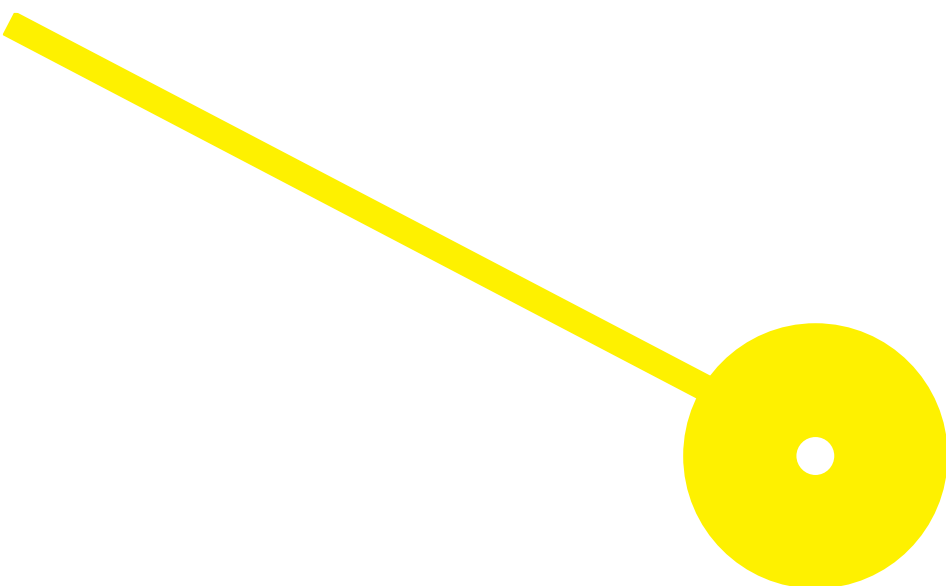




Resilience among Portuguese healthcare professionals: A cross-sectional study

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09/2023





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Resilience among Portuguese healthcare professionals: a cross-sectional study

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Dissertação apresentada para cumprimento dos requisitos necessários à obtenção do grau de Mestre em **Terapia Ocupacional – Saúde Mental** pela Escola Superior de Saúde do Instituto Politécnico do Porto.

Agradecimentos

A primeira palavra de agradecimento é dirigida à minha orientadora, a Professora Doutora Raquel Simões de Almeida, que me acompanhou desde o momento da minha decisão neste tema e que me orientou ao longo deste percurso e que acreditou sempre em mim.

De seguida, agradeço à Professora Doutora Artemisa Rocha Dore, no papel de coorientadora e por demonstrar toda a sua disponibilidade em me ajudar a concluir este projeto.

Agradeço às minhas amigas e colegas de curso que me deram força para continuar nos momentos mais difíceis deste percurso. Um agradecimento especial à minha amiga Ana e ao meu amigo Eduardo que estiveram sempre presentes e não me deixaram desistir. Agradeço aos meus pais, Carla e António, e namorado, Luís, todo o apoio que me deram desde o início deste percurso, por me ouvirem, por me secarem as lágrimas e, acima de tudo, por estarem sempre do meu lado. Deixo o meu agradecimento à Escola Superior de Saúde do Porto que me permitiu ser o que sou hoje, Terapeuta Ocupacional.

Por fim, mas não menos importante, agradeço a todos os profissionais de saúde que, de livre vontade, participaram neste estudo e possibilitaram que tudo isto acontecesse e que permitiram o meu crescimento.

Resumo

Trabalhar em ambientes stressantes pode aumentar o risco de doença mental, bem como de sofrimento físico e psicossocial entre os profissionais de saúde. Assim, a promoção da resiliência entre estes profissionais pode ser considerada uma abordagem para lidar com níveis mais elevados de stress no local de trabalho. Este estudo tem como objetivo caracterizar os níveis de resiliência entre os profissionais de saúde em Portugal, que trabalharam durante a pandemia de CoVID-19, de março de 2020 a fevereiro de 2022.

Neste estudo transversal, 271 profissionais de saúde (idade 33.90 anos, $DP = 9.59$, 90.80% mulheres) preencheram a Escala de Resiliência para Adultos (RSA). A pontuação média para a RSA total foi de 178.17 ($DP = 22.44$), pelo que concluímos que durante a pandemia da CoVID-19, os profissionais de saúde em Portugal desta amostra apresentaram níveis moderados a altos de resiliência. Os resultados demonstraram que os médicos/psicólogos e os profissionais com grau de mestrado e doutoramento apresentaram níveis mais altos de resiliência comparativamente com as outras profissões e outros graus de educação inferiores. Em estudos futuros, seria importante investigar as potenciais implicações na prática clínica, abrangendo tanto a dimensão organizacional, quanto a dimensão política.

Palavras-chave: Resiliência; Pandemia de CoVID-19; Profissionais de Saúde; Saúde Mental; Escala de Resiliência para Adultos.

