

PAPER

Review of Healthcare Workers' Strategies for Coping with the Stress of COVID-19 and Their Relevance to the Future of Society and Education

H. Elmastini()
N. Abdessamad

Man, Society and Values'
Laboratory, Faculty of
Human and Social Sciences,
University Ibn Tofail Kenitra,
Kenitra, Morocco

hanaa.elmastini@uit.ac.ma

ABSTRACT

The literature on frontline healthcare professionals' coping strategies in the face of COVID-19 stress is growing rapidly, highlighting their high risk of stress and strain associated with the pandemic. This study examines the methods they use to cope with this stress, analyzing 21 articles out of 2560, published between 2019 and 2023 on PubMed, Google Scholar, and ScienceDirect. The results show that social support and proactive emotion management are essential for maintaining psychological health. The stