ORIGINAL ARTICLE

FACTORS ASSOCIATED WITH DEPRESSION AMONG HOSPITAL HEALTHCARE WORKERS

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Highlights: (1) 79% of healthcare professionals reported clinical depression during the pandemic. (2) Women and people without a partner showed higher levels of depression. (3) The work environment in the hospital explained 24% of depression among professionals. (4) Devaluation and stigma contributed to vulnerability to depression.

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ABSTRACT

Recent evidence has shown the presence of high prevalence of depression, anxiety, stress, trauma, and insomnia problems among hospital healthcare workers (HCWs) during the Covid-19 pandemic. We aim to identify psychosocial and sociodemographic predictors of depression among HCWs at hospitals during the pandemic. A cross-sectional online survey was carried out between July 2020, and January 2021, with 384 HCWs from southern Brazil. Depression rates were assessed by the Center for Epidemiologic Studies Depression Scale (CES-D), and psychosocial aspects (vulnerability to stress at work, perception of stigma, sociodemographic, health, and labor variables) were assessed. Associations were tested using multiple linear regression (Stepwise method). About 79% of HCWs showed depression at a clinical level, and scores were higher among women, people without a partner, and among those who perceived a worse organizational climate and functioning, higher pressure at work, stigma, and social devaluation related to HCWs. The work climate measure explained 24.3% of depression levels. We discuss actions to manage mental health risks related to the healthcare labor context and the long-term psychosocial consequences of pandemic outbreaks.

Keywords: depression; health personnel; hospitals; covid-19; stress.

FATORES ASSOCIADOS À DEPRESSÃO ENTRE TRABALHADORES DA SAÚDE EM HOSPITAIS

RESUMO

Evidências recentes têm mostrado a presença de alta prevalência de depressão, ansiedade, estresse, trauma e problemas de insônia entre os profissionais de saúde hospitalares (PSH) durante a pandemia de Covid-19. O objetivo do estudo foi identificar preditores psicossociais e sociodemográficos de depressão entre os PSH em hospitais durante a pandemia. Um levantamento transversal online foi realizado entre julho de 2020 e janeiro de 2021, com 384 PSH do sul do Brasil. Os índices de depressão foram avaliados pela Escala de Depressão do Centro de Estudos Epidemiológicos (CES-D) e aspectos psicossociais (vulnerabilidade ao estresse no trabalho, percepção de estigma, variáveis sociodemográficas, de saúde e laborais) foram avaliados. As associações foram testadas usando regressão linear múltipla (método Stepwise). Cerca de 79% dos PSH apresentaram depressão em nível clínico e os escores foram mais altos entre mulheres, pessoas sem parceiro, e entre aqueles que perceberam um pior clima

e funcionamento organizacional, maior pressão no trabalho, estigma e desvalorização social relacionada aos PSH. A medida do clima de trabalho explicou 24,3% dos níveis de depressão. Discutiu-se ações para gerenciar os riscos de saúde mental relacionados ao contexto laboral da saúde e as consequências psicossociais de longo prazo dos surtos pandêmicos.
Palavras-chave: Depressão; trabalhadores da saúde; hospitais; Covid-19; Estresse.

INTRODUCTION

The pandemic caused by Sars Cov-2 is considered a major public health problem in recent years reaching more than 7 million deaths worldwide[1]. In this scenario, healthcare workers (HCW) represent a group that is highly vulnerable to contamination, as well as suffering a high workload and psychological burden. Several studies around the world have shown the presence of a high prevalence of depression, anxiety, stress, trauma, and insomnia problems among these workers during the pandemic[2-6].

Depressive symptoms have been one of the most investigated factors in studies with HCW during the pandemic, using screening scales and focusing on the hospital context[5, 6]. A meta-regression meta-analysis included 29 studies with more than 22,000 frontline professionals during the pandemic and found a 24.3% prevalence of depression[5]. Another systematic review with 161 studies located until November 2022, and including more than 300,000 healthcare workers worldwide, reported a prevalence of depression of 34%[6]. In a study conducted online in February 2020 with 2,285 Chinese health professionals, depression was detected in 44.4% of them[4]. Nursing workers, especially women, were more susceptible to psychological problems, which, according to the authors, were related to a higher workload and increased risk of exposure to the virus[4].

In Italy, an online study of 2,195 professionals pointed out that 63% of the participants reported traumatic work-related experiences with Covid and 26.6% symptoms of moderate depression[3]. Women, nurses, frontline professionals, and those with pre-existing psychological problems were at increased risk of mental distress because of the pandemic[3]. Another cross-sectional study with 490 Brazilian nursing professionals from medium and high complexity services in a northeastern Brazilian state identified that the symptoms of anxiety and depression were related to being a female nursing professional, of color or mixed-race, with a monthly

income below 5 minimum wages, who worked in the private sector and lived with their parents[7]. It is noticed that mental suffering among HCWs is significant, but it is heterogeneously distributed according to gender and professional category, with women and nurses being the most affected since they are most of the workforce in healthcare globally[8].

Brazil has reached the top position on the worldwide rank in the number of deaths by Covid-19 in the world, with 715.689 deaths until March 2025[9]. The Brazilian pandemic`s response has been marked by political disputes, the lack of federal articulation, scientific denial, low testing rate, and delays in the acquisition of vaccines[10, 11]. Although there is incomplete official data, a recent survey led by Public Health International accounted for at least 4,500 deaths related to COVID-19 among HCWs in Brazil up to December 2021[12], which entails a frightening picture of precarious working conditions.

Several challenges faced by HCWs during the pandemic are related to individual, social, and programmatic contexts of vulnerability[13]. In Brazil, HCWs individual vulnerabilities had come together with a highly adverse social and programmatic scenario which includes science distrusting, dissemination of fake news, recent losses of labor and social security rights, and lack of funding health policies[13]. However, so far, few publications are addressing psychosocial drivers of depression among Brazilian healthcare workers, such as perceived stigma, and the quality of conditions of labor context. Given the scientific gaps and the urgency to encourage long-term actions to support these professionals during future disasters and new pandemics, this study sought to identify sociodemographic, occupational, and psychosocial predictors of depression among HCWs working in hospitals in a southern Brazilian state during the Covid-19 pandemic.

METHODS

Design

It was a cross-sectional study using an online survey between July 21st, 2020, and January 14th, 2021.

Participants and Procedures

The selection of the participants was by convenience, using snowball and individual invitations through social media groups (Whatsapp, Facebook, LinkedIn, and Instagram). The

research was also publicized through email lists from some regional hospital managers, as well as through a website ad in the Regional Nursing Council. The Research Ethics Committee of University of Vale do Rio dos Sinos approved the study.

The study sample consisted of 384 HCWs from different categories of hospital work in the state of Rio Grande do Sul, Brazil. All participants reported being in face-to-face activity during the Covid-19 pandemic.

Measures

A standardized and self-administered questionnaire, consisting of questions with structured answers on sociodemographic data, working conditions, psychosocial aspects, and physical and mental health, was constructed using an online form. The questionnaire was pre-tested with seven healthcare workers (HCWs) in hospital settings to assess the average response time (approximately 30 minutes) and evaluate the clarity of the questions. Participants in the pilot study were instructed to pay attention to the phrasing of the items and to provide feedback on their comprehensibility. Based on this feedback, some questions were reworded to enhance clarity, for example, by including additional professional categories. Other suggestions from the pilot study concerned the ordering of certain questions to ensure a more logical and fluid response flow.

Sociodemographic, health and labor variables

Age (in years), gender, race (white, black, brown, indigenous, others), having a partner (yes/no), having children (yes/no), living area (metropolitan or interior), presence of chronic conditions and risk for Covid-19 (obesity, hypertension, diabetes, heart or lung diseases), workload (weekly hours), occupation (nursing or other occupations), and being working in frontline or support roles in the care of Covid-19 patients were evaluated.

Psychosocial variables

Vulnerability to stress at work was assessed using the Scale of Vulnerability to Stress at Work - EVENT[14]. The scale is Brazilian and consists of 40 items describing situations that are considered as stressors at work, and are organized into three factors: Organizational Climate and Functioning (16 items; e.g. “Lack of opportunities for progress in my work”; “Unprepared bosses”); Pressure at Work (13 items; e.g. “Overload of work”; “I do work that does not belong

to my function") and Infrastructure and Routine (11 items; e.g. "Precarious equipment"; "Recurring health leave of the colleagues"). The score is given by the sum of the items marked according to answers on a three-point Likert scale (never=0; sometimes=1; often=2), and higher scores represent greater vulnerability to stress. The study that explored evidence of validity for the scale indicated an internal consistency between .77 and .91 for the subscales[14]. Continuous scores were used in each of the three EVENT subscales.

