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Article

Risks of Ecosystems' Degradation: Portuguese Healthcare Professionals' Mental Health, Hope and Resilient Coping

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Abstract: Healthcare professionals constantly face situations that reflect ecosystems' degradation. These can negatively affect their mental health. Research suggests that hope and resilience can play an important role in this scenario; since they are related to/predict mental health in highly heterogeneous samples (considering geography, age, profession, health, etc.). In this context, the aims of the present study are: to characterize and explore the relationship between hope, resilient coping and mental health of Portuguese healthcare professionals. Using Google Forms, 276 healthcare professionals answered to the GHQ-28, the (adult) Trait Hope Scale, and the Brief Resilient Coping Scale (cross-sectional study). The minimum and maximum possible scores were reached, with the exception of the maximum score of GHQ-28-Total. Regarding Hope, 19.6% scored below the midpoint ($M=43.46$, $SD=11.97$); 29.3% revealed low resilience ($M=14.93$, $SD=4.05$); and the average of 4 of the 5 Mental Health scores (exception: Severe Depression) indicates the probability of a psychiatric case. Hope correlated with Social Dysfunction and GHQ-28-Total; resilient coping proved to be a (weak) predictor of 4 of the 5 GHQ-28 indicators (exception: Severe depression). The results support the need to promote the sample's mental health, hope and resilient coping. They also suggest that stimulating resilient coping may contribute to improving healthcare professionals' mental health. Prior research (e.g., on therapies to enhance hope, resilience, and, thus, mental health), to which the current study contributes, supports optimism towards the necessary internal sustainability transition.

Keywords: healthcare professionals; mental health; hope; resilient coping; sustainability's factors related to health; ecosystems's degradation risks

1. Introduction

Healthcare professionals constantly face situations that reflect ecosystems' degradation. These can negatively affect their mental health. "Crises and emergencies at the local and national levels challenge the mental health and psychological resilience of individuals, and health care workers are no exception" (Akinnusotu et al., 2023, p. 100), quite the contrary, considering the roles they are expected to have in these situations. The COVID-19 pandemic is a recent example.

There is evidence of the effect of human over-exploitation of natural resources/ecosystem degradation regarding the distribution of COVID-19 infections during the first pandemic wave. The pandemic (lockdowns) brought some ecological benefits, but also new challenges, along with signs that human activity levels prior to lockdown might be permanently reduced (Castelli et al., 2023; Guo & Lee, 2022; Srivastava et al., 2021).

The COVID-19-related research provided additional evidence on the human-environment relationships. While COVID-9 lockdowns were associated with a decrease in mental health and well-

being, exposure to nature benefited mental health, with differences between countries (Ribeiro et al., 2021). In Portugal, exposure to public natural spaces was related with lower levels of stress and viewing nature from home was connected with decreased psychological discomfort, somatization, and stress levels. In Spain, interaction with indoor plants was linked to lower levels of stress, whereas exposure to public and private green spaces was significantly and negatively associated with somatization.

A narrative review of evidence regarding nature's contributions to health and well-being during COVID-19 pandemic showed that, in general, Nature exposure was related with lower levels of anxiety, depression, loneliness, and stress, as well as increased happiness and life satisfaction (Labib et al., 2022). Nature exposure was also linked to decreased physical sedentariness and less sleep disruptions, with inconsistent results for COVID-related health consequences.

While a healthy ecosystem furnishes numerous products and (provisioning, regulating, supporting, and cultural) services that benefit humans in terms of social and economic value, and are vital for well-being, health and survival, the vast effect of human activity in the increasingly demanding economic world spill over many environmental issues (Aronson et al., 2016; Lu et al., 2015; United Nations Environment Programme, 2000).

In general, there are intermediaries connecting ecosystem change and human health, there are some environmental changes that directly affect the quality of human health (United Nations Environment Programme, 2000). There is significant evidence that environmental degradation can have acute and chronic implications on human health and well-being, with data showing an urgent need for action to avert severe and persistent declines in human health and well-being caused by environmental degradation (Armenteras et al., 2021; Aronson et al., 2016; Mumtaz et al., 2022; Pappaioanou & Kane, 2023).

"Since 2001, the Millennium Ecosystem Assessment has worked to assess the consequences of ecosystem change for human well-being, and establish the scientific basis for actions needed to enhance the conservation and sustainable use of those systems, so that they can continue to supply the services that underpin all aspects of human life", with 2005 report representing "a call to the health sector, not only to cure the diseases that result from environmental degradation, but also to ensure that the benefits that the natural environment provides to human health and well-being are preserved for future generations" (World Health Organization, 2005, n.p.).

Responding effectively to ecosystem degradation requires: changes in behavior as citizens, parents, and customers; a shift to more environmentally sound technology, taxes, and legislation; and long-term investments in small, medium, and large-scale ecological restoration initiatives will also expand. (Aronson et al., 2016). In this context, an interdisciplinary team, a coalition of specialists on ecological restoration and healthy landscapes with physicians and public health professionals could be particularly successful in raising awareness for global restoration and transforming it into effective action, namely because the language of clinical medicine supplies useful metaphors for communication, education, research, lobbying, and outreach (Aronson et al., 2016).

Complementarily, since climate change and ecosystem restoration are not commonly taught in formal education across the world (Dhiman, 2022), it is time to include it in universities' teaching and research programs, integrating environmental health, climate change, and diagnosing and treating climate-related ill health consequences in contexts such as veterinary medical education and research (Leal Filho et al., 2021; Pappaioanou & Kane, 2023). More generally, Leal Filho et al. (2021), giving an overview of the extent to which climate change-related elements are handled in the teaching and research methods at universities, and made ideas to assist universities better educate and train their students on how to deal with the problems associated with climate change.

Focusing on external regulations and internal dimensions has a more lasting effect on sustainable transformations, with sustainability specialists underscoring the potential of psychological aspects and relational skills (e.g., mindfulness, (self-)compassion, spirituality) for the necessary internal sustainability transformation (Müller et al., 2023). Furthermore, holistic human-nature relationships, where all of the nature possesses dignity and rights, even though not dominant, exist in several indigenous cultures (Müller et al., 2023). To contribute to the individual sustainability

transformations, considering that to help individuals conceive nature as equal some psychological prerequisites need to guide transformative individual resonance processes and individual human–nature partnerships, Müller et al. (2023) presented the notion of personal resonance between humans and environment, as well as an operationalization for transformative rituals (enhanced by psychology and psychotherapy),

The 17 Sustainable Development Goals (SDGs), central to the 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, stress that ending poverty and other deprivations cannot be separated from efforts to optimize health and education, decrease inequality, support economic growth, and address climate change and Earth’s preservation (United Nations, n.d.). It is worth stressing that SDG number 3 is “Good health and well-being”, number 8 is “Decent work and economic growth”, and number 16 is “Peace, justice and strong institutions”. Knowing and improving the health and well-being of professionals working in healthcare institutions is certainly an important aspect of (at least) these three SDG.

In this context, a narrative literature review on healthcare professionals’ mental health, and its relationships with hope and resilience is presented, as the conceptual basis of the present study.

1.1. Healthcare Professionals’ Mental Health

Exposure to psychosocial risk factors not only impacts health and well-being, but is also associated with healthcare workers’ physical, vicarious and psychological violence, which is frequently experienced (Barros et al., 2022).

Due to its likelihood and range of consequences, healthcare professionals’ mental health has been considered a significant area of health concern, before, during and after the COVID-19 pandemic. Consequently, it has been a popular research subject in different scientific areas. So much so that systematic reviews are currently necessary.

Hill et al. (2022), for instance, searched, from inception to 31 March 2020, in MEDLINE, Embase, Cochrane Library and PsychINFO, for cohort, cross-sectional and case–control studies for their systematic review and meta-analysis on the incidence and prevalence rates of mental health disorders among healthcare professionals before, during, and after pandemic outbreaks. There was no incidence study in the 43 eligible studies, reported in 45 papers. Based on prevalence estimates, post-traumatic stress disorder was the most prevalent mental health problem, PTSD (21.7%), followed by anxiety (16.1%), major depression (13.4%), and acute stress disorder (7.4%). The prevalence of psychological distress (using GHQ-28 – General Health Questionnaire-28) was estimated at 25.5%.

Although researchers and clinicians have a wide variety of techniques to assess adults’ mental health, the GHQ-28 is frequently used worldwide. In fact, in recent years, before and during the COVID-19 pandemic, the GHQ-28 was administered to several samples of health professionals around the globe¹ (Almeida et al., 2022; Babicki et al., 2021; Díaz-Ramiro et al., 2020; Hyseni et al., 2023; Kolivand et al., 2023; Kootch et al., 2023; Kowalczyk et al., 2023; Maciaszek et al., 2020; Magaña Salazar et al., 2023; Salehi et al., 2023; Seabra et al., 2021; Zonp et al., 2022).

Research has shown there is a multitude of factors that may influence healthcare professionals’ mental health. Consequently, the systematic review and meta-analysis undertaken by Hill et al. (2022) also focused on the factors that influence the incidence and prevalence rates of mental health disorders among medical personnel both during and following pandemic epidemics. The following characteristics were taken into consideration that might affect prevalence rates, identified from prior systematic reviews, were: pandemic period (pre-and post-); age; nation income; therapeutic setting for major depressive disorder, anxiety disorders and PTSD. I.e., no modifiable/psychological factor was considered.

Even though identifying the sociodemographic, clinical and professional profile associated with poor mental health is relevant (e.g., Babicki et al., 2021; Díaz-Ramiro et al., 2020; Hill et al., 2022; Hyseni et al., 2023; Kolivand, et al., 2023; Kowalczyk et al., 2023; Maciaszek et al., 2020; Salehi et al.,

¹ When available, mean and standard deviation values of these samples are presented in the Results section, Table 2.

2023; Zonp et al., 2022), identifying modifiable variables that are associated with/predict healthcare professionals' mental health (e.g., physical activity levels – Almeida et al., 2022; sleep habits - Díaz-Ramiro, et al., 2020; perceived social support - Kooteh et al., 2023; (subjective) occupational stress - Kowalczyk et al., 2023; Magaña et al., 2023; well-being - Zonp, Aktas, & Adıgüzel, 2022; burnout and coping skills - Hyseni et al., 2023) seems more promising in terms of intervention on/prevention of poor mental health. In this context, it is worth remembering that, in their systematic review and meta-analysis, Hill et al. (2022, p. 1569) concluded that “although it is evident that certain healthcare workers may be at higher risk, further research would help to clarify who they are, and which interventions should be used to prevent and manage the different mental health conditions”.

In their quasi-experimental study, lasting seven months, Oliveira et al. (2021) gave a contribute to this endeavor. They had 53 Portuguese Red Cross ambulance personnel participating in a peer support providers group ($n=9$; i.e., they underwent specialized training to assist their peers of the experimental group), an experimental group ($n=19$) or a control group ($n=25$). After the Peer Support Programme, The group of peer support givers had superior outcomes in terms of overall health and psychological well-being, anxiety/insomnia and somatic symptoms (GHQ-28).

Among a long list of modifiable variables, positive psychological qualities, as hope and resilience (protective factors), may be particularly worth considering. In fact, research suggests that hope and resilience can play an important role in healthcare professionals' mental health, since they are related to/predict mental health in highly heterogeneous samples (considering geography, age, profession, health, etc.).

1.2. Hope and Mental Health

It has been proposed that hope “reflects individuals' perceptions of their capacities to: (1) clearly conceptualize goals; (2) develop the specific strategies to reach those goals (pathways thinking); and (3) initiate and sustain the motivation for using those strategies (agency thinking)”, with hope theory giving the same importance to all these aspects (Lopez et al., 2004, p. 388), that reciprocally influence each other (Cheavens et al., 2006; Snyder, 2002).

On the other hand, research has shown that even though hope can be defined/conceptualized and, consequently, measured in different ways, it effectively buffers against psychopathology/negative (mental health) outcomes, has a key role in recovery from mental illness, and is a robust correlate/predictor of several positive outcomes across various populations, cultures and countries, making it a protective resilience factor (e.g., Acharya & Agius, 2017; Ahmadi & Ramazani, 2020; Antunes et al., 2023; Ding et al., 2021; Feldman et al., 2023; Hayes et al., 2017; Laranjeira & Querido, 2022; Olsman, 2020; Park & Chen, 2016; Rustøen, 2021; Senger, 2023; Sarker et al., 2022; Snyder, 2002; Su et al., 2023; Tee et al., 2022).

In other words, hope “is a way of feeling, thinking, and influencing one's behavior”; it “is forward-looking, realistic, and multidimensional. It is a resource for health and health-promoting processes and can be considered a salutogenic resource” (Rustøen, 2021, p. 61).

Between April and May 2020, Feng and Yin (2021) collected data to analyse the mediating roles of (perceived) social support (from family, friends and others) and hope (agency thinking and pathways thinking) in the relationship between gratitude and depression among 344 front-line medical doctors (40.1%) and nurses (59.9%), in Wuhan, China, who had been on the frontline of treating COVID-19 for more than two months before participating (age: $M=34.05$ years, $SD=7.25$, 20-57). The prevalence of mild depressive illness was present in 9.59% of cases, whereas moderate depression was present in 40.12% of cases. Hope was significantly and negatively related with depression. Gratitude had a direct and negative effect on depression; it was a negative predictor of depression via the mediation variables hope and social support as well as through an indirect pathway from hope to social support.

In June 2020, Kotera et al. (2021) examined the associations between 142 Japanese medical professionals and the (adult) general public ($n=138$) in terms of mental health issues, loneliness, hope, and self-compassion. Medical workers (28 doctors, 29 pharmacists, 27 rehabilitation workers, 34 nurses, and 24 included social workers and radiographers) compared to the general population,

exhibited lower levels of optimism and self-compassion, as well as greater levels of mental health issues and loneliness. Among medical professionals, loneliness, hope, and self-compassion were all very significant predictors of mental health issues (and general population). Among medical professionals, loneliness was the best indicator of mental health issues, however among the general public, hope was the most reliable.

In this context, based on theoretical and empirical data, several authors have focused on the enhancement of hope (e.g., Cheavens et al., 2006; Feldman & Dreher, 2012; Honey et al., 2023; Lopez et al., 2004; Pouyanfard et al., 2020; Safaralizadeh et al., 2022).

Still, more data is necessary on the hope of healthcare professionals (e.g., Feldman et al., 2023) and “future (synthesis) studies should examine the hope that is held by health care providers because their hope affects their care provision” (Olsman, 2020, p. 204).

In fact, among the gaps in the evidence currently available on hope's effects on resilience and mental health during pandemic listed by Senger (2023) is a limited number of studies in healthcare professionals.

1.3. Resilience and Mental Health

Simply put, “resilience is the ability to persist in the face of challenges and to bounce back from adversity” (Reivich et al., 2011, p. 25). In other words, “resilience reflects basic developmental processes operating normally under extraordinary circumstances, not individual strength or deficiency”; it is not an individual's characteristic, it is a developmental multidetermined process (Yates & Masten, 2004, p. 535).

As with hope, a considerable volume of research, from different countries, focusing on varied populations, using diverse assessment techniques, has evidenced an association between (diversely operationalized) resilience and mental health (e.g., Afek et al., 2021; Al Omari et al., 2023; Hildebrand et al., 2019; Konaszewski et al., 2021; Rudwan & Alhashimia, 2018; Wu et al., 2020).

Recently, Sheikhrabari et al. (2022) presented a scoping review, based on Embase, Scopus, PubMed, Web of Science, and Google Scholar, from January 2014 to December 2020. The 63 articles reviewed, using diverse theoretical frameworks, showed that: (1) the main aspects of healthcare providers' resilience were personal resilience (sub-sub-categories: personality; self-care), resilience in the emergency department (sub-sub-categories: organizational support; geographical capacity; suitable healthcare infrastructure), and resilience in healthcare providers (sub-sub-categories: escalation exercises, medical professionals' resilience, nurses' resilience, and psychologists' resilience); (2) the primary method of becoming resilient is handling adversity and hardship.. The authors concluded that it is necessary to consider distinctive strategies to increase the resilience of different healthcare providers.

