

Burnout among Physicians Working in Palliative Care During the COVID-19 Pandemic in Portugal: A Cross-Sectional Study



Burnout nos Médicos que Trabalham em Cuidados Paliativos durante a Pandemia de COVID-19 em Portugal: Um Estudo Transversal

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ABSTRACT

Introduction: Physicians working in palliative care have a greater risk of burnout. Burnout has three dimensions: emotional exhaustion, depersonalization and reduction of personal accomplishments. Burnout is associated with different consequences for the professionals like less professional satisfaction and increase of overall levels of exhaustion. Burnout in healthcare professionals has an impact in the patients with increased probability of clinical errors. In order to monitor the quality of the care it is mandatory to assess overall levels of burnout. This study aimed to determine burnout levels and associated variables of physicians working in the Portuguese national network of palliative care.

Material and Methods: A cross-sectional, exploratory and quantitative design was employed and participants were sampled using convenience and snowball technique. The Copenhagen Burnout Inventory was used to determine burnout levels of physicians working in the Portuguese National Network of Palliative Care. The contributions of personal, work and COVID-19 variables were evaluated in three subclasses: work, personal and patient-related burnout. The results obtained enabled the identification of healthcare professionals at risk, comparison with previous results published and to assess the impact of COVID-19 in their non COVID-19 activity.

Results: Seventy-five physicians participated. Socio-demographic characterization was conducted and the levels of burnout and determinants were explored. High levels of personal, work and patient-related burnout were present in 32 (43%), 39 (52%) and 16 (21%) physicians, respectively. The majority agreed that COVID-19 had an impact on their activities. Exclusive dedication to palliative care and type of palliative care unit were associated with lower levels of patient and work-related burnout. Weekly physical activity was associated with lower levels of work and personal burnout. Self-perceived health status was associated with lower levels of burnout for all subclasses.

Conclusion: There was a high level of burnout among physicians working in the Portuguese National Network of Palliative Care. Measures to identify and prevent burnout are necessary in order to protect these professionals.

Keywords: Burnout, Professional; Burnout, Psychological; COVID-19; Palliative Care; Physicians; Portugal

RESUMO

Introdução: Os médicos que trabalham em cuidados paliativos apresentam um risco mais elevado de *burnout*. Esta perturbação psicológica caracteriza-se por três dimensões – exaustão emocional, despersonalização e redução da realização pessoal – e está associada a diversas consequências para os profissionais como a diminuição da satisfação profissional ou o aumento dos níveis de exaustão. Ao afetar os profissionais de saúde, o *burnout* tem também impacto nos utentes, visto causar um aumento da probabilidade de erros clínicos. Com vista a monitorizar a qualidade dos cuidados prestados é fundamental monitorizar os níveis de *burnout*. O objetivo deste estudo foi o de determinar os níveis de *burnout* e variáveis associadas dos médicos que trabalham na Rede Nacional de Cuidados Paliativos em Portugal.

Material e Métodos: Estudo transversal, exploratório e quantitativo com amostragem por conveniência e bola de neve. Foi utilizado o questionário *Copenhagen Burnout Inventory* para determinar os níveis de *burnout* de médicos que exercem funções na Rede Nacional de Cuidados Paliativos. As contribuições das variáveis pessoais, laborais e decorrentes da pandemia de COVID-19 foram analisadas segundo três subclasses: *burnout* pessoal, *burnout* relacionado com a atividade profissional e *burnout* relacionado com o utente. Os resultados obtidos permitiram identificar profissionais em risco, fazer uma comparação com resultados prévios na literatura e determinar o impacto da COVID-19 na atividade assistencial não relacionada com COVID-19.

Resultados: Setenta e cinco médicos participaram neste estudo. Foi realizada a caracterização socio-demográfica e determinados os níveis de *burnout* e variáveis associadas. Níveis elevados de *burnout* pessoal, relacionados com a atividade profissional e para com o utente estavam presentes, respetivamente, em 32 (43%), 39 (52%) e 16 (21%) dos participantes. A maioria considerou que a COVID-19 teve um impacto na sua atividade clínica. A dedicação exclusiva em cuidados paliativos e o tipo de unidade de cuidados paliativos estavam associados a menor nível de *burnout* relacionado com atividade profissional e para com o utente. A autopercepção de saúde estava associada a menores níveis de *burnout* em todas as subclasses.

