



OPEN A 2-year longitudinal study of anxiety caused by COVID-19 and job burnout among Iranian healthcare workers

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Limited longitudinal studies can be found to describe the psychological effects of COVID-19 on healthcare workers (HCW); Therefore, the present study aimed to investigating the anxiety caused by COVID-19 (COV-anxiety) and job burnout (JB) among a sample of Iranian HCW during this pandemic longitudinally. This longitudinal study performed on 310 Iranian HCW. The data collection is done twice during 2020 and 2022. The Corona Diseases Anxiety Scale (CDAS) and the Maslach Burnout Inventory (MBI) have been used through online platform (Google Form). Using frequency tables, Paired-samples T tests, Pearson correlations as well as linear regression modeling data were analyzed through SPSS 16. While reductions observed in prevalence of COV-anxiety in time 2, the prevalence of severe levels of JB dimensions increased in time 2 compared to time (1) Negative correlations existed between JB and COV-anxiety. Moreover, using multivariate linear regressions, we found that COV-anxiety and JB were the final predictors of each other both in time 1 and (2) Despite the positive association between COV-anxiety and JB, increasing in JB levels with respect to decreasing in COV-anxiety levels highlights the existence of other risk factors that should be considered in future research.

Keywords COVID-19, Anxiety, Job burnout, Healthcare, Pandemic

Along with the progress of technology and population increase, mental preoccupations and conflicts have also increased. Nowadays, most of individual's mental preoccupations are related to their jobs. From a health and safety perspective, all jobs have their own problems. HCW consisting of doctors, nurses, etc., have an important role in the public health of a society¹. In a way, many studies have shown that the health status and wellbeing of HCW is associated with patient safety as well as public health². Therefore, it is not surprising that we found a lot of research performed to study various aspects of HCW' health and its impacts^{1,3,4}. Moreover, since 2019 with the appearance of COVID-19, the majority of studies in this regard focusing on these occupational setting. Especially for HCW who faced with positive cases of COVID-19 during their working hours, the rate of COVID-19 induced anxiety (COV-anxiety) was high. As reported in a meta-analysis by Santabárbathat prevalence of COV-anxiety was up to 43% among frontline HCW⁵. Moreover, Kibert et al.⁶ and Chirico et al.⁷ also stated that the moderate and severe levels of this type of anxiety was prevalent among this occupational group.

A domino effect can be assumed to be existed which it can be started with negative stress due to the high workload and continued with decreasing in career passion and job satisfaction^{1,8}. Long time working without work pleasure simply leads to job burnout⁹. Job burnout (JB) is another well addressed issue during the COVID-19 pandemic^{10,11}. It is state which individuals are emotionally exhausted and/or depersonalized and/or they tough personally inadequate. These are three main symptoms of JB developed by Maslach¹². As a syndrome, job burnout adversely affects individuals' job performance as well as increase in the rate of absenteeism¹³. So many previous research reported high prevalence for severe levels of job burnout among HCW during the COVID-19 pandemic^{14,15}.

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Reviewing the literature regarding the impacts of COVID-19 on HCW worldwide revealed several cross-sectional studies documenting the prevalence of both COVID-19 anxiety and burnout among this occupational group. Iranian researchers also documented the status and risk factors of COVID-19 anxiety and job burnout among physicians, nurses, and other hospital staff using cross-sectional studies^{16–19}. Moreover, we found several review studies on this topic. For instance, Zaree et al. reviewed seven studies conducted on job burnout among nurses and demonstrated that the severity of this syndrome ranges from moderate to high²⁰. “Rezaee Hachesu et al. also reviewed 10 studies and reported that the prevalence of anxiety among Iranian nurses was 54%²¹. In a systematic review and meta-analysis conducted by Ghahramani et al., the mental health problems of Iranian HCW were described. In this meta-analysis, insomnia emerged as the leading mental health concern among HCW amid the COVID-19 pandemic. Moreover, they reported that other prevalent mental issues included anxiety, PTSD, depression, and stress²².”

Along with cross-sectional and review studies, longitudinal studies are essential to explore the trends and changes in the above-mentioned mental health issues. To the best of our knowledge, only a few longitudinal studies have been published that investigate job burnout and COVID-19 anxiety among HCW. We searched using related keywords in several databases and found a few related documents. Identifying the factors associated with insomnia symptoms during COVID-19 was the aim of a longitudinal study conducted by Abdalla et al. among a group of HCW in New York City. They reported an overall elevation in the high rate of insomnia ten weeks after the baseline measurement²³. “Another longitudinal study conducted simultaneously among HCW from several countries, including Iran, showed that HCW experienced a notable rise in depressive and anxiety symptoms. Those with high levels of these symptoms at both studied times also had a history of mental illness, exhibiting lower self-compassion and a decreased sense of coherence over time²⁴. Armstrong et al. stated in their longitudinal study that ‘hospital staff reported an increase in burnout levels throughout the eight-month period’²⁵. A prospective longitudinal survey published by Maunder et al. showed the highest rate of burnout among nurses compared to other HCW. They reported that while emotional exhaustion improved over time, it remained higher than before the pandemic²⁶.”

We also found a systematic review of longitudinal studies which showed heterogeneous results. According to this review, various mental health problems such as anxiety, insomnia, and depression worsened over time in the majority of included papers, while positive changes were observed in the remainder²⁷.

Iranian HCW face several work-related issues, including high workload, long and frequent shifts, low levels of social support, low levels of supervisor support, and living in a low-income country. These factors can synergistically affect their mental health. The COVID-19 impacts on so many occupational settings are well documented in previous research. Focusing on HCW, also several studies done. However, as mentioned, most previous studies are designed cross-sectionally^{28–32}. The main limitation of cross-sectional studies is related to their less power in discovering causal relationships³³. Also, using these studies we are not able to observe the changes in a specific phenomenon (e.g. job burnout and anxiety); whereas longitudinal studies cover all these limitations. Given the advantages of longitudinal studies compared to cross-sectional studies, it can be said that there is shortage of longitudinal data driven models to predict the factors associated with anxiety and job burnout during pandemics like COVID-19. Thus, present study aimed to investigate and prediction of COVID-19 anxiety and JB among a sample of Iranian HCW during two years of facing with the pandemic.

Materials and methods

Study design and participants

This is a longitudinal study performed on 310 individuals working as HCW in a hospital located in the southeast of Iran. Data was collected twice; the first series of data was collected between April and May 2020. The second time of data collection was May 2022 (approximately 2 years later). We initially had 353 participants in the first phase of data collection. It is noteworthy that our initial results were published in an internal journal in Iran³². By the second phase of data collection, we had 310 participants remaining. Therefore, we conducted our longitudinal research on these HCW to ensure the best possible comparison of conditions between T1 and T2. The respondents included all job groups in the hospital (i.e. nurses, physicians, and other hospital staff). Participation in this study was entirely voluntary, and all participants signed an informed consent form. It is worth mentioning that the inclusion criteria were having at least 1 year of experience in the first phase of data gathering, and not having a second job or extra activity in any governmental or non-governmental clinics. Data were collected anonymously; however, to follow-up the respondents, the Personal Code was asked to fit data based on it. It should be noted that all methods were carried out in accordance with Iran National Committee for Ethics in Biomedical Research which approved by Hamadan University of Medical Sciences (code: IR.UMSHA.REC.1401.175).

Measurement tools

The current study was survey-based research that used a three-part questionnaire. The first section of the questionnaire aimed to obtain the demographic and job characteristics of individuals (i.e., age, work experience, sex, marital status, job, shift type, death of a family member due to COVID-19, and vaccine type). The second section of the questionnaire was about assessing the burnout syndrome, and the last part assessed the COVID-19 anxiety among participants. It should be noted that the questionnaire was provided as a Google Form, and the link sent to participants through e-mail, WhatsApp, and Telegram. The link contains a brief description of the project as well as the informed consent form, which individuals could sign it online.

COVID-19 anxiety

To assess the COVID-19 anxiety, The Corona Diseases Anxiety Scale (CDAS) was used. This questionnaire has been developed by Alipour et al.³⁴. It has 18 items and assesses two aspects of anxiety called psychological symptoms

(items 1–9) and somatic symptoms (items 10–18). Its scoring was based on a 4-choice Likert (0 for “Never” and 3 for “Always”). Alipour et al. reported that the questionnaire validity was assessed based on the GHQ-28, which showed significant correlations with the relevant subscales of the GHQ-28. Also, they reported that Cronbach’s alpha for psychological and somatic symptoms were 0.87 and 0.86, respectively, and it was 0.92 for the total questionnaire. The questionnaire has been used frequently in previous research and has shown good validity^{35–37}. In the present study, its reliability was assessed using Cronbach’s alpha, which was 0.81 for the total questionnaire.

The raw scores of the questionnaire and its subscales were converted to qualitative levels such that in the psychological symptoms, the scores between 0 and 5 indicated the low level, the scores between 6 and 19 indicated the moderate level, and the scores between 20 and 27 indicated the high level of anxiety. For the somatic symptoms, the low level of anxiety was expressed by the scores between 0 and 1. The scores between 2 and 9 indicated a moderate level of anxiety in terms of somatic symptoms, and the severe somatic symptoms are expressed by the scores between 10 and 27. These categories exist for the total questionnaire, too. The scores between 0 and 16 showed the low level, the scores between 17 and 29 were representative of the moderate level, and the scores between 30 and 54 indicated severe levels of anxiety.

Job burnout

Using the Maslach Burnout Inventory (MBI), the burnout syndrome of individuals was assessed. The MBI is the most commonly known scale for the assessment of burnout³⁸. It has 22 items and measures three aspects of burnout, including “Emotional Exhaustion” (EE), “Personal Inadequacy” (PI), and “Depersonalization” (DP). The scoring system for MBI is based on a 7-choice Likert (from 0 for “Never” to 6 for “Always”). The Persian version of MBI was developed by Filian³⁹ and its validity and reliability were assessed later by Moalemi et al.⁴⁰. Previous research used the Persian version of MBI frequently and confirmed its validity and reliability⁴¹. However, its reliability was assessed in this study ($\alpha = 0.78$).

The scores of each subscale of burnout have been categorized into three qualitative levels: low, moderate, and high. These categorizing were as follow:

- In EE, the scores between 0 and 16 were indicated as low; the scores between 17 and 26 were indicated as moderate, and the scores equal to or more than 27 were indicated as high.
- In DP, the scores between 0 and 6 were indicated as low; the scores between 7 and 12 indicated as moderate, and the scores equal to or more than 13 were indicated as high.
- In PI, the scores between 0 and 31 were indicated as high; the scores between 32 and 38 were indicated as moderate, and the scores equal to or more than 39 were indicated as low.

Data analyzing

Using the frequency tables, the descriptive analysis of data was done. Then, using the paired samples T-tests, the values of anxiety caused by COVID-19 (COV19-anx) and job burnout (JB) in time 1 and time 2 were compared. Moreover, the predictors of during the surveyed period were identified using linear regression modeling. Moreover, the existing linear correlations between the changes in job burnout and anxiety dimensions values investigated using Pearson correlations. All statistical analyzing was performed using the Statistical Package for the Social Sciences (SPSS) version 16.0 (<https://www.ibm.com/products/spss-statistics>) considering 0.95 of confident interval and $p < 0.05$ for all tests.

Results

Demographic and job characteristics

The mean age was 30.71 ± 6.82 with the range of 20 to 56 years, and the mean work experience was 7.07 ± 6.59 with the range of 1 to 35 years, at the first time of data collecting. More than half of the respondents had an age range between 20 and 29 years and most of them had experience of work less than 10 years. Most participants were nurse (62.9%), female (59.0%), married (59.4%), had rotating shift (72.9%), and no faces to family death due to COVID-19 (64.5%). Also, it was found that more than half of individuals were vaccinated with the Sinopharm vaccine. These data are given in detail in Table 1.

COVID-19 anxiety

The mean scores of COV-anxiety and its subscales were reduced in time 2 compared with time 1. Using the paired samples T-tests, it was found that all these changes were statistically significant ($P < 0.001$). The exact values of COV-anxiety and its subscales in Time 1 and Time 2 has been shown in Fig. 1.

Moreover, Fig. 2 depicted changes in the prevalence of COV-anxiety in time 1 and 2. As it can be seen, the prevalence of severe levels of psychological and somatic symptoms as well as the total anxiety reduced in time 2 compared with time 1.

Using multivariate linear regressions, the predictors of COV-anxiety in the two surveyed times were identified (Tables 2 and 3). As it can be observed, EE in time 1 and PI in time 1 were the final predictors of COV-anxiety values in time 1 ($\beta = 0.652$, $P < 0.001$; $\beta = -0.104$, $P = 0.032$, respectively). Similarly, EE in time 2 and PI in time 2 were the final predictors of COV-anxiety values in time 2 ($\beta = 0.370$, $P < 0.001$; $\beta = -0.162$, $P = 0.009$, respectively). The models’ evaluation criteria were $R^2 = 0.442$, and $R^2 = 0.178$ for the two above-mentioned models.

Job burnout

Investigating the subscales of JB in time 1 and time 2 (Fig. 3) demonstrated increases in the levels of JB among individuals in time 2, in comparison with time 1. It is worth mentioning, increase in the mean values of EE and

Variable	Group	n (%)
Age	20 – 29 years	172 (55.5)
	30- 39 years	100 (32.3)
	≥ 40 years	38 (12.2)
Work experience	1 – 9 years	235 (75.8)
	≥ 10 years	75 (24.2)
Sex	Male	127 (41.0)
	Female	183 (59.0)
Marital status	Single	126 (40.6)
	Married	184 (59.4)
Job	Nurse	195 (62.9)
	Physician	40 (12.9)
	Others	75 (24.2)
Shift type	Fixed	84 (27.1)
	Rotating	226 (72.9)
Death of a family member	No	200 (64.5)
	Yes	110 (35.5)
Vaccine type	AstraZeneca	89 (28.7)
	Sinopharm	161 (51.9)
	Sputnik	46 (14.8)
	Other types	14 (4.5)

Table 1. The demographic and job characteristics of individuals.

DP were indicated higher levels of JB; whereas the decrease in the mean value of PI was pointed out the same results. As it was depicted in Fig. 3, both increasing in EE and decreasing in PI were statistically significant ($P < 0.01$); however, the slight increase in DP was not significant ($P > 0.05$).

Moreover, investigation of the JB prevalence among individuals was one of the study questions. As it has been shown in the Fig. 4, the increases were observed in severe levels of EE and DP as well as PI in time 2 (31.0, 10.0, and 75.8%, respectively) compared with time 1 (22.9, 7.4, and 57.1%, respectively).

Same as reported for COV-anxiety in previous section, using multivariate linear regressions, the predictor roles of demographic variables as well as anxiety were surveyed in predicting the values of EE (the representative subscale for JB) both in time 1 and 2. As it can be observed in Table 4, experience, and COV-anxiety value in time 1 were the final predictors of EE in time 1 ($\beta = -0.276$, $P = 0.020$; $\beta = 0.632$, $P < 0.001$, respectively). Table 5 also showed that the only predictor of EE in time 2 was COV-anxiety value in time 2 ($\beta = 0.385$, $P < 0.001$). The models' evaluation criteria were $R^2 = 0.449$, and $R^2 = 0.156$ for the two above-mentioned models.

The correlations between changes in anxiety and job burnout dimensions were summarized in Table 6. The moderate correlations between the changes in anxiety dimensions and EE were observed. Also, week correlations were observed between anxiety dimensions and other two dimensions of job burnout.

Discussion

The continuation of the COVID-19 pandemic for approximately three years growth the global concern. During this time, several studies were done by researchers over the world to describe the psychological impacts of this phenomenon on various working and general populations, especially on HCW. But there were a few longitudinal results that showed the status of these psychological impacts over time and their associated factors. HCW act as frontline in facing this pandemic. Despite the pandemic is now finished, there are so many lessons we should learn to better manage the next possible similar pandemics in future. Regarding the importance of the issue among HCW, the present study designed to investigate the changes in COV-anxiety and JB among a sample of Iranian HCW during two years of facing with this pandemic (since May 2020 to May 2022).

COVID-19 anxiety

Using the CDAS, two main aspects of COVID-19 anxiety have been measured in this study: psychological and somatic symptoms. In terms of psychological symptoms, it was observed that the severe levels reduced in time 2 compared with time 1 (-9%). More investigation in this regard indicated that the scores of psychological symptoms were reduced only in 82 cases, and in most of them (199 cases) any changes not observed. In other words, it can be said that regardless the prevalence of severe psychological symptoms has been reduced, these symptoms not alleviated in most individuals. This finding revealed the fact that the psychological impacts sustained for long time. Other aspect of COVID-19 anxiety was the somatic symptoms. These symptoms are included headaches, tachycardia, sleep disturbance, decreased appetite and so on. Our results showed that the prevalence of severe levels of the somatic symptoms were reduced nearly 5% from time 1 to time 2. Moreover, it was found that in most individuals (126 cases) the levels of somatic symptoms were alleviated. It means that the change in somatic symptoms takes less time. Indeed, it is not surprising that COV-anxiety alleviated after two years of subjecting to it. This matter happens through several mechanisms. Exposure to critical and anxious

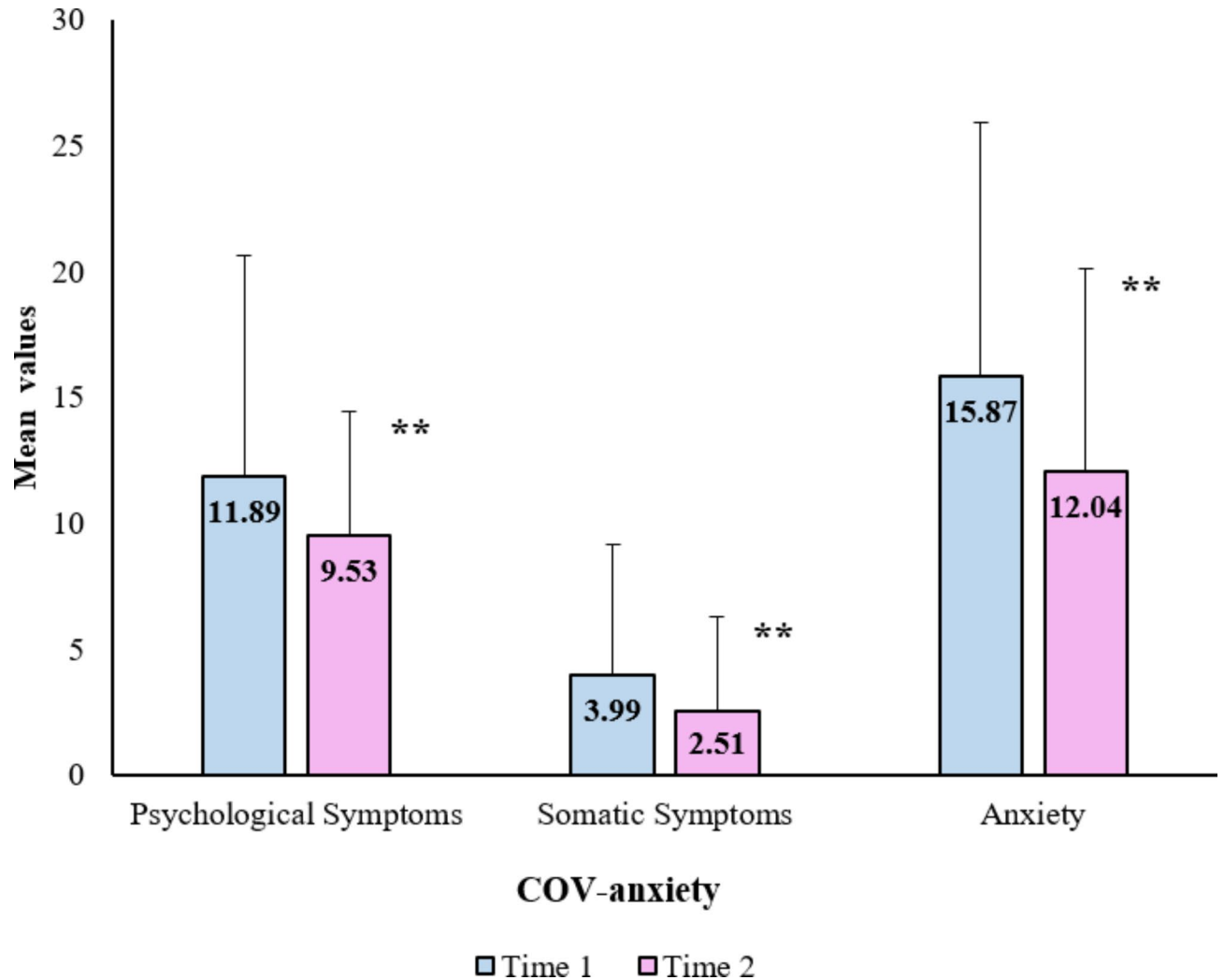


Fig. 1. The mean values of COV-anxiety and its subscales in Time 1 and Time 2; Double stars indicated $p < 0.01$.

conditions for a long time during the pandemic along with implementation of vaccination program leads to the normalization of these conditions and reduction of anxiety levels. Also, decrease in workload due to reduction of positive cases and hospitalization times can result in alleviating the somatic outcomes of anxiety. Several studies proved negative relationships between workload and physical and psychological health status among HCW⁴²⁻⁴⁴.

Job burnout

An increase was found in number of individuals reporting severe levels of EE after two years of investigation which indicated that the HCW experience more exhaustion over time. The same results were obtained by Martin et al.⁴⁵ and Armstrong et al.²⁵. The increased emotionally exhausted individuals can be due to several occupational and non-occupational factors such as virtualization of work meetings and scientific congress as well as decreased time spending with family. Using linear regressions models, we found that increasing in job experience was associated with decreasing in job burnout (based on EE) in the first phase of data collection; however, in the second phase of data collection, job burnout had no relationship with work experience. By increasing in work experience, early career workers tend to report higher JB due to lower job involvement and increased stress factors like role ambiguity⁴⁶. In this study the mean of work experience for participants were approximately 7 years and most of them (75.8%) had less than 10 years of experience. Therefore, it is normal to expect an increase in JB during two years of investigation.

Moreover, the prevalence of severe levels of PI increased after two years of survey. PI refers to individuals' self-evaluation of their skills and performance. Our findings indicate that due to some factors such as high workload, less treatment apparatuses and/or low levels of knowledge for treatment of COVID-19 positive cases, HCW fail frequently and facing to several died cases. Thus, they feel that they are not adequate for this job.

We observed that COV-anxiety positively associated with job burnout both in first and second time of data gathering. Based on regression models, our studied variables can predict 44% of changes in EE in the first phase

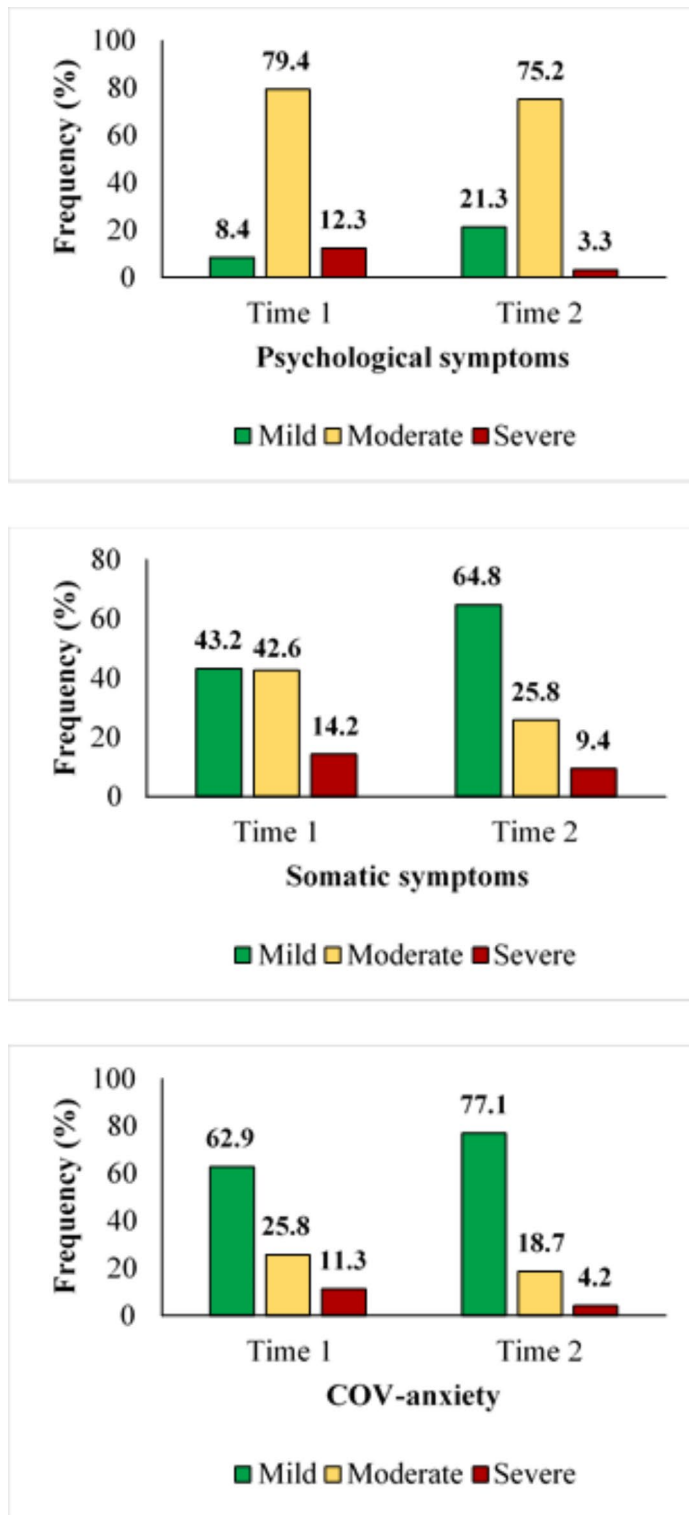


Fig. 2. The prevalence of COV-anxiety and its subscales during Time 1 and Time 2 of data collection.

of data selection. This rate decreased to 15% in the second phase. These results showed that during COVID-19 pandemic, several factors could be associated with JB. Personality may be one of these factors which can mediate the relationship between job burnout and anxiety. As Martin et al. reported, some demographic variables as well as personality traits are associated with increasing in job burnout. Moreover, Armstrong et al. also stated that a negative relationship was observed between resilience and job burnout. It can be concluded that more experienced individuals and those with higher levels of resiliency can better manage the stressful conditions. As mentioned in previous studies, perceived support from supervisors also can mediate the adverse impacts of

