Original article

Healthcare Workers' Mental Health in Pandemic Times: The Predict Role of Psychosocial Risks

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ABSTRACT

Background: Healthcare workers perform an emotionally exhausting daily work activity, making them prone to occupational hazards, namely psychosocial ones. This study aims to assess the impact of psychosocial risk factors on healthcare workers' mental health.
Methods: A cross-sectional study was developed between May and June of 2021 with 479 healthcare workers from Portuguese hospitals. The Depression, Anxiety and Stress Scale was used to assess mental health, and psychosocial risks were assessed through the Health and Work Survey − INSAT. Statistical analysis was performed to identify the psychosocial risk factors related to anxiety, depression, and stress. Subsequently, a multiple linear regression was performed to identify the models that better explained psychosocial risk factors' relationship with anxiety, depression, and stress.
Results: Data showed a strong exposure to psychosocial risks. Work pace and intensity, work relationships, and emotional demands stood out with higher global average percentages for yes answers to "exposure and discomfort." The analysis of the β values and p-values from the multiple linear regression shows that some cross-sectional psychosocial risks are predictors of anxiety and stress dimensions, and other psychosocial risks differ in the two mental health dimensions. However, it is important to highlight that healthcare workers still showed great joy and pleasure in performing their work activities.
Conclusion: Support network development in the work environment is needed to prevent healthcare workers' emotional stress and promote their psychological well-being. Therefore, new research is essential to understand the psychosocial risks that affect healthcare workers and assess the less visible effects of work−health relationships.

1. Introduction

The pandemic has triggered new challenges for humanity and public health. The past two years have been marked by restrictions with several confinements established by all countries with a high economic and social impact. Social distancing measures changed social interactions leading to different behavioral responses that impacted on mental health [1—4].

This calamity affected health systems and increased the physical and emotional stress on healthcare workers [5—8]. Due to the work

activity and emotional and social demands, healthcare workers' physical and mental health are more likely to be at risk. Healthcare workers are one of the most vulnerable professional groups, revealing mental health disorders: anxiety, depression, and stress levels have increased with the pandemic situation [9—11] aggravated with psychosocial risks such as work overload. This situation has also a strong impact in their daily performance, putting in risk patient safety.

Patient safety, while by itself a fundamental issue for any healthcare organization, became a high priority for healthcare

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systems since the publication of "To Err is Human: building the safer health system" by the Institute of Medicine Report [12]. The importance of understanding the causes underlying errors and adverse events was the backbone of several studies, which noted that common causes are related to organizational factors such as: lack of communication, workload, reduced number of employees, procedures inconsistently implemented, lack of leadership, and lack of operations support [13,14]. A more in-depth analysis of occupational health and safety aspects concluded that many of the risk factors that affect healthcare workers are also directly, or indirectly, error enhancers which may generate adverse events in patient. The improvement of occupational and patient safety climate can improve healthcare workers safety performance and, consequently, decrease occupational and patient-related adverse outcomes for healthcare providers [15—20].

The current COVID-19 pandemic has worsened this situation: healthcare workers performance and mental health were significantly affected, and, consequently, a decrease of the capacity to provide consistent quality of care was noticed [21—23]. World Health Organization and others international organizations developed guidelines and standards to assist improving occupational health and well-being of healthcare workers, but they require well-coordinated measures for occupational health and safety promotion, health workforce management and mental health, and psychosocial support [24]. This has actually shifted the focus to studies that measure the impact of psychosocial risks on healthcare workers' mental health and well-being, due to the increased exposure to different categories of psychosocial risks, including increased workloads, time pressure, difficulties in communication and work organization, high emotional demands, lack of support from staff and management, insufficient social relationships, and ethical and social conflicts at work [21,25,26].

Therefore, the main objective of this study is to analyze the impact of psychosocial risks factors in pandemic times on the mental health of healthcare workers, taking into account the dimensions of anxiety, depression, and stress. This study also aims to identify protective predictors that should be analyzed by organizations in order to promote the mental health of their workers and better manage its impact on patient safety.

2. Methods

2.1. Participants

The sample is composed by 479 healthcare workers: physicians (22.3%), nurses (61.8%), and healthcare assistants (15.9%)—working in public and private hospitals in Portugal's north and center regions. It is mainly composed by 76.6% female and 23.4% male aged between 20 and 74 years (M = 39.01; SD = 10.54). The working time of healthcare workers ranges from those who had worked for less than 1 year to those who had worked for 44 years (M = 13.25; SD = 10.09). Regarding the contract type, 85.4% of the participants work under permanent contract. 91.4 % have full-time, 54.4 % work rotating shifts, and 48.4 % work weekends.

2.2. Procedures

This cross-sectional study was developed with healthcare workers from public and private hospitals in Portugal's northern region (311 healthcare workers from 3 hospitals, 64.9% of the sample, 2 public and 1 private) and center region (168 healthcare workers from 2 hospitals, 35.1% of the sample, 1 public, and 1 private). The aim was to assess the impact of psychosocial risk factors on workers' mental health, particularly in anxiety, depression and stress. The data collected from 479 healthcare workers took place

from May until June 2021. In the first moment, each healthcare worker received an envelope from Human Resources with information regarding the goals of the study and the tools used in the study protocol, which were later returned in a closed envelope after its completion. The return rate in the first moment was low (17%). In the second moment, a new approach was implemented by sending awareness emails to healthcare workers to appeal to their participation. At the end of these two moments the final return rate was 32%. All ethical procedures of an anonymous, confidential, and voluntary questionnaire submission were followed. The study protocol was approved by the Ethics Committee of Fernando Pessoa University (Ref. PI-112/20), respecting all procedures of the Declaration of Helsinki.

2.3. Instruments

The Depression, Anxiety and Stress Scale (DASS-21) [27,28] was used to assess mental health. The DASS-21 consists of three subscales of 7 items, with a total of 21 items. The depression subscale contains items that describe dysphoria, discouragement, devaluation, low self-esteem, anhedonia, and apathy symptoms. The anxiety subscale encompasses items related to situational anxiety and subjective experiences of anxiety and fear. The stress subscale includes items that focus on symptoms such as difficulty to relax, impatience and irritability, as well as low tolerance to frustration and disappointment. This 4-point Likert-type scale (0 = does not apply to me; 3 = applies to me a lot or most of the time) assesses the negative emotional states experienced for anxiety, depression, and stress. The Portuguese version [29] was used, showing good internal consistency and convergent and discriminant legitimacy, with a three-factor hierarchical structure (depression, anxiety and stress). This scale is widely used in several contexts, particularly with healthcare workers [9,30].

The psychosocial risks were assessed through the Health and Work Survey − INSAT. The INSAT Survey [31] is a self-administered questionnaire (in Portuguese) that evaluates the relationships between working conditions, risk factors, and health problems. It is made up of seven axes that mainly include Likert scales (ranging from 0-not exposed to 5-exposed with high discomfort): (I) Work; (II) Working conditions and risk factors; (III) Life conditions outside of work; (IV) Training and work; (V) Health and work; (VI) My health and my work; and My health and my well-being. For this study's purpose, the chosen scale integrated the following psychosocial risk factors at work: work pace and intensity; lack of autonomy; work relationships with co-workers; employment relationships with the organization; emotional demands; ethical and value conflicts; and job characteristics. INSAT has been used in several health-related studies before [32—35].

2.4. Data analysis

Data were analyzed with the support of the IBM SPSS statistical program for Windows, version 2 8.0 (SPSS Inc.: Chicago, IL, USA). The adopted significance level was $p \leq 0.05$. Frequency and percentage analyses were performed on the demographic characteristics of the participants (nominal variables from the INSAT questionnaire). Afterward, all psychosocial risk factors were transformed into nominal variables (0 for "no" answer and 1 for "yes" answer, regardless the discomfort level) to analyze the associations between risk factors and DASS-21 (the main goal of the study was to understand if participants were exposed to psychosocial risk factors, regardless the discomfort level). Then, a Bivariate analysis was performed using point-biserial correlation to identify the psychosocial risk factors related to the dependent variables, particularly anxiety, depression and stress. Subsequently, a

Table 1
Percentage distribution of psychosocial risk factors

	% Yes
High demands and work intensity	**% Yes**
Intense work pace	91.2
Depend on colleagues to do my work	73.2
Depend on direct clients' requests	74.4
Have to deal with contradictory instructions	60.2
Exposed to frequent interruptions	73.4
Exposed to hyper-solicitation	71.5
Working Hours	**% Yes**
Have to continue working beyond my assigned timetable	80.9
Have to "skip" or shorten a meal or not have a break	77.7
Have to maintain permanent availability	57.0
Work Relationships	**% Yes**
Needing help from colleagues and not having it	38.9
My opinion being disregarded for the service's functioning	36.5
Not having recognition by colleagues	31.5
Not having anyone I can trust	24.3
Being exposed to sexual harassment	19.5
Being exposed to moral harassment	28.0
Labor relations	**% Yes**
Lack of means to carry out my work	41.5
I feel exploited most of the time	37.9
Being afraid of suffering a work-related injury	58.5
The organization shows no concern with my well-being	48.4
Remuneration does not allow me to have a satisfactory standard of living	60.1
Carrer progress almost impossible	60.5
Emotional demands	**% Yes**
Have to deal with situations of tension with the public	86.3
Exposed to the risk of verbal aggression	76.4
Exposed to the risk of physical aggression	69.4
Being exposed to the suffering of the others	91.6
Have to simulate good mood and/or empathy	73.6
Have to hide emotions	73.8
Ethical and value conflicts	**% Yes**
Have to do things I disapprove	51.4
Lack the means to do the job well done	44.5
Pleasure and satisfaction at work	**% Yes**
Having the opportunity to do things that give me pleasure	97.5
Having the opportunity to develop professional skills	97.3
Being satisfied with the work performed	97.7
Being a valuable contribution to society	96.9
Having the feeling of a job well done	97.3

Table 2
Descriptive analysis of anxiety, depression and stress values from the DASS-21 scale

Variables	M (SD) Min.−max.	n (%)
Anxiety	4.03 (3.81) 0−15	479 (100%)
Depression	3.48 (3.79) 0−17	479 (100%)
Stress	6.54 (4.62) 0-21	479 (100%)

M, mean; SD, standard deviation.

subscale that translates into persistent states of tension and agitation, irritability, low tolerance to frustration, and difficulties in relaxing and calming down.

For a better and comprehensive analysis, the higher rates for stress can be explain by high rates of positive responses (answered all questions with "applied to me …") to stress subscale items such as: I tended to over-react to situations, 67.2%; I felt that I was using a lot of nervous energy, 61.4%, and I found it difficult to relax, 65.6%. For anxiety, second subscale with higher rates, it can be highlighted items such as: I was aware of dryness of my mouth, 50.2% and I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat), 43.0%. Finally, to depression subscale items it can be pointed: I couldn't seem to experience any positive feeling at all, 31.1% and I felt that I had nothing to look forward to, 29.4%.

After the descriptive analysis, the inferential analysis was performed, starting with the Bivariate analysis to verify the statistically significant correlations between psychosocial risk factors and anxiety, depression, and stress dimensions, respectively. Table 3 shows the results of the psychosocial risk factors, including pleasure and satisfaction at work factors.

Afterward, a multiple linear regression was performed only with the psychosocial work risk factors that showed statistically significant correlations to identify the predictive model of each dimension based on the psychosocial risk factors (Table 4). These risk factors statistically significantly predict Anxiety ($F(3, 0.95) = 7.510$, $p < 0.001$, $R = 0.614$) and Stress ($F(4, 0.95) = 8.394$, $p < 0.001$, $R = 0.642$). For Depression dimension this was not verified and it was removed from this analysis.

The analysis of the β values and respective p-values shows that some cross-sectional psychosocial risks are predictors of anxiety and stress dimensions, and other psychosocial risks differ in the two mental health dimensions. "Have to simulate good mood and/or empathy" ($β = 0.124$; $p = 0.008$ for Anxiety and $β = 0.122$; $p = 0.008$ for Stress) and "Having the opportunity to develop professional skills" ($β = -0.124$; $p = 0.006$ for Anxiety and $β = -0.124$; $p = 0.006$) are shown to be cross-sectional predictors for the manifestation of anxiety and stress, with last psychosocial risk factor working as protector.