Conclusão: Foi observado um elevado nível de *burnout* nos médicos que trabalham na Rede Nacional de Cuidados Paliativos. São necessárias medidas para identificar e prevenir o *burnout* nestes profissionais, com vista à sua proteção.

Palavras-chave: COVID-19; Cuidados Paliativos; Esgotamento Profissional; Esgotamento Psicológico; Médicos; Portugal

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INTRODUCTION

Average life expectancy has been rising worldwide according to the World Health Organization (WHO).¹ The long-term consequences of the coronavirus disease 2019 (COVID-19) pandemic are still unknown. Nevertheless, it has exacerbated the discrepancies in access to health care.² As a result of the gradual aging of the world's population, healthcare systems are facing new problems and a need to offer new answers³ involving palliative care delivery.

The WHO defines palliative care as an approach that improves the quality of life of patients who are facing an incurable or serious illnesses and their families. This is done through the prevention and relief of suffering by early identification and treatment of different problems⁴ and it can help with a variety of disorders that are not terminal, including cancers.⁵

The Portuguese National Network of Palliative Care (NNPC) was developed as a response to the country's demand for palliative care. This network is comprised of different types of units.⁶ Palliative Care units (PCUs) provide inpatient care and belong to the Portuguese National Health Service or to private hospitals that have an agreement with it. Hospital support Palliative Care teams (HSPCTs) provide support to inpatients in hospitals in which they are integrated, as well as support to families or informal caregivers. Home Palliative Care teams (HPCTs) assist the community including patients in their homes and their informal caregivers or families.⁷

Clinical care teams in palliative care usually include groups of different healthcare professionals.⁸ Working teams face different difficulties while working in palliative care, which have been exacerbated due to COVID-19⁹: professionals in palliative care always need to be scientifically up to date,¹⁰ face ethical dilemmas¹¹ or have to deal with the expectations and suffering.¹²⁻¹⁴ The low number of professionals working in palliative care also leads to an increased workload.⁸ Physicians may have a lower risk of burnout as they are more prepared to deal with their patient's death,¹⁵ but all the previous reasons mentioned could also increase the risk of burnout in palliative care physicians.¹⁶⁻¹⁸

Freudenberger was one of the first to describe the symptoms of exhaustion and burnout.¹⁶ Burnout was described as a constellation of non-specific symptoms that are usually related to helping professions (healthcare workers). Maslach and Leiter¹⁷ further developed the concept of burnout. It shifted from being a crisis while helping or working with people to a crisis related to the environment at work.^{17,18} Burnout can thus be defined as a "state of physical, emotional and mental exhaustion that results from long-term involvement in work situations that are emotionally demanding".¹⁹ Maslach and Jackson²⁰ also characterized burnout syndrome through three dimensions: depersonalization, emotional exhaustion and a lack of personal accomplishment.^{21,22} As for burnout syndrome in healthcare workers, it is also important to focus the effects of this syndrome in patients.²³ The WHO defines burnout as "a syndrome conceptualized as resulting from chronic workplace stress that has not been successfully managed. It is characterized by three dimensions: 1) feelings of energy depletion or exhaustion; 2) increased mental distance from one's job or feelings of negativism or cynicism related to one's job and 3) a sense of ineffectiveness and lack of accomplishment".²⁴ Burnout in healthcare professionals is related to a lot of consequences like reduction in work performance or increased probability of errors.^{14,21,25} Burnout syndrome could be less prevalent among physicians working in palliative care compared to other medical specialties.^{16,26,27} However, it is important to be aware of the importance of early screening of physicians who are at risk as the early detection can lead to the implementation of measures to avoid and mitigate burnout. It is also important to highlight that it is only possible to deliver high-quality care when professionals are satisfied and committed.²³ The real impact of burnout on palliative care physicians during the pandemic is still unknown and we could only retrieve one relevant study in the literature that has been published after the outbreak of COVID-19.²⁸ The COVID-19 pandemic has been a challenge for palliative care practitioners^{29,30}: some of the patients in palliative care have died alone, contact with families and friends has been impossible and some resources have not been available.³¹

The aim of this study was to evaluate the level of burnout among physicians working in Portuguese NNPC using the Copenhagen Burnout Inventory (CBI).³² This study also examined whether there was any significant association of different socio-demographic and professional variables in this population with the three burnout dimensions. As far as we know, this study is the second of its kind worldwide and the first in Portugal to evaluate the levels and the associations of burnout among palliative care physicians during the COVID-19 pandemic. The first article published²⁸ only evaluated the level of burnout of home palliative care physicians and nurses, whereas our study focuses on all palliative care physicians in the country. Since this study was conducted during the COVID-19 pandemic, the findings were also compared with previous results in the literature before the outbreak of COVID-19. Measurement of the level of burnout was done using the CBI³² and this study also examined whether there was any significant association of different socio-demographic and professional variables in this population with the three burnout dimensions.

MATERIAL AND METHODS

In this exploratory, quantitative and cross-sectional study, physicians working in NNPC in Portugal were sampled by convenience and snowball techniques. This study was approved by the Ethics Committee of São João Hospital Centre (approval number 195/2020 on June 15, 2020) and followed ethical procedures complying with the Declaration of Helsinki. All physicians provided informed consent online in accordance with the General Data Protection Regulation Guidelines.³³ The author responsible for the validation of the CBI for Portuguese language gave permission for the use of this scale.³⁴

Personal and work-related variables were collected using a self-administered questionnaire that we developed. The personal variables collected were gender, age, marital status, parental responsibility of underage children, weekly physical exercise and self-perceived health status. The work-related variables collected were academic degree, medical specialization, exclusive dedication to palliative care (yes/no), years of activity in palliative care, unit type as the place of work in NNPC: HPCTs, HSPCTs, PCUs and weekly hours in palliative care. Regarding the impact of COVID-19, physicians were asked whether their work in palliative care was affected by COVID-19 and if they were transferred from palliative care activity to COVID-19 units.

The target population and inclusion criteria of this study were all the palliative care physicians working in NNPC in Portugal. A questionnaire was made on Google Forms (Google, Mountain View, California, United States) and comprised a section with socio-demographic and professional questions followed by the validated Portuguese version of the CBI.³⁴ There were no missing data. The response rate was impossible to estimate as there are no official data concerning the total number of physicians working in NNPC. The survey was distributed via the institutional e-mails of all the teams that work in NNPC,³⁵ as well as the social networks LinkedIn (Microsoft, Mountain View, California, United States) and Facebook (Meta Inc, Menlo Park, California, United States). The questionnaire was available for online responses and data were collected between July 20th, 2020 to November 1st, 2020. This project was supported by the Portuguese Association of Palliative Care and the University of Oporto which promoted this questionnaire.

Burnout was evaluated using the Portuguese validated version of the CBI.³⁴ This scale has 19 questions that are related to three subscales of burnout: personal, work-related, and client-related (reformulated to patient-related). Questions were answered on a 5-point Likert response scale. Each question of the different subscales has five different possible answers that are scored as 0, 25, 50, 75, or 100 according to the authors' instructions.

The personal burnout subscale (six questions) evaluates the degree of physiological, physical, and personal feeling of exhaustion. The work-related burnout subscale (seven questions) evaluates the degree of physical and psychological fatigue and the personal sensation of exhaustion towards work. The patient-related burnout subscale (six questions) assesses the degree of physical and psychological fatigue and personal feeling of exhaustion related to working with patients. The total score for each subscale is the calculated mean of the scores of that subscale's answers, which ranged from 0 to 100. If the total score of a subscale was greater than or equal to 50, it was considered a high level of burnout for that subscale.^{22,24} All subscales have high internal consistency with Cronbach's alpha (α) in the original version ranging from 0.84 to 0.87. In the Portuguese version, α for personal burnout was 0.85, that for work-related burnout was 0.87, and that for client-related burnout was 0.84.³⁴ In our sample, α was 0.84, 0.90, and 0.87, respectively. Additionally, the correlations item-total were in the range (0.61 - 0.82) for personal burnout, (0.41 - 0.83) for work-related burnout and (0.55 - 0.68) for client-related burnout, emphasizing the internal consistency of the CBI Portuguese version.

All the data from Google Forms were exported to an Excel 2016 spreadsheet (Microsoft, Washington, United States) and data analysis was performed using SPSS Statistics (version 26.0; SPSS Inc., Chicago, Illinois, United States) and Jamovi software (The Jamovi project (2021), Jamovi (Version 1.6) (Computer Software) (Sydney, Australia). Absolute and relative frequencies [n (%)] were used to describe the categorical variables. In the case of normally distributed quantitative variables, the mean and standard deviation were used to describe the variables. If the quantitative variables were non-normally distributed, they were described using medians and interquartile intervals (Q1, Q3). The observation of histograms was used for verification of normality. For each independent variable (personal, work and COVID-19 related), a simple linear regression was performed for each outcome: personal burnout, work and patient-related burnout. If the variables were related to the outcomes ($p \leq 0.20$), these variables were included in the multiple linear regression analyses for each outcome.³⁶ In the final model, only the significant ($p \leq 0.05$) independent variables were maintained for each outcome and the results of linear regressions are shown with unstandardized coefficients (B), 95% confidence intervals (95% CI), and p -values.

Standardized β and semi-partial squared-correlations (sum-of-squares of the effect divided by the total sum-of-square, η^2) for the final models are also presented. The final multivariable models were evaluated using F statistics, p -values, and coefficients of determination (R^2). The assumptions of the linear regression models were verified as follows. Normality of residuals was assessed by visual analysis of histograms, t -tests were employed to test whether average residuals were zero, and homoscedasticity was checked using scatter plots of residuals versus the predictive values. The absence of multicollinearity was verified assessing the tolerance for each independent variable in the final model, which should be close to 1, and the variance inflation factor (VIF), using VIF < 5 as the cut-off point.³⁷ In all tests, values of $p \leq 0.05$ were considered significant.

RESULTS

Seventy-five physicians participated in this study. The majority were women ($n = 58, 77.3\%$), and the median (Q1, Q3) age of all physicians was 44 (36, 48) years old. Most of them ($n = 52, 69.3\%$) did not work entirely in palliative care, but the majority had formal training in palliative care ($n = 71, 94.7\%$). Nineteen physicians (25.3%) worked in HPCTs, 42 physicians (56%) worked in HSPCTs and 14 physicians (18.7%) worked in a PCUs. The majority ($n = 62, 82.7\%$) believed that their

clinical activity in palliative care was affected by COVID-19, and were not allocated to other clinical functions in COVID-19 units ($n = 51$, 68%). Regarding the number of years working in palliative care, the median (Q1, Q3) was 6 (3, 9) years. Most physicians reported a good health status ($n = 40$, 53.3%) or very good health status ($n = 13$, 17.3%), but almost half ($n = 30$, 40%) did not report having any regular physical activity. The most frequent medical specialties were internal medicine ($n = 35$, 46.7%) and family medicine ($n = 24$, 32%). The full characterization of all participants is summarized in Table 1.

The physicians' level of burnout for each subscale was divided between low and high levels (final scores equal or above 50). High levels of personal burnout were found in 32 physicians (43%), high levels of work-related burnout in 39 physicians (52%) and high levels of patient-related burnout in 16 physicians (21%).

The personal, work, and COVID-19 variables that were eligible for the multiple linear regression models ($p \leq 0.20$ in the simple regression) were different for each subscale of burnout (Table 2). For personal burnout, the variables were gender, weekly hours of physical activity, self-perceived health status and type of unit. For work-related burnout, the variables included were gender, weekly hours of physical activity, exclusive dedication to palliative care, self-perceived health status, years and weekly hours of activity in palliative care and type of palliative care unit. For patient-related burnout the variables included were weekly hours of physical activity, exclusive dedication to palliative care, self-perceived health status, type of palliative care unit and weekly hours of activity in palliative care.

In the final multiple linear regression model for personal burnout, the significant variables were weekly hours of physical exercise and self-perceived health status. The final model explained approximately 50% of the total data variance (Table 3). For work-related burnout, the significant variables were weekly hours of physical exercise, exclusive dedication to palliative care, self-perceived health status and type of palliative care unit. The final model explained approximately 47.6% of the total data variance (Table 3). For patient-related burnout, the significant variables were exclusive dedication to palliative care, self-perceived health status and type of palliative care unit. The final model explained approximately 30.2% of the total data variance (Table 3). Self-perceived health status represented the most relevant variable in terms of variance explained for all burnout dimensions (Table 3). No problems of multicollinearity were present, as the final model presented variance inflation factors between 1.09 and 1.20 for personal burnout, between 1.05 and 1.22 for work-related burnout and between 1.02 and 1.05 for patient-related burnout.

The personal burnout levels of physicians who perceived their health status as very good or good were 21.2 points lower on average than those of physicians who perceived their health status as bad or not good or bad. In addition, physicians who weekly exercised 75 minutes or more had lower levels of personal burnout. On average, their personal burnout levels were 11.7 points lower than those of physicians with no regular physical activity (Table 4).

Work-related burnout levels of physicians who perceived their health status as very good or good were 17.1 points lower, on average, in comparison with physicians who perceived their health status as bad or not good or bad. Physicians who exercise who weekly exercised 75 minutes or more had lower levels of work-related burnout, with a reduction of 12 points, on average, compared with physicians with no regular physical activity. Physicians who worked exclusively in palliative care showed lower levels of work-related burnout with a reduction of 8.9 points on average in comparison with physicians that did not work exclusively in palliative care. Physicians working at HSPCTs had lower levels of work-related burnout by 7.8 points on average compared to physicians working in HPCTs (Table 4).

Patient-related burnout levels of physicians who perceived their health status as very good or good were 15 points lower, on average, in comparison with physicians who perceived their health status as bad or not good or bad. Physicians who worked exclusively in palliative care showed lower levels of work-related burnout with a reduction of 11.4 points, on average, in comparison with physicians that did not work exclusively in palliative care. Physicians working at HSPCTs and PCUs had lower levels of patient-related burnout by 15.2 and 13.2 points, on average, compared to physicians working in HPCTs. These results are summarized in Table 4.

DISCUSSION

A difference between the prevalence of high levels in personal (43%), work-related (52%) and patient-related (21%) burnout was found. The results indicated higher levels of burnout in comparison to other studies.^{16,17,38} It is important to note that this study was conducted during the COVID-19 pandemic, thus leading to higher levels of burnout being reported.²⁹ Most physicians ($n = 62$, 82.7%) agreed that COVID-19 had an impact on their palliative care work, but the majority were not allocated to COVID-19 units which could have had a protective effect on the overall levels of burnout.

The impact of COVID-19 on non-COVID-19 situations like palliative care activity has already been described.³⁰ There are different variables that could be related to higher levels of burnout³⁹ in healthcare workers: depression,⁴⁰ resilience,⁴⁰ stress,⁴¹ previous psychological problems⁴² or traumatic events in relation with COVID-19.⁴²

Health is defined by the WHO as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity".⁴³ Being deployed to a COVID unit could have an impact on one or more of these elements and lead to higher levels of burnout. It is also now clear that even more than after the outbreak, COVID-19 will continue to be a challenge and a possible source of burnout for all healthcare workers. It is mandatory that institutions protect their workers and offer tools for early detection of professionals at risk.⁹ The high levels of burnout in this study were in

agreement with some of the results in the literature.^{38,41,44} It is important to note that this study was, to the best of our knowledge, the second study worldwide to assess the levels of burnout in palliative care physicians after the COVID-19 outbreak. Our study focuses on all palliative care physicians in the country and is the first national study of its kind in Portugal to be conducted after the outbreak of COVID-19. It is necessary to highlight that the prevalence of burnout varies in studies involving healthcare workers in palliative care and the majority used the Maslach Burnout Inventory and were conducted before the outbreak of COVID-19, which makes it more difficult to compare the results.⁴⁵ One review found no major differences between physicians and nurses,⁴⁵ and the burnout levels of nurses working in palliative care in Portugal during the COVID-19 pandemic were similar to the results in this study³⁰ which supports the conclusions of this study. The most recent report of the NNPC also supports our conclusions in this study about the median age of the physicians, the number of years of working in palliative care and weekly hours of work in NNPC.⁸

For the three burnout dimensions, the personal and work variables that were included in the final model were different. Patient-related burnout is related to individuals' exhaustion in relation to their work with patients. The personal and work variables that were included in the final model of patient-related burnout were exclusive dedication to palliative care, self-perceived health status and type of unit. Depersonalization can be harmful to patients as it leads to detachment from patients, colleagues and the organization.⁴⁴ According to our final model, exclusive dedication to palliative care was significantly associated with less burnout in both patient-related and work-related burnout. These results can seem like a paradox, but in fact, other studies had the same results.^{17,26} Several reasons could be related to the fact that physicians working in palliative care⁴⁷ have a lower probability of burnout. For example, they have a higher degree of job satisfaction, a less stressful working environment or better conditions to do their job.²⁶ Furthermore, while working with only palliative care patients, the risk of becoming infected or infecting other patients with COVID-19 is lower, which could have an effect on overall levels of burnout.

