analysis among pediatricians, females had statistically higher mean GAD as compared to males ($P = 0.001$). Mean GAD was highest among age group of 26–40 years. Consultant and junior residents had a mean GAD score of 8.53 and 9.09, respectively, which were significantly higher as compared to retired professionals ($P = 0.01$). First-line workers had a statistically higher mean GAD score (9.32 vs. 8.15) as compared to second-line workers [Table 3].

Univariate analysis of baseline characteristics among pediatricians having significant anxiety versus non-significant anxiety revealed statistical difference in sex ($P = 0.002$), age ($P = 0.05$), marriage status ($P = 0.01$), and designation ($P = 0.04$) [Table 4]. On logistic multivariable regression analysis male gender (odds ratio [OR] 0.59, confidence interval [CI] 0.42–0.84, $P = 0.003$) had lower incidence of significant anxiety whereas being married (OR 2.33, CI 1.20–4.51, $P = 0.012$) was associated with significant anxiety [Table 5].

Discussion

A recent position paper in The Lancet, called for high-quality data on the mental health effects of the

Table 2: Mean and severity categories of anxiety among pediatricians and teachers

Characteristic	Doctors (n=702)	Teachers (n=203)	P-value
*Mean GAD	8.48±5.64 (95% CI 8.06–8.90)	5.49±4.46 (95% CI 4.87–6.11)	0.001
Normal	192 (27.35)	101 (49.75)	0.000
Mild	229 (32.62)	67 (33.00)	
Moderate	155 (22.08)	27 (13.30)	
Severe	126 (17.95)	8 (3.94)	
Non-significant	421 (59.97)	168 (82.76)	0.000
Significant	281 (40.03)	35 (17.24)	

Categorical variables are displayed as n (%) except *mean (SD); GAD: Generalized anxiety disorder

Table 3: Subgroup analysis of mean anxiety levels in pediatricians based on baseline characteristic

Variables	Mean GAD (SD)	95% CI	P-value
Sex			
Male	8.05 (5.63)	7.56–8.54	0.001
Female	9.63 (5.54)	8.84–10.42	
Age (years)			
18–25	4.6 (2.07)	2.27–6.42	0.00
26–30	9.20 (5.71)	7.79–10.61	
31–40	9.52 (5.27)	8.82–10.23	
>40	7.88 (5.76)	7.32–8.43	
Marriage status			
Married	8.55 (5.70)	8.11–9.00	0.27
Unmarried	7.74 (4.97)	6.51–8.97	
Place of residence			
Rural	9.23 (5.72)	7.96–8.84	0.23
Urban	8.40 (5.63)	7.90–10.57	
Designation			
Junior Resident	9.09 (5.28)	7.88–10.31	0.01
Consultant	8.53 (5.65)	8.08–8.99	
Retired	5.4 (5.88)	3.09–7.70	
Place of working			
Tertiary Government Setup	9.57 (5.50)	8.58–10.56	0.17
Primary/Secondary Government Setup	8.29 (5.50)	6.98–9.60	
Private Medical College	8.68 (5.90)	7.37–9.98	
Corporate Hospital	8.13 (5.26)	7.06–9.21	
Private (with IPD)	8.51 (5.88)	7.73–9.29	
Private (Only OPD)	7.64 (5.48)	6.67–8.60	
Working Position			
Front Line	9.32 (5.83)	8.50–10.13	0.01
Second Line	8.15 (5.54)	7.66–8.64	

GAD: Generalized anxiety disorder

Table 4: Results of univariate analysis of factors among pediatricians with significant anxiety levels

Variables	Non-significant (n=421)	Significant anxiety (n=281)	P-value
Sex			
Male	325 (77.19)	187 (66.54)	0.002
Female	96 (22.81)	94(33.46)	
Age			
18–25	5 (1.18)	0	0.05
26–30	36 (8.55)	27 (9.6)	
31–40	118 (28.02)	99 (35.23)	
>40	262 (62.22)	155 (55.16)	
Marriage status			
Married	378 (89.78)	261 (92.88)	0.01
Unmarried	43 (10.22)	20 (7.12)	
Place of residence			
Rural	40 (9.5)	31 (11.03)	0.5
Urban	381 (90.5)	250 (88.97)	
Designation			
Junior resident	43 (10.21)	30 (7.12)	0.04
Consultant	357 (84.79)	247 (87.90)	
Retired	21 (4.98)	4 (1.42)	
Place of working			
Tertiary government setup	59 (14.01)	60 (21.35)	0.19
Primary/secondary government setup	43 (10.21)	25 (8.89)	
Private Medical College	48 (11.4)	31 (11.03)	
Corporate Hospital	61 (14.4)	32 (11.38)	
Private (with IPD)	131 (31.11)	87 (30.96)	
Private (Only OPD)	79 (18.76)	46 (16.37)	
Working position			
Front line	111 (26.36)	88 (31.31)	0.15
Second line	310 (73.6)	193 (68.69)	