Abstract

Working in stressful environments can increase the risk of mental illness as well as physical and psychosocial suffering among healthcare professionals. Therefore, promoting resilience among these professionals can be considered an approach to deal with higher levels of stress in the workplace. This study aims to characterise the levels of resilience among healthcare professionals in Portugal who worked during the CoVID-19 pandemic, from March 2020 to February 2022.

In this cross-sectional study, 271 healthcare professionals (age 33.90 years, SD = 9.59, 90.80% women) completed the Resilience Scale for Adults (RSA). The average score for the total RSA was 178.17 (SD = 22.44), so it can be concluded that during the CoVID-19 pandemic, healthcare professionals in Portugal in this sample have shown moderate to high levels of resilience. The results showed that physicians/psychologists and professionals with master's and doctorate degrees had higher levels of resilience compared to other professions and lower levels of education. In future studies, it would be important to investigate the potential implications for clinical practice, covering both the organisational and political dimensions.

Keywords: Resilience; CoVID-19 Pandemic; Healthcare Professionals; Mental Healthcare; The Resilience Scale for Adults

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1. Introduction

The CoVID-19 pandemic has caused an unprecedented global crisis, including millions of lives lost, public healthcare systems in shock and economic and social disruption, disproportionately affecting the most vulnerable and the healthcare professionals (1). This pandemic has challenged local, national and global capacities and has exposed the limitations of many healthcare systems (2,3). A comprehensive analysis of the resilience of healthcare systems during a pandemic can point to important lessons and help strengthen countries' preparedness, response, and approach to future healthcare challenges (1–3).

Major epidemic outbreaks represent an increasing demand for healthcare professionals. Increased infection cases and mortality rate, lack of specific drugs and/or vaccines, media coverage, increased workload, lack of personal protective equipment and feelings of inadequate support can all contribute to the mental burden of healthcare personnel (4,5). Working in these environments can increase the risk of various psychological and mental illnesses, as well as physical and emotional distress among healthcare professionals (4,5).

An increasing amount of information is available around topics such as disease epidemiology, pathogenesis and infection control and prevention (6). However, there is a shortage of literature on interventions to support healthcare professionals during disease outbreaks (6). With the knowledge acquired from previous global outbreaks and their psychosocial impacts, early assessment of healthcare professionals mental health and consideration of appropriate psychological interventions is imperative (4).

Moreover, in a crisis, a resilient healthcare system can adapt in response to dynamic situations and reduce vulnerability across the system. Experience from previous epidemics has highlighted the links between resilience and preventing the transmission of new outbreaks (7).

Psychosocial risks and work-related stress are among the most challenging issues concerning occupational safety and healthcare, having a significant impact on the health of individuals, organizations and national economies (7). Some examples of factors identified as causing emotional distress are concern for family, workplace stress, interpersonal isolation, stigmatisation, time pressure, the responsibility of medical decision making, as well as social expectations of healthcare professionals (1,8,9).

Research and interest on resilience has been growing in recent decades and the increasing focus on the role of resilience in healthcare promotion represents a more suitable approach to

prevention and treatment, as it allows to balance the emphasis on pathology and vulnerability with the focus on protective mechanisms and positive adaptation (10).

Resilience represents a concept that is still insufficiently clear, despite its increased use in daily life and in several professional areas. Therefore, in the literature, it is possible to find multiple definitions for the concept of resilience (11,12). Resilience is a process in which people can adapt well to the adversities that they face on a daily basis and remain hopeful about their future (13,14). Being resilient may also be defined as an innate trait, considered to be the physical and psychological characteristics of the individuals (6,15,16). Consistent patterns of psychological qualities associated with successful adaptation include emotional intelligence, altruism, and an active style of coping with stress (16,17). This describes the phenomenon in which an individual does not experience, or only temporarily experiences, mental health problems despite being subjected to psychological or physical stress of short (acute) or long (chronic) duration (9,18,19). So, there are slightly different perspectives on how to view resilience. Some authors argue that resilience is a personality trait, thus it is defined as static and a positive personal resource that enhance individual adaptation (9). This approach has been largely superseded by a view of resilience as an outcome rather than a static personality trait (9,18,20–22). Psychosocial resilience factors are well evidenced according to the current state of knowledge, and thought to be modifiable, including meaning/purpose in life, sense of coherence, positive emotions, toughness, self-esteem, active coping, self-efficacy, optimism, social support, cognitive flexibility, and religiosity or spirituality (23). More recently, resilience has been conceptualised as a multidimensional and dynamic process. In general, resilience is seen as the result of an interaction between individuals and their environment, which can be influenced through personal and environmental resources. Accordingly, resilience is modifiable and can be improved/promoted through interventions (9,18,22,24).

Hu et al have shown that resilience is negatively associated with emotional exhaustion and depersonalisation, and it is positively associated with job satisfaction (25). Therefore, they suggest that resilience could mitigate the negative impact of work on mental health and act as a mechanism to prevent adverse outcomes (25).

As previously mentioned, resilience is dynamic and multidimensional since it can be maintained or developed through learning and training (11). Some authors argue that there are seven pillars of resilience which include optimism, acceptance, focus on problem solving, defence mechanisms, forgiveness, responsibility, knowledge, and planning for the future (11). Most studies indicate that

females show lower levels of resilience compared to males (26–28). However, other studies show opposite results, presenting higher levels of resilience in the female gender (12,26,29). Several studies have also mentioned age as a possible factor related to levels of resilience, but so far, no significant data has been found to prove this correlation (12,30,31).

Overall, the concept of resilience has become increasingly important in healthcare professionals in recent years (6). Promoting resilience among healthcare professionals can be considered an approach to cope with higher levels of stress in the workplace and to reduce burnout (32). Therefore, more research is necessary to provide healthcare professionals with tools, scientifically validated, to develop their resilience. Therefore, an urgent need arises to increase our focus on resilience and strategies to enhance/promote it.

Healthcare professionals experience higher levels of stress than other professions due to the challenges they face in their working environment. During the CoVID-19 pandemic, healthcare professionals had to cope with some environmental factors, such as social distancing, limited access to physical spaces and they were forced to change their choices, habits and professional roles, which negatively affected their occupational performance (33,34).

The World Federation of Occupational Therapy (WFOT) defines that the main goal of occupational therapy is to enable people to participate in activities of daily living (35,36). In occupational therapy, the individual has the right to engage in occupations that are important and necessary for their health and well-being. Occupational therapists understand the influence that the environment has on an individual's occupational performance and interventions are focused on the individual (36–38). During the CoVID-19 pandemic, occupational therapists' main objectives were to help individuals and their families to modify and adapt the ways in which they engage in different occupations (work, leisure, self-care) (38,39). Consequently, it is important to promote resilience and highlight that daily occupations are important for the health of individuals, since exposure to traumatic experiences can bring challenges and may result in disruptions of habits and routines, which promote active involvement in meaningful occupations (36,39). However, there is still a lack of literature on interventions to support healthcare professionals during disease outbreaks (6). So, occupational therapists helped the healthcare professionals coping with changes in work routines, changes in performance in occupational roles and in the search for new activities that were interesting and meaningful to them, in order to carry out their work effectively and promote higher levels of resilience (33,34).

Considering the relevance of this topic for the promotion of mental health in healthcare professionals, particularly in adverse situations, this study aims to characterise the levels of resilience among healthcare professionals in Portugal, who worked during the pandemic of CoVID-19, from March 2020 to February 2022 (from the 1st to the 5th wave). The authors also want to explore the relation between the level of resilience and some variables according to age, gender, education level, profession and the organization type.

2. Methodology

This study is part of the European project “Empower4Pandemias—Learning from Covid19.” Briefly, the main objective of the project is to pilot a blended learning training to enhance the resilience skills of professionals and decision-makers in the health and emergency sector and related public administrations to strengthen their individual and organizational resilience to better cope with a pandemic crisis.

In this particular study, a quantitative with a cross-sectional observational analytical study was design (40,41). This was chosen because the authors wanted to evaluate the study sample in a single moment and describe its characteristics (42,43). The study protocol was approved by the School of Health, Polytechnic Institute of Porto Ethics’ Committee (CE0111C) and the international project “Empower4Pandemias” was approved by UMIT Ethics Committee (RCSEQ AZ2102).

2.1 Participants

The target population of this study are healthcare professionals that worked, during the CoVID-19 pandemic. The sample for this study was recruited through the non-probability convenience sampling method (44). The inclusion criteria for this study were: (a) being a healthcare professional, (b) have worked during the CoVID-19 pandemic in Portugal in the period of March 2020 to February 2022 (from the 1st to the 5th wave) and (c) being professionally active at the time of data collection. The sample number was calculated through G*Power calculator (45) which showed that for a total of 114.000 healthcare professionals, the sample size should be at least 246.

2.2 Data Collection

Data collection was conducted in Portugal between April and May 2023. The characterisation of the levels of resilience in the population and the collection of the variables under study were

carried out through the application of an online survey, developed on the Microsoft Forms platform (46). The dissemination occurred mainly through publications on health platforms, specifically, the Portuguese Association of Occupational Therapists, as well as, on social networks (e.g., Facebook, LinkedIn, Instagram). A snowball sampling technique was used; participants were invited to complete the survey and share it with their contacts. The survey was organised into three sections: (1) Sociodemographic Characterization, (2) Work-related issues during the CoVID-19 pandemic, and (3) The Resilience Scale for Adults. The sections one and two were created by the researcher's team and reviewed by a panel of experts. The variables analysed from the survey were age, education level, occupation, years of work experience in healthcare system, type of healthcare organization, number of working hours (per week), shift work and perception about their general health during the CoVID-19 pandemic (view appendix 1).

2.3 Instrument

The Resilience Scale for Adults (RSA)(10) is a self-administered questionnaire that assesses several characteristics of resilience, containing items that in their original structure are organised into the following six factors: Perception of the Self (PoS), Planned Future (PF), Social Competence (SC), Family Coherence (FC), Social Support (SS) and Personal Structure (PS). The six domains measure the resilience features that are available in the individual at an intrapersonal level (PoS, 6 items; PF, 4 items; SC, 6 items; and PS, 4 items) and also at an interpersonal level (FC, 6 items; and SS, 7 items). In general, each domain assesses self-efficacy, optimism, social interaction, family and social support, and the ability to organize and follow routines (10,47,48). This scale can be applied to adults in any context. Regarding the total score of the scale, each question is rated in a Likert-scale, from 1 to 7, and higher scores mean higher levels of resilience. There are 17 items that should be inverted. To obtain the score for each factor it should be calculated its average or used the total value. This scale is validated for the Portuguese population and has a very good internal consistency with a Cronbach's alpha of 0.94 (10,49). The scale is only available for psychologists' use. It is important to emphasise that a psychologist was part of the research team to ensure the correct application of the scale.

2.4 Data Analysis

Descriptive analyses were used to characterise the sample and the result of the RSA and the six subscales. Pearson's correlation coefficient was used to measure the correlations between total

scale and subscales values and age, years of working as a healthcare professional, number of working hours (per week) and perception about their general health during the CoVID-19 pandemic. The total scale and the resilience subscales were compared with sociodemographic data (e.g., gender, education level, occupation, type of organization and shift work). Thus, independent *t*-student tests were performed to check if data follow normal distribution and 1-factor ANOVA to compare the means of independent groups. All analyses were performed using Statistical Package for the Social Sciences (SPSS) version 27.0 for Windows (50) and an alpha of 0.05.

3. Results

3.1 Sociodemographic Characterization

Table 1 shows the characteristics of the 271 participants, with a mean age of 33.90 (*SD* = 9.59 years) and 246 (90.80%) female. Almost 75.00% (*n* = 201) had a bachelor's degree, 23.20% (*n* = 63) had a master degree, and seven (2.60%) had a doctorate degree. Most of the individuals had an Allied Healthcare Profession 201 (74.20%), 43 (15.90%) were nurses and 10,00% (*n* = 27) were physicians or psychologists. During the CoVID-19 period, participants worked mainly in secondary care institutions (*n* = 103; 38.00%) or in long-term care (*n* = 82; 30.30%), with 69 (25.50%) working in the private sector and only 16 (5.90%) in primary care settings and, in the same period, 92 (34.20%) shift work. Participants qualified their healthcare during pandemic period as almost 6.5 out of 10.

Table 1 – Sociodemographic characteristics of participants in the survey

Variables		Frequency n (%)	M (SD)
Age	---	---	33.90 (SD= 9.59)
Quality of healthcare during pandemic	---	---	6.47 (SD=1.97)
Gender	Female	246 (90.80)	
	Male	25 (9.20)	
Education level	Bachelor's degree	201 (74.20)	
	Master's degree	63 (23.20)	
	Doctorate degree	7 (2.60)	
Occupation	Nurse	43 (15.90)	
	Allied Healthcare Profession	201 (74.20)	
	Physicians/Psychologist	27 (10.00)	
Organization type	Primary care	16 (5.90)	
	Secondary care	103 (38.00)	
	Long-term care	82 (30.30)	
	Private sector	69 (25.50)	
Shift work (n= 269)	Yes	92 (34.20)	
	No	177 (65.80)	

Note. M – mean; SD – standard deviation

3.2 The Resilience Scale for Adults and subscales

According to Table 2, the mean score obtained from the total RSA was 178.17 (SD= 22.44) out of a total of 231 in The Resilience Scale for Adults, thus showing a moderate to high level of resilience. The mean of subscales was 30.32 (SD= 9.95) out of 42 points to PoS, 20.52 (SD= 4.34) out of 28 points to PF, 31.27 (SD= 5.90) out of 42 points to SC, 20.36 (SD= 3.65) out of 28 points to PS, 33.40 (SD= 6.24) out of 42 points to FC, and 42.31 (SD= 5.44) out of 49 points to SS. Therefore, the overall results for each subscale suggest below average values compared to the study population, i.e., the study participants have lower levels of self-efficacy and confidence

in their own abilities, optimism, social interaction skills, the ability to organise and follow routines and social and family support skills.