Based on prior evidence that discusses the stigmatization process of HCWs during past pandemics[15, 16] and in light of the absence of validated measures on this topic during the study`s data collection (first months of Covid-19 pandemic)[17], the researchers developed the following questions to assess the perception of stigma and professional valuation in this context: "People close to me have already avoided being close to me for fear of being contaminated" and "I feel valued as a health professional by most of the people around me"). The answers were on a Likert scale and included the options: Never (0); Sometimes (1); Always (2). Continuous scores were considered for each question individually.

Outcome variable

It was measured by the total score of the Center for Epidemiologic Studies Depression Scale (CES-D), which assesses the risk of depression through the depressive symptoms experienced in the week before application. The instrument includes 20 items on mood, somatic symptoms, interactions with others and motor functioning. Answers are on a four-point Likert scale (0=Rarely up to 3=Always). The higher the scores, the higher the index of depressive symptoms. The scale validated for Portuguese had an internal consistency between .65 and .86 in the dimensions[18].

Data analysis

The data were organized, excluding incomplete questionnaires from the answers on the online form, and identifying duplicate answers based on crossing all sociodemographic, occupation, and labor variables. Data analysis was performed using the SPSS v21 program. Initially, absolute and relative frequencies, central tendency, and dispersion measures were obtained. Then, Spearman correlations between continuous variables. Finally, multiple linear regression with the Stepwise method was used to identify predictors of depressive symptoms. The assumptions of multiple linear regression were tested without identifying a violation that

would contraindicate its use[19]. There was no multicollinearity between the variables, as all correlation values were below 0.49, the Variance Inflation Factor (VIF) value was below 4 (1.73) and the tolerance value was below 1 (0.98). The analysis of the Durbin-Watson coefficient was close to 2 (1.99), indicating the independence of the distribution and the non-correlation of the residuals. Cook's distance showed a value of 0.003, less than 1, revealing that there are no atypical predictors and an adequate adjustment of the model. A significance level of 5% was considered to detect an association with the outcome. The reached sample size revealed a statistical power considered high (R^2=0.31), according to Marôco[19]. In this sense, they indicate that the identified relations will possibly be present in the target population of HCWs.

RESULTS

Among the 384 participants, most were women (85.9%), declared to be white (86.7%), lived with a partner (63.7%), had children (56.7%), and lived in the metropolitan region of the State of Rio Grande do Sul/Brazil (79.4%). Almost half (49.2%) reported having a health condition associated with a higher risk of developing severe forms of Covid-19. Regarding their occupation, 50.0% were from the nursing team (technical level or higher education). Among the others, 19.7% were physicians, and 30.3% were workers from various occupations such as physiotherapists, psychologists, and nutritionists. Most worked part or full-time on the front line of the pandemic (73.7%) and in public hospitals (62.2%). The mean age for the study sample was 39,9 (SD=11,3).

Table 1 describes other sample characteristics, the means obtained in the measures evaluated, and the bivariate associations with depression levels. As for depressive symptoms, it was found that the HCWs had mean scores above the cutoff point of the instrument (16 points or more), and 79.7% had indexes for clinical depression. Depression levels were positively associated with the three dimensions of vulnerability to stress at work (moderate correlations), as well as with the perception of stigma during the pandemic for being a health professional (weak correlation). The perception of appreciation for being a professional working in the coping with Covid-19 had a weak and inverse association with levels of depression.