Related to the anxiety dimension risk factors such as "lack or means to carry out my work" ($β = 0.140$; $p = 0.003$) and "Have to simulate good mood and/or empathy" ($β = 0.124$; $p = 0.008$), can be considered significant predictors. The analysis of stress dimension showed that psychosocial risk factors such as "Exposed to frequent interruptions"($β = 0.113$; $p = 0.016$), "Not having recognition by colleagues"($β = 0.114$; $p = 0.013$), "Have to simulate good mood and/or empathy" ($β = 0.122$; $p = 0.008$), and "Having the opportunity to do things that give me pleasure" ($β = -0.109$; $p = 0.020$) can be considered significant predictors, with the last psychosocial risk factors working as protector.

The positive β values corresponding to the significant predictors allow to conclude that exposure to psychosocial risks is related to anxiety and stress symptoms. The strength of the different predictors in this model is very similar since the β values are identical.

multiple linear regression (*Backward* method) was used only with the statistically significant associations to identify the models that better explained the relationship between psychosocial risk factors and anxiety, depression, and stress dimensions. The regression equations satisfied all assumptions, and the results of the regression analyses were considered reliable.

3. Results

The INSAT survey's descriptive analysis, presented in Table 1, shows the frequency distribution of "yes" answers to psychosocial risk factors at work that have a significant impact on the healthcare workers' practice. Results show a high exposure to psychosocial risks. Pace and intensity of work and emotional demands stand out as risk factors with higher overall mean percentages. However, it is worth noting that healthcare workers still showed great joy and pleasure in performing their work activities.

The results of DASS-21 scale descriptive analysis are presented in Table 2 for the subscales of anxiety, depression and stress. It should be noted that higher average values were found in the stress

Table 3
Bivariate analysis of anxiety, depression, and stress dimensions − psychosocial risk factors

Psychosocial factors	Anxiety		Depression		Stress	
	r	p	r	p	r	p
Work pace and intensity						
Exposed to frequent interruptions					0.139**	0.002
Have to deal with contradictory instructions	0.108*	0.019				
Work relationships						
Not having recognition by colleagues			0.112*	0.015	0.143**	0.002
Not having anyone I can trust			0.096*	0.035		
Employment relationships						
Lack of means to carry out my work	0.126**	0.006				
The organization shows no concern with my well-being					0.101*	0.028
Emotional demands						
Have to deal with situations of tension with the public			0.094*	0.042	0.101*	0.028
Exposed to the risk of verbal aggression					0.109*	0.033
Have to hide emotions					0.093*	0.043
Have to simulate good mood and/or empathy	0.099*	0.032			0.161**	<0.001
Ethical and value conflicts						
Lack the means to do the job well done					0.108*	0.031
Have to do things I disapprove					0.114*	0.028
Pleasure and satisfaction at work						
Having the opportunity to do things that give me pleasure	−0.127**	0.005			−0.107*	0.034
Having the opportunity to develop professional skills	−0.140**	0.002			−0.106*	0.021

*p < 0.05; **p < 0.01.

The stress symptoms were also found to be related to a higher number of different psychosocial risks factors (related to increased workloads, labor relations, and emotional demands), thus being the most worrying dimension.

4. Discussion

Pandemic times for healthcare daily activity became even more demanding, increasing the psychological vulnerability of healthcare workers. Results revealed that psychosocial risk factors are significantly present. Performing work activities became more exhausting and emotionally challenging due to the pace and intensity of work and high emotional demands. Working conditions worsened due to the interactions with seriously ill patients and consequent fear of being contaminated, associated with the lack of means and resources to perform a quality work. Therefore, exposure to this set of psychosocial risks led to the aggravation of mental health disorders, as already mentioned in other studies with healthcare [7,8,33].

In this study, symptoms associated with healthcare workers' mental health are associated with anxiety and stress. Healthcare workers reported having symptoms of mental and emotional exhaustion, stress, fatigue, accompanied by anxiety and irritability. Results indicate that stress was the symptom with the highest average scores, translated by persistent manifestations of distress, agitation, and tension, consistent with studies developed in this pandemic period [10,36−38].