Engaging in weekly physical activity was also associated with lower levels of personal and work-related burnout which is supported by the literature.⁴⁶ The type of unit was related with different levels of burnout in work and patient-related burnout in accordance with another study.¹⁷ The levels of work (not statistically significant) and patient-related burnout of physicians working in the HSPCTs and PCUs were 7.8, 6.2 points and 15.2, 13.2 points lower on average, respectively, in comparison with those in home palliative care teams. These differences could be associated with the organization of NNPC.⁶ Physicians working in HSPCTs or PCUs have a different work environment and better support in contrast with HPCTs. HSPCTs have the advantage of working in a hospital with better support from different specialties and from other professionals like nurses. In contrast, physicians working in HPCTs have a more demanding environment⁴⁷ and fewer resources available.¹⁷ Physicians working in PCUs can also count on the support of the institution and other workers in contrast to HPCTs. Overall, having better support from the work environment and other professionals could be responsible for the lower levels of work and patient-related burnout.¹⁷ It is important to note that COVID-19 required a modification of the normal procedures across all the teams, but the impact could be higher in HPCTs in terms of burnout while having clinical meetings in their homes such as the need to protect patients and their caregivers while having clinical meetings.²⁸

Self-perceived health status was the only variable present in the three final models. The notion of very good or good health status was significantly related to less personal, work, and client-related burnout, as expected. These results are also supported by the literature, which indicates that physicians who perceived having a better health status are more likely to be able to control situations that could increase overall levels of burnout.⁴⁸

We could not find any other study similar to this one that was conducted after the outbreak of COVID-19. This study offers the first possibility to assess the impact of the new reality of these healthcare workers during the COVID-19 pandemic. The majority (83%) agreed that COVID-19 had an impact on their clinical activity. As expected, patient-related burnout levels were low, but the high prevalence of personal and work-related burnout requires measures and solutions from institutions. The authors note the limitation of the sample size that could have influenced the overall results. In future studies it would be important to have a bigger sample size. However, as far as the authors know, this study has the biggest sample size concerning palliative care physicians in Portugal, which offers the possibility to provide new insights about burnout in these professionals.^{49,50} We are also aware that COVID-19 could have contributed to higher levels of burnout. During the period of data collection, Portugal was experiencing the COVID-19 pandemic crisis, which could have influenced the overall burnout levels. Another limitation that this study could have is lower representation of physicians who use the internet less as the data were collected entirely through electronic means. This study was a cross-sectional study with no follow-up of the physicians over time or during different phases of the COVID-19 pandemic. Other variables related with COVID-19 could have an influence on the overall results of burnout levels, like physicians or their relatives being infected with COVID-19 during the period of data collection. It would be important to have more studies in the literature conducted after the outbreak of COVID-19 in order to make the comparison with the obtained results. Lastly, although this study was also totally anonymous, participants could still have a tendency to rate themselves in a better position while answering the questions related to burnout levels.

We are now in a different phase of the COVID-19 pandemic with fewer cases and a majority of the population being vaccinated in some countries. Thus, it would be interesting to see whether these factors have had an impact on overall

levels of burnout by replicating this study in the same population. These high levels of burnout in physicians demonstrate the importance of applying measures in the National Health Service to identify physicians who are at risk and to decrease overall levels of burnout to protect these healthcare workers and deliver high-quality health care services to their patients.

CONCLUSION

The prevalence of personal burnout, work-related burnout, and patient-related burnout was 43%, 52% and 21%, respectively. We have found high levels of burnout in comparison with other studies, but the COVID-19 pandemic situation could have influenced the overall levels of burnout.

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AUTHORS CONTRIBUTION

JVG, LC: Design of the study, data acquisition and analysis, draft and critical review of the manuscript.

RN, GR: Data analysis, draft and critical review of the manuscript.

PROTECTION OF HUMANS AND ANIMALS

The authors declare that the procedures were followed according to the regulations established by the Clinical Research and Ethics Committee and to the Helsinki Declaration of the World Medical Association updated in 2013.