Almeida et al. (2023) reported that the resilience level of 271 healthcare professionals in Portugal (74.20% allied health professionals, 15.90% nurses, 10% doctors or psychologists; age: $M=33.90$ years, $SD=9.59$; 90.80% females), using the Resilience Scale for Adults, was moderate. In-depth interviews with 10 healthcare workers (27-70 years) revealed 4 major themes on organizational factors that enhance individual resilience: “Professional's Training”, “Support and Wellbeing Measures”, “Reorganization of Services”, and “Professional Acknowledgment”.

From August to September 2020, Rayani et al. (2022) focused on the relationship between resilience and anxiety in 184 healthcare workers from public health centers in Bushehr and Borazjan cities, Iran, during the COVID-19 pandemic (age: $M=35.54$ years, $SD=7.11$; 81.5% females). Forty percent encountered COVID-19 anxiety at both moderate and high levels. The COVID-19 anxiety and resilience were shown to be significantly inversely correlated: the higher the resilience, the lower the total anxiety score.

Mendoza Bernal et al. (2023) evaluated the level of resilience of 590 nurses (63.7% women; age: $M=38.12$ years, $SD=7.23$), to ascertain if two times differed from one another of the COVID-19 pandemic: first (March 2020, $n=288$) and second waves (October 2020, $n=302$), in Spain. All risk and protective psychological factors showed significant variations between the two waves, with the exception of anxiety, which remained constant at all assessments. All protective variables decreased

and risk variables rose in the second wave. Additionally, there were notable negative associations with anxiety and depression and substantial positive connections with resilience and all protective factors, namely emotional intelligence, self-efficacy, and optimism, during both waves.

Between July 2021 and February 2022, during the height of the COVID-19 outbreak in Serbia, Safiye et al. (2023) explored if the resilience and mentalizing ability of 406 healthcare professionals may account for their levels of stress, anxiety, and depression. (141 doctors and 265 nurses; half frontline healthcare workers; age: $M=40.11$ years, $SD =9.41$, 19-62). Resilience was negatively correlated with stress, anxiety, and depression—the three components of mental health status. Depression, anxiety, and stress were found to be adversely connected with hypermentalizing (a higher degree of certainty in one's capacity to judge purposeful mental states), but hypomentalizing was favorably correlated. Resilience and hypermentalizing were significant negative predictors of depression, anxiety, and stress, but hypomentalizing was a positive predictor of these results, rendering to hierarchical linear regression analysis.

Studying anxiety and depression symptoms among people from 11 nations during the COVID-19 lockdown, Ding et al. (2021) assessed resilient coping with the 4-item Brief Resilient Coping Scale. There were considerable variations regarding resilient coping, with an overall mean score of 15.1 ($SD=3.1$). Reduced anxiety was linked to higher levels of resilient coping, but not depression.

Congruently, in the healthcare professionals studied by Hyseni et al. (2023), mental health scores correlated with burnout and coping skills, i.e., lower levels of coping skills were associated with higher levels of mental health problems.

The recognized relevance of studying health workers' mental health and its relationship with variables like resilience lead to a Research Topic - Resilience of mental health professionals following the COVID-19 pandemic - aiming to explore the long-term consequences of the pandemic on mental health professionals (van den Broek et al. 2023). This is particularly important, since "mental health needs of health workers have traditionally been neglected, ... and there is a need to integrate interventions to address increased mental distress and enhance resilience in medical work settings for those providing care" (Akinnusotu et al., 2023, p. S100). In reality, reviewing the literature, Akinnusotu et al. (2023, p. S101) concluded that: "strong evidence to guide health administrators on best practices is still lacking. Common weaknesses include an absence of preintervention data on the mental well-being of health care workers"; "there has been little development of best practices on psychological health in workplaces and interventions to improve psychological resilience".

Nevertheless, for quite some time now, several solid steps have been taken in the right direction (e.g., American Psychological Association, 2020; DeTore et al., 2022; Freitas et al., 2023; Johnson et al., 2015; Nila et al., 2016; Reivich et al., 2011; Sood et al., 2014; Sylvia et al., 2021). These and other studies prove that resilience can be enhanced in children and adults even with brief group interventions. Being so, if "a resilience framework recognizes that all communities, families, and individuals are composed of multiple assets, risks, protective factors, and vulnerabilities that interact and transact to shape the course of development" (Yates & Masten, 2004, p. 534), low risk groups should also be offered resilience promotion programs.

In 2004, Sinclair and Wallston defended that "after decades of correlational research dedicated to identifying individual and environmental protective factors promoting resilient behavior, the current research focus has shifted to the protective process of resilient coping" (p. 94). Emphasizing that much less was known about the resilient coping process when compared to resilience, they clarified that "the distinguishing feature of resilient coping is its ability to promote positive adaptation despite high stress" (p. 95).

Moreover, research, encompassing different groups, has concentrated on their hope and resilience and its association with mental health.

1.4. Hope, Resilience and Mental Health

The relationship between hope and resilience beyond mental health and between the three variables has also been explored (e.g., Laranjeira et al., 2020; Sińska et al., 2021; Sun et al., 2023).