Regarding the occupation, the mean score for the total RSA for nurses was 170.37 ($SD = 25.02$), for Allied Health Professionals 178.90 ($SD = 21.81$) and for physicians/psychologists 185.26 ($SD = 22.22$) out of a total of 231. The mean score for the subscales in the nurses' group was 28.81 ($SD = 5.84$) out of 42 points for PoS, 19.26 ($SD = 4.73$) out of 28 points to PF, 28.86 ($SD = 6.56$) out of 42 points to SC, 19.19 ($SD = 3.94$) out of 28 points to PS, 33.19 ($SD = 6.12$) out of 42 points to FC and 41.07 ($SD = 6.26$) out of 49 points to SS. The mean score for the subscales in the Allied Health Professional group was 30.24 ($SD = 5.90$) out of 42 points for PoS, 20.51 ($SD = 4.28$) out of 28 points to PF, 31.63 ($SD = 5.71$) out of 42 points to SC, 20.59 ($SD = 3.53$) out of 28 points to PS, 33.39 ($SD = 6.27$) out of 42 points to FC and 42.53 ($SD = 5.26$) out of 49 points to SS. The average obtained in the subscales in the physicians/psychologist group was 33.33 ($SD = 5.66$) out of 42 points for PoS, 22.56 ($SD = 3.48$) out of 28 points to PF, 32.44 ($SD = 5.36$) out of 42 points to SC, 20.52 ($SD = 3.82$) out of 28 points to PS, 33.74 ($SD = 6.45$) out of 42 points to FC and 42.67 ($SD = 5.32$) out of 49 points to SS.

In relation to the education level, the average obtained by the total RSA in the participants with a bachelor's degree was 176.07 ($SD = 22.88$), in the participants with a master's degree was 184.05 ($SD = 20.06$) and in the participants with a doctorate degree was 185.57 ($SD = 29.52$) out of 231. The mean score for the subscales in the bachelor's degree group was 29.98 ($SD = 5.94$) out of 42 points for PoS, 19.98 ($SD = 4.45$) out of 28 points to PF, 30.78 ($SD = 6.04$) out of 42 points to SC, 20.15 ($SD = 3.67$) out of 28 points to PS, 33.16 ($SD = 6.04$) out of 42 points to FC and 42.01 ($SD = 5.76$) out of 49 points to SS. The mean score obtained in the subscales in the master's degree group was 30.98 ($SD = 5.93$) out of 42 points for PoS, 21.95 ($SD = 3.82$) out of 28 points to PF, 32.56 ($SD = 5.18$) out of 42 points to SC, 20.92 ($SD = 3.68$) out of 28 points to PS, 34.52 ($SD = 5.87$) out of 42 points to FC and 43.11 ($SD = 4.25$) out of 49 points to SS. The mean score obtained in the subscales in the doctorate degree group was 34.29 ($SD = 5.25$) out of 42 points for PoS, 22.86 ($SD = 4.74$) out of 28 points to PF, 34.00 ($SD = 6.30$) out of 42 points to SC, 21.14 ($SD = 2.48$) out of 28 points to PS, 29.71 ($SD = 12.26$) out of 42 points to FC and 43.57 ($SD = 5.19$) out of 49 points to SS.

For total scale, significant difference in resilience values according to education level was found, with those with a higher degree (master's and doctorate degree) presenting a higher resilience than those with a bachelor's degree ($p < 0.034$). Also, a significant difference in total resilience was found between occupations, with nurses presenting the lowest levels and physicians/psychologists the highest ($p = 0.018$). Differences between occupations were also found in PoS, PF and FC subscales ($p_{PoS} = 0.007$; $p_{PF} = 0.008$; $p_{FC} = 0.011$), all with nurses presenting the lowest resilience results. In PF subscale, resilience has significant differences according to education level, with those of higher education level presenting higher resilience ($p_{PF} = 0.002$).

Table 3 shows the correlation between RSA scale and the subscales and age, years of working (yw) as a healthcare professional, number of working hours (per week) and perception about their general health during the CoVID-19 pandemic (health). Although lower, positive correlations were found between the sociodemographic variables and the subscales. There was positive correlation between age and the PoS subscale ($r_{age} = 0.205$, $p < 0.001$), so the older the person, the higher the PoS. Also, the results show a positive correlation between the years of work and the PoS subscale ($r_{yw} = 0.171$, $p = 0.005$), which shows that the more years of work, the higher the PoS. Finally, the results of this study show the existence of positive correlations, namely between the perception about their general health during the CoVID-19 pandemic and the subscales PoS, PF, SC and PS and the total RSA scale ($r_{PoS} = r_{PF} = 0.250$, $p < 0.001$; $r_{SC} = 0.147$, $p = 0.016$; $r_{PS} = 0.162$, $p < 0.007$, $r_{RSA} = 0.200$, $p < 0.001$). Therefore, the higher the perception about their general health during the CoVID-19 pandemic, the higher PoS, PF, SC, PS and total RSA.

Table 2 – RSA scale and subscales values according to participant sociodemographic characteristics