	Unstandardized coefficients		Standardized coefficients	t	p-value	Model evaluation criteria
	B	Std. error	Beta			
(Constant)	9.501	5.311		1.789	0.075	R = 0.665 R ² = 0.442
Age	-0.130	0.179	-0.088	-0.727	0.468	
Sex	1.300	0.931	0.064	1.396	0.164	
Marital status	0.112	0.990	0.005	0.113	0.910	
Job	0.565	0.520	0.048	1.086	0.278	
Experience	0.243	0.183	0.159	1.329	0.185	
Shift type	0.508	1.021	0.022	0.497	0.619	
EE in time 1	0.530	0.045	0.652	11.712	0.000	
DP in time 1	-0.119	0.113	-0.058	-1.058	0.291	
PI in time 1	-0.125	0.058	-0.104	-2.152	0.032	

Table 2. Multivariate linear regression model: coefficients for COV-anxiety in time 1. Significant values are in bold.

	Unstandardized coefficients		Standardized coefficients	t	p-value	Model evaluation criteria
	B	Std. error	Beta			
(Constant)	16.037	5.517		2.907	0.004	R = 0.422 R ² = 0.178
Age	-0.125	0.176	-0.105	-0.712	0.477	
Sex	-0.627	0.881	-0.038	-0.712	0.477	
Marital status	0.243	0.965	0.015	0.252	0.801	
Job	-0.693	0.509	-0.073	-1.362	0.174	
Experience	0.167	0.178	0.136	0.936	0.350	
Shift type	0.279	0.990	0.015	0.281	0.779	
EE in time 2	0.248	0.040	0.370	6.266	0.000	
DP in time 2	-0.173	0.120	-0.094	-1.448	0.149	
PI in time 2	-0.159	0.060	-0.162	-2.637	0.009	

Table 3. Multivariate linear regression model: coefficients for COV-anxiety in time 2. Significant values are in bold.

stressor factors on individuals mental health (i.e. job burnout)⁴⁷. Therefore, it is highly recommended to more support HCW especially during pandemics to reduce JB rate and its negative outcomes among them.

Another finding of this study is related to the light increasing in percentage of individuals who reported severe levels of depersonalization (7.4% in time 1 and 10.0% in time 2). Depersonalization is related to the human sense which responsible to make good relationships with others and to be kindly with them. Interpersonal relationship in critical organizations such as hospitals has special important in terms of organizational reliability as well as reduce job stress among staffs. As previously stated by so many researches (e.g. Rahmani et al.¹) job stress is negatively associated with job satisfaction and it can lead to JB over time. Also it is reported that depersonalization is associated with low agreeableness and neuroticism in previous research^{45,48}. As we know, JB is adversely affecting job performance; therefore, this issue should be addressed in similar situations in future (i.e. future crisis and disasters).

In this longitudinal study we found that despite COV-anxiety being alleviated after 2 years of investigation, severe levels of job burnout have increased. These findings may have several reasons. The first reason is related to post traumatic stress disorder (PTSD). Facing to COVID-19 pandemic, loss of loved ones (family members or friends) can have long-lasting psychological effects which remains after the end of the pandemic⁴⁹. "Some supporting evidence exists in this regard. Lanzara et al., in their longitudinal study, reported an increase in the level of certain mental health problems, such as depression, in T2 compared to T1²⁴."

After pandemics such as COVID-19, psychological interventions are necessary to improve the mental health of HCW⁵⁰. In Iran's hospitals, any psychological interventions not implemented for them. "Moreover, as stated in the [Introduction](#) section, Iranian HCW face various harmful occupational factors, such as high workload and inadequate leisure time due to the shortage of HCW in most hospitals, economic-related problems due to living in a low-income country, and so on. Additionally, Iranian HCW often work with low levels of social and supervisory support throughout much of their careers. As previously discussed, not only COV-anxiety but several factors exist to be associated with JB. It can be said that JB is the last loop of psychological distress cycle which may start with fear, anxiety, and stress. In other words, long time working in anxious and/or stressful conditions lead to JB. Reducing the level of COV-anxiety can't lead to reduction in JB severity immediately. The process of this reduction occurs slowly and depends on several factors which mentioned previously. Since it was

