

Anxiety, Sleep Quality and Coping Strategies Adopted among the Frontline COVID Warriors during Second Wave of COVID Pandemic: Evidence from a Retrospective Study in Central India

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Abstract

The second wave of COVID 19 struck in March-April 2021, and it proved to be more severe than the first, with significantly higher cases and mortality rates worldwide. This study aimed to assess anxiety, sleep quality, and coping strategies among Health Care Workers (HCWs) engaged in the care of COVID-19 patients during the second wave of the pandemic at tertiary care hospitals in Central India. It was a retrospective cross-sectional web-based survey conducted among HCWs at a tertiary care hospital in central India during the second wave of COVID-19, utilising a convenience sampling method via Google Forms. The survey assessed anxiety, depression, sleep quality, and coping strategies using the Hospital Anxiety and Depression Scale (HADS) and the Pittsburgh Sleep Quality Index (PSQI), along with a self-structured 4-point Likert scale. Data was collected from August to September 2021, with 114 HCWs. Ethical approval was obtained, and data were analysed using SPSS version 24, employing descriptive and inferential statistics, including Chi-square tests for associations, with significance set at $p < 0.05$. Approximately 38.6 percent of HCWs experienced borderline abnormal anxiety, while 31.6 percent reported borderline abnormal depression. Most (57%) exhibited poor coping skills, and all participants reported poor sleep quality. Significant associations were found between anxiety and marital status ($\chi^2=11.994$, $p=0.017$) as well as living conditions ($\chi^2=12.101$, $p=0.002$). To conclude, enhancing coping mechanisms and sleep quality is crucial for reducing anxiety and depression among HCWs. Providing them with more time to connect with friends and family may also improve their overall well-being and resilience.

Key words: Frontline warriors, Sleep quality. COVID 19 second wave

At the beginning of 2020, the widespread devastation caused by COVID-19 plunged entire populations into a state of shock. Unprepared for the pandemic's rapid evolution, the healthcare industry faced the crisis head-on. In response to the outbreak, the World Health Organisation (WHO) declared it a public health emergency of global concern (Munawar & Choudhary, 2021). India as well as other countries imposed lockdown (Gupta et al, 2020). After navigating several challenging months, healthcare workers were burdened with fatigue and a profound fear of how much worse the situation could become and how they would cope against a constantly mutating adversary. Amongst this, the second wave struck in March-April 2021, and it proved to be more severe than the first, with significantly higher cases and mortality rates worldwide. In India, the death rate increased from the first wave to the second (Tendulkar et al, 2023). Similar to many regions globally, particularly in Europe,

India experienced a sharp rise in COVID-19 cases and fatalities, becoming the country with the third-highest number of cases as of 10 April 2021, following the USA and Brazil (Kar et al, 2021). The second wave led to a rapid increase in infections, a higher mortality rate, and an overwhelming demand for medical services, significantly heightening the stress and pressure faced by frontline workers. For these healthcare warriors, the challenges extended beyond immediate patient treatment, monitoring, and recovery; they also had to prioritise their own safety. Working in a state of emergency 24/7 was both physically and emotionally draining. Previous studies have provided evidence of the severe psychological impact of COVID-19, highlighting increased stress, fear, anxiety, and poor sleep outcome (Choi et al, 2020; Huang & Zhao, 2020; Ahorsu et al, 2020; Jahrami et al, 2021). A strong association has been established between high anxiety levels and functional impairments, alcohol or drug use as coping mechanisms, negative religious coping, extreme hopelessness, and passive suicidal ideation (Lee, 2020). A similar association has also been found to be established between problematic sleep and adverse consequences on the patient's

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psychological, social, and cognitive functioning, which leads to deterioration of the overall quality of life (Szentkiralyi et al, 2009). Several studies conducted during or after the pandemic, including emerging literature on COVID-19, has highlighted and continues to highlight that awareness programmes about the psychological problems among the HCWs, better communication/support systems in the hospital, including mental health support system and so forth, have had a positive effect on the mental health of the HCWs (Gupta & Sahoo, 2020).