DATA CONFIDENTIALITY

The authors declare having followed the protocols in use at their working center regarding patients' data publication.

COMPETING INTERESTS

All authors report no conflicts of interest.

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Table 1 – Sample characterization (n = 75)

Characteristics	n	%
Gender		
Male	17	22.7
Female	58	77.3
Marital status		
Married/civil union	46	61.3
Divorced/separated	8	10.7
Single	21	28.0
Underage children		
Yes	32	42.7
No	43	57.3
Nationality		
Portuguese	72	96
Non-Portuguese	3	4.0
Exclusive dedication to PC		
Yes	23	30.7
No	52	69.3
Specialization in PC		
No	4	5.3
Bachelor's degree or post-graduation	38	50.7
Master's or PhD degree	33	44.0
Type of PC unit		
HPCT	19	25.3
HSPCT	42	56.0
PCU	14	18.7
PC affected by COVID-19		
Yes	62	82.7
No	13	17.3
Allocated to COVID-19 units		
Yes	24	32.0
No	51	68.0
Weekly hours of activity		
Less than 20	26	34.7
Between 20 and 40	34	45.3
More than 40	15	20.0
Self-perceived health status		
Very good	13	17.3
Good	40	53.3
Not good or bad	16	21.3
Bad or very bad	6	8.0
Medical specialty		
Anaesthesiology	6	8.0
Family medicine	24	32.0
Internal medicine	35	46.7
Others	10	13.3
Workplaces		
Northern Portugal	18	24.0
Central Portugal	15	20.0
Lisbon	21	28.0
Alentejo	17	22.7
Algarve	2	2.7
Autonomous Region of Azores	1	1.3
Autonomous Region of Madeira	1	1.3

PC: Palliative Care; HPCT: home Palliative Care teams; HSPCT: hospital support Palliative Care teams; PCU: Palliative Care units

Table 2 – Unstandardized regression coefficients of univariable models for the subscales of burnout according to Copenhagen Burnout Inventory as outcomes and personal, work and coronavirus disease 2019 (COVID-19) variables as predictors

Variables	Personal burnout B [95% CI]	Work-related burnout B [95% CI]	Patient-related burnout B [95% CI]
Gender			
Male	Ref	Ref	Ref
Female	14.6 [4.66; 24.00]**	13.9 [4.61; 23.20]**	-1.27 [-11.90; 9.40]
Age (years)	0.07 [-0.35; 0.49]	0.07 [-0.34; 0.47]	-0.24 [-0.67; 0.20]
Marital status			
Married/Civil union	Ref	Ref	Ref
Divorced/Separated/Single	0.96 [-7.83; 9.74]	-0.58 [-9.06; 7.9]	-1.76 [-10.9; 7.41]
Underage children			
No	Ref	Ref	Ref
Yes	-2.35 [-11.00; 6.28]	-3.71 [-12.00; 4.60]	1.96 [-7.07; 11.00]
Weekly physical exercise			
No regular practice	Ref	Ref	Ref
Less than 75 min	-18.70 [-27.30; -10.00]***	-14.90 [-23.50; -6.32]***	-15.20 [-25.30; -5.15]**
75 min or more	-22.40 [-31.20; -13.70]***	-20.70 [-29.40; -11.97]***	-12.10 [-22.30; -1.87]**
Exclusive dedication to PC			
No	Ref	Ref	Ref
Yes	-3.93 [-13.20; 5.30]	-6.62 [-15.40; 2.20]⁺	-7.51 [-17.00; 2.02]⁺
Self-perceived health status			
Bad /Not good or bad	Ref	Ref	Ref
Good / Very Good	-20.43 [-28.47; -12.40]**	-17.13 [-25.40; -8.84]***	-15.00 [-23.50; -6.48]***
Years of activity in PC	-0.17 [-1.11; 0.77]	-0.61 [-1.51; 0.29]⁺	-0.43 [-1.41; 0.55]
Type of PC unit			
HPCT	Ref	Ref	Ref
HSPCT	-7.91 [-18.00; 2.22]⁺	-8.61 [-18.40; 1.14]⁺	-14.60 [-24.80; -4.39]⁺
PCU	-3.15 [-16.10; 9.76]	-4.70 [-17.10; 7.72]	-11.90 [-24.90; 1.08]⁺
Weekly hours of activity			
Less than 20	Ref	Ref	Ref
Between 20 and 40	-3.50 [-13.10; 6.13]	-4.36 [-13.60; 4.85]	0.88 [-8.97; 10.73]
More than 40	-6.90 [-18.90; 5.07]	-9.55 [-21.00; 1.91]⁺	-11.10 [-23.36; 1.16]⁺
Allocated to COVID-19 units			
No	Ref	Ref	Ref
Yes	0.12 [-9.05; 9.29]	-0.72 [-9.57; 8.13]	3.56 [-5.98; 13.10]