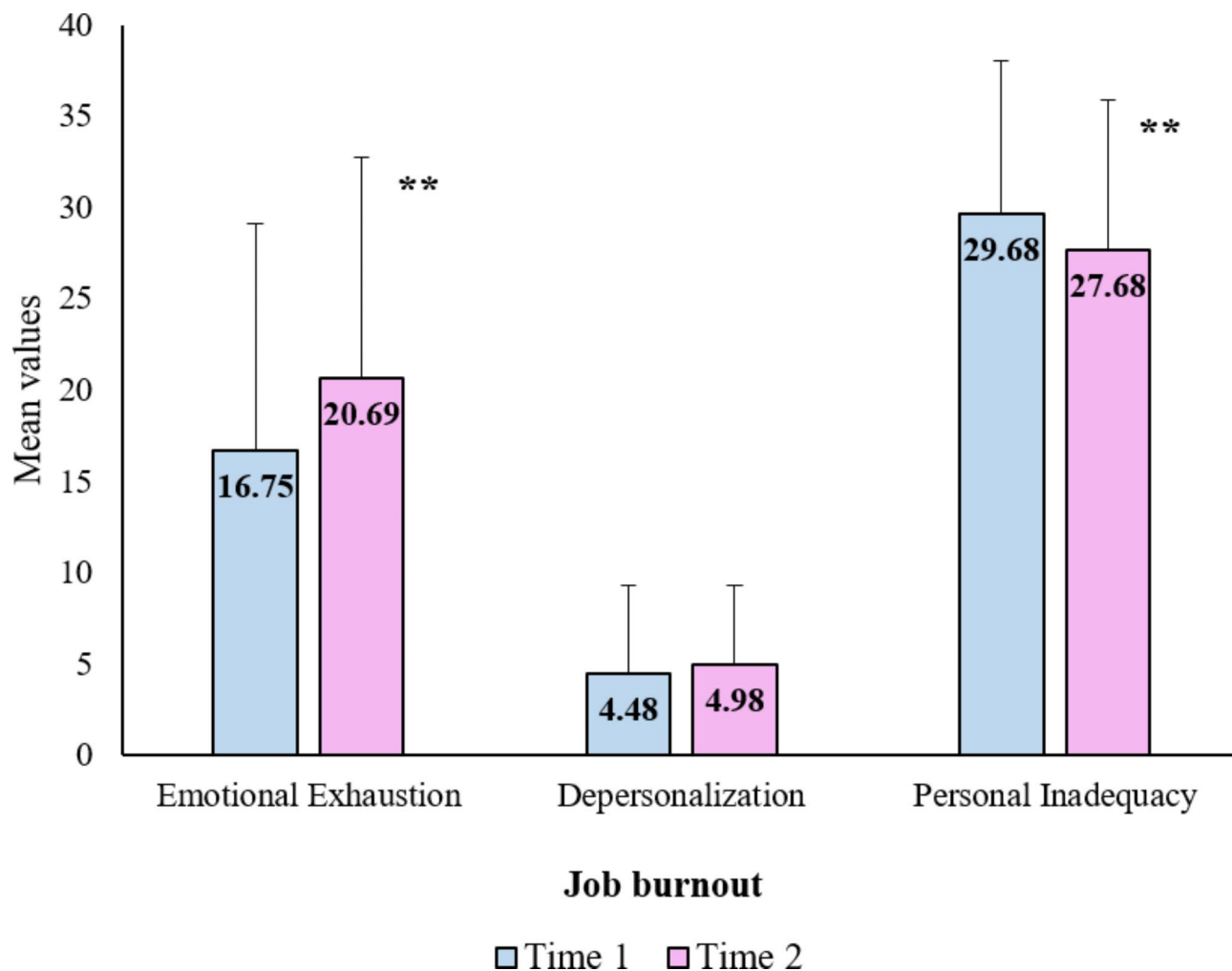


Fig. 3. The mean values of JB subscales in Time 1 and Time 2; Double asterisk indicated $p < 0.01$.

well documented that JB had adverse impacts on workforce, as an important lesson learned from COVID-19 pandemic, it is highly recommended to designing some interventions in workplaces to reducing the risk of JB in future disasters. Also, as another lesson learned, we are suggesting holding some emergency manures to prevent skill decay and maintain HCW ability at high level in which they can faced to any crisis situations without fear and anxiety. The last but not least lesson learned is to manage workload in crisis situations (i.e. future pandemics) to reduce its adverse physical and psychological effects.

Along with the strength of our longitudinal study, it also has some limitations. The first limitation is related to subjective measuring of both COV-anxiety and JB. If possible, objective measures are more reliable and had less biases. The second limitation of this study is that we did not record more factors which potentially may be associated with JB (such as workload and personality). Therefore, it is highly recommended that giving the results of this study, more comprehensive studies designed to manage the JB among HCW in future critical situations.

Conclusion

Overall, decreasing in prevalence of severe COV-anxiety and increasing in prevalence of severe JB were observed during two surveyed years. Using Pearson correlations, we found that positive correlations existed between COV-anxiety and JB. Regardless these positive associations, increasing in JB levels with respect to decreasing in COV-anxiety levels reveals this fact that JB is multifactorial and the reduction in its severity needs sufficient psychological interventions as well as more time. Giving the importance of JB and its adverse impacts on healthcare performance, more comprehensive studies should be designed to identify all risk factors affecting anxiety and JB among HCW in future pandemics and similar crisis.

