

RESEARCH ARTICLE

Burnout in Portuguese physiotherapists during COVID-19 pandemic

Cristina Jácome^{1,2}  | Adérito Seixas³  | Carla Serrão^{4,5} | Andreia Teixeira^{1,2,6} | Luísa Castro^{1,2,7} | Ivone Duarte^{1,2}

¹Center for Health Technology and Services Research (CINTESIS), Faculty of Medicine, University of Porto, Porto, Portugal

²Department of Community Medicine, Information and Health Decision Sciences (MEDCIDS), Faculty of Medicine, University of Porto, Porto, Portugal

³Escola Superior de Saúde, Fundação Fernando Pessoa, Porto, Portugal

⁴Centro de Investigação e Inovação em Educação (INEd), Porto, Portugal

⁵Escola Superior de Educação do Politécnico do Porto, Porto, Portugal

⁶Instituto Politécnico de Viana do Castelo (IPVC), Viana do Castelo, Portugal

⁷Escola Superior de Saúde, Politécnico do Porto (ESS-IPP), Porto, Portugal

Correspondence

Cristina Jácome, Center for Health Technology and Services Research (CINTESIS), Faculty of Medicine, Universidade do Porto, Rua Dr. Plácido da Costa, Porto 4200-450, Portugal.
Email: cristinajacome.ft@gmail.com

Abstract

Objective: This study described the burnout experienced by physiotherapists during the COVID-19 pandemic and analysed the role of possible factors of this occupational phenomenon.

Methods: Cross-sectional study based on a web-based survey applied to physiotherapists living in Portugal. The survey included sociodemographic, health status and clinical practice questions. The Copenhagen Burnout Inventory (personal, work- and patient-related burnout), the Resilience Scale, the Depression Anxiety and Stress Scales and the Satisfaction with Life Scale were used.

Results: A total of 511 physiotherapists (median 33 years old, 82% females) completed the survey. The participants worked mainly in private practice (50%) and wards (35%). During COVID-19, 52% were working directly with patients, but only 18% were working with COVID-19 patients. Personal (42%), work- (42%) and patient-related burnout (25%) was observed. Three significant models explained personal- ($R^2 = 51\%$), work- ($R^2 = 31\%$) and patient-related burnout ($R^2 = 16\%$). Lower levels of resilience and higher levels of depression and stress were significantly associated with personal, work- and patient-related burnout. Being female and working directly with patients were additionally associated with both personal and work-related burnout. Having health problems and working with COVID-19 patients were only associated with personal burnout.

Conclusions: More than 40% of physiotherapists experienced personal and work-related burnout and 25% patient-related burnout, with resilience, depression and stress having a relevant role in the three burnout dimensions. Early detection and management strategies need to be implemented to address physiotherapists' physical and psychological fatigue and exhaustion.

KEYWORDS

burnout, healthcare workers, rehabilitation, resilience, stress

1 | INTRODUCTION

The World Health Organization defines burnout syndrome as an occupational phenomenon resulting from exposure to chronic workplace stress, characterized by three dimensions: feelings of energy depletion or exhaustion; increased mental distance from one's job, or feelings of negativism or cynicism related to one's job; and reduced professional efficacy (World Health Organization, 2019). Yet, in support of an integrative view of health, burnout is currently not only a job-related phenomenon but a multi-domain syndrome (Bianchi et al., 2014). In 2019, the syndrome was included in the International Classification of Diseases (World Health Organization, 2019).

Healthcare professionals (HCPs) are one of the most studied occupational groups. The stressful nature of their work leads to experiencing a wide range of physical and psychological symptoms (Maslach et al., 2001), especially if we consider the chronic nature of the exposure to work-related stress (Bridgeman et al., 2018). Indeed, recent systematic reviews show high prevalence of burnout among HCPs (Low et al., 2019; Woo et al., 2020), which is alarming as this chronic exposure to burnout may lead to lack of productivity, increased professional error, longer patient recovery time and lower patient satisfaction, greatly impairing the quality of healthcare services (Panagioti et al., 2017; Salyers et al., 2017; Shanafelt et al., 2017; Spinelli et al., 2019).