Table 1

Descriptive statistics, Cronbach's alphas, and associations of the studied variables

Variables	2	3	4	5	6	7	8	M	SD	Range	α
1 Depression	.49**	.41**	.32**	-.09	.04	.28**	-.15**	22.74	8.97	4-54	.89
2 Organization climate and functioning	1	.63**	.66**	.00	.13**	.20**	-.06	12.71	8.06	0-32	.92
3 Work pressure		1	.65**	-.07	.15**	.23**	.02	12.74	6.52	0-26	.91
4 Infrastructure and routine			1	-.01	.16**	.22**	-.01	6.22	4.06	0-22	.78
5 Age (years)				1	-.08	-.08	-.10	39.89	11.3	18-78	-
6 Workload (hours per week)					1	.11*	-.01	41.23	15.6	4-100	-
7 Perception of stigma related to Covid-19						1	-.04	.85	.66	0-2	-
8 Perception of support for being a healthcare worker							1	1.36	.69	0-2	-

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

To explain depression in the sample of HCWs, multiple linear regression analysis (Stepwise method) was performed with the variables that correlated with depression (Climate and organizational functioning, Pressure at work, Infrastructure and routine), in addition to the gender (male/female), marital status (without/with a partner) and profession (nursing/others) variables. Climate and organizational functioning, Pressure at work, gender, and marital status were included in the final model, in addition to the variables on perception of stigma and valuation of the HCWs, which were shown to significantly influence depression (Table 2). Depression levels were mostly impacted by the perception of the Climate factor, which explained 24.3% of the outcome. This means that the greater the perception of stressful aspects related to the organizational climate and functioning, the greater the level of depression among HCWs. The other variables, in turn, accounted for 8.3% of the variance together. Thus, being a woman, not having a partner, noticing greater pressure in the work environment, having experienced a situation of discrimination, and not feeling valued for being an HCW in the context of the pandemic were also related to higher depression scores.

Table 2

Multiple Regression Analysis for depression (Stepwise method).

Variables included in the model (Step 6)	*R*	R^2	R^{Adj}	ΔR^2	B	SE	β	*t*
Organization Climate and Functioning	.49	.24	.24	.24	0.42	0.06	0.37	6.80**
People close to me have avoided me for fear of contamination	.53	.28	.27	.03	2.05	0.59	0.15	3.48*
Gender(a)	.54	.29	.28	.01	2.54	1.11	0.10	2.30*
I am supported by most people to continue working as a healthcare worker	.55	.30	.30	.01	-1.62	0.55	-0.13	-2.96**
Marital Status (b)	.56	.31	.31	.01	2.049	0.79	-0.11	-2.58**
Work pressure	.57	.33	.31	.01	0.184	0.08	0.13	2.41*
F Model			30.35					

*p <.05; ** p <.01; (a) 1- Female, 0- Male; (b) 1- With a partner, 0- Without a partner.

DISCUSSION

The present study sought to identify predictors of depressive symptoms among HCWs working in hospitals during the Covid-19 pandemic. HCWs constitute a labor category that has been heavily affected by mental problems before[20] and during the pandemic[2], which is in line with our findings. There were high levels of depression symptoms in these workers, especially among women, people without a partner, those who perceived a worse organizational climate and functioning and greater pressure at work, as well as those who had a perception of stigma and low valuation of health work. Thus, the vulnerability to mental illness among HCWs at hospitals during the pandemic was mainly related to social and programmatic aspects such as gender, the low availability of social support, unfavorable work processes, and the low recognition and stigma at the community level predicted levels of depression.

The study data support recent literature that indicates more symptoms of depression among female HCWs during the pandemic[3, 4, 21]. On the other hand, factors identified in these studies, such as being a nursing worker, were not associated with levels of depression in our study. In this regard, it is important to highlight that half of the sample was composed of nursing workers who are mostly women, and gender may have overlapped with the labor category as an explanatory factor. In the pandemic scenario, the role of women in pandemics as essential, as they are at the forefront of the response (whether as HCWs and other paid occupations, and/or

in unpaid care practices in community and family contexts)[8], assume physical and emotional costs of this exposure, as well as present a higher risk of infection. HCWs are often affected by a lack of information and by experiencing an overload in the workday.

Furthermore, institutions that provide health care, such as hospitals, have well-defined gender regimes and inequalities that act by marginalizing women's interests[22] and, in many cases, producing programmatic vulnerability[13]. In this sense, Connell[22] points out that the workforce in this sector is gendered, with a historical constitution of professions through the contrast between masculinized medicine and feminized nursing. Although these categories have been partially remodeled, due to changes in gender relations, the intimate and bodily dimension of care remains mostly linked to women's work[22]. It is no coincidence that in situations of a health crisis, the work of women tends to intensify, either because they represent most of the workers in the sector, or because they have more attributions linked to care. A recent in-depth study interviewed 41 English HCWs of the National Health System (NHS) during the Covid-19 pandemic and revealed that inequities and asymmetrical power relations, organizational structures, norms, and gendered individual bodies interact to shape labor experiences[23].