Categorical variables are displayed as n (%)

Table 5: Results of logistic multivariable regression analysis of factors among pediatricians with significant anxiety levels

Variable	SE	OR (95% CI)	P-value
Sex	0.10	0.59 (0.42–0.84)	0.003
Age	0.13	0.93 (0.70–1.24)	0.657
Marriage status	0.785	2.33 (1.20–4.51)	0.012
Designation	0.18	0.67 (0.39–1.14)	0.146

OR: Odds ratio, CI: Confidence interval

COVID-19 pandemic across the whole population and vulnerable groups such as health-care professionals.^[14] To the best of our knowledge, this is

the first study of its kind which specifically focuses on the anxiety levels among pediatricians. Our web-based study shows a high prevalence of anxiety among pediatricians. Compared with teachers as representatives of general population pediatricians had significantly higher level of anxiety. In a recent meta-analysis anxiety was estimated in 12 studies, majority of which were in HCW from China. The estimated pooled prevalence was 23.20%. Four studies that have used the GAD-7 scale had a pooled prevalence of 36.90% (95% CI 26.06– =99%).^[4,5,7,8,10]

In our study, the overall prevalence of anxiety in pediatricians was 72.65%. The prevalence rate of

significant anxiety among them was 40.03% which is similar to the studies which used the GAD-7 scale. Anxiety levels among HCW from India have also been studied recently as part of a multinational study where the prevalence was estimated as 17%.^[8] This difference could be attributed to the fact that HCW included in their study was not only doctors of various specialties but also nurses and paramedics and they used a different tool for assessment of anxiety.

General population reported anxiety ranged between 22.6 and –36.3% in China during the same period.^[15,16] In our study, the significant anxiety levels among teachers were similar (around 17%), which reflects a major effect of the crisis on the entire population; however, it is significantly less compared to the HCW.

In a study by Lai *et al.*,^[5] median GAD score was significantly higher in female (4 vs. 2), front line workers (5 vs. 3) and those working in secondary level hospitals as compared to tertiary care hospital (4 vs. 3). Similarly, in our study, mean anxiety level was more in females and those working as first-line workers. However, there was no significant difference in pediatricians working in different hospital setup. This could be due to the fact that study by Lai *et al.* had a mixed population comprising both nurses and doctors. Moreover, the HCW in India has undergone

training, awareness and overall preparation sessions at all levels after lessons learned from the experiences in the interim time of 2 months from the peak in Wuhan city, China.

In our study, on logistic multivariable regression analysis, we found male pediatricians had a lesser level of significant anxiety as compared to their female colleagues. Married pediatricians had significant anxiety levels. Most of the studies do have similar observations about female gender. The probable reason being an already established gender gap for anxiety symptoms.^[17]

The difference in other implicated risk factors of anxiety in various studies may be attributed to non-uniformity of the studied factors, heterogeneity among study population; different study design and use of different scoring tool [Table 6].^[4,5,7,9,10]

Limitations

To the best of our knowledge, this is the first study investigating anxiety as marker of psychological impact of COVID-19 outbreak among pediatricians. However, there are some limitations. First, the study is cross-sectional in design without longitudinal follow-up. Data collection phase of the study was completed within 10 days. Being a pandemic situation, we aimed to quickly explore anxiety levels and its related factors among pediatricians

Table 6: Summary of factors associated with significant anxiety in various studies

Study	Sample size study population	Anxiety score	Factors on multivariate analysis
Huang <i>et al.</i> ^[4]	7236 General Population including HCW	GAD-7	Age <35 years More than 3 h time spend focusing on COVID-19
Lai <i>et al.</i> ^[5]	1257 HCW	GAD-7	Female gender Secondary level hospital Intermediate level of working Front line
Zhu <i>et al.</i> ^[7]	3387 HCW	Self-rating anxiety scale	History of depression or anxiety
Elbay <i>et al.</i> ^[9]	442 HCW	Depression anxiety Stress Scale	Female gender Young age History of depression or anxiety Front line workers
Pappa <i>et al.</i> ^[10]	33602	Meta-analysis	Female gender Nursing staff
Our study	703 pediatricians	GAD-7	Female gender Married

GAD: Generalized anxiety disorder, HCW: Healthcare workers

so that findings of this study would help to identify immediate needs and plan subsequent social support for all HCW. The possibility of selection bias remains as it was a voluntary survey. Moreover, during lockdown, face-to-face diagnostic assessment by mental health professionals was not possible so we used a self-reported questionnaire. In this study, we have only investigated anxiety levels, further studies incorporating depression, insomnia; post-traumatic stress disorder assessment in all HCW across India would significantly help to fully understand the magnitude of psychological problems and thus plan its effective interventions.

Conclusion

Providing sound mental well-being of HCW is essential for ensuring the sustainability of healthcare services during fight against COVID-19. Our study shows that female pediatricians and pediatricians who are married are at risk of having significant anxiety. We recommend formation of social support circles with provisions to maintain optimal mental health of HCW.

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