	PoS		PF		SC		PS		FC		SS		Total RSA	
	<i>M (SD)</i>	<i>p</i>	<i>M (SD)</i>	<i>p</i>	<i>M (SD)</i>	<i>p</i>	<i>M (SD)</i>	<i>p</i>	<i>M (SD)</i>	<i>p</i>	<i>M (SD)</i>	<i>p</i>	<i>M (SD)</i>	<i>p</i>
Total participants	30.32 (9.95)		20.52 (4.34)		31.27 (5.90)		20.36 (3.65)		33.40 (6.24)		42.31 (5.44)		178.17 (22.44)	
Gender	30.24 (5.95)	0.462	20.48 (4.34)	0.661	31.13 (5.89)	0.225	20.42 (3.70)	0.360	33.68 (5.95)	0.077	42.43 (5.51)	0.252	178.39 (22.56)	0.628
Female	31.16 (6.03)		20.88 (4.47)		32.64 (5.94)		19.72 (3.08)		30.56 (8.27)		41.12 (3.65)		176.08 (23.75)	
Education level	29.98 (5.94)	0.103	19.98 (4.45)	0.002	30.78 (6.04)	0.125	20.15 (3.67)	0.295	33.16 (6.04)	0.092	42.01 (5.76)	0.312	176.07 (22.88)	0.034
Bachelor degree	30.98 (5.93)		21.95 (3.52)		32.56 (5.18)		20.92 (3.68)		34.52 (5.87)		43.11 (4.25)		184.05 (20.06)	
Master degree	34.29 (5.25)		22.86 (4.74)		34.00 (6.30)		21.14 (2.48)		29.71 (12.26)		43.57 (5.19)		185.57 (29.52)	
Occupation	28.81 (5.84)	0.007	19.26 (4.73)	0.008	28.86 (6.56)	0.011	19.19 (3.94)	0.071	33.19 (6.12)	0.937	41.07 (6.26)	0.264	170.37 (25.02)	0.018
Nurse	30.24 (5.90)		20.51 (4.28)		31.63 (5.71)		20.59 (3.53)		33.39 (6.27)		42.53 (5.26)		178.90 (21.81)	
Allied Healthcare Professional	33.33 (5.66)		22.56 (3.48)		32.44 (5.36)		20.52 (3.82)		33.74 (6.45)		42.67 (5.32)		185.26 (22.22)	
Physicians/ Psychologist	26.69 (5.10)	0.883	19.69 (4.78)	0.824	31.00 (4.68)	0.357	20.81 (3.66)	0.838	33.56 (6.36)	0.821	42.50 (6.20)	0.829	177.25 (17.32)	0.837
Organization type	30.58 (6.01)		20.61 (4.66)		30.47 (6.43)		20.14 (3.48)		32.90 (6.25)		41.90 (5.69)		176.58 (24.04)	
Primary care	30.34 (5.97)		20.68 (4.17)		31.91 (5.58)		20.33 (3.93)		33.73 (5.97)		42.57 (4.84)		179.57 (21.35)	
Secondary care	29.93 (6.02)		20.30 (3.10)		31.67 (5.62)		20.57 (3.60)		33.55 (6.57)		42.49 (5.63)		178.51 (22.95)	
Long-term care	30.65 (5.76)	0.497	20.62 (4.72)	0.766	30.93 (6.27)	0.483	20.16 (3.40)	0.588	33.73 (5.83)	0.561	42.36 (5.39)	0.997	178.46 (22.77)	0.899
Private sector	30.13 (6.08)		20.45 (4.17)		31.47 (5.72)		20.42 (3.78)		33.26 (6.47)		42.36 (5.47)		178.08 (22.75)	
Shift work														
Yes														
No														

Note. PoS – Perception of the self; PF – Planned future; SC – Social competence; PS – Personal structure; FC – Family coherence; SS – Social support; RSA – Resilience Scale for Adults; M – mean; SD – standard deviation; t-test student; 1-factor ANOVA

Table 3 – Correlation between the RSA scale and subscales values and age, years of working, number of working hours (per week) and perception about their general health (ranging from 1 to 10) during the CoVID-19 pandemic

	PoS		PF		SC		PS		FC		SS		Total RSA	
	r	p	r	p	r	p	r	p	r	p	r	p	r	p
Age	0.205	<0.001	0.007	0.914	-0.002	0.974	0.015	0.806	0.050	0.408	0.038	0.532	0.080	0.188
Years of work in healthcare	0.171	0.005	0.016	0.790	0.014	0.824	0.032	0.601	0.036	0.552	0.008	0.891	0.069	0.260
Number of working hours (per week)	-0.068	0.269	-0.055	0.375	0.011	0.860	0.014	0.818	-0.039	0.527	0.001	0.981	-0.033	0.587
Perception about their general health	0.213	<0.001	0.025 0	<0.001	0.147	0.016	0.162	0.007	0.032	0.597	0.093	0.126	0.200	<0.001

Note. PoS – Perception of the self; PF – planned future; SC – social competence; PS – personal structure; FC – family coherence; SS – social support; RSA – Resilience Scale for Adults; r – Pearson's correlation

4. Discussion

This study aimed to characterize the levels of resilience of healthcare professionals in Portugal who have worked during the pandemic of CoVID-19, from March 2020 to February 2022.

