DOI: 10.1590/1413-812320232810.09922023

Brazilian physiotherapist anxiety and depression during the COVID-19 pandemic: a cross-sectional survey

Ansiedade e depressão em fisioterapeutas brasileiros durante a pandemia de COVID-19: um estudo transversal

Verena Kise Capellini (https://orcid.org/0000-0002-7247-0103) [1]
Flavia Marini Paro (http://orcid.org/0000-0003-1715-3778) [2]
Rodrigo Daros Vieira (http://orcid.org/0000-0002-9475-7973) [3]
Veronica Lourenço Wittmer (https://orcid.org/0000-0002-3552-8169) [2]
Marcela Cangussu Barbalho-Moulim (https://orcid.org/0000-0001-5154-2457) [2]
Samanta Caroline Santos Soares (https://orcid.org/0000-0001-5875-3564) [2]
Christyne Gomes Toledo de Oliveira (https://orcid.org/0000-0002-4940-3340) [4]
Halina Duarte (http://orcid.org/0000-0003-4029-6558) [2]

Abstract *This study investigated the prevalence and the potential risk factors for anxiety and depression among physiotherapists during the pandemic. Physiotherapists answered a web-based questionnaire including 1) sociodemographic, professional and clinical information; 2) psychosocial demands; and 3) two validated questionnaires to measure anxiety and depression. Binary logistic regression identified the risk factors by means of odds ratio (OR) and 95% confidence interval (CI). In 417 participants, there was a high prevalence of anxiety (48.2%) and depression (53.0%). The risk factors for anxiety were female sex (OR 2.07; 95%CI 1.01-4.24), worsening in sleep patterns (OR 3.78; 95%CI 1.92-7.44), moderate (OR 2.24; 95%CI 1.00-5.00) and extreme concern about financial issues (OR 3.47; 95%CI 1.57-7.65), and extreme loneliness (OR 3.47; 95%CI 1.71-7.07). The risk factors for depression were female sex (OR 2.16; 95%CI 1.03-4.55), low family income (OR 2.43; 95%CI 1.21-4.89), worsening in sleep patterns (OR 5.97; 95%CI 3.02-11.82), extreme concern about financial issues (OR 2.61; 95%CI 1.15-5.94), and extreme loneliness (OR 4.38; 95%CI 2.00-9.63). This study found a high prevalence of anxiety and depression in the studied population and identified risk factors for both.*

Key words *COVID-19, Pandemics, Physical therapists, Anxiety, Depression*

Resumo *Este estudo investigou a prevalência e potenciais fatores de risco para ansiedade e depressão em fisioterapeutas durante a pandemia. Fisioterapeutas responderam a um questionário na web, incluindo: dados sociodemográficos, profissionais e clínicos; demandas psicossociais; e dois questionários validados para medir ansiedade e depressão. Regressão logística binária identificou fatores de risco para ansiedade e depressão por meio de odds ratio (OR) e intervalo de confiança de 95% (IC). Em 417 participantes houve alta prevalência de ansiedade (48,2%) e depressão (53%). Os fatores de risco para ansiedade foram: sexo feminino (OR 2,07; IC95% 1,01-4,24), piora nos padrões de sono (OR 3,78; IC95% 1,92-7,44), moderada (OR 2,24; IC95% 1,00-5,00) e extrema preocupação financeira (OR 3,47; IC95% 1,57-7,65) e extrema solidão (OR 3,47; IC95% 1,71-7,07). Os fatores de risco para depressão foram: sexo feminino (OR 2,16; IC95% 1,03-4,55), baixa renda familiar (OR 2,43; IC95% 1,21-4,89), piora nos padrões de sono (OR 5,97; IC95% 3,02-11,82), extrema preocupação financeira (OR 2,61; IC95% 1,15-5,94) e extrema solidão (OR 4,38; IC95% 2,00-9,63). Este estudo mostrou alta prevalência de ansiedade e depressão na população estudada e identificou fatores de risco para ambos.*

Palavras-chave *COVID-19, Pandemia, Fisioterapeutas, Ansiedade, Depressão*

[1] Departamento de Biociências, Instituto de Saúde e Sociedade, Universidade Federal de São Paulo. R. Silva Jardim 136, Vila Matias. 11015-020 Santos SP Brasil. verena.capellini@unifesp.br
[2] Departamento de Educação Integrada em Saúde, Centro de Ciências da Saúde, University Federal do Espírito Santo. Vitória ES Brasil.
[3] Faculdade de Fisioterapia, Centro Universitário Salesiano. Vitória ES Brasil.
[4] Departamento de Psicologia, Centro Universitário Salesiano. Vitória ES Brasil.

Introduction

The coronavirus disease 2019 (COVID-19) pandemic has a potential of dramatically affect the mental health and psychological well-been of healthcare professionals[1]. Healthcare workers had a high prevalence of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), probably due to the increased exposure to virus[2]. Since, in several countries, physiotherapists often perform aerosol-generating procedures, they are among the health workers most exposed to the virus[3-5]. Many of the infected professionals are asymptomatic, favoring silent transmission to co-workers, family members and other people in the community[2]. This situation can cause a great fear of contamination in these professionals and can result in psychological disorders[6], increasing the risk of anxiety and depression development[7].

The impact of the pandemic on the mental health of physiotherapists and other health professionals goes far beyond the fear of being infected, and probably also involves financial and other personal aspects. Due to the high transmissibility of coronavirus, once the pandemic started, public restraining measures were necessary, generating important socio-economic and psychological impacts[8]. Therefore, many physiotherapists and rehabilitation services had to interrupt or reduce their activities abruptly without prior planning, which probably caused an important economic impact, especially on self-employed professionals[9].

However, other physiotherapists had to continue practicing, as they play an important role in the management of respiratory conditions in patients admitted to hospitals wards or intensive care units with suspected or confirmed COVID-19[5]. These professionals had to deal with an increase in workload[10] due to a lack of personnel and to a high number of patients to attend in a short time[10,11]. The work overload is described as workplace stressor and has been experienced by physiotherapists in their daily routine, even before the current pandemic[11]. To work in a front line of care, self-rated increases in workload, negative coping style, and fear of getting infected by the virus were identified as some risk factors for anxiety and depression in health professionals[10].

During this pandemic, physiotherapists reported high levels of perceived stress[12]. However, we do not know to what extent the pandemic context is affecting the physiotherapists mental health, since we found only one study showing high levels of anxiety and depression on a small sample of South Korean physiotherapists[13]. Therefore, considering that physiotherapists are essential for both treatment of acute COVID-19 patients[3-5,14] and rehabilitation of patients presenting possible sequelae[15], we believe that knowing the factors that affect the mental health of these professionals is of utmost importance for creating strategies to prevent and/or mitigate possible psychological disorders.