Need of the study: In India, with a population of approximately 1,393,409,038 (Indian Pop Growth Rate, 2021), and a doctor-population ratio of 1:1456 (Deccan herald, 2021), the already inadequate public health care system, crumbled during the COVID-19 pandemic, further pushing frontline HCWs to the edge. Moreover, HCWs have been rendered vulnerable to physical and psychological fatigue and poor sleep outcomes due to increased workload, physical exhaustion with irregular work schedules, frequent work shifts (Zhang et al, 2020), and the occasional need to make ethically challenging decisions, including rationing of care (Chan-Yeung, 2004; Lai et al, 2020; Klein 1974). The Indian health infrastructure lacks the robustness to address and provide coping strategies for its HCWs. Investigating these changes can help the public health experts, hospital infection control and disaster management committee, to come up with specific measures that would be customised to the different cadres of HCWs and contextually robust (e.g. attitudinal factors like stigma, uncontrolled ability about the situation, helplessness). One of the rationales behind opting for a cross-sectional, quantitative study on anxiety, depression as well and the quality of sleep among healthcare workers employed at tertiary care centres in Central India was to come up with further data on the effect of the COVID-19 situation on healthcare workers.

Objective

The objective of the study were:

1. To estimate the incidence of anxiety and depression among frontline healthcare workers employed at tertiary care hospitals in Central India,
2. To assess their quality of sleep and coping strategies.
3. To find the association between socio-demographic data and the levels of anxiety, depression, and coping strategies.

Review of Literature

Extensive exploration of both research and non-research literature from search engines/databases

such as Google Scholar, Research-gate, PubMed, Scopus, Wiley Online Library, and Cochrane was conducted to acquire insights into various facets of the current researches. The search terms employed included front-line warriors anxiety, depression, and sleep quality, COVID 19, second wave. Literature from Asia-Pacific nations and Canada, especially during the SARS (2003), revealed that with time, the level of psychological problems among the HCWs was significantly reduced through the acquisition of adaptive coping, better awareness about the condition, greater support from the authorities as well as from society and family, and so forth (Maunder, 2004; McAlonan et al, 2007; Su et al, 2007). Among the nurses, 51 percent reported stressors related to work- and work-related environment, and 50 percent reported stressors related to self-safety (Rohisha et al, 2023). There was a significant difference in the severity and course of the COVID-19 infection across the two waves (first wave, 2020; the second wave, 2021) of the pandemic in India (Jain et al, 2021). During the first wave, the people as well as HCWs, had a lower awareness score about the course and outcome of the pandemic including the issue of lesser technical skills among HCWs in dealing with the condition. The above conditions could have been an attributing factor to the evolving nature of the infection, and lack of evidence-based treatment. COVID-19-related morbidity and mortality were lesser during the first wave. In contrast, Busch et al (2021), Gupta et al (2021) and Clark & Fallowfield (1986) showed that the second wave resulted in greater infliction of middle adults, a higher rate of secondary infection, greater hospitalisations, and limited availability of hospital beds and oxygen cylinders.

Materials and Methods

A cross-sectional, web-based survey was conducted among healthcare workers HCWs including full-time practicing doctors, nurses, dentists, AYUSH practitioners and paramedic staff. These individuals were directly involved in patient care, including triage, screening, diagnosis, treatment, and allied services during the second wave of the COVID-19 pandemic at the tertiary care teaching hospital in Central India. Data collection was performed using a web-based survey via Google Forms, employing a convenience sampling method.

The survey included a standardised tool to assess participants' anxiety, depression, and sleep quality as well as a self-structured 4-point Likert scale to assess coping strategies. The survey link was circulated among HCWs through WhatsApp. Frontline COVID-19 warriors who were not on active medical duty due to any leave of absence or those unwilling to participate were excluded from

the study. Data collection was conducted from August to September 2021. All participants were informed of their right to withdraw at any time, and the anonymity of the responses was ensured by the researchers. Ethical approvals for the study was obtained from the Institutional Ethics Committee.

