Stress and Associated Factors Among Nursing Workers in Pandemic Times

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Abstract *Objective* This study aims to assess the impact of psychosocial risk factors on nurses' stress. *Background* The overall impact of COVID-19 on healthcare workers, nursing workers especially, led to an emotionally exhausting daily work activity, making them prone to occupational hazards, namely psychosocial ones. *Method* A cross-sectional study was developed with 284 nurses from public and private hospitals in Portugal. The Depression, Anxiety and Stress Scale (DASS-21) was used to assess mental health, and psychosocial risks were assessed through the Health and Work Survey (INSAT). *Results* Results showed a strong exposure to psychosocial risks. Work pace and intensity, work relationships and emotional demands stood out with higher global average percentages. However, it is worth noting that nurses still showed great joy and pleasure in performing their work activities. *Conclusion* A support network in the work environment needs to be promoted to prevent nurses' emotional stress and promote their psychological well-being during the present global health crisis. *Application* Therefore, research in this area is essential to understand the psychosocial risks that affect nursing workers and assess the less visible work-health relationships.

Keywords COVID-19 · Psychosocial risks · Mental health · Nursing workers

1 Introduction

The overall impact of COVID-19 affected health systems and increased the physical and emotional stress on healthcare professionals (Backes et al. 2021; Pereira et al. 2020). Due to the nature of work activity, and the exceptional characteristics of social and emotional demands, experienced in a pandemic, healthcare workers, especially

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nurses', are more likely to be at risk (Neres et al. 2021; Shaukat et al. 2020; Vizheh et al. 2020). Nursing workers are one of the most vulnerable professional groups, manifesting physical and psychological disorders, aggravated by the increased of work overload, social isolation, and interactions with patients.

The pandemic has actually shifted the focus to studies that measure the impact of psychosocial risks on healthcare professionals' mental health and well-being (Barros 2017; Barros et al. 2019; Leka et al. 2015; Baylina et al. 2018; Moreno Martínez et al. 2022; Salvador et al. 2021).

Nurses are exposed to a large and variable category 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 Akkus et al. 2021; Del Pozo-Herce et al. 2021; Franklin and Gkiouleka 2021; Sampaio et al. 2021).

Therefore, it is imperative to identify and assess psychosocial risk factors that may influence the health and well-being of healthcare workers. This study aims to assess the impact of psychosocial risk factors on nurses' stress in pandemic times.

2 Material and Methods

This cross-sectional study was developed with healthcare professionals from public and private hospitals in Portugal's north and center regions to assess the impact of psychosocial risk factors on nurses' mental health, particularly in anxiety, depression and stress. Data collected from 284 nurses took place between May and June 2021. Each healthcare professional received an envelope with the instruments used in the study protocol, which were later returned in a closed envelope after its completion. All ethical procedures of an anonymous, confidential, and voluntary questionnaire submission were followed.

The Depression, Anxiety and Stress Scale (DASS-21) (Lovibond and Lovibond 1995; Antony et al. 1998) was used to assess mental health. The DASS-21 consists of three subscales of 7 items, totaling 21. The anxiety subscale encompasses items related to situational anxiety and subjective experiences of anxiety and fear. The depression subscale contains items that describe dysphoria, discouragement, devaluation, low self-esteem, anhedonia, and apathy symptoms. 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 (Pais-Ribeiro et al. 2004) was used, showing good internal consistency and convergent and discriminant legitimacy, with a three-factor hierarchical structure (anxiety, depression, and stress). This scale is widely used in several contexts, particularly with healthcare workers (Luo et al. 2020; Moreira et al. 2020).

The psychosocial risks were assessed through the Health and Work Survey—INSAT. The INSAT Survey (Barros et al. 2017) is a self-completion questionnaire that evaluates the relationships between working conditions, risk factors, and health problems. It is made up of seven axes that mainly include relative Likert scales: (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 (VII) 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 (Barros et al. 2019; Correia et al. 2021).

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 $p \leq .05$. Frequency and percentage analyses were performed on the demographic characteristics of the participants (nominal variables from the INSAT questionnaire). Afterward, all psychosocial factors were transformed into nominal variables (no—0, yes—1) to analyze the associations between risk factors and DASS-21. Then, a Bivariate analysis was performed using point-biserial correlation to identify the psychosocial factors related to the dependent variables, particularly anxiety, depression and stress. Subsequently, a multiple linear regression (*Backward* method) was used only with the statistically significant associations to identify the models that best explained the relationship between psychosocial factors and anxiety, depression, and stress dimensions. The study's regression equations satisfied all hypotheses, and the results of the regression analyses were considered reliable.

The study protocol was approved by the Ethics Committee of Fernando Pessoa University (Ref. PI-112/20), respecting all the Declaration of Helsinki procedures.