In the end of 2019, the coronavirus disease (COVID-19) appeared in Whang, a city in the Hubei province in China (Wang et al., 2020b) and due to the global widespread of the disease it was declared as a pandemic in 11th March 2020 (Pan American Health Organization, 2020). The pandemic and outbreaks have increased the pressure over healthcare systems worldwide and the negative consequences over the well-being of physicians and nurses has been explored (Barello et al., 2020; Sasangohar et al., 2020). Yet, the COVID-19 pandemic also exposed the critical importance of patient rehabilitation and the vital role of physiotherapy during the distinct phases of the disease (acute, sub-acute and long-term) (WHO, 2020; World Physiotherapy, 2020). Thus, research focussing on the impact for physiotherapists is also needed.

Moreover, the impact of the pandemic on physiotherapists' clinical practice is not restricted to the rehabilitation of patients with COVID-19. The governmental response to the pandemic differed across countries, but in general, the delivery of physiotherapy care to the other populations was dramatically affected, with most face-to-face contacts being suspended and replaced by telehealth interventions. Portuguese physiotherapists have an additional problem, as most work in the private setting, and during the first months of the COVID-19 pandemic were either in layoff or working remotely through telehealth interventions (Alpalhão & Alpalhão, 2020; Minghelli et al., 2020). The impact of the suspension of their clinical practice and the impact of working directly with patients, and specifically patients with COVID-19, on physiotherapists' burnout needs therefore to be properly addressed.

Therefore, the aim of this study was to describe the burnout among physiotherapists working in Portugal and to analyse potential predictors of this burnout during the COVID-19 pandemic.

2 | METHODS

2.1 | Study design

This was a cross-sectional quantitative study with a web-based survey applied to physiotherapists living in Portugal. The web-survey was implemented in Google Forms platform and was available during the national calamity period (between May 9th and June 8th). This study is reported according to the Strengthening the Reporting of Observational Studies in Epidemiology guidelines (Elm et al., 2007). This study was conducted in line with the Declaration of Helsinki and received approval from the Ethic Committee of São João Hospital Center (148/2020, May 7th). All participants gave their online informed consent at the beginning of the survey: when accessing the link participants were presented with an introduction with the study purposes, duration of the survey and guarantees of anonymity and confidentiality. If they agreed with the study procedures, they were asked to click on a confirmation button to proceed to the survey.

2.2 | Participants

This study population consisted of physiotherapists, who were Portuguese speakers, and were working in Portugal at the time COVID-19 pandemic started. No other eligibility criteria existed.

2.3 | Data collection

The link of the survey was disseminated through institutional web-pages (Faculty of Medicine of University of Porto, Escola Superior de Educação do Instituto Politécnico do Porto, Center for Health Technology and Services Research), professional organization representing physiotherapists (Associação Portuguesa de Fisioterapeutas) and social media platforms (Facebook, Instagram, LinkedIn). The survey included sociodemographic data (Section 1, included sex, age, civil status, information regarding the existence of children, academic status, years of clinical practice, area of residence, work setting before COVID-19, work status during COVID-19 and information regarding income reduction), the Copenhagen Burnout Inventory (CBI) (Sections 2, 4 and 6), the Resilience Scale (Section 3), the Depression Anxiety Stress Scale (Section 5) and the Satisfaction with Life Scale (Section 7). Each one of the instruments used is described in detail below.

The Portuguese validated version of the CBI was used to measure burnout (Fonte, 2011; Kristensen et al., 2005). This is a 19-item

tool integrating three burnout subscales (personal, work-related and client-related). The six items on the personal burnout subscale assess the degree of physical and psychological fatigue and exhaustion which the person attributes to non-work factors (e.g., health problems, family demands). The work-related burnout subscale contains seven items assessing the symptoms that respondents' attribute to work. The six items on the client-related burnout subscale describe feelings of physical and psychological fatigue and exhaustion that respondents attribute to their work with clients (i.e., patients). All items are scored on a five-point Likert scale (always/to a very high degree = 100, often/to a high degree = 75, sometimes/sometimes-what = 50, seldom/to a low degree = 25 and never/almost never/to a very low degree = 0). The last item of the work-related burnout subscale was reverse scored. The score for each subscale is the average of item scores within the subscale and ranges from 0 to 100 –maximum burnout. The three subscales were not answered sequentially to avoid stereotyped answers. Scores of 50 or above in each of the three subscales were used to consider burnout presence. These subscales are characterized by high internal consistency (original version Cronbach's $\alpha = 0.85$ – 0.87 and Portuguese version Cronbach's $\alpha = 0.84$ – 0.87 ; Fonte, 2011; Kristensen et al., 2005). In the current study, Cronbach's alphas were 0.90, 0.88 and 0.87 for personal-, work- and client-related burnout, respectively.

The Resilience Scale includes 25 items answered in a 7-point Likert scale (from strongly disagree, 1, to strongly agree, 7; Oliveira & Machado, 2011; Wagnild & Young, 1993). Scoring and interpretation was in the following format: 25–120 low resilience, 121–145 moderate resilience and 145–175 high resilience (Oliveira & Machado, 2011; Wagnild & Young, 1993). The Portuguese version distinguishes five domains (personal competence, self-discipline, autonomy, problem solving and optimism) and presents high internal consistency ($\alpha = 0.89$; Oliveira & Machado, 2011).

The Depression Anxiety and Stress Scales (DASS-21) was used to assess health professionals' emotional states (Lovibond & Lovibond, 1995; Pais-Ribeiro et al., 2004). DASS-21 has been one of the preferred instruments to assess mental status during COVID-19 pandemic (Chew et al., 2020; Wang et al., 2020a, 2021). This version consists of a 21-item four-point Likert questionnaire, which includes three self-report subscales designed to measure the negative emotional states of depression, anxiety and stress. Each of the three subscales contains seven items, and the responders are asked to rate the extent to which they have experienced each state over the past week, using a scale from 0 (did not apply to me at all) to 3 (applied to me very much, or most of the time). The scores for each subscale vary from 0 to 21, with higher scores indicating a more negative emotional state. The DASS-21 has good internal consistency, with Cronbach's alpha between 0.74 and 0.85 (Pais-Ribeiro et al., 2004).

The Satisfaction with Life Scale (SWLS) is a 5-item scale that assesses an individual's global judgement regarding their life satisfaction ($\alpha = 0.77$; Diener et al., 1985). Individuals were asked to indicate their level of agreement with the statements on a five-point Likert-type scale (Simões, 1992), from 1 (strongly disagree) to 5

(strongly agree). Scores range from 5 to 25, with higher scores indicating greater life satisfaction.

2.4 | Data analysis

Data from Google forms were exported in a table (Microsoft Excel spreadsheet 2016) and all statistical analyses were carried out using SPSS Statistics (version 26.0; SPSS Inc.). The level of significance was set at 0.05. Descriptive statistics were used to characterize the sample. The distribution of each variable was investigated with Kolmogorov–Smirnov tests and visual analysis of histograms. Absolute and relative frequencies, n (%), were used for categorical variables; mean, standard deviation (mean \pm SD) and minimum and maximum values (min–max) for normally distributed continuous/quantitative variables; and, median and interquartile interval, Med [Q1–Q3], for ordinal or non-normally distributed continuous/quantitative variables. Spearman's rho was also used to explore the correlation between the different domains assessed (resilience, anxiety, depression, stress, life satisfaction, burnout). Differences between participants working or not working directly with patients were conducted using Mann–Whitney U tests for continuous/quantitative non-normally distributed data and chi-square tests for categorical data.

Multiple linear regression models were constructed for accessing the potential factors explaining each of the three burnout dimensions (personal burnout, work-related burnout and client-related burnout). The independent variables to include in each multiple regression were chosen by performing simple linear regressions with each variable in the dataset. All variables that correlated with the outcomes at $p \leq 0.05$ in the simple regression were included in the multiple linear regression analyses (Enter method), and only the significant variables were maintained in the final model. The models were evaluated using the F statistic of the overall model test, p -values and coefficients of determination (R^2). The assumptions of the linear regression models were verified as follows: (1) visual analysis of a histogram to assess the normality of residuals; (2) a t -test to determine whether mean residuals were equal to zero; and (3) plots of residuals versus the fitted predictive values to check for homoscedasticity.

3 | RESULTS

A total of 511 physiotherapists (median age 33 years, 82% females) from all over the country participated in this study. The participants worked mainly in private practice ($n = 253$; 50%), wards ($n = 177$; 35%) and intensive/intermediate care units ($n = 70$; 14%) and 91 physiotherapists (18%) reported working directly with COVID-19 patients. Table 1 describes participants' characteristics.

A large percentage of physiotherapists reported personal burnout ($n = 213$; 42%), work-related burnout ($n = 215$; 42%) and patient-related burnout ($n = 130$; 25%). Most physiotherapists

TABLE 1 Characteristics of participants (n = 511)

Characteristics	
Age (years), Med (Q1; Q3)	33 (28; 41)
Female	417 (82%)
Civil status	
Single	241 (47%)
Married	241 (47%)
Widowed/Divorced	29 (6%)
Children	211 (41%)
Children \leq 12 years	145 (69%)
Number of children, Med (Q1; Q3)	2 (1; 2)
Academic	
Degree	378 (74%)
Post-graduation course	16 (3%)
Master	108 (21%)
PhD	8 (2%)
Years of clinical practice	
0–5 years	127 (25%)
6–10 years	132 (26%)
>10 years	252 (49%)
NUTSII	
Lisbon Metropolitan Area	185 (36%)
North	127 (25%)
Centre	111 (22%)
Alentejo	48 (9%)
Algarve	18 (4%)
Azores	13 (3%)
Madeira	9 (2%)
Diagnosis of a health problem	103 (20%)
Setting before COVID-19	
Private practice	253 (50%)
Wards	177 (35%)
Intensive/Intermediate care	70 (14%)
Continuous care facilities/residential homes/day-care centres/home care	53 (10%)
Primary care	38 (7%)
Palliative care	17 (3%)
Others	48 (9%)
Working status during COVID-19	
Working directly with patients	265 (52%)
Teleworking	60 (12%)
Not working (vacations, lay-off, unemployed, parental leave, activity suspended)	186 (36%)
Working with patients with COVID-19	91 (18%)
Income reduction	284 (56%)

Note: Data are presented as n(%) unless otherwise indicated.

Abbreviations: Med, median; NUTSII, Nomenclature of Territorial Units for Statistics; Q1, percentile 25th; Q3, percentile 75th.

reported moderate levels of resilience ($n = 282$; 55%), 135 (26%) elevated resilience and 94 (18%) reduced resilience. Depression, anxiety and stress levels had a median of 1 [0–5], 2 [0–5] and 6 [3–9], respectively (Table 2). When comparing the outcomes in physiotherapists working directly with patients and those not working with patients, significant differences were found in the scores of personal burnout ($p = 0.001$), work-related burnout ($p = 0.043$) and anxiety ($p = 0.019$). Moreover, the proportion of physiotherapists with personal burnout was higher in the group of physiotherapists working directly with patients ($p = 0.015$).

The correlations between burnout, resilience, depression, anxiety and stress measures were all statistically significant ($p < 0.001$). The correlation between resilience and the other variables was negative, varying between -0.274 and -0.470 , and the correlations between burnout, depression, anxiety and stress were positive, varying between 0.310 and 0.732 (Table 3).

Three significant multivariate models explained personal ($R^2 = 51\%$; $p < 0.001$), work-related ($R^2 = 31\%$; $p < 0.001$) and patient-related ($R^2 = 16\%$; $p < 0.001$) burnout (Table 4). Lower levels of resilience and higher levels of depression and stress were significantly associated with personal ($B = -0.11$, $B = 1.31$, $B = 1.72$,

respectively, where B is the unstandardized regression coefficient), work-related ($B = -0.08$, $B = 1.27$, $B = 1.08$) and patient-related ($B = -0.12$, $B = 0.93$, $B = 0.90$) burnout. Being female ($B = 7.72$, $B = 4.28$) and working directly with patients ($B = 4.55$, $B = 3.23$) were additionally associated with both personal and work-related burnout. Having health problems ($B = 3.59$) and working with COVID-19 patients ($B = 4.78$) were only associated with personal burnout.

4 | DISCUSSION

To the best of our knowledge, this study is one of the first focussing on assessing the burnout experienced by physiotherapists during the COVID-19 pandemic. We found that more than 40% of physiotherapists experienced personal and work-related burnout, and 25% experienced patient-related burnout. We also found that all three burnout dimensions might be explained by distinct characteristics, with resilience, depression and stress having a relevant role in all burnout dimensions.

The burnout prevalence observed in this study was higher than in previous studies in Portuguese physiotherapists (pre COVID-19),

TABLE 2 Comparison of burnout, resilience, depression, anxiety and stress measures in physiotherapists working and not working directly with patients

	Total ($n = 511$)	Not working directly with patients ($n = 246$)	Working directly with patients ($n = 265$)	p -value
CBI				
CBI personal	46 [29; 58]	38 [25; 54]	46 [33; 63]	0.001 ^{a,*}
CBI personal ≥ 50 , n (%)	213 (42%)	89 (36%)	142 (47%)	0.015 ^{b,*}
CBI work	43 [32; 57]	43 [29; 57]	46 [36; 61]	0.043 ^{a,*}
CBI work ≥ 50 , n (%)	215 (42%)	95 (39%)	120 (45%)	0.127 ^b
CBI patient	33 [17; 50]	35 [21; 50]	33 [17; 50]	0.872 ^a
CBI patient ≥ 50 , n (%)	130 (25%)	63 (26%)	67 (25%)	0.932 ^b
Resilience				
Total score	136 [125; 146]	138 [126; 146]	135 [124; 146]	0.327 ^a
Reduced (<121), n (%)	94 (18%)	46 (19%)	48 (18%)	0.984 ^b
Moderate (121–145), n (%)	282 (55%)	135 (55%)	147 (56%)	-
Elevated (>145), n (%)	135 (26%)	65 (26%)	70 (26%)	-
DASS-21				
Depression	1 [0; 5]	2 [0; 5]	1 [0; 5]	0.451 ^a
Anxiety	2 [0; 5]	1 [0; 5]	2 [1; 5]	0.019 ^{a,*}
Stress	6 [3; 9]	6 [3; 9]	6 [3; 9]	0.695 ^a
SWLS	18 [15; 20]	17 [14; 20]	18 [15; 20]	0.251 ^a

Note: Values presented as Med [Q1; Q3], unless otherwise indicated.

Abbreviations: CBI, Copenhagen Burnout Inventory; DASS, Depression Anxiety and Stress Scales; SWLS, Satisfaction with Life Scale.

^aMann-Whitney test.

^bChi-square test.

*significant at 0.05.

TABLE 3 Associations between burnout, anxiety, stress, depression, and resilience measures represented by spearman's rho values

	CBI Personal	CBI Work	CBI Patient	Resilience	DASS Depression	DASS anxiety	DASS stress	SWLS
CBI personal	-	-	-	-	-	-	-	-
CBI work	0.678*	-	-	-	-	-	-	-
CBI patient	0.424*	0.661*	-	-	-	-	-	-
Resilience	-0.404*	-0.339*	-0.274*	-	-	-	-	-
DASS depression	0.617*	0.502*	0.382*	-0.470*	-	-	-	-
DASS anxiety	0.575*	0.443*	0.310*	-0.330*	0.605*	-	-	-
DASS stress	0.625*	0.479*	0.344*	-0.378*	0.679*	0.732*	-	-
SWLS	-0.320*	-0.439*	-0.347*	0.407*	-0.409*	-0.274*	-0.280*	-

Abbreviations: CBI, Copenhagen Burnout Inventory; DASS, Depression Anxiety and Stress Scales; SWLS, Satisfaction with Life Scale.

* $p < 0.001$.

TABLE 4 Multivariate linear regression models to explain the three burnout domains: personal, work- and patient-related

	CBI Personal		CBI Work		CBI Patient	
	B [95%CI]	<i>p-value</i>	B [95%CI]	<i>p-value</i>	B [95%CI]	<i>p-value</i>
Sex						
Male	Reference		Reference			
Female	7.72 [4.43; 10.99]	<0.001	4.28 [0.72; 7.84]	0.019		
Working directly with patients						
No	Reference		Reference			
Yes	4.55 [1.88; 7.22]	<0.001	3.23 [0.54; 5.93]	0.019		
Diagnosis of a health problem						
No	Reference					
Yes	3.59 [0.50; 6.69]	0.023				
Working with patients with COVID-19						
No	Reference					
Yes	4.78 [1.27; 8.30]	0.008				
Resilience	-011 [-0.18; -0.05]	<0.001	-0.08 [-0.15; -0.002]	0.045	-0.12 [-0.21; -0.03]	0.013
Depression	1.31 [0.84; 1.77]	<0.001	1.27 [0.77; 1.78]	<0.001	0.93 [0.30; 1.55]	0.004
Stress	1.72 [1.33; 2.10]	<0.001	1.08 [1.50; 5.08]	<0.001	0.90 [0.39; 1.42]	<0.001
R ²	51%	<0.001	31%	<0.001	16%	<0.001

Abbreviations: B, unstandardized regression coefficient; CBI, Copenhagen Burnout Inventory; R², coefficients of determination.

pointing out that 16% reported global burnout (20% from physical fatigue, 13% from cognitive weariness and 3% from emotional exhaustion; Seixas et al., 2020), 31% from exhaustion and 23% from cynicism (unfeeling and impersonal response towards patients) (Rodrigues et al., 2016). Nevertheless, we need to be cautious when making these comparisons, as these studies assessed burnout with distinct instruments (Shirom–Melamed Burnout Measure and Maslach Burnout Inventory, respectively). In addition, these studies were restricted to small samples of physiotherapists working only in the private setting and in the Northern region of Portugal (Rodrigues et al., 2016; Seixas et al., 2020).

When comparing our data with international studies focussing on physiotherapists, we observe that slightly lower burnout levels have been reported in the period pre-COVID. But again, direct comparisons are difficult due to the same problems addressed before. Yet, irrespective of the difference, if it exists, the truth is that burnout levels were already alarming before pandemic, with around ~10%–20% physiotherapists experiencing high levels of burnout (Corrado et al., 2019; Pavlakis et al., 2010; Śliwiński et al., 2014) and with ~30%–50% with high risk of developing it (Corrado et al., 2019; de Araújo Silva & Alchieri, 2014; Śliwiński et al., 2014). When comparing our data with international pre-COVID studies focussing

in other groups of HCPs, similar burnout levels were observed (Low et al., 2019; Woo et al., 2020). It is thus urgent to understand the impact of the pandemic in the mental health of physiotherapists, which will allow the implementation of adequate mitigation strategies to promote their health and prevent the development of diseases, especially considering that a second wave of infections is already happening. Cognitive behavioural therapy and mindfulness-based cognitive therapy, delivered through web-based/digital tools, are examples of psychological interventions that could be explored (Sijbrandij et al., 2016; Soh et al., 2020).

Previous studies have analysed the prevalence of burnout in general samples of HCP during the COVID-19 pandemic, mostly including physicians, nurses and nurse assistants (Barello et al., 2020; Ferry et al., 2020; Giusti et al., 2020; Jalili et al., 2020; Luceño-Moreno L, 2020; Martínez-López JÁ, 2020). We found only two studies that included a small sample of physiotherapists ($n = 11$, 2% of total sample and $n = 35$, 10.6% of total sample, respectively; Ferry et al., 2020; Giusti et al., 2020), but have not reported the prevalence of burnout specifically in this group. Therefore, although a considerable amount of research on this topic has been published, data related to physiotherapists is lacking. Moreover, all studies were conducted in HCP in contact with COVID-19 patients, with the exception of the studies of Ferry et al. (2020) and Giusti et al. (2020) that included HCP independently of being in contact with COVID-19 patients or not.

Most previous studies used a different instrument to analyse burnout, the Maslach Burnout Inventory (MBI), which assesses dimensions of emotional exhaustion, depersonalization and personal accomplishment. In studies including HCP in contact with patients with COVID-19, the prevalence of high emotional exhaustion varied between 20% (Martínez-López JÁ, 2020) and 50% (Jalili et al., 2020), high depersonalization between 13% (Jalili et al., 2020) and 39% (Martínez-López JÁ, 2020) and low levels of personal accomplishment between 1% (Jalili et al., 2020) and 20% (Martínez-López JÁ, 2020). Interestingly, Giusti et al. which included HCP independently of being in contact or not with COVID-19 patients, reported slightly lower prevalence of high depersonalization (12%), higher prevalence of low professional accomplishment (34%) and a prevalence of high emotional exhaustion within the range of the previous studies (32%) (Giusti et al., 2020). The MBI was, however, not used in the present study as it restricts burnout as a job-related phenomenon and does not consider its multidimensionality. A recent study explored HCP burnout using the CBI, but unfortunately they merged the three burnout subscales and reported a global burnout of 79% (Ferry et al., 2020), which does not allow to establish direct comparisons with the present results. However, considering that the total score is an average of the three dimensions, the prevalence of high scores in each dimension is higher than the reported in this study. The differences in the prevalence of burnout might be related to the fact that the study of Ferry et al. evaluated the impact of the COVID-19 pandemic on the mental wellbeing of HCP in the United Kingdom that were mostly engaged with patients with COVID-19 (70%), variable that we show in our work to be associated with burnout (Sabat et al., 2020).

Giusti et al. reported that working from home was significantly associated with lower levels of emotional exhaustion and depersonalization and with higher levels of personal accomplishment (Giusti et al., 2020). It also observed that contacting with COVID-19 patients was significantly associated with higher levels of emotional exhaustion and depersonalization and lower levels of professional accomplishment (Giusti et al., 2020). Moreover, these variables were significant predictors of emotional exhaustion and depersonalization. Furthermore, in the study of Ferry et al. exposure to patients with COVID-19 was a significant predictor of high burnout levels (Ferry et al., 2020). This is in line with the results of the present study, in which personal and work-related burnout scores were significantly higher in physiotherapists working directly with patients. Moreover, working directly with patients seems to be a potential predictor of personal ($B = 4.55$) and work-related burnout ($B = 3.23$), and working with COVID-19 patients appears to be a potential predictor of personal burnout ($B = 4.78$).

In pandemic situations, stress responses are associated with fear of being infected by contacting with objects or other subjects (Taylor, 2019). On the other hand, resilience reduces the impact of traumatic events and the development of stress disorders, as it helps individuals to deal with adversities and challenges and is a process of positive adaptation to stressful events (Castro, 2020; Foster et al., 2019; Lee et al., 2014). In the present study, personal, work-related and patient-related burnout scores were significantly and positively associated with depression, anxiety and stress scores and significantly and negatively associated with resilience scores. This is in line with the results of Luceño-Moreno et al. that suggested that stress, anxiety and depression measures were significantly and positively associated with emotional exhaustion and depersonalization scores and that resilience was significantly and negatively associated with emotional exhaustion and depersonalization scores (Luceño-Moreno et al., 2020). Anxiety can trigger the development or worsening of burnout and psychological distress syndromes (Giusti et al., 2020). Indeed, in the present study, anxiety scores were significantly higher in physiotherapists working directly with patients, which appears to play an important role in burnout development in our sample. Yet, the influence of anxiety was not strong enough to be integrated in the multivariate models. Possibly if anxiety was considered together with depression, results could have been different. Previous diagnosed anxiety and depression have been reported to be associated with higher burnout prevalence (Ferry et al., 2020).

Female gender was also found to be a potential predictor of personal ($B = 7.72$) and work-related burnout ($B = 4.28$) in our sample, which is in line with the findings of most studies analysing the impact of COVID-19 in health professionals mental health (Barello et al., 2020; Ferry et al., 2020; Giusti et al., 2020; Jalili et al., 2020), reporting female gender as significantly associated with burnout measures. The presence of psychological comorbidities (Ferry et al., 2020; Giusti et al., 2020) and a significant past medical history (Ferry et al., 2020) have been associated with burnout. The present results are in line with the previous findings as being diagnosed with a health problem is a

significant predictor of personal burnout. Physiotherapists with health issues may experience physical symptoms and may perceive themselves in higher risk to be infected, increasing emotional, mental and physical fatigue and exhaustion. In fact, a recent study showed a significant association between the prevalence of physical symptoms and psychological outcomes among healthcare workers during the COVID-19 outbreak (Chew et al., 2020).

The high prevalence of personal and work-related burnout might be related also to other variables. Income reduction is one of the variables we hypothesised that could help explain the personal burnout, yet it was not retained in the model. Income satisfaction has been associated with burnout levels (Poulsen et al., 2014), unfortunately we did not collect information on this issue. In Portugal, the income of physiotherapists with only one employment is low. As reported by Bejer et al., low income requires additional employment which results in additional workload (Bejer et al., 2019), which is associated with higher levels of burnout (Seixas et al., 2020). Moreover, the uncertainty generated by the pandemic may also play a role in burnout development. A recent study with Portuguese data reported that 73.2% of the included physiotherapists interrupted their in-person work activity due to the pandemic, the majority (51%) imposed by the workplace and ~60% of these implemented telehealth services (Minghelli et al., 2020). The uncertainty related to the working status was also expected to contribute to burnout levels. However, considering the pandemic situation, losing income due to interruption of work activity and the uncertainty regarding the working status, which would be expected to be associated with burnout, may have been balanced by the feeling of security of not working with patients, which is a potential predictor for burnout development in our sample.