Based on a sample of 168 healthcare professionals (60.1% nurses, 35.7% allied health personnel, 3.6% doctors; age: 20-49 years, $M=29.19$, $SD=6.13$) working at a state hospital in Turkey, Yıldırım and Güler (2021) used a model to examine the associations between coronavirus anxiety, hope, fear of COVID-19, and resilience. The findings suggested that resilience acted as a mediating factor in the association between COVID-19 fear and coronavirus anxiety. The mediating channel from coronavirus fear to resilience was modulated by hope. In contrast to low level of hope condition, COVID-19 anxiety exerted a more significant influence on resilience among individuals in the moderate and high hope conditions.

More recently, between January and May 2023, in the late stage of COVID-19 pandemic emergency, Torales et al. (2023) studied 591 adults from the general population of Paraguay (18-80 years, $M=37.7$, $SD=11.3$). Participants with flourishing mental health showed higher hope, resilience, and subjective happiness. Inversely, participants with languishing mental health showed lower hope, resilience, and subjective happiness.

Olsman (2020), aiming to describe hope in health care, reviewed 73 review studies and identified three conceptualizations of hope: as an expectation, resilience (“meant that hope was the strength or a (coping) strategy to endure adversity”; p. 200), and desire. Olsman stated that even though “the effects of hope bore a relationship to hope as resilience”, “the effects of hope cannot be reduced to hope as resilience” (p. 201).

The relationship between resilience/hope and (mental) health should not be considered in only one direction after all. In reality, “the way we view our health and health-related challenges are assumed to impact on hope” (Rustøen, 2021, p. 61), with loss of health (among others) having a negative impact on hope (Olsman, 2020).

In this context, the aims of the present study are: to characterize and explore the relationship between hope, resilient coping and mental health of Portuguese healthcare professionals.

2. Materials and Methods

2.1. Participants

The criteria for participation in the study were: being a healthcare professional from Portugal, informed consent, voluntary participation and confidentiality.

The sample is composed by 276 healthcare workers who work in Portuguese hospitals and basic healthcare facilities make up the sample: nurses (59.1%), doctors (16.3%), healthcare assistants (14.0%), and administrative assistants (11.6%). The majority of its members are female (83.3% vs. 16.7% male), with ages ranging from 18 to 71 ($M=38.17$; $SD=10.51$). The majority of participants had been working for less than 16 years (64.9%) and worked under permanent contract (80.1%).

2.2. Measures

2.2.1. Demographics

Participants' demographic data, collected with closed questions, included information about age, sex, professional class and activity and years of experience.

2.2.2. General Health Questionnaire-28 (GHQ-28; Goldberg & Hillier, 1979, Portuguese version from Pais Ribeiro et al., 2015)

The GHQ is usually administered to assess mental health or psychological well-being. According to the GHQ-28 manual, it is used to detect the existence of probable psychiatric disorder in the general population; it assesses the current state of the individual and identifies if that state differs from its normal state, making it sensible to recent (vs stable, prolonged) psychiatric disorders (Pais Ribeiro et al., 2015).

The answer to each of the 28 items is given in a 4-point Likert scale (0-3). The items are equally distributed by 4 symptomatology dimensions/sub-scales (7 each): Somatic symptoms; Anxiety and insomnia; Social dysfunction; and Severe depression (Goldberg & Hillier, 1979). By summing specific

GHQ-28 items it is possible to obtain a score for each of its dimensions and also a total score (the sum of the dimensions' scores). Consequently, the sub-scales scores vary between 0 and 21 and the total score varies between 0 and 84, with higher scores representing worse mental health. The original authors defend that a score above the 4/5 cut-off indicates the probability of psychiatric case, with the literature suggesting a total score of 23/24 as the indicator of a case to be studied (Pais Ribeiro et al., 2015).

There are several validation studies of the GHQ in European Portuguese (cf. Pais Ribeiro et al., 2015). Pais Ribeiro et al. (2015) studied 384 adults (65.8% females; age: $M=46.33$, $SD=15.65$, 18-85 years) without mental disease frequenting health units and reported good psychometric properties. Table 1 presents the Cronbach alpha values from the Portuguese validation and the present study.

Table 1. GHQ-28 Internal Consistency (Cronbach Alpha).

GHQ-28 Score /Study	Present study (N=276)	Pais Ribeiro et al. (2015)
Total	.95	.94
Somatic symptoms	.89	.85
Anxiety and insomnia	.93	.89
Social dysfunction	.89	.86
Severe depression	.93	.89

In both cases, the alpha values are high, indicating items' homogeneity in each dimension and in accordance with previous (inter)national literature (Pais Ribeiro et al., 2015).

2.2.3. Trait Hope Scale (Snyder et al., 1991, Portuguese version from Pais Ribeiro, Pedro, & Marques, 2006)

The (adult) Trait Hope Scale comprises 8-point Likert scale (1-8) and 12 items: 4 are distractors and 8 assess hope - 4 assess "agency" (past, present, and future) and the other 4 assess "pathways". Three scores can be derived from the scale: the total Hope Scale score (computed by the sum of the 8 items), and a score for each hope dimension/subscale (the sum of the respective 4 items).

The study by Pais Ribeiro et al. (2006), with 184 individuals (age: $M=39.90$, $SD=9.52$, 16-70 years; 83.5% females; 108 with multiple sclerosis and 76 without disease) revealed acceptable metric and structural properties if only one factor is considered. The internal consistency, according to Cronbach alpha, was .86 for the scale (.76 for the agency subscale and .79 for the pathways subscale - Pais Ribeiro et al., 2006). In the present study $\alpha=.92$ (overall scale), higher than reported in the literature (Snyder et al., 1991).