In view of this scenario, the objectives of this study were: 1) to quantify the prevalence and the magnitude of anxiety and depression among physiotherapists during the COVID-19 pandemic, 2) to verify whether sociodemographic, professional, clinical and psychosocial factors associate with anxiety and depression, and 3) to find out potential risk factors for anxiety and depression.

Methods

Design

A cross-sectional study was conducted from 22 May to 24 June 2020 (approximately 8 weeks after the implementation of the social distancing rules due to the COVID-19 pandemic in Brazil). A convenience sample of physiotherapists participated in an online survey. The Regional Physiotherapy Council sent an e-mail for all physiotherapists registered on it. The e-mail had a link to a questionnaire built on the Survey Monkey platform. A 3-step e-mailing process was implemented to optimize the response rate, with seven days apart among each step. Multiple entries from the same individual were prevented by the electronic survey system through e-mail addresses.

The Ethics Committee of Federal University of Espírito Santo approved this study (number 4.032.838 / CAAE: 31522720.2.0000.5060).

Participants

Physiotherapists registered on Regional Physiotherapy Council, who practice in Espírito Santo (ES), a Southeastern Brazilian state, and who agreed with the informed consent term, were included in this survey. It is worth mentioning that registration on Regional Physiotherapy Council is mandatory for all physiotherapists who work in the ES state. The physiotherapists who did not complete the questionnaire were excluded from the study.

According to Regional Physiotherapy Council, there were 4,173 physiotherapists registered

Ciência & Saúde Coletiva, 28(10):2951-2963, 2023

on it in May 2020. Using this number, a confidence level of 0.95 with a margin of error of 5%, the sample size was estimated in 352 participants.

Questionnaire

The self-reported questionnaire was structured in five sections: 1) sociodemographic and professional characteristics, 2) clinical characteristics and information related to the COVID-19 pandemic, 3) psychosocial demands, 4) Generalized Anxiety Disorder-7 (GAD-7), and 5) Patient Health Questionnaire-9 (PHQ-9).

The section concerning sociodemographic and professional characteristics included questions about: 1) sex, 2) age, 3) marital status (with; without a partner), 4) children (yes; no), 5) number of children (1; > 2), 6) number of household members including the participant (1; 2; 3; ≥ 4 members), 7) ES areas (North, Central and South; Metropolitan), 8) family income (< 3; 3 to 5; > 5 minimum wage), 9) professional rolling before COVID-19 (patient care; other including teaching, research, administration, or not working), 10) workplace before COVID-19 (Physiotherapy clinic; hospital; home care; university/college; community-based primary health care center; other), 11) work sector (private; public; philanthropic; other), and 12) working face to face as a physiotherapist during the pandemic (yes; no).

The clinical characteristics and information related to the COVID-19 pandemic looked on: 1) confirmed diagnosis of COVID-19 (yes; no), 2) previous diagnosis of depressive, anxiety or any psychological or psychiatric disorder (yes; no), 3) change in sleep patterns during the pandemic (improved a little; kept the same; worsened), 4) change in family income during the pandemic (no change; small reduction; large reduction; improvement), 5) practicing social distancing appropriately (yes; no), 6) COVID-19 infected or dead people in your social environment (no; yes for far people; yes for close people like family or friends), and 7) psychological treatment (yes, I am doing psychotherapy; I was doing psychotherapy, but I stopped it due to pandemic; nowadays no, but I already had done; I have never done).

The section about psychosocial demands asked physiotherapists an answer on a five-point Likert scale (not at all; slightly; moderately; very; extremely) to the question "In the past seven days, how much the factors below did affect you psychologically?": 1) housework, 2) care and relationship with children, 3) relationship with the partner, 4) excessive professional activities, 5) concern about financial issues, 6) concern about yourself being infected by coronavirus, 7) concern about close people/family members being infected or becoming ill by COVID-19, 8) restriction of leisure/social interaction, and 9) loneliness.

The GAD-7 is a self-reported scale used to screen for anxiety disorders and to assess its severity level[16]. The Brazilian version of GAD-7 was translated into the Portuguese language and was validated for the Brazilian population[17]. The GAD-7 consists of seven items about the frequency of symptoms over the last two weeks. The answer to each item is scored on a four-point Likert scale, ranging from 0 (not at all) to 3 (nearly every day)[17]. The GAD-7 scores range from 0 to 21, and scores 5, 10, and 15 represent mild, moderate, and severe anxiety symptoms, respectively[18]. According to a systematic review, the GAD-7 had acceptable properties for identifying generalized anxiety disorders at cutoff scores from 7 to 10[19]. In the present study, a score of 10 was chosen as the cutoff.

The PHQ-9 is a brief self-administered tool widely used to screen for the signs and symptoms of major depression and to assess their severity[20]. It was translated into Brazilian Portuguese (Copyright© 2005 Pfizer Inc., New York, NY) and validated[20,21]. The PHQ-9 consists of nine questions assessing the rate of depressive symptoms and signs, in the last two weeks, with answers presented as a four-point Likert scale ranging from 0 (none) to 3 (almost every day)[20]. The final score ranges from 0 to 27. Scores from 0 to 4 indicate the absence of depressive disorders. The depressive symptoms may be classified as mild (5-9), moderated (10-14), moderately severe (15-19), and severe (≥ 20)[21]. In the present study, a cut-off score ≥ 10 was used because it has high sensitivity (88%) and specificity (88%) for major depression[21], and it has proven to be the most suitable for depression screening[20].

Data analysis

The Statistical Package for the Social Sciences (SPSS), version 22 (IBM, Armonk, NY, United States), was used for data analysis. The normality was evaluated by the Kolmogorov-Smirnov test. Categorical data are presented as absolute and relative frequencies. Continuous variables are shown as median and interquartile range (IQR). Chi-square test for independence was used to

explore the relationship between each dependent variable (GAD-7 and PHQ-9) with each independent (sociodemographic, professional, clinical and psychosocial factors). Some sociodemographic and professional characteristics were not considered as independent variables and were used only for sample characterization. The independent variables that were associated with each outcome in these previous univariate analyses entered in binary logistic regression models, being the results presented as odds ratio (OR) and 95% confidence interval (95%CI). The assumptions of multicollinearity and outliers were evaluated. A significance level of 5% was adopted in all statistical steps.

Results

Participants

A total of 533 individuals accessed the link sent by Regional Physiotherapy Council. Among them, five people did not accept to participate, and six did not meet the inclusion criteria. Therefore, 522 physiotherapists started filling the questionnaire and 417 subjects fully answered it, yielding a completion rate of 79.9%.