3 Results

284 nurses working in public and private hospitals in Portugal's north and center regions participated in this study. The sample is mainly composed of 82.0% female and 18.0% male nurses aged between 21 and 64 years (M = 38.85; SD = 10.03). Of the 284 nurses who participated in this study, 55.7% were married or cohabiting, and 45.1% had no children. Professional experience ranges considerably from those who had worked for less than one year to those who had worked for 42 years (M = 13.49; SD = 9.63). Regarding the contract type, 90.1% of the participants work under permanent or open-ended contracts. 93.3% have full-time working hours, 64.8% work rotating shifts, and 51.1% work weekends.

The INSAT survey's descriptive analysis, described in Table 1, shows the frequency distribution of "yes" answers to psychosocial risk factors at work that have a significant impact on the nurses' professional 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 nurses still showed great joy and pleasure in performing their work activities.

The results of the DASS-21 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. Subscale that translates into persistent states of tension and agitation, irritability, low tolerance to frustration, and difficulties in relaxing and calming down.

After the descriptive analysis, the inferential analysis was performed, starting with the Bivariate analysis to verify the statistically significant correlations between psychosocial factors and stress dimensions, respectively (Table 3). Only stress was used (high average values, 7.08) to the bivariate analysis. Stress translates the persistent states of tension and agitation, irritability, low tolerance to frustration, and difficulties in relaxing and calming down. The results shows that psychosocial work factors, such as work pace and intensity; work relationships; employment relationships; emotional demands have a positive and significant correlations with stress dimensions.

Afterwards, a multiple linear regression was performed only with the psychosocial work factors that showed statistically significant correlations to identify the predictive model of stress dimension based on the psychosocial factors (Table 4). The R-value found for stress dimension was statistically significant (Table 4).

The analysis of the beta values and respective *p*-values shows that cross-sectional psychosocial risks, predictors of stress, and psychosocial risks differ. No help from colleagues when solicited ($\beta = .138$; $p = .038$ for stress); Untrustworthy colleagues ($\beta = .204$; $p < .001$ for stress) are shown to be cross-sectional predictors for the manifestation of stress. Psychosocial risks related to emotional demands, particularly: hiding emotions ($\beta = .211$; $p < .001$ for stress); being afraid of suffering a work-related injury ($\beta = .109$; $p = .040$ for stress) are also equally significant predictors. Significant predictors were also found for the psychosocial risks related to work pace and intensity, such as frequent interruptions ($\beta = .115$; $p = .032$) for stress. The positive beta values corresponding to the significant predictors allow us to conclude that exposure to psychosocial risks is related to stress symptoms. The latter was also found to be related to a higher number of different psychosocial risks (related to increased workloads, social relationships, and emotional demands), thus being the dimension with the most worrying values.

Later on, the same was done for the job satisfaction and pleasure factors. The R-value found for being satisfied with the work performed was statistically significant (Table 5).

The analysis of the values found shows that pleasure and job satisfaction psychosocial factors can be protectors of mental health. Being satisfied with the work performed is a particularly protective factor against stress ($\beta = .117$; $p = .038$), with a higher average mental health value.

Table 1 Description of psychosocial work factors

Work pace and intensity	% yes
Working at an intense pace	94.4
Having to rely on the work of colleagues	82.9
Relying on direct orders from customers	76.1
Frequent interruptions	82.4
Hyper-solicitation	81.0
Work hours	% yes
Exceeding normal working hours	86.3
"Skipping" or shortening a meal or not taking the break at all because of work	82.7
Maintaining permanent availability	58.1
Work relationships	% yes
Needing help from colleagues and not having it	46.1
My opinion being disregarded for the service's functioning	44.4
Little recognition by management	47.5
Not having anyone I can trust	30.0
Being exposed to bullying	39.4
Employment relationships	% yes
I feel exploited most of the time	50.0
Being afraid of suffering a work-related injury	71.1
Lack of means to perform the work	50.7
The company disregards my well-being	63.0
Emotional demands	% yes
Confronted with public relations tense situations	94.7
Fear of verbal aggression	86.3
Being exposed to the difficulties and/or suffering of other people	94.7
Faking good mood and/or empathy	75.4
Hiding emotions	75.0
Ethical and value conflicts	% yes
Doing things, I disapprove of	64.8
My professional conscience is undermined	52.8
Lack of necessary means to perform a good job	57.7
Pleasure and satisfaction at work	% yes
Having the opportunity to do things that give me pleasure	90.4
Having the opportunity to develop professional skills	89.9
Being satisfied with the work performed	87.5
Being a valuable contribution to society	97.8
The performed work is valued and recognized	51.8
Having the feeling of a job well done	88.9

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

Variables	M (DP) min.-max	n (%)
Anxiety	4.12 (3.95) 0–15	284 (100%)
Depression	3.63 (3.81) 0–16	284 (100%)
Stress	7.08 (4.51) 0–21	284 (100%)