Results actually point to a consistency between psychosocial risks and anxiety and stress symptoms. A set of psychosocial risks, mainly work pace and intensity, social relationships, and emotional demands, may predict the manifestation of psychological disorders. In fact, increased work pace and intensity, lack of work and working hours organization, accompanied by the lack of support and resources, aggravated during the pandemic, increased healthcare workers' psychological vulnerability [21,39,40].

Due to a strongly aversive and threatening work environment imposed by the extended COVID-19 pandemic, along with the concerns in patient care and the risk of infection, emotional demands experienced by healthcare workers, led to emotionally stressful states, also demonstrated in other studies [26,41,42].

However, if psychosocial risk factors can usually impact on workers' mental health negatively − personal, interpersonal, and

Table 4
Anxiety and stress multiple linear regression predictive models − psychosocial risk factors

Predictive models	Non-standardized coeff.		Standardized coeff.			C.I. to β (95%)	
	B	Standard error	β	t	p	Lower limit	Upper limit
Anxiety							
Constant	7.076	1.285		5.506	<0.001	4.551	9.602
Lack of means to carry out my work	1.086	0.358	0.140	3.032	0.003	0.382	1.789
Have to simulate good mood and/or empathy	1.069	0.399	0.124	2.682	0.008	0.286	1.852
Having the opportunity to develop professional skills	−3.461	1.263	−0.124	−2.740	0.006	−5.943	−0.979
Stress							
Constant	8.465	1.546		5.474	<0.001	5.426	11.503
Exposed to frequent interruptions	1.183	0.490	0.113	2.411	0.016	0.219	2.146
Not having recognition by colleagues	1.137	0.459	0.114	2.480	0.013	0.236	2.039
Have to simulate good mood and/or empathy	1.278	0.481	0.122	2.660	0.008	0.334	2.223
Having the opportunity to do things that give me pleasure	−1.137	0.475	−0.109	−0.576	0.020	−2.729	0.244
Having the opportunity to develop professional skills	−4.189	1.519	−0.124	−2.757	0.006	−7.174	−1.203

organizational — certain resources can interact positively to preserve their psychological balance. In fact, results point to the presence of pleasure and job satisfaction factors as protective factors of mental health. Being satisfied with the work performed and having the opportunity to develop professional skills were appear to be a protective factors against stress and anxiety, meaning it can be a key element for preventing and protecting these professionals' mental health and well-being. During the COVID-19 pandemic, healthcare workers actually found the best strategies to perform their duties in the best possible way, making them more aware of the importance of their profession and their own personal and professional fulfillment.

5. Limitations

This study has some limitations that should be acknowledged: (i) this cross-sectional study was supported by a "paper & pencil" approach which may had contributed to the low return rate; (ii) the sample size has also limited a comparative analysis between the different regions and between the different types of healthcare workers; (iii) no retrospective information was collected; and (iv) the study was carried out during a specific pandemic period, 15 months after the beginning of this public health crisis, which corresponded to a cumulative exhaustion level that might have led to a decrease on the study response rate; (iv) To increase the response rate of the study, given the very low initial adherence, implementation of awareness-raising activities was required, notably through the assistance of hospitals' human resources department, by sending emails to healthcare workers. Although the email was sent to all healthcare workers this approach could be responsible for a bias in the responses obtained ("some pressure" to get answers).

6. Conclusion

The study's findings demonstrated that the COVID-19 pandemic significantly impacted healthcare workers' psychological health, showing predictive effects of psychosocial risks in anxiety, depression and stress. Work pace and intensity, work relationships, and emotional demands proved to be particular predictors of mental health disorders. The pandemic eventually triggered the development of studies in the mental health field. However, few studies have attempted to assess the relationship between psychosocial risks and mental health in work settings. These results highlight the need to promote an adequate support network to prevent healthcare workers from emotional stress and promote psychological well-being during the current global health crisis. It is also important to analyze the psychosocial risk factors that directly affect the well-being of healthcare workers, considering the comprehensive impact on patient safety. Therefore, research in this area is essential to understand the psychosocial risks that affect health workers and to assess less visible work-health relationships.

Conflicts of interest

All authors declare that they have no conflicts of interest.

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