Regarding sample (n = 417) characterization: 339 (81.3%) participants were female; the median age was 35 (IQR 28; 40) years; 348 (83.7%) physiotherapists lived in the Metropolitan Region of the ES State; 203 (48.7%) subjects had children, among which 107 (52.7%) had one child and 96 (47.3%) had two or more children; 31 (7.4%) lived alone, 114 (27.3%), 126 (30.2%) and 146 (35.1%) had two, three and four or over members (including the study participant) sharing the house, respectively; 266 (63.8%), 111 (26.6%), 26 (6.2%) and 14 (3.4%) physiotherapists worked in private, public, philanthropic and other sectors, respectively.

Prevalence and magnitude of anxiety and depression

The prevalence of anxiety and depression among the physiotherapists in this study were 48.2% and 53.0%, respectively. The medians of GAD-7 and PHQ-9 scores were 9 and 10, respectively. More details about prevalence and magnitude of anxiety and depression can be seen in Table 1.

Factors associated with anxiety and depression

Table 2 shows the associations between sociodemographic and professional characteristics and the outcomes - anxiety and depression. Anxiety and depression were significantly associated with sex and professional rolling before COVID-19. Depression was also significantly associated with marital status, children and family income.

Table 3 demonstrates the associations between clinical characteristics and information related to the COVID-19 pandemic and the outcomes - anxiety and depression. Anxiety and depression were significantly associated with previous diagnosis of depressive, anxiety or any psychological or psychiatric disorder, change in sleep patterns, change in family income, COVID-19 infected or dead people in social environment, and psychological treatment.

Table 4 presents the associations between psychosocial demands and the outcomes – anxiety and depression. Depression was significantly associated with all psychosocial demands. Anxiety did not associate only with care and relationship with children.

Risk factors for anxiety and depression

After the multiple binary logistic regression results, controlling for confounders, the risk factors for anxiety were female sex, worsening in sleep patterns, moderate and very/extreme concern about financial issues, and very/extreme loneliness. Similarly, the risk factors for depression were female sex, family income < 3 minimum wage, worsening in sleep patterns, very/extreme concern about financial issues, and very/extreme loneliness. Among all these risk factors, the worsening in sleep patterns was the strongest one, increasing 3.78 and 5.97 times the risk for anxiety and depression, respectively, in comparison to those that kept the same sleep pattern (Table 5).

Discussion

In the present study, 1) Brazilian physiotherapists presented a high prevalence of anxiety and depression; 2) female sex, worsening in sleep patterns, concern about financial issues, and loneliness were found as risk factors for both anxiety and depression, being the worsening in sleep

Table 1. Prevalence and magnitude of anxiety and depression among physiotherapists during the COVID-19 pandemic.

GAD-7 score	Anxiety prevalence according to Kroenke et al. (2007) classification		Anxiety prevalence according to 10 points cutoff	
9 (6; 14)	no	88 (21.1)	no anxiety	216 (51.8)
	mild	128 (30.7)		
	moderated	104 (24.9)	anxiety	201 (48.2)
	severe	97 (23.3)		
PHQ-9 score	**Depression prevalence according to Kroenke et al. (2001) classification**		**Depression prevalence according to 10 points cutoff**	
10 (5; 16)	no depression	84 (20.1)	no depression	196 (47.0)
	mild	112 (26.9)		
	moderated	96 (23.0)	depression	221 (53.0)
	moderately severe	88 (21.1)		
	severe	37 (8.9)		

N = 417; categorical data are presented as absolute and relative frequencies; continuous variables are shown as median and interquartile range; COVID-19: coronavirus disease 2019; GAD-7: Generalized Anxiety Disorder-7; PHQ-9: Patient Health Questionnaire-9.

Source: Authors.

patterns the strongest one; and 3) family income lower than 3 minimum wage was also found as a risk factor for depression.

When a score of 10 on the GAD-7 was used as a cutoff, the prevalence of anxiety among Brazilian physiotherapists was 48.2%, which was higher than 12.3%[7] and 12.9%[22] found in Chinese healthcare workers and 19%[23] reported in Israeli population. In addition, when 9, 8 and 5 were used as GAD-7 cutoff points, the anxiety prevalence rates were 35.1%[24] and 24.1%[25] in Chinese health professionals, and 32.3% in South Korean physiotherapists[13], respectively. Regarding depression, when 10 was used as the cutoff score for PHQ-9, the prevalence among Brazilian physiotherapists was 53%, which was higher than 18.5% found in South Korean physiotherapists[13], and 13.5%[25], 14.8%[7], and 17.2%[22] found in health professionals from other countries.

Professional characteristics could justify the high prevalence of anxiety and depression among physiotherapists. A recent systematic review showed that nurses had higher prevalence of anxiety and depression than physicians did, probably because nurses work closer to patients and are more exposed to contamination risk, suffering and death issues, and ethical dilemmas than physicians do[1]. It is worth mentioning that Physical Therapy practice demands close and long-term contact with patients and frequently includes aerosol-generating procedures, increasing the contamination risk[5]. However, comparing the findings of the present work with another study[13], which are the only one research sampled exclusively by physiotherapists, Brazilian professionals still showed greater anxiety and depression prevalence rates than South Korean pairs. Beyond the enormous differences among Latin American and Asian culture, experience in previous pandemics, sociodemographic and economic aspects, South Korea was recognized for its precocious and proactive approach to prevent and treat pandemic related mental health diseases, including national policies on mental health[26,27], which was not adopted in Brazil. Another possible explanation for the higher prevalence of anxiety and depression among Brazilian physiotherapists in comparison with health professionals from other countries might be the higher incidence of COVID-19 in Brazil compared to these countries[28]. A recent study found higher distress levels in healthcare workers who lives in the geographical areas with the highest incidence of COVID-19[29].

Another factor that contributed to these high rates of anxiety and depression was the female predominance (81.3%) in the present sample, since the female sex emerged as a risk factor for anxiety and depression in the present study and in previous ones[7,30]. Moreover, even before COVID-19 context, the preponderance of anxiety[31,32] and depression[33,34] disorders among women was already well evidenced in the literature. Considering 1) the female sex as a risk factor for anxiety and depression; 2) the global tendency

Table 2. Anxiety and depression according to sociodemographic and professional characteristics of physiotherapists.

Characteristics	Absolute and relative frequencies		*p* value	Absolute and relative frequencies		*p* value
	Anxiety	No anxiety		Depression	No depression	
Sex						
Male	23 (29.5)	55 (70.5)	0.000	25 (32.1)	53 (67.9)	0.000
Female	178 (52.5)	161 (47.5)		196 (57.8)	143 (42.2)	
Age group						
20-29	65 (56.5)	50 (43.5)	0.074	70 (60.9)	45 (39.1)	0.123
30-39	92 (46.9)	104 (53.1)		100 (51.0)	96 (49.0)	
40-69	44 (41.5)	62 (58.5)		51 (48.1)	55 (51.9)	
Marital status						
With a partner	105 (44.7)	130 (55.3)	0.125	108 (46.0)	127 (54.0)	0.002
Without a partner	96 (52.7)	86 (47.3)		113 (62.1)	69 (37.9)	
Children						
Yes	93 (45.8)	110 (54.2)	0.394	95 (46.8)	108 (53.2)	0.018
No	108 (50.5)	106 (49.5)		126 (58.9)	88 (41.1)	
Family income						
< 3 minimum wage	79 (53.0)	70 (47.0)	0.164	93 (62.4)	56 (37.6)	0.015
3 to 5 minimum wage	60 (49.6)	61 (50.4)		59 (48.8)	62 (51.2)	
> 5 minimum wage	62 (42.2)	85 (57.8)		69 (46.9)	78 (53.1)	
Professional rolling before COVID-19						
Patient care	172 (50.9)	166 (49.1)	0.025	189 (55.9)	149 (44.1)	0.017
Other	29 (36.7)	50 (63.3)		32(40.5)	47 (59.5)	
Workplace before COVID-19						
Physiotherapy clinic	87 (53.7)	75 (46.3)	0.165	90 (55.6)	72 (44.4)	0.233
Hospital	53 (48.2)	57 (51.8)		56 (50.9)	54 (49.1)	
Home care	27 (49.1)	28 (50.9)		35 (63.6)	20 (36.4)	
University/College	15 (31.3)	33 (68.8)		19 (39.6)	29 (60.4)	
Community-based primary health care center	7 (41.2)	10 (58.8)		8 (47.1)	9 (52.9)	
Other	12 (48.0)	13 (52.0)		13 (52.0)	12 (48.0)	
Working face to face as a physiotherapist during the pandemic						
Yes	131 (47.8)	143 (52.2)	0.906	141 (51.5)	133 (48.5)	0.443
No	70 (49.0)	73 (51.0)		80 (55.9)	63 (44.1)	

N = 417; COVID-19: coronavirus disease 2019; the groups anxiety/no anxiety and depression/no depression were formed from the 10 points cutoff of Generalized Anxiety Disorder-7 (GAD-7) and Patient Health Questionnaire-9 (PHQ-9), respectively.

Source: Authors.

of higher proportion of female workers in the health workforce than in the general workforce[35], which was also observed in the present study; 3) that women and men are exposed differently to the social and psychological consequences from a pandemic[36]; and 4) the highest degree of gender equality has been related to low depression scores among men and women[33]; future researches and mental health policies should pay attention to biological, psychological, social, environmental, and economic factors that contribute to this sex/gender gap, especially in healthcare professionals during pandemic contexts[36,37].

In this sample, 69.5% of physiotherapists reported worsening in sleep patterns, which was identified as a risk factor for anxiety and depression. By the way, it appeared as the most potential risk factor, increasing in 3.78 and 5.97 times the probability of those who have worsening in sleep patterns to present anxiety and depression, respectively. Previous studies also described the sleep disorders-anxiety/depression association in

Table 3. Anxiety and depression according to clinical characteristics and information related to COVID-19 pandemic.

Characteristics	Absolute and relative frequencies		p value	Absolute and relative frequencies		p value
	Anxiety	No anxiety		Depression	No depression	
Confirmed diagnosis of COVID-19						
Yes	17 (60.7)	11 (39.3)	0.240	20 (71.4)	8 (28.6)	0.068
No	184 (47.3)	205 (52.7)		201 (51.7)	188 (48.3)	
Previous diagnosis of depressive disorder						
Yes	38 (66.7)	19 (33.3)	0.004	40 (70.2)	17 (29.8)	0.008
No	163 (45.3)	197 (54.7)		181 (50.3)	179 (49.7)	
Previous diagnosis of anxiety disorder						
Yes	65 (67.0)	32 (33.0)	0.000	71 (73.2)	26 (26.8)	0.000
No	136 (42.5)	184 (57.5)		150 (46.9)	170 (53.1)	
Previous diagnosis of any psychological or psychiatric disorder						
Yes	91 (64.1)	51 (35.9)	0.000	96 (67.6)	46 (32.4)	0.000
No	110 (40.0)	165 (60.0)		125 (45.5)	150 (54.5)	
Change in sleep patterns						
Improved a little	2 (11.1)	16 (88.9)	0.000	2 (11.1)	16 (88.9)	0.000
Kept the same	20 (18.3)	89 (81.7)		20 (18.3)	89 (81.7)	
Worsened	179 (61.7)	111 (38.3)		199 (68.6)	91 (34.4)	
Change in family income						
No change	27 (35.5)	49 (64.5)	0.001	35 (46.1)	41 (53.9)	0.013
Small reduction	38 (37.3)	64 (62.7)		43 (42.2)	59 (57.8)	
Large reduction	120 (56.9)	91 (43.1)		126 (59.7)	85 (40.3)	
Improvement	16 (57.1)	12 (42.9)		17 (60.7)	11 (39.3)	
Practicing social distancing						
Yes	169 (46.9)	191 (53.1)	0.251	185 (51.4)	175 (48.6)	0.131
No	32 (56.1)	25 (43.9)		36 (63.2)	21 (36.8)	
COVID-19 infected people in social environment						
No	28 (35.0)	52 (65.0)	0.018	28 (35.0)	52 (65.0)	0.001
Yes for far people	86 (48.6)	91 (51.4)		98 (55.4)	79 (44.6)	
Yes for close people like family or friends	87 (54.4)	73 (45.6)		95 (59.4)	65 (40.6)	
COVID-19 dead people in social environment						
No	96 (42.5)	130 (57.5)	0.038	105 (46.5)	121 (53.5)	0.010
Yes for far people	89 (54.6)	74 (45.4)		97 (59.5)	66 (40.5)	
Yes for close people like family or friends	16 (57.1)	12 (42.9)		19 (67.9)	9 (32.1)	
Psychological treatment						
Yes, I am doing psychotherapy + I was doing psychotherapy, but I stopped it due to pandemic	42 (72.4)	16 (27.6)	0.000	41 (70.7)	17 (29.3)	0.000
Nowadays no, but I already had done	72 (55.0)	59 (45.0)		81 (61.8)	50 (38.2)	
I have never done	87 (38.2)	141 (61.8)		99 (43.4)	129 (56.6)	

N = 417; COVID-19: coronavirus disease 2019; the groups anxiety/no anxiety and depression/no depression were formed from the 10 points cutoff of Generalized Anxiety Disorder-7 (GAD-7) and Patient Health Questionnaire-9 (PHQ-9), respectively.

Source: Authors.

healthcare workers during the COVID-19 outbreak[38,39]. Difficulty sleeping was one of the risk factors most strongly associated with anxiety in physicians[38] and positive correlation between depression and sleep disturbance was demonstrated in frontline medical staff from a designated

Table 4. Anxiety and depression according to the intensity by which psychosocial demands affected the physiotherapists during the COVID-19 pandemic.

Psychosocial demands	Absolute and relative frequencies		p value	Absolute and relative frequencies		p value
	Anxiety	No anxiety		Depression	No depression	
Housework						
Not at all/slightly	85 (38.8)	134 (61.2)	0.000	95 (43.4)	124 (56.6)	0.000
Moderately	53 (48.6)	56 (51.4)		65 (59.6)	44 (40.4)	
Very/extremely	63 (70.8)	26 (29.2)		61 (68.5)	28 (31.5)	
Care and relationship with children						
Not at all/slightly	135 (44.6)	168 (55.4)	0.052	149 (49.2)	154 (50.8)	0.039
Moderately	27 (58.7)	19 (41.3)		29 (63.0)	17 (37.0)	
Very/extremely	39 (57.4)	29 (42.6)		43 (63.2)	25 (36.8)	
Relationship with the partner						
Not at all/slightly	116 (40.8)	168 (59.2)	0.000	134 (47.2)	150 (52.8)	0.002
Moderately	41 (58.6)	29 (41.4)		45 (64.3)	25 (35.7)	
Very/extremely	44 (69.8)	19 (30.2)		42 (66.7)	21 (33.3)	
Excessive professional activities						
Not at all/slightly	73 (39.5)	112 (60.5)	0.001	87 (47.0)	98 (53.0)	0.004
Moderately	44 (46.8)	50 (53.2)		45 (47.9)	49 (52.1)	
Very/extremely	84 (60.9)	54 (39.1)		89 (64.5)	49 (35.5)	
Concern about financial issues						
Not at all/slightly	29 (24.2)	91 (75.8)	0.000	37 (30.8)	83 (69.2)	0.000
Moderately	37 (43.5)	48 (56.5)		42 (49.4)	43 (50.6)	
Very/extremely	135 (63.7)	77 (36.3)		142 (67.0)	70 (33.0)	
Concern about yourself being infected						
Not at all/slightly	19 (24.1)	60 (75.9)	0.000	25 (31.6)	54 (68.4)	0.000
Moderately	31 (34.4)	59 (65.6)		37 (41.1)	53 (58.9)	
Very/extremely	151 (60.9)	97 (39.1)		159 (64.1)	89 (35.9)	
Concern about close people/family members being infected						
Not at all/slightly	2 (7.7)	24 (92.3)	0.000	3 (11.5)	23 (88.5)	0.000
Moderately	17 (31.5)	37 (68.5)		22 (40.7)	32 (59.3)	
Very/extremely	182 (54.0)	155 (46.0)		196 (58.2)	141 (41.8)	
Restriction of leisure/social interaction						
Not at all/slightly	19 (25.7)	55 (74.3)	0.000	18 (24.3)	56 (75.7)	0.000
Moderately	30 (34.9)	56 (65.1)		37 (43.0)	49 (57.0)	
Very/extremely	152 (59.1)	105 (40.9)		166 (64.6)	91 (35.4)	
Loneliness						
Not at all/slightly	68 (30.6)	154 (69.4)	0.000	76 (34.2)	146 (65.8)	0.000
Moderately	48 (55.2)	39 (44.8)		54 (62.1)	33 (37.9)	
Very/extremely	85 (78.7)	23 (21.3)		91 (84.3)	17 (15.7)	

N = 417; COVID-19: coronavirus disease 2019; the groups anxiety/no anxiety and depression/no depression were formed from the 10 points cutoff of Generalized Anxiety Disorder-7 (GAD-7) and Patient Health Questionnaire-9 (PHQ-9), respectively.

Source: Authors.

hospital for COVID-19 infection[39]. Moreover, during the COVID-19 pandemic, health professionals have shown worse sleep quality when compared to other occupational groups[24,40] and the disruption of the circadian rhythm, due to the overwork imposed to health professionals during the pandemic, was pointed as a possible cause of insomnia and difficulty sleeping[38]. Sleep deprivation can impair cognitive domains such as attention, memory, decision making, as well as psychomotor speed, all of which can affect performance in more complex cognitive tasks[41].

Ciência & Saúde Coletiva, 28(10):2951-2963, 2023

Table 5. Risk factors for anxiety and depression in physiotherapists during the COVID-19 pandemic.

Independent variables	Anxiety		Depression	
	OR (95% CI)	p value	OR (95% CI)	p value
Sex				
Male	reference		reference	
Female	2.07 (1.01-4.24)	0.046	2.16 (1.03-4.55)	0.042
Family income				
< 3 minimum wage	NA		2.43 (1.21-4.89)	0.012
3 to 5 minimum wage	NA		reference	
> 5 minimum wage	NA		1.97 (0.99-3.92)	0.055
Change in sleep patterns				
Improved a little	0.35 (0.06-2.22)	0.267	0.40 (0.07-2.40)	0.317
Kept the same	reference		reference	
Worsened	3.78 (1.92-7.44)	< 0.001	5.97 (3.02-11.82)	< 0.001
Concern about financial issues				
Not at all/slightly	reference		reference	
Moderately	2.24 (1.00-5.00)	0.049	1.94 (0.85-4.44)	0.116
Very/extremely	3.47 (1.57-7.65)	0.002	2.61 (1.15-5.94)	0.022
Loneliness				
Not at all/slightly	reference		reference	
Moderately	1.35 (0.70-2.64)	0.373	1.49 (0.73-3.01)	0.271
Very/extremely	3.47 (1.71-7.07)	0.001	4.38 (2.00-9.63)	< 0.001

N = 417; COVID-19: coronavirus disease 2019; OR: odds ratio; 95%CI: 95% confidence interval; NA: not applicable (variable did not enter the binary logistic regression model); cutoff scores ≥ 10 in Generalized Anxiety Disorder-7 (GAD-7) and Patient Health Questionnaire-9 (PHQ-9) were used to identify anxiety and depression, respectively; pseudo R square statistics for anxiety and depression models were 0.38 to 0.50 and 0.40 to 0.54, respectively.

Source: Authors.

Complex procedures, such as handling the mechanical ventilation, caring for artificial airways, weaning and extubation, demand high degree of attention and decision making by physiotherapists. In addition, physiotherapists need increased attention with personal and environmental protection measures to avoid aerosol particles exposure and themselves and team contamination[4]. Therefore, managers should guarantee adequate rest time for health workers in an attempt to minimize anxiety, depression, and negative impacts of worsening sleep on professional performance.

Concern about financial issues was also identified as a risk factor for anxiety and depression in Brazilian physiotherapists. It was already demonstrated that the economic situation plays a role in anxiety development during the pandemic[42]. The COVID-19 pandemic has globally increased fears of an impending economic crisis and recession, causing a reduction in workforce demand across most of the economic sectors and many jobs lost[43]. Although intensive care and inpatient units have faced unprecedented demand during pandemic, that increases the need for health professionals[44], a distinct economic reality emerged in other health sectors due to elective surgeries cancel[44,45], outpatient rehabilitation close[46,47], patient office visits reduction, resulting in salaries decrease and many groups demission[45].

Beyond the concern about financial issues, family income was associated with depression in the current study. Physiotherapists who had family income lower than three minimum wages had 2.43 more chances of having depression than those who had a family income higher than or equal to three and lower than or equal to five minimum wages. Previous studies in general population have been demonstrating this association[48-50]. A meta-analysis indicated that a 1 percent increase in relative ranking on income led to a 0.74 percent decrease in the log odds ratio of being depressed[50]. An Australian longitudinal cohort study showed that underemployment was associated with increased risk of depression and that inadequate remuneration associated with underemployment is a determinant of the poorer mental health[48]. Recently, a cross-sectional observational study done during COVID-19 pandemic also demonstrated the association between low-

er income and depression[49]. Moreover, evidence has shown that the COVID-19 pandemic exacerbated previous inequalities and created others. While higher-income families could have a reduction in expenditure due to social distancing, since they spend a larger part of their total expenditure on services affected by the quarantine (i.e. leisure, holidays, restaurants, personal care), lower-income families spend a larger part of their income on primary necessities that are difficult to adjust to any earning reduction. In addition, lower-income workers are more likely to have their earnings reduced and are more likely to have lost their job[51]. Therefore, there is a need to protect the economically vulnerable people in times of financial crisis[52].

Another risk factor for anxiety and depression among Brazilian physiotherapists was loneliness. Similarly, loneliness, due to COVID-19 measures of social distancing, was the most prominent risk factor for anxiety and depression in Israeli general population[23]. Although social distancing and lockdown have shown efficacy in reducing viral transmission[53], these control measures can trigger or increase lonely feelings[54]. Three months after the first case of COVID-19, 35.86% of 15,530 people in the United Kingdom reported that sometimes or often felt lonely[37]. A study performed during this pandemic in 50 states of the United States of America showed that loneliness was significantly higher than reported previously, and it was associated with higher levels of depression and ideation of suicide[55]. Although loneliness has been shown as an important risk factor for anxiety and/or depression during the pandemic in general population[23,37,55], the role of loneliness in depression and anxiety among health professionals was fair investigated. It was demonstrated that loneliness was related to lower mental health in healthcare professionals[56]. Therefore, it is important to access feelings of loneliness among health professionals to plan strategies to increase social support for these professionals.

This study has some limitations. First, the cross-sectional design used does not allow address the long-term changes in anxiety and depression over the pandemic period. Second, answering all questions was mandatory to continue through the survey, which may have discouraged some participants from completion, reducing the sample size. However, the number of participants exceeded the estimated sample size to meet a 95% confidence level. Third, the convenience sample added to the fact that this survey was conducted in Brazil, where pandemic scenario was worse than in other countries, preclude the external generalization of the findings. On the other hand, it can help to strength evidence that urgent measures are needed in all scenarios when dealing with a global health issue. Finally, the self-reporting nature of the clinical variables, although using validated scales, may have less reliability than the assessment by mental health professionals.

Conclusion

This research found a high prevalence of anxiety and depression among studied physiotherapists during the COVID-19 pandemic. Female sex, worsening in sleep patterns, concern about financial issues, and loneliness were identified as risk factors for both anxiety and depression. In addition, family income lower than 3 minimum wage also emerged as a risk factor for depression. Among all these risk factors, the worsening in sleep patterns appeared as the strongest one. Therefore, a proactive approach to prevent and treat physiotherapists mental burdens due to this and future pandemics should be implemented.

Collaborations

VK Capellini worked in design, data analysis and interpretation, writing, review and approval; FM aroP worked in conception and design, data collection, data interpretation, writing, review and approval; RD Vieira worked in conception and design, data collection, writing, review and approval; VL Wittmer worked in conception and design, data collection, writing, review and approval; MC Barbalho-Moulim worked in conception and design, data collection, writing, review and approval; SCS Soares worked in design, data analysis; writing, review and approval; CGT Oliveira worked in conception, writing, review and approval; H Duarte worked in conception and design, data collection coordination, data interpretation, writing, review and approval. The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008.

Acknowledgements

Conselho Regional de Fisioterapia e Terapia Ocupacional da 15ª Região (CREFITO-15).

References

1. Pappa S, Ntella V, Giannakas T, Giannakoulis VG, Papoutsi E, Katsaounou P. Prevalence of depression, anxiety, and insomnia among healthcare workers during the COVID-19 pandemic: a systematic review and meta-analysis. *Brain Behav Immun* 2020; 88:901-907.
2. Gómez-Ochoa SA, Franco OH, Rojas LZ, Raguindin PF, Roa-Díaz ZM, Wyssmann BM, Guevara SLR, Echeverría LE, Glisic M, Muka T. COVID-19 in health-care workers: a living systematic review and meta-analysis of prevalence, risk factors, clinical characteristics, and outcomes. *Am J Epidemiol* 2021; 190(1):161-175.
3. Lazzeri M, Lanza A, Bellini R, Bellofiore A, Cecchetto S, Colombo A, D'Abrosca F, Del Monaco C, Gaudiello G, Paneroni M, Privitera E, Retucci M, Rossi V, Santambrogio M, Sommariva M, Frigerio P. Respiratory physiotherapy in patients with COVID-19 infection in acute setting: a Position Paper of the Italian Association of Respiratory Physiotherapists (ARIR). *Monaldi Arch Chest Dis* 2020; 90(1). DOI:10.4081/monaldi.2020.1285.
4. Righetti RF, Onoue MA, Politi FVA, Teixeira DT, Souza PN, Kondo CS, Moderno EV, Moraes IG, Maida ALV, Pastore Junior L, Silva FD, Brito CMM, Baia WRM, Yamaguti WP. Physiotherapy care of patients with coronavirus disease 2019 (COVID-19) – a Brazilian experience. *Clinics (Sao Paulo)* 2020; 75:e2017.
5. Thomas P, Baldwin C, Bissett B, Boden I, Gosselink R, Granger CL, Hodgson C, Jones AY, Kho ME, Moses R, Ntoumenopoulos G, Parry SM, Patman S, van der Lee L. Physiotherapy management for COVID-19 in the acute hospital setting: clinical practice recommendations. *J Physiother* 2020; 66(2):73-82.
6. Lu W, Wang H, Lin Y, Li L. Psychological status of medical workforce during the COVID-19 pandemic: a cross-sectional study. *Psychiatry Res* 2020; 288:112936.
7. Lai J, Ma S, Wang Y, Cai Z, Hu J, Wei N, Wu J, Du H, Chen T, Li R, Tan H, Kang L, Yao L, Huang M, Wang H, Wang G, Liu Z, Hu S. Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. *JAMA Netw Open* 2020; 3(3):e203976.
8. Bhat BA, Khan S, Manzoor S, Niyaz A, Tak HJ, Anees S, Gull S, Ahmad I. A study on impact of COVID-19 lockdown on psychological health, economy and social life of people in Kashmir. *Int J Behav Healthc Res* 2020; 5(2):36-46.
9. Minghelli B, Soares A, Guerreiro A, Ribeiro A, Cabrita C, Vitoria C, Nunes C, Martins C, Gomes D, Goulart F, Santos RMD, Antunes R. Physiotherapy services in the face of a pandemic. *Rev Assoc Med Bras* 2020; 66(4):491-497.
10. Chen J, Liu X, Wang D, Jin Y, He M, Ma Y, Zhao X, Song S, Zhang L, Xiang X, Yang L, Song J, Bai T, Hou X. Risk factors for depression and anxiety in healthcare workers deployed during the COVID-19 outbreak in China. *Soc Psychiatry Psychiatr Epidemiol* 2021; 56(1):47-55.
11. Lindsay R, Hanson L, Taylor M, McBurney H. Workplace stressors experienced by physiotherapists working in regional public hospitals. *Aust J Rural Health* 2008; 16(4):194-200.

12. Duarte H, Daros Vieira R, Cardozo Rocon P, Andrade ACS, Wittmer VL, Capellini VK, Soares SCS, Paro FM. Factors associated with Brazilian physical therapists' perception of stress during the COVID-19 pandemic: a cross-sectional survey. *Psychol Health Med* 2022; 27(1):42-53.
13. Yang S, Kwak SG, Ko EJ, Chang MC. The mental health burden of the COVID-19 pandemic on physical therapists. *Int J Environ Res Public Health* 2020; 17(10):3723.
14. Wittmer VL, Paro FM, Duarte H, Capellini VK, Barbalho-Moulim MC. Early mobilization and physical exercise in patients with COVID-19: a narrative literature review. *Complement Ther Clin Pract* 2021; 43:101364.
15. Barker-Davies RM, O'Sullivan O, Senaratne KPP, Baker P, Cranley M, Dharm-Datta S, Ellis H, Goodall D, Gough M, Lewis S, Norman J, Papadopoulou T, Roscoe D, Sherwood D, Turner P, Walker T, Mistlin A, Phillip R, Nicol AM, Bennett AN, Bahadur S. The Stanford Hall consensus statement for post-COVID-19 rehabilitation. *Br J Sports Med* 2020; 54(16):949-959.
16. Spitzer RL, Kroenke K, Williams JB, Löwe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. *Arch Intern Med* 2006; 166(10):1092-1097.
17. Moreno AL, DeSousa DA, Souza AMFLP, Manfro GG, Salum GA, Koller SH, Lima O, Crippa JAS. Factor structure, reliability, and item parameters of the Brazilian-Portuguese version of the GAD-7 Questionnaire. *Temas Psicol* 2016; 24(1):367-376.
18. Kroenke K, Spitzer RL, Williams JB, Monahan PO, Löwe B. Anxiety disorders in primary care: prevalence, impairment, comorbidity, and detection. *Ann Intern Med* 2007; 146(5):317-25.
19. Plummer F, Manea L, Trepel D, McMillan D. Screening for anxiety disorders with the GAD-7 and GAD-2: a systematic review and diagnostic metaanalysis. *Gen Hosp Psychiatry* 2016; 39:24-31.
20. Osório FL, Mendes AV, Crippa JA, Loureiro SR. Study of the discriminative validity of the PHQ-9 and PHQ-2 in a sample of Brazilian women in the context of primary health care. *Perspect Psychiatr Care* 2009; 45(3):216-227.
21. Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. *J Gen Intern Med* 2001; 16(9):606-613.
22. Zhang C, Yang L, Liu S, Ma S, Wang Y, Cai Z, Du H, Li R, Kang L, Su M, Zhang J, Liu Z, Zhang B. Survey of insomnia and related social psychological factors among medical staff involved in the 2019 novel coronavirus disease outbreak. *Front Psychiatry* 2020; 11:306.
23. Palgi Y, Shrira A, Ring L, Bodner E, Avidor S, Bergman Y, Cohen-Fridel S, Keisari S, Hoffman Y. The loneliness pandemic: loneliness and other concomitants of depression, anxiety and their comorbidity during the COVID-19 outbreak. *J Affect Disord* 2020; 275:109-111.
24. Huang Y, Zhao N. Generalized anxiety disorder, depressive symptoms and sleep quality during COVID-19 outbreak in China: a web-based cross-sectional survey. *Psychiatry Res* 2020; 288:112954.
25. Zhu Z, Xu S, Wang H, Liu Z, Wu J, Li G, Miao J, Zhang C, Yang Y, Sun W, Zhu S, Fan Y, Chen Y, Hu J, Liu J, Wang W. COVID-19 in Wuhan: Sociodemographic characteristics and hospital support measures associated with the immediate psychological impact on healthcare workers. *EClinicalMedicine* 2020; 24:100443.
26. Hyun J, You S, Sohn S, Kim SJ, Bae J, Baik M, Cho IH, Choi H, Choi KS, Chung CS, Jeong C, Joo H, Kim E, Kim H, Kim HS, Ko J, Lee JH, Lee SM, Lee SH, Chung US. Psychosocial support during the COVID-19 outbreak in Korea: activities of multidisciplinary mental health professionals. *J Korean Med Sci* 2020; 35(22):e211.
27. Shin YJ, Lee JY. South Korea's proactive approach to the COVID-19 global crisis. *Psychol Trauma* 2020; 12(5):475-477.
28. World Health Organization (WHO). Coronavirus disease (COVID-19). Situation Report – 162. 2020. [cited 2023 jun 17]. Available from: https://www.who.int/docs/default-source/coronaviruse/20200630-covid-19-sitrep-162.pdf?sfvrsn=e00a5466_2
29. Romero CS, Delgado C, Catalá J, Ferrer C, Errando C, Iftimi A, Benito A, de Andrés J, Otero M; PSIMCOV group. COVID-19 psychological impact in 3109 healthcare workers in Spain: The PSIMCOV group. *Psychol Med* 2022; 52(1):188-194.
30. Zhang WR, Wang K, Yin L, Zhao WF, Xue Q, Peng M, Min BQ, Tian Q, Leng HX, Du JL, Chang H, Yang Y, Li W, Shangguan FF, Yan TY, Dong HQ, Han Y, Wang YP, Cosci F, Wang HX. Mental health and psychosocial problems of medical health workers during the COVID-19 epidemic in China. *Psychother Psychosom* 2020; 89(4):242-250.
31. Eaton NR, Keyes KM, Krueger RF, Balsis S, Skodol AE, Markon KE, Grant BF, Hasin DS. An invariant dimensional liability model of gender differences in mental disorder prevalence: evidence from a national sample. *J Abnorm Psychol* 2012; 121(1):282-288.
32. McLean CP, Asnaani A, Litz BT, Hofmann SG. Gender differences in anxiety disorders: prevalence, course of illness, comorbidity and burden of illness. *J Psychiatr Res* 2011; 45(8):1027-1035.
33. Kuehner C. Why is depression more common among women than among men? *Lancet Psychiatry* 2017; 4(2):146-158.
34. Salk RH, Hyde JS, Abramson LY. Gender differences in depression in representative national samples: Meta-analyses of diagnoses and symptoms. *Psychol Bull* 2017; 143(8):783-822.
35. Shannon G, Minckas N, Tan D, Haghparast-Bidgoli H, Batura N, Mannell J. Feminisation of the health workforce and wage conditions of health professions: an exploratory analysis. *Hum Resour Health* 2019; 17(1):72.
36. Gausman J, Langer A. Sex and Gender Disparities in the COVID-19 Pandemic. *J Womens Health (Larchmt)* 2020; 29(4):465-466.
37. Li LZ, Wang S. Prevalence and predictors of general psychiatric disorders and loneliness during COVID-19 in the United Kingdom. *Psychiatry Res* 2020; 291:113267.
38. Mosheva M, Hertz-Palmor N, Dorman Ilan S, Matalon N, Pessach IM, Afek A, Ziv A, Kreiss Y, Gross R, Gothelf D. Anxiety, pandemic-related stress and resilience among physicians during the COVID-19 pandemic. *Depress Anxiety* 2020; 37(10):965-971.

39. Wu K, Wei X. Analysis of psychological and sleep status and exercise rehabilitation of front-line clinical staff in the fight against COVID-19 in China. *Med Sci Monit Basic Res* 2020; 26:e924085.
40. Qi J, Xu J, Li BZ, Huang JS, Yang Y, Zhang ZT, Yao DA, Liu QH, Jia M, Gong DK, Ni XH, Zhang QM, Shang FR, Xiong N, Zhu CL, Wang T, Zhang X. The evaluation of sleep disturbances for Chinese frontline medical workers under the outbreak of COVID-19. *Sleep Med* 2020; 72:1-4.
41. Goel N, Basner M, Rao H, Dinges DF. Circadian rhythms, sleep deprivation, and human performance. *Prog Mol Biol Transl Sci* 2013; 119:155-190.
42. Bareket-Bojmel L, Shahar G, Margalit M. COVID-19-related economic anxiety is as high as health anxiety: findings from the USA, the UK, and Israel. *Int J Cogn Ther* 2021; 14(3):566-574.
43. Nicola M, Alsafi Z, Sohrabi C, Kerwan A, Al-Jabir A, Iosifidis C, Agha M, Agha R. The socio-economic implications of the coronavirus pandemic (COVID-19): a review. *Int J Surg* 2020; 78:185-193.
44. Willan J, King AJ, Jeffery K, Bienz N. Challenges for NHS hospitals during covid-19 epidemic. *BMJ* 2020; 368:m1117.
45. Vaccaro AR, Getz CL, Cohen BE, Cole BJ, Donnally CJ 3rd. Practice management during the COVID-19 pandemic. *J Am Acad Orthop Surg* 2020; 28(11):464-470.
46. Besnier F, Gayda M, Nigam A, Juneau M, Bherer L. Cardiac rehabilitation during quarantine in COVID-19 pandemic: challenges for center-based programs. *Arch Phys Med Rehabil* 2020; 101(10):1835-1838.
47. Karloh M, Sousa Matias T, Fleig Mayer A. The COVID-19 pandemic confronts the motivation fallacy within pulmonary rehabilitation programs. *COPD* 2020; 17(4):343-345.
48. Crowe L, Butterworth P. The role of financial hardship, mastery and social support in the association between employment status and depression: results from an Australian longitudinal cohort study. *BMJ Open* 2016; 6(5):e009834.
49. Ettman CK, Abdalla SM, Cohen GH, Sampson L, Vivier PM, Galea S. Low assets and financial stressors associated with higher depression during COVID-19 in a nationally representative sample of US adults. *J Epidemiol Community Health* 2020; jech-2020-215213.
50. Lorant V, Deliège D, Eaton W, Robert A, Philippot P, Ansseau M. Socioeconomic inequalities in depression: a meta-analysis. *Am J Epidemiol* 2003; 157(2):98-112.
51. Blundell R, Costa Dias M, Joyce R, Xu X. COVID-19 and inequalities. *Fisc Stud* 2020; 41(2):291-319.
52. Pereira JM. Financial crisis increases the risk of depression relapse. *J Psychiatr Res* 2015; 61:235-236.
53. Lavezzo E, Franchin E, Ciavarella C, Cuomo-Dannenburg G, Barzon L, Del Vecchio C, Rossi L, Manganelli R, Loregian A, Navarin N, Abate D, Sciro M, Merigliano S, De Canale E, Vanuzzo MC, Besutti V, Saluzzo F, Onelia F, Pacenti M, Parisi SG, Carretta G, Donato D, Flor L, Cocchio S, Masi G, Sperduti A, Cattarino L, Salvador R, Nicoletti M, Caldart F, Castelli G, Nieddu E, Labella B, Fava L, Drigo M, Gaythorpe KAM; Imperial College COVID-19 Response Team; Brazzale AR, Toppo S, Trevisan M, Baldo V, Donnelly CA, Ferguson NM, Dorigatti I, Crisanti A; Imperial College COVID-19 Response Team. Suppression of a SARS-CoV-2 outbreak in the Italian municipality of Vo'. *Nature* 2020; 584(7821):425-429.
54. Smith BJ, Lim MH. How the COVID-19 pandemic is focusing attention on loneliness and social isolation. *Public Health Res Pract* 2020; 30(2):3022008.
55. Killgore WDS, Cloonan SA, Taylor EC, Dailey NS. Loneliness: a signature mental health concern in the era of COVID-19. *Psychiatry Res* 2020; 290:113117.
56. Cabello M, Izquierdo A, Leal I. Loneliness and not living alone is what impacted on the healthcare professional's mental health during the COVID-19 outbreak in Spain. *Health Soc Care Community* 2022; 30(3):968-975.

Article submitted 03/07/2022
Approved 01/06/2023
Final version submitted 26/06/2023

Chief editors: Romeu Gomes, Antônio Augusto Moura da Silva