Study instruments: The data collection questionnaire consisted of four main components: demographic details, screening for anxiety and depression, assessment of sleep quality, and coping strategies adopted. Demographic characteristics included age, gender, domicile, marital status, level of professional education, profession, years of experience, area of work, family type, residence, and monthly income.

The Hospital Anxiety and Depression Scale (HADS) was used to screen for anxiety and depression (Zigmond, 1983). This standardised tool consist of 14 items, 7 for anxiety and 7 for depression, each scored on a 4-point Likert scale (0 to 3). The participants were instructed to select the closest response based on how they felt. Scores of 0-7 were considered “normal,” 8-10 as “borderline,” and 11-21 as indicating abnormal levels of anxiety or depression. The HADS is quick to complete, taking only 2 to 5 minutes, and is well accepted by the population for which it was designed.

Sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI) (Sancho-Domingo et al, 2021), a self-rated questionnaire that evaluates sleep quality and disturbances over a one-month period. The PSQI generates seven component scores and a global score. The tool demonstrated acceptable internal homogeneity, test-retest reliability, and validity. A global score above 5 had a diagnostic sensitivity of 89.6 percent and specificity of 86.5 percent ($\kappa = 0.75$, $p < 0.001$) in distinguishing between good and poor sleepers.

A self-structured 4-point Likert scale was developed and validated to assess the coping strategies adopted by HCWs. The scale was divided into four levels: individual, family, social, and organisational levels. The individual level was further subdivided into appraisal-focused, problem-focused, emotion-focused, and behaviour-focused strategies. Participants were asked to rank their coping methods on a scale from 1 to 4, with 1 being “Not at all,” 2 “Occasionally,” 3 “Most of the time,” and 4 “Always.”

The survey was distributed via WhatsApp, and the contact details of participants were obtained from the establishment section of the hospital. Informed consent forms were appended to the survey form. The estimated time required to complete the questionnaire was approximately 15–20 minutes.

Sample size was calculated by using formula, $n = \{(Z1-\alpha/2)^2 (p) (q)\} / d^2$ where the prevalence rate of abnormal anxiety among HCWs during the second wave was found to be 8 percent in a pilot study (Sharma et al, 2024). The calculated sample size was 124, accounting for a 10 percent dropout rate. The response rate was 96 percent (124 HCWs), with 119 participants responded to the online survey. We excluded 5 responses as the participants took less than 5 minutes to complete the survey, deeming them unreliable. The final statistical analysis was performed on data from 114 participants.

Statistical analysis: The data were analysed using SPSS software version 24. Descriptive and inferential statistics, such as frequency and percentage, were used to describe the participants’ characteristics and the prevalence of anxiety, depression, coping strategies, and sleep quality. The Chi-square test was used to examine the association between levels of anxiety and participants’ characteristics. A p-value of less than 0.05 was considered statistically significant.

Results

A total of 119 HCWs gave their consent for participation in this online survey. Of these, 5 respondents took less than 5 minutes to complete the survey and similar responses were marked by them for maximum number of questions. Therefore, such participants were excluded and data from 114 HCWs were included in final analysis of this study.

In terms of participants’ characteristics, data from the present study reveal that the majority of healthcare workers (70.2%) were between the ages of 21 and 30. Additionally, 55.3 percent were female, 52.6 percent were married, and 88.6 percent identified as Hindu. Educationally, 75.4 percent of participants were graduates, and 90.4 percent were nursing professionals. Furthermore, 70.2 percent of HCWs resided in urban areas, and 52.6 percent lived with their families. In terms of health history, 92.1 percent of HCWs had no history of non-communicable diseases, and 98.2 percent reported no previous history of mental illness.