Consequently, the hope score can vary between 8 and 64, with a higher score indicating higher hope (36 is the midpoint). Snyder (2002) indicated that a typical mean score is 49 ($SD=7$).

2.2.4. Brief Resilient Coping Scale (BRCS; Sinclair & Wallston, 2004, Portuguese version from Pais Ribeiro & Morais, 2010)

Since they knew of no scale to assess resilient coping in adults, Sinclair and Wallston (2004) developed the Brief Resilient Coping Scale, to assess the ability to adaptively deal with stress, using two samples of individuals with rheumatoid arthritis (90 women enrolled in a cognitive-behavioral intervention program - age: $M=46$ years, $SD=11.8$ - plus 140 men and women (73% women) participating in a study of adaptation to this disease - age: $M=57.8$ years, $SD=13.35$). The BRCS, unidimensional, is composed of 4 items and a 5-point Likert scale, with a range from 4 to 20, and, according to the its creators, those who endorse these four characteristics would be anticipated: they should have clear goals, have confidence in their ability to handle challenging situations, and typically succeed in the difficulties they are given, since they describe an effective, active problem-

solving coping pattern. Low-resilient copers score 13 or less, and high-resilient copers score 17 or more (Sinclair & Wallston, 2004).

Cronbach's alpha reliability for the combined (pooled) original sample was .69 (.64-.76); test-retest reliability (5- to 6-week interval and 3 months interval) was adequate for a research instrument; and, in both samples, a consistent pattern of theoretically predictable correlations between BRCS scores and measures of personal coping resources, pain coping behaviors, and psychological well-being was found (Sinclair & Wallston, 2004). Regarding predictive validity, averaged pre-intervention BRCS scores were a significant predictor of post-intervention outcomes; sensitivity to change was revealed.

As regards the Portuguese version, Pais Ribeiro and Morais (2010) analysed the properties of the BRCS using a sample of 501 high-school students (15-25 years, $M=17,90$) from the centre of Portugal. For all the psychometric parameters considered, the Portuguese values were considerably lower than those of the original study (e.g., $\alpha=.53$) and generally below what would be traditionally adequate. Principal components analysis revealed one component for the Portuguese version ($\alpha=.89$).

2.3. Procedure

Considering its aims, the present study used a cross-sectional, descriptive and correlational research design.

The study was approved by the Ethics Committee of the Fernando Pessoa University (Porto, Portugal, Ref. FCHS/PI-219/21-2) and complies with the Declaration of Helsinki, the general data protection regulation, and the Code of Ethics of the Order of Portuguese Psychologists.

The sampling was non-probabilistic by the snowball technique with healthcare professionals from Portugal. Data was collected online, by sharing a questionnaire through Google Forms between March and April of 2022. Before accessing the 4 assessment instruments, (potential) participants saw a cover page with a brief, but complete, explanation about the study. Informed consent was obtained from all participants previous to answering the survey. The estimated time to complete the questionnaire was around 10 minutes. Participants did not receive any compensation for completing the survey.

2.4. Data Analysis

For every variable evaluated, a descriptive statistical analysis was carried out. Analyses of frequency and percentage were conducted on the participant's demographic data. Afterward, a bivariate analysis was performed using Pearson correlation to identify the association between mental health, hope and resilient coping indicators. Subsequently, a multiple linear regression (Enter and Stepwise method – the last regarding the predictors of GHQ-28-Total and Social Dysfunction) was only applied to the statistically significant correlations in order to determine which models best described the connection between mental health and the other two psychological variables. The regression equations satisfied all assumptions, and the results of the regression analyses were considered reliable. Data were analyzed with the support of the IBM SPSS statistical program for Windows (SPSS Inc.: Chicago, IL, USA). All analyses were computed with 95% confidence interval and $p \leq 0.05$.

3. Results

3.1. Health Professionals' Mental Health, Hope and Resilient Coping

The sample can be considered heterogeneous regarding the psychological constructs assessed: the minimum and maximum possible scores were reached, with the exception of the maximum score of GHQ-28-Total.

In terms of mental health, Table 2 presents the GHQ-28 mean, standard-deviation, minimum and maximum scores obtained in the present sample, along with the mental health characterization of other samples reported in the literature, according to the same instrument.

Table 2. Mental Health of the Present and Previous Samples.

GHQ-28 Score	Present study	Pais Ribeiro et al. (2015) – validation	Seabra et al. (2021)	Díaz-Ramiro et al. (2020)	Kooteh et al. (2023)*	Maciaszek et al. (2020)	Babicki et al. (2021)	Kolivand et al. (2023)	Almeida et al. (2022)	Kowalczyk et al. (2023)*
	<i>M (SD); min-max (N=276)</i>	<i>M (SD); min-max</i>	<i>M (SD)</i>	<i>M (SD); % high score</i>	<i>M (SD); min-max</i>	<i>M (SD) (medical professionals)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD); min-max</i>
Total	30.01 (15.42) 0-79	22.43 (12.42); 0-66; 27.3% with scores higher than 23	30.09 (13.86)	19.15 (10.33); 26.4%	53.16 (12.31); 28.00-93.00	29.7 (14.9)	30.35 (14.53); 64.27% scored at least 24 points)	21.1 (14.2)	21.7 (9.1)	5.42 (6.21); 0-28
Somatic symptoms	8.87 (4.56) 0-21	5.90 (3.90); 0-21	8.35 (0.30)	5.47 (3.77)	13.27 (3.97); 7.00-28.00	7.7 (4.6)	7.83 (4.40)	6.2 (3.62)	4.87 (3.3)	2.05 (2.20); 0-7
Anxiety and insomnia	9.05 (5.42) 0-21	6.37 (4.39); 0-21	9.13 (4.83)	5.50 (4.31)	13.51 (4.94); 7.00-43.00	10.0 (5.4)	9.85 (5.26)	6.08 (4.9)	6.53 (4.8)	1.87 (2.23); 0-7
Social dysfunction	7.49 (4.33) 0-21	7.59 (3.00); 0-21	9.23 (3.13)	7.07 (2.27)	14.24 (3.06); 7.00-25.00	8.5 (3.5)	8.86 (3.40)	3.72 (3.7)	8.64 (3.2)	1.12 (1.83); 0-7
Severe depression	4.60 (4.40) 0-21	2.52 (3.70); 0-21	3.38 (4.34)	1.11 (2.50)	10.13 (3.56); 7.00-25.00	3.5 (3.9)	3.82 (4.36)	5.02 (3.67)	1.62 (3.0)	0.38 (1.13); 0-7