Another revealing result of our study was that the levels of depression experienced by HCWs were largely explained by their perception of the quality of the climate and functioning of hospitals and by feeling pressured at work. It is understood that the high demands of health organizations, especially during the pandemic, such as pressure for results, repetitive tasks, accelerated work pace, overload, and the strong hierarchical and gendered system, favor a process of physical and mental exhaustion[24]. In this sense, a systematic review of 21 studies found that the perception of HCWs of a good organizational climate was associated with better mental health outcomes, such as lower levels of burnout, depression, and anxiety[25]. Also, group relationships between co-workers, aspects of leadership, and supervision were important to explain the workers' mental health[26].

In addition to the pandemic scenario, several political, economic, and institutional problems have affected the Brazilian Unified Health System (SUS), and negatively affect the working conditions of HCWs. There are great challenges regarding the management of work in the SUS, such as the outsourcing of contracts and the low qualifications in some areas[27]. Such vicissitudes are due to historical social inequalities, such as the underfunding of the SUS and, from 2016 on, the freezing of spending in the health sector, with direct consequences such

as the deterioration of services and the precariousness of the workforce[28]. The lack of continuous and consistent training because of the expansion of demand and the absence of national coordination to lead the reorganization of the work processes[10] makes the mental health of HCWs even more vulnerable. In this sense, our results show that symptoms of depression were associated with perceptions of devaluation of health work and greater stigmatization during the pandemic, which highlights the influence of the programmatic and social scenario. In line with this, a broad survey in Brazil found that 75% of the HCWs interviewed felt undervalued and 30.4% reported the occurrence of episodes of violence and discrimination[29].

At the same time, our data did not confirm that frontline HCWs would be more exposed to mental illnesses than those working in support activities, as reported by other studies[3, 21]. In this regard, it is possible to think that the general negative scenario of coping with the pandemic in the country, as well as the low valuation and poor working conditions of most HCWs, are contributing to the spread of mental symptoms among them.

Among the non-labor-related factors, not having a partner was associated with depression scores among HCWs during the pandemic. Thus, in addition to aspects related to the work environment, it is necessary to consider the family status and the availability of a nearby support network, and people without a partner/and living alone may be more vulnerable to mental illnesses[30].

The study has limitations that need to be considered. As it has a cross-sectional character and a convenience sample, it is assumed that reverse causality and selection bias might affect the interpretation of the findings. On the other hand, the sample obtained seems to reflect the distribution in terms of gender and professions in the health sector, with a predominance of women and nursing workers. Furthermore, as far as we know, this is one of the first studies to investigate the association between depressive symptomatology scores and aspects related to the labor and social context of workers during the pandemic in Brazil.

As this is a cross-sectional study, further studies would be important to investigate the risk symptoms of depression and their predictors through longitudinal designs to assess the stability of the predictive model through different pandemic periods. To expand knowledge on the subject, it is suggested that new quantitative studies be carried out with the inclusion of other variables such as coping, psychosocial support at work, and previous psychiatric history to increase the explanatory variance of the identified model. Qualitative studies to know how

contextual and individual aspects interact to produce mental distress would be equally important.

CONCLUSION

The findings of the study reinforce the need to develop actions to support HCWs that focus on the quality of work and communication processes, enabling relationships that are less vertical and more equitable about gender. While the number of infected people and deaths decreases worldwide, the long-term effects on the mental health of HCWs cannot be neglected, as it has been documented during and after other pandemics[31, 32]. Among psychosocial long-term consequences of the COVID-19 outbreak on HCW, studies have described moral injury, chronic depression and anxiety, and career abandonment intention[33-35]. Long COVID-19 symptoms also pose worries about HCWs` health[36]. In this sense, actions for the management of labor risks to mental and physical health are essential during disasters and pandemics. We suggest promoting psychological care assistance for workers, producing online material on ways to reduce anxiety in times of crisis, providing more constant technical qualification events to intensify security in the provision of assistance, and creating mutual support groups for affected workers, mediated by mental HCWs[24].

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