Table 1: frequency and percentage distribution of level of anxiety depression, coping and sleep quality (N=114)

Variable	Level of Scores	Frequency	Percentage
Anxiety	Abnormal (17-24)	0	0.0
	Borderline abnormal (9-16)	44	38.6
	Normal (0-8)	70	61.4
Depression	Abnormal (13-18)	0	0.0
	Borderline abnormal (7-12)	36	31.6
	Normal(0-6)	78	68.4

Variable	Level of Scores	Frequency	Percentage
Coping	Effective coping . (196-240)	3	2.6
	Good coping (151-195)	29	25.4
	Poor coping (106-150)	65	57.0
	Ineffective coping (60-105)	17	14.9
Sleep Quality	Poor sleep	114	100.0
	Good sleep	0	0.0

Out of the 114 participants, 70 (61.4%) did not experience symptoms of anxiety, while 44 (38.6%) reported borderline anxiety (Table 1). Regarding depression, 36 (31.6%) HCWs experienced borderline abnormal depression. Additionally, 57 percent of the participants exhibited poor coping skills, and notably, all HCWs (100%) reported poor sleep quality during the second wave of COVID-19.

Table 2: Mean, Standard deviation, maximum and minimum of anxiety depression, coping and sleep quality (N=114)

Variable	Mean	SD	Maximum	Minimum
Anxiety	6.93	3.96	16	0
Depression	4.66	3.11	12	0
Coping	134.04	33.73	237	60
Sleep quality	12.21	2.62	20	8

Table 2 depicts that the anxiety score was 6.93 (SD = 3.96), ranging from 0 to 16, while the mean depression score was 4.66 (SD = 3.11), with a range of 0 to 12. For coping strategies, the mean score was 134.04 (SD = 33.73), with a minimum of 60 and a maximum of 237. Sleep quality scores averaged 12.21 (SD = 2.62), varying between 8 and 20. These findings indicate that most participants experienced moderate anxiety and depression, with significant variability in coping strategies and consistently poor sleep quality across all respondents.

Table 3 shows a significant association between anxiety levels and HCWs' marital status and living conditions at a 0.05 significance level. Unmarried HCWs and those not living with family had higher anxiety levels. The association was also computed between depression, coping strategies and participants' characteristics which reveals no significant association between participants' characteristics and coping or depression levels among HCWs during COVID-19.

Discussion

In our study of 114 HCWs at a tertiary care teaching hospital in Central India, 38.6 percent experienced anxiety and 31.6 percent reported depression. Additionally, 57 percent exhibited poor coping mechanisms, and all HCWs demonstrated subpar

sleep quality. The mean anxiety score was 6.93 (SD 3.96), the mean depression score was 4.66 (SD 3.11), the mean coping score 134.04 (SD 33.73), and the mean sleep quality score was 12.21 (SD 2.62).

Similar findings reported by Gupta et al (2020) in India who found that 29.3 percent of healthcare workers experienced anxiety disorders. A meta-analysis on COVID-19's impact on healthcare workers in China revealed rates of 23.2 percent for anxiety and 22.8 percent for depression. Zang et al (2020) observed prevalence rates of 44.7 percent for anxiety and 50.7 percent for depression among healthcare professionals. Memarian et al (2023) reported a mean depressive symptom score of 11.67 with a standard deviation of 2.68, with 29.6 percent of participants exhibiting depressive symptoms. Additionally, the mean score for sleep quality was 5.47 with a standard deviation of 3.02, with 59.6 percent of participants experiencing poor sleep quality. Wang et al (2020) found that 35 percent of HCWs in China displayed symptoms of depression amidst the COVID-19 outbreak. Additionally, approximately 61.6 percent of HCWs encountered sleep issues during this period. Zarzour et al (2020) observed that 61.5 percent of participants exhibited moderate to severe symptoms of anxiety, while 48.4 percent experienced poor sleep quality.

A similar observation in a study by Naik et al (2022) showed that 80 percent of HCWs experienced altered sleep quality. Similarly, Qi et al (2020) showed identified that 71.7 percent of HCW's had poor sleep quality. During COVID-19, the prevalence of anxiety and depression in India was slightly higher compared to China. Besides, sleep quality among frontline HCWs in India was notably poor. Conversely, in Iran as well as China sleep quality was reported to be better than in India.