Note: *The values suggest traditional scoring was not followed in these studies.

The average of 4 of the 5 Mental Health scores (exception: Severe Depression) indicates the probability of a psychiatric case. The percentage of the sample with a total score below 25 was 30.8%. Since a total score of 23/24 is an indicator of a case to be studied (Pais Ribeiro et al., 2015), the sample's mean score also reveals low mental health.

Regarding hope, 19.6% of the sample scored below the (36) midpoint ($M=43.46$, $SD=11.97$; 8-64).

In terms of resilient coping, 29.3% do the participants revealed low resilience, i.e., a score below 13, while 32.2% showed strong resilience, i.e., a score above 17 ($M=14.93$, $SD=4.05$; 4-20).

3.2. Relationship between Mental Health, Hope, and Resilient Coping

Hope correlated with Social Dysfunction ($r(276)=-.127$, $p=.035$) and GHQ-28-Total ($r(276)=-.127$, $p=.036$).

Resilient coping correlated with Somatic Symptoms ($r(276)=-.177$, $p=.003$), Anxiety and Insomnia ($r(276)=-.186$, $p=.002$), Social Dysfunction ($r(276)=-.163$, $p=.007$), GHQ-28-Total ($r(276)=-.184$, $p=.002$).

Resilient coping proved to be a (weak) predictor of 4 of the 5 GHQ-28 indicators (exception: Severe depression), with the following adjusted R^2 :

- GHQ-28-Total $R_a^2=.030$
- Social Dysfunction $R_a^2=.023$
- Somatic Symptoms $R_a^2=.028$
- Anxiety and Insomnia $R_a^2=.031$.

4. Discussion

It is important to stress that all the indicators used in the present study revealed high alpha values/internal consistency, which supports the validity of the results.

Even though the results are from a convenience sample, it proved to be heterogeneous in terms of mental health, hope, and resilient coping (cf. minimum and maximum scores), suggesting there was no response tendency, nor social desirability responses.

4.1. Health Professionals' Mental Health, Hope and Resilient Coping

Similarly, to what was identified by Pais Ribeiro et al. (2015), low means and high standard-deviations were found, revealing a considerable dispersion of results.

Mean GHQ-28 total score was, nevertheless, higher than the one reported by Zonp et al. (2022), Salehi et al. (2023), Pais Ribeiro et al. (2015), Díaz-Ramiro et al. (2020), Maciaszek et al. (2020), Kolivand et al. (2023), and Almeida et al. (2022), but slightly lower than the one found by Seabra et al. (2021) and Babicki et al. (2021); the standard-deviation was higher than the ones presented in Table 2.

Regarding Somatic symptoms, the mean score of the present sample was the highest among the studies summarized in Table 2. Inversely, the Anxiety and insomnia mean score was lower than the ones reported by Seabra et al. (2021), Maciaszek et al. (2020), and Babicki et al. (2021), with the samples studied by Díaz-Ramiro et al. (2020) and Kolivand et al. (2023) having a lower social dysfunction mean score. Finally, only the sample assessed by Kolivand et al. (2023) had a mean Severe depression score higher than the present sample.

Although different publications use slightly different cut-offs for the GHQ-28 total score (23 vs 24), the divergence between samples cannot be explained solely by this. In the present study 69.2% of the health professionals had a worrying total score, (much) higher than the samples analysed by Pais Ribeiro et al. (2015), Díaz-Ramiro et al. (2020), Hill et al. (2022), Maciaszek et al. (2020), Kolivand et al. (2023), Hyseni et al. (2023), and Babicki et al. (2021).

Even though only a small percentage scored below the midpoint in the hope scale, considering Snyder's (2002) indication of a typical mean score ($M=49$, $SD=7$), the present sample's hope was not exactly typical, unlike the group of healthcare workers assessed by Yıldırım and Güler (2021), whose mean score was 48.83 ($SD=10.40$), indicating higher hope.

This study's participants revealed a mean score of resilient coping very similar to the sample used in the development of the BRCS (adults with rheumatoid arthritis - Sinclair & Wallston, 2004), with not very different percentages of low and high-resilient copers (somewhat more positive and diverse). The mean score was also similar (scarcely more positive and more heterogeneous) to the one reported by Sińska et al. (2021) regarding Polish inhabitants during the COVID-19 pandemic, the one found by Pais Ribeiro and Morais (2010) with high-school students, and the one presented by Ding et al. (2021).