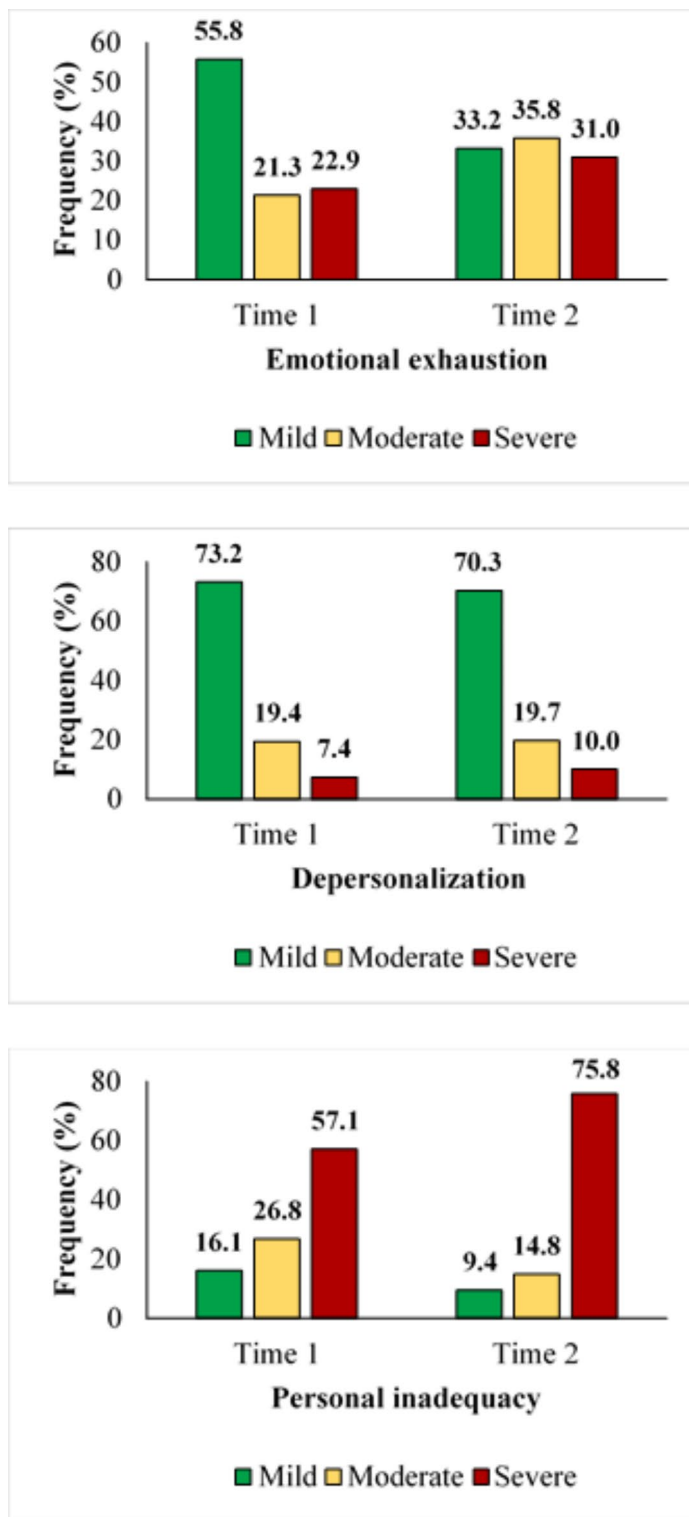


Fig. 4. The prevalence of JB subscales during time 1 and time 2 of data collection.

	Unstandardized coefficients		Standardized coefficients	t	p-value	Model evaluation criteria
	B	Std. error	Beta			
(Constant)	-2.053	6.326		-0.325	0.746	R=0.670 R ² =0.449
Age	0.375	0.216	0.207	1.734	0.084	
Sex	1.421	1.117	0.056	1.271	0.205	
Marital status	-2.026	1.200	-0.080	-1.688	0.092	
Job	-0.641	0.630	-0.044	-1.017	0.310	
Experience	-0.519	0.221	-0.276	-2.346	0.020	
Shift type	0.357	1.236	0.013	0.289	0.773	
COV-anxiety in time 1	0.777	0.054	0.632	14.520	0.000	

Table 4. Multivariate linear regression model: coefficients for emotional exhaustion in time 1. Significant values are in bold.

	Unstandardized coefficients		Standardized coefficients	t	p-value	Model evaluation criteria
	B	Std. error	Beta			
(Constant)	9.632	7.684		1.253	0.211	R=0.395 R ² =0.156
Age	0.270	0.260	0.153	1.037	0.301	
Sex	-0.292	1.325	-0.012	-0.220	0.826	
Marital status	0.440	1.442	0.018	0.305	0.761	
Job	-0.437	0.762	-0.031	-0.574	0.566	
Experience	-0.338	0.266	-0.185	-1.267	0.206	
Shift type	-0.744	1.487	-0.028	-0.501	0.617	
COV-anxiety in time 2	0.574	0.079	0.385	7.245	0.000	

Table 5. Multivariate linear regression model: coefficients for emotional exhaustion in time 2. Significant values are in bold.

	Psychological	Physical	COV-anxiety	EE	DP	PI
Psychological	1	0.707**	0.938**	0.512**	0.129*	-0.278**
Physical	0.707**	1	0.909**	0.498**	0.194**	-0.221**
COV-anxiety	0.938**	0.909**	1	0.547**	0.172**	-0.273**
EE	0.512**	0.498**	0.547**	1	0.420**	-0.367**
DP	0.129**	0.194**	0.172**	0.420**	1	-0.415**
PI	-0.278**	-0.221**	-0.273**	-0.367**	-0.415**	1

Table 6. Correlations between changes in values of COV-anxiety and job burnout dimensions.

**Correlation is significant at the 0.01 level.

*Correlation is significant at the 0.05 level.

Data availability

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Received: 22 April 2024; Accepted: 27 November 2024

Published online: 03 December 2024

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Acknowledgements

We would like to thank all Iranian healthcare workers participating in this study.

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Ramin Rahmani: Data curation, Writing- Original draft preparation. Venus Sargazi: Data curation, Sampling, Writing- Reviewing and Editing. Mehdi Shirzaei Jalali: Data curation, Sampling, Writing- Reviewing and Editing. Mohammad Babamiri: Conceptualization, Methodology, and Supervision. Maryam Farhadian: Methodology, Data analysis, and Supervision.

Declarations

Competing interests

The authors declare no competing interests.

Additional information

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