PC: Palliative Care; HPCT: home Palliative Care teams; HSPCT: hospital support Palliative Care teams; PCU: Palliative Care units; Ref: reference category; B: unstandardized coefficient; CI: confidence interval

⁺: $p \leq 0.20$; ^{*}: $p \leq 0.05$; ^{**}: $p \leq 0.01$; ^{***}: $p \leq 0.001$

Table 3 – Standardized regression coefficients and semi-partial squared correlations in multivariable models for the subscales of burnout according to Copenhagen Burnout Inventory as outcomes and personal, work and coronavirus disease 2019 (COVID-19) variable as predictors

Variables	Personal burnout		Work-related burnout		Patient-related burnout	
	Standardized β	η^2	Standardized β	η^2	Standardized β	η^2
Exclusive dedication to PC						
No	-	-	Ref	0.05	Ref	0.69
Yes			-0.48*		-0.59**	
Self-perceived health status						
Bad / Not good or bad	Ref	0.19	Ref	0.13	Ref	0.12
Good / Very good	-1.10***		-0.96***		-0.78***	
Weekly physical exercise						
No regular practice	Ref		Ref		-	-
Less than 75 min	-0.42	0.05	-0.32	0.06		
75 min or more	-0.63**		-0.67**			
Type of PC unit						
HPCT	-	-	Ref		Ref	
HSPCT			-0.44*	0.03	-0.79**	0.10
PCU			-0.35		-0.69*	
R ²	0.50		0.48		0.30	
F	23.70***		10.30***		7.56***	

PC: Palliative Care; HPCT: home Palliative Care teams; HSPCT: hospital support Palliative Care teams; PCU: Palliative Care unities; Ref: reference category; β : standardized coefficient; η^2 : semi-partial squared-correlations; R²: determination coefficient; F: F statistics.

*: $p \leq 0.05$; **: $p \leq 0.01$; ***: $p \leq 0.001$.

Table 4 – Unstandardized regression coefficients of multivariable models for the subscales of burnout according to Copenhagen Burnout Inventory as outcomes and personal, work and coronavirus disease 2019 (COVID-19) variable as predictors

Variables	Personal burnout B [95% CI]	Work-related burnout B [95% CI]	Patient-related burnout B [95% CI]
Exclusive dedication to PC			
No	-	Ref	Ref
Yes		-8.89 [-15.90; -1.83]*	-11.4 [-20.10; -2.78]**
Self-perceived health status			
Bad / Not good or bad	Ref	Ref	Ref
Good / Very good	-21.21 [-29.30; -13.14]***	-17.13 [-25.4; -8.84]***	-15.00 [-23.50; -6.48]***
Weekly physical exercise			
No regular practice	Ref	Ref	
Less than 75 min	-7.77 [-16.20; 0.68]	-5.62 [-14.20; 2.95]	-
75 min or more	-11.65 [-20.20; -3.14]**	-11.99 [-20.80; -3.18]**	
Type of PC unit			
HPCT	-	Ref	Ref
HSPCT	-	-7.80 [-15.60; -0.01]*	-15.20 [-24.80; -5.71]**
PCU		-6.20 [-16.60; 4.16]	-13.20 [-25.50; -0.96]*
R ²	0.50		0.30
F	23.70***		7.56***

PC: Palliative Care; HPCT: home Palliative Care teams; HSPCT: hospital support Palliative Care teams; PCU: Palliative Care unities; Ref: reference category; B: unstandardized coefficient; CI: confidence interval; R²: determination coefficient; F: F statistics.

*: $p \leq 0.05$; **: $p \leq 0.01$; ***: $p \leq 0.001$.