Table 3 Bivariate analysis of stress dimensions and psychosocial work factors

Psychosocial factors	Stress	
	R	p
Work pace and intensity		
Frequent interruptions	.187**	.002
Hyper-solicitation	.142*	.016
Work relationships		
No help from colleagues when solicited	.221**	<.001
Little recognition by management	.206**	<.001
Untrustworthy colleagues	.268**	<.001
Employment relationships		
I feel exploited most of the time	.120*	.045
Being afraid of suffering a work-related injury	.161**	.006
The company disregards my well-being	.190**	.001
Emotional demands		
Being exposed to the difficulties and/or suffering of other people		
Faking good mood and/or empathy	.196**	<.001
Hiding emotions	.216**	<.001

$^*p < .05$; $^{**}p < .01$

4 Discussion

Nursing is a physically and emotionally exhausting professional activity that has become more demanding with the pandemic, increasing the psychological vulnerability of these professionals. Results revealed that psychosocial risk factors at work 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 quality work, which paved the way for the appearance of psychological health problems. Therefore, exposure to this set of psychosocial risks led to the aggravation of mental health disorders, as already mentioned in other

Table 4 Stress multiple linear regression predictive model—psychosocial work factors

Predictive models	Non-standard coeff.		Standar coeff.		I.C. to β (95%)		
	B	Standard error	β	t	p	Lower limit	Upper limit
Stress							
Constant	1.540	1.079		1.427	<.001	−.585	3.666
Frequent interruptions	1.283	.709	.115	1.808	.032	−.114	2.680
No help from colleagues when solicited	1.199	.574	.138	2.089	.038	.069	2.330
Untrustworthy colleagues	1.962	.579	.204	3.388	<.001	.822	3.103
Being afraid of suffering a work-related injury	1.058	.602	.109	1.756	.040	−.129	2.244
Hiding emotions	2.126	.633	.211	3.358	<.001	.879	3.373

* $p < .05$; ** $p < .01$

Table 5 Stress multiple linear regression predictive models—pleasure and job satisfaction factors

Predictive models	Non-standard coeff.		Standardized coeff.		I.C. to β (95%)		
	B	Standard error	B	t	p	Lower limit	Upper limit
Stress							
Constant	5.559	.780		7.122	<.001	4.022	7.096
Being satisfied with the work performed	1.593	.836	.117	1.906	.038	−.053	3.238

* $p < .05$; ** $p < .01$

studies with healthcare professionals (European Agency for Safety and Health at Work 2022; Miranda et al. 2020; Shaukat et al. 2020; Vizheh 2020).

In this study, symptoms associated with nurses' mental health were shown to be associated with anxiety, depression and stress symptoms. This situation has been reported in recent studies, which state that the COVID-19 pandemic has had a significant impact on these professionals' health: more than 90% of nursing professionals reported having symptoms of mental and emotional exhaustion, stress, fatigue, accompanied by anxiety and irritability (Del Pozo-Herce et al. 2021; Kang et al. 2020). Results indicate that stress was the symptom with the highest average scores, translated by persistent manifestations of irritability, agitation, and tension, consistent with studies developed in this pandemic period (Pedrozo-Pupo et al. 2020; Wang

et al. 2020). In addition to the risk of infection and the lack of knowledge about the virus, the continuous shifts and the intense pace of work, accompanied by insufficient social support, increased the nurses' experienced levels of anxiety and stress (Ornell et al. 2020).

Results actually point to a consistency between psychosocial risks 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 nurses' psychological vulnerability (Da Rosa et al. 2021; Duarte et al. 2021; Osório et al. 2021; Sampaio et al. 2021). However, the presence of pleasure and job satisfaction factors as protective role on mental health. Being satisfied with the work performed was specifically shown to be a protective factor against stress, meaning it can be a key element for preventing and protecting. During the COVID-19 pandemic, nurses 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 (Akkus et al. 2021; Buheji and Buhaid 2020).

5   Limitations

Although this research has made significant contributions and can be used by the care units and government to attendance the adverse psychological effects during Covid-19, it has some limitations. A larger sample, especially of nurses but also of healthcare workers like physicians and other heath supporters, could give more confident results. Moreover, establishing causality in any relationship between work and mental health is complex, as psychological health may be both a cause and a consequence of a change in work environment and performance, particularly during pandemic times. Then, more studies should be conducted to better understand this relation and endorse better working practices during alarming and other emergency situations.

6   Conclusions

This study's findings demonstrated that the COVID-19 pandemic significantly impacted healthcare professionals' psychological health, showing predictive effects of psychosocial risks in anxiety, depression and stress. Intensity and pace of work, 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 at work to prevent nurses' emotional stress and promote psychological well-being during the present global health crisis. Therefore, research in this area is essential to understand the psychosocial risks that affect nursing professionals and assess the less visible work-health relationships.

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