This was not the first time India had battled an outbreak, unprepared for the sudden upsurge and large-scale rampage, which led to widespread panic, longer hours of work for HCWs, the incidence of panic at not having enough resources for protection, compiled with the piling of cases, heaps of deaths not only in India but across the world. All this left a sense of profound loss of surety among these workers, thus putting their health indicators at risk. The incidence of anxiety, depression, disturbed sleep patterns, and physical as well as emotional breakdown as cited by several studies that sought to understand the problems faced by HCWs, highlight the need for the Government as well as the institutions employing the HCWs, to identify appropriate measures to promote moral, mental as well as physical health under such trying circumstances as was faced during the COVID - 19 pandemic. Our study's primary strength is its

Table 3: Association between level of anxiety and participant's characteristics (N=114)

Demographic data		Levels (N=114)			Association with anxiety score				
Variables	Options	Abnormal	Borderline abnormal	Normal	Chi Test/ Fisher Exact	p value	df	Table value	Result
Age	≤ 20 years	0	1	1	4.294	0.368	4	9.488	Not significant
	21-30 years	0	30	50					
	31-40 years	0	9	18					
	41-50 years	0	3	1					
	51-60 years	0	0	0					
	>60 years	0	1	0					
Gender	Male	0	18	33	0.425	0.515	1	3.841	Not significant
	Female	0	26	37					
Marital Status	Unmarried	0	23	17	11.994	0.017	4	9.488	significant
	Married	0	16	44					
	Married with children	0	4	8					
	Widowed	0	1	0					
	Divorced	0	0	1					
Religion	Hindu	0	38	63	1.855	0.603	3	7.815	Not significant
	Muslim	0	2	2					
	Christian	0	3	5					
	Buddhist	0	1	0					
Educational level	High school	0	7	5	2.216	0.330	2	5.991	Not significant
	Graduate	0	31	55					
	Postgraduate	0	6	10					
	Doctorate	0	0	0					
Profession	Doctor	0	1	1	2.266	0.519	3	7.815	Not significant
	Nurse	0	38	65					
	Paramedics	0	1	0					
	Hospital attendants/ supporting staff	0	4	4					
Monthly family income (Rs)	Up to 20,000	0	7	14	9.948	0.077	5	11.070	Not significant
	21,000-40,000	0	5	1					
	41,000-60,000	0	8	6					
	61,000-80,000	0	14	29					
	81,000-1,000,00	0	6	7					
	>1 lakh	0	4	13					
Area of residence	Rural	0	17	17	2.658	0.103	1	3.841	Not significant
	Urban	0	27	53					
Living condition	Alone	0	11	20	12.101	0.002	2	5.991	Significant
	With family members	0	17	43					
	Hostel resident	0	16	7					
Previous history of mental illness	No	0	44	68	1.280	0.258	1	3.841	Not significant
	Yes	0	0	2					
Any history of non-communicable illness	No	0	41	64	0.114	0.735	1	3.841	Not significant
	Yes	0	3	6					

emphasis on frontline HCWs who contracted 2nd wave of COVID-19, as they faced the greatest difficulties and complications during the pandemic.

Limitation: The study was limited to one tertiary care hospital in Central India and there may be response bias particularly due to using an online Google form to collect the data.

Nursing implication

A congenial work environment with a special emphasis on the maintenance of sound mental health by incorporating adequate session of breaks, manageable duty schedules, and counselling sessions targetted mental health interventions and support systems for healthcare workers as and when required are crucial to keep the morale of the healthcare workers high to combat pandemics.

Recommendation

- An exploratory study using a mixed method design may be undertaken to better understands the psychological toll of the pandemic on frontline workers and develop strategies to mitigate these effects.
- Intervention can be planned to improve coping strategies and its effectiveness can be assessed.

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Conclusion

This study among healthcare workers during the second wave of COVID-19 revealed borderline abnormal anxiety and depression, as well as poor coping skills and sleep quality. There is a need to enhance coping skills and sleep quality to improve functioning

and manage anxiety and depression. The conditions faced by frontline HCWs during 2nd wave of COVID-19 provide concrete data for the requirement of strong interpersonal communications, assurances, and a sense of safety in the work atmosphere.

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