As described in the literature, resilience is a dynamic and complex process, and can be defined as the individual's ability to successfully adapt to adversity, and to cope with stressful events, threats and (51). It can be defined as an ongoing process, which presents a great potential for change throughout (51,52). In general, pandemics occur suddenly and without warning. In this sense, healthcare professionals have important roles in acting and preventing them (53,54). The literature indicates that healthcare care professionals, in comparison to the general public, suffered a greater deterioration of their mental healthcare during the pandemic, thus showing higher levels when assessing variables such as anxiety, depression and burnout, which in turn may influence resilience levels (53,54). Based on the results obtained, the healthcare professionals in Portugal showed a moderate to high level of resilience. The same was observed in other studies whose assessed healthcare professionals and resilience levels and showed moderate to high levels of resilience (Lourdes et al., (55), Leodoro & Janet (56) and Lin et al. (51)). According to the studies by Roberts et al. (57) and Negar et al. (53), conducted with nurses, it was expected that nurses showed lower levels of resilience compared to other occupations. The results obtained in this study were similar to those found in the literature and showed that nurses showed lower levels of resilience compared to other occupations, namely physicians and psychologists, who showed higher levels of resilience. This may happen, considering that these professionals were in direct contact with patients and perform several functions, such as administering medication, vaccination, physical examinations and also because the workload becomes heavier due to working in shifts (58), increased during the pandemic. Nurses assumed a more active role in the CoVID-19 pandemic, compared to other healthcare professionals, and their occupational balance was altered (59,60). Besides, according to the literature, these professionals may be unhappy with the discrepancies they perceived in relation to the physicians, which, by contrast, has a higher remuneration and does not have such an active role with the patient (61–63). In the opposite way, according to the study by Sinu et al. (64), conducted in India, the frontline nurses during the CoVID-19 pandemic showed moderate to high levels of resilience, which is not consistent with the results presented in this study.

As shown in the results of this study, physicians and psychologists have moderate to higher levels of resilience. Psychologists are expected to have extensive knowledge in several areas

associated with mental healthcare, namely in the use of adaptive coping strategies that allow managing emotions in a positive and meaningful way (31,65). In this perspective, these strategies may make it possible to perform certain stressful activities without having a significant negative impact on their mental health (66). This acquired knowledge and experience directly with the patient may also help or increase the awareness of these professionals about the consequences that certain daily situations may cause in their lives, as well as the symptoms that may appear in cases of extreme stress (e.g., anxiety or depressive symptoms). According to the literature, physicians were one of the professional groups showing lower levels of resilience, showing some mental health problems such as depression and anxiety. So, the results of this study, where physicians had moderate levels of resilience, were not expected (67,68). Also, psychologists may, in a preventive and adaptive way, have more effective strategies which enable them to deal with stressful situations in the most effective way. Therefore, it is essential for psychologists to cooperate directly with other healthcare professionals, as they can help strengthen perceptions and feelings of confidence in their own abilities (self-efficacy) (66).

In this study, significant differences were found between the different academic degree and the level of resilience. It was possible to verify that healthcare professionals with a master's or doctorate degree had higher levels of resilience compared to those with a bachelor degree. It was possible to find evidence to support the data found, since most studies showed higher levels of resilience in those with higher education (69–74). Resilience can help students to deal with unexpected situations associated with academic life effectively, stress and study overload during the learning process, and can lead to occupational imbalance (75). Throughout the academic journey and as they graduate to higher levels, they are expected to be able to cope better with adverse and unpredictable situations successfully. In other words, they are expected to show higher levels of resilience.

In this study, the subscales which showed an association with resilience and other variables, namely age, years of work and the perception about their general health during the CoVID-19, were the Perception of the Self (PoS), Social Competence (SC) and Planned Future (PF), which assess self-efficacy, optimism and social interaction, respectively. These significant results are congruent with some results found in the literature (58). As previously mentioned, during the period of the CoVID-19 pandemic, healthcare professionals demonstrated their resilience in the face of adversity (58). The literature defines that the characteristics that allow promoting high levels of resilience are self-efficacy, optimism, positive emotions and adaptive coping strategies

(74). Social variables such as social support and social network are crucial for individuals' well-being and mental health (74,76,77). Previous studies have identified social support as a relevant resilience resource in particular to highly stressed individuals (54,74,78). Professionals without previous experience were more likely to show lower levels of social support and resilience (79). Furthermore, Park et al. (80) evidenced that the existence of a wider social network was associated with greater resilience in older adults (74). Social support is described as an element that helps individuals to cope with adversity, which effectively proves its link to resilience (54,81–83). Several studies have shown that social support, mainly from family and friends, has a positive relationship with the mental health of healthcare professionals, especially during traumatic and stressful events (81,84). So, establishing social contacts, even in a different way than usual (e.g., through online communication, to respect the contingency measures imposed and prevent transmission), seems essential to promote healthy emotional states in healthcare professionals (54,65). Evidence shows that healthcare professionals experienced personal and professional growth due to the demands placed on them during the pandemic (85,86).

For example, optimism plays an important role in resilience and is associated with the activity of the neural circuits of the reward system. Positive emotions, self-regulation skills, social support, greater flexibility of thinking and optimism are very important components of resilience (87). In the study conducted by Hart et al. (88) it was found that the decrease in personal balance, the feeling of conflict and a challenging work environment may be factors that contribute to a decrease in resilience (57,88). Healthcare professionals with a high level of self-efficacy are more likely to implement effective strategies to deal with challenges, as well as to pursue social support and take measures to cope with adversities. These positive behaviours are important to promote the development of resilience, enabling healthcare professionals to rehabilitate and adapt to difficult situations (89).

Lastly, the CoVID-19 pandemic placed a heavy burden on healthcare systems which consequently impacted the workload of healthcare workers. Healthcare professionals faced new challenges as well as stressful environments that negatively affected their work performance and mental healthcare (53). Traumatic situations and stress-related conditions were a cause of concern for occupational therapists, as involvement in significant occupations, such as work and school, can affect the healthcare and well-being of healthcare professionals (90). Occupations involve activities and tasks that represent value and meaning to the individual. In this sense, and so that they are performed in harmony with each other, it is necessary to establish occupational

balance (91). Occupational therapists state that occupational balance is the basis for the promotion of healthcare and well-being. This concept allows the individual to develop their roles and their own identity based on participation in various activities, which in turn increases well-being and socialisation (59). The healthcare professionals who worked actively in the pandemic faced various obstacles in their participation in occupations as well as in the roles they played. This context led to family constraints (e.g., inability to socialize with the family), increased working hours, greater limitations in leisure activities and also an impact on self-care activities. That said, their occupational balance was impaired. In the study by Güleser et al. (59), the results showed that the level of occupational balance of healthcare professionals, specifically, those who played an active role during the pandemic, was lower than in those who did not play an active role (59). In the present study, occupational therapists were included in the Allied Healthcare Professionals group. This group of professionals has a moderate to high levels of resilience. This study presents some limitations. The study was conducted many months after the coronavirus pandemic onset, and this possibly affected not only the participants' ability to properly recall those specific times, but also the reliance on self-reported data. Additionally, the study's findings may not be generalizable to all healthcare professionals in Portugal, as the sample may not be fully representative of the entire population. Another limitation identified was the questions mentioned in the survey, as there was no specific selection of one of the waves. That is, the five variants that were present in Portugal were addressed. This is considered a limitation because the first wave had greater implications on healthcare professionals. During the first wave, personal protective equipment was limited, there was little scientific evidence about the respiratory virus, as well as the lack of drugs that could help in the post-infection recovery process. However, during the 5th wave, vaccination and a greater scientific knowledge about the virus were already present. Therefore, another limitation found were the questions presented in the characterization of the levels of resilience in healthcare professionals during the CoVID-19 pandemic. Since the pandemic began in 2020 and three years have already passed (retrospective study), healthcare professionals may not have an identical perception of the difficulties and challenges that were presented to them at that time. The healthcare professionals' emotional state at the time of completing the survey may also have had an impact on their answers, since they tend to respond negatively to life events that they consider or have considered stressful. So, this factor may positively or negatively affect the results about the levels of resilience.

5. Conclusion

This study aimed to characterize the levels of resilience of healthcare professionals in Portugal who worked during the pandemic of CoVID-19 in Portugal, from March 2020 to February 2022. The results indicated that the sample in this study had moderate to high levels of resilience during the CoVID-19 pandemic. In addition, there were significant differences between nurses with bachelor's degree and those with master's and doctorate degrees, as well as between the group of nurses and the other occupations. Nurses and healthcare professionals with a bachelor's degree showed lower levels of resilience compared to those with master's and doctorate degrees and those from other occupations. The results also show that there were positive correlations between the RSA subscales and age, years of work in healthcare, number of working hours (per week) and the perception about their general health during the CoVID-19. Based on the results of this study, resilience may have been a protective psychological factor in physicians and psychologists and other healthcare professionals, mitigating the impact of the CoVID-19 pandemic. In conclusion, it is important to analyze the resilience levels of healthcare professionals in order to provide preventive and coping strategies in crisis and disaster situations, since resilience levels show an impact on healthcare professionals. Occupational therapists could have an important role in this matter.

Further research would be needed to understand the effect and impact of resilience on healthcare professionals regarding the CoVID-19 pandemic. This could be achieved, for example, through interviews with participants who demonstrated lower and higher levels of resilience, in order to identify which specific skills should be developed and what measures should be taken by health systems and services.

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Supplementary material

Appendix 1 – Sociodemographic Survey

Development of a digital app to promote resilience in Healthcare Professionals

Sociodemographic Characterization

- Gender
 - Female
 - Male
 - Other
- Age (in years)

- Education level
 - Bachelor's degree
 - Master's degree
 - Doctorate degree
- Occupation
 - Nurse
 - Allied Healthcare Profession
 - Physicians
 - Psychologist
 - Other
- Years of work experience in healthcare care

- Type of healthcare care organization
 - Primary care
 - Secondary care
 - Long-term care
 - Private sector
- Number of working hours (per week)

- Shift work
 - Yes

- No
- How you rate your general healthcare during CoVID-19?
1 – Very poor 2 3 4 5 6 7 8 9 10 – Excellent