Moreover, the results are in line with those reported by Almeida et al. (2023), using the Resilience Scale for Adults, since they identified a moderate resilience level in the healthcare professionals studied.

In sum, the present results are globally consistent with previous research, even with quite different samples.

4.2. Relationship between Mental Health, Hope, and Resilient Coping

4.2.1. Mental Health & Hope

The results of the present study are in line with those reported by Hayes et al. (2017), Ahmadi and Ramazani (2020), Sarker et al. (2022), Tee et al. (2022), since, though weak, a statistically significant linear correlation was found between hope and mental health.

They are, nonetheless, inconsistent with the results obtained by Ding et al. (2021), Kotera et al. (2021), Feng and Yin (2021), and Su et al. (2023). During the COVID-19 lockdown, in adults from 11 countries (Portugal not included), Ding et al. (2021) found that higher hope was associated with reduced anxiety and depression. In Kotera et al. (2021) study, hope was a significant predictor of mental health problems in medical workers and general population. Among the front-line medical doctors and nurses studied by Feng and Yin (2021) hope was significantly and negatively associated with depression. Similarly, in students from two elementary schools in China hope and depressive symptoms were significantly correlated to each other (Su et al., 2023).

In the literature reviewed there was no mention to a relationship between hope and social dysfunction. It would be interesting to explore further this result. Considering the content of the subscale items, and the fact that data was collected in the context of a broader project on violence against health professionals, it is possible that the answers were affected by some degree of negative working experiences.

4.2.2. Mental Health & Resilient Coping

The results are in accordance with the results from Hildebrand et al. (2019), whose participants with low resilience had a higher probability of mental health problems, an association not apparent for all the indicators considered. They are also in accordance with those from Rudwan and Alhashimia (2018), that reported a positive and statistically significant correlation between resilience and mental health, with resilience predicting mental health. Moreover, they are consistent with Al Omari et al. (2023) results - resilience was significantly associated with regular sleep and perceived stress (vs. anxiety and insomnia) - and Rayani et al. (2022) - the greater the resilience of healthcare workers, the lower their overall COVID-19 anxiety score.

The results are partially in line with the results from Wu et al. (2020), Mendoza Bernal et al. (2023) and Safiye et al. (2023). Wu et al. (2020) found negative and significant correlations between depression, anxiety, stress, and resilience. Mendoza Bernal et al. (2023) found a significant inverse relationship between resilience and anxiety and depression in nurses, while Safiye et al. (2023) found negative correlations between resilience and: depression, anxiety, and stress, with resilience being a significant negative predictor of depression, anxiety, and stress among healthcare workers.

However, the results diverge from those presented by Konaszewski et al. (2021) - resilience was negatively and moderately related to depression risk assessment, and the only significant predictor of depression - and Afek et al. (2021) - there were no significant correlations between resilience and any of the mental health scales used (psychological distress and anxiety).

Considering another conceptually similar construct, the results are aligned with those from Hyseni et al. (2023) with healthcare professionals: lower levels of coping skills were associated with higher levels of mental health problems.

More specifically, Ding et al. (2021), using the same instrument, found that higher levels of resilient coping were associated with reduced anxiety, but not depression, supporting the present findings.

4.3. Limitations and Future Research

First, this is a cross-sectional study, rendering it impossible to determine causal relationships between the variables. Consequently, future research should not only contribute to the body of moderation/mediation studies (e.g., Sun et al., 2023; Yıldırım & Güler, 2021) but also to longitudinal studies or cross-lagged research methods use to explore the causal relationships among the three variables evaluated (e.g., Su et al, 2023; Wu et al., 2020).

Second, the study used online, brief, self-reported questionnaires, which has known limitations. Therefore, future research would benefit from combining qualitative and experimental methods to gain more depth and confirmation by external assessments, without using protocols whose extension can stimulate unwelcomed biases.

Third, the sampling method and the heterogeneity of the sample makes it impossible to generalize the results. Nevertheless, the inclusion of healthcare professionals with different specialities, from primary and specialised care, enabled a more thorough image of the dynamics in place. Over-representation of certain sub-groups may have influenced the results, but eliminating participants was not an option for ethical reasons.

Fourth, the studied variables are expected to reflect complex constructs influenced by several factors not considered in the study, since brevity was an important principle during the study design, considering the typical workload of healthcare professionals.

Notwithstanding, this study made a contribution to the area, in need of more research (e.g., Feldman et al., 2023; Olsman, 2020; Senger, 2023), and may be relevant for planning brief and effective interventions, preferably offered to the healthcare teams at their institutions, in order to enhance health professionals' mental health, hope and resilience/resilient coping.

5. Conclusions

The results support the need to promote the sample's mental health, hope and resilient coping. They also suggest that stimulating resilient coping may contribute to improving healthcare professionals' mental health.

Bearing in mind what was previously said regarding the interventions to enhance hope and resilience (hopefully also leading to better mental health), the importance of support (e.g., Oliveira et al., 2021; Olsman, 2020) and what was defended by Müller et al. (2023), one can be optimistic towards the necessary internal sustainability transformation. No doubt there is a long way ahead, but there is a clear path already crossed by many. The rest have only to keep walking vigorously on the right path.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data presented in this article are not readily available since they were not approved to be shared outside of the research team. Requests to access the datasets should be directed to rmeneses@ufp.edu.pt.

Conflicts of Interest: The authors declare no conflict of interest.

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