4.1 | Limitations

This study has however some limitations that should be acknowledged. The study is based on a web-based survey, disseminated through email and social networks, which might have been affected by self-selection bias. For example, we can hypothesize that physiotherapists that were more prone to respond to the survey were those more Internet literate or also possibly those experiencing higher burnout levels. Despite this disadvantage, this low-cost method allowed us to gather data in a short period of time, which would not be possible with other means during the pandemic. The cross-sectional design of the study only enabled us to assess the burnout experienced during a specific period. It would be interesting to replicate this web-survey in other occasions to compare changes in burnout levels (e.g., winter of 2020/2021). The sample size used ($n = 511$) allowed us to explore the burnout in physiotherapists and to explain its main associated variables, yet we should be cautious as these results cannot be generalised to all Portuguese physiotherapist (data from 2018, 14.2 physiotherapists per 100,000 inhabitants (PORDATA; <https://www.pordata.pt/Europa/Fisioterapeutas-1936>). Based on the small sample size, it was also not possible to compare

burnout levels across distinct work settings, which were shown to be one explanation factor for other HCPs (Tan et al., 2021). This should be explored in future studies.

This study shows that the prevalence of burnout among physiotherapists is high, with 42% reporting personal and work-related burnout and 25% reporting patient-related burnout. Female gender, working directly with patients, diagnosis of a health problem and working directly with COVID-19 patients were potential predictors of personal burnout. Female gender and working directly with patients were potential predictors of work-related burnout, and resilience, depression and stress were potential predictors of all burnout dimensions. The COVID-19 pandemic is a stressful event that involves uncertainty, unpredictability and increased work intensity. This event requires resilience from physiotherapists and, to respond positively to the challenges imposed to the healthcare system, they need organizational support. Our results suggest that physiotherapists, especially those working directly with patients with COVID-19, should be closely monitored as a high-risk group for burnout development and given proper support and training in coping strategies. One practical action could be implementation and determination of effectiveness of resilience development strategies by healthcare institutions. Future research should explore the strategies adopted by physiotherapists to cope with burnout and the effects of workplace interventions to address physiotherapists' mental health, aiming to preserve the professionals' health and to increase the healthcare system preparedness to face this pandemic situation in the medium- and long-term.

ACKNOWLEDGEMENTS

We would like to thank the following institutions and professional organizations for promoting the study on their Internet platforms: Portuguese Association of Physiotherapists, Faculty of Medicine of University of Porto, School of Education of Polytechnic of Porto, Centre for Research and Innovation in Education (inED) and the Center for Health Technology and Services Research (CINTESIS). We thank all the physiotherapists for their participation in this study.

CONFLICT OF INTEREST

None.

ETHICS STATEMENT

This study was conducted in line with the Declaration of Helsinki and received approval from the Ethic Committee of São João Hospital Center (148/2020, May 7th).

AUTHOR CONTRIBUTIONS

Cristina Jácome, Carla Serrão, Andreia Teixeira, Luísa Castro and Ivone Duarte provided the concept/idea/research design and data collection. Andreia Teixeira and Luísa Castro performed the data analysis. Cristina Jácome and Adérito Seixas interpreted the data and drafted the manuscript. All authors provided consultation (including review of manuscript before submission). Carla Serrão and Ivone Duarte were responsible for project management.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

ORCID

Cristina Jácome  <https://orcid.org/0000-0002-1151-8791>

Adérito Seixas  <https://orcid.org/0000-0002-6563-8246>

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How to cite this article: Jácome, C., Seixas, A., Serrão, C., Teixeira, A., Castro, L., & Duarte, I. (2021). Burnout in Portuguese physiotherapists during COVID-19 pandemic. *Physiotherapy Research International*, 26(3), e1915. <https://doi.org/10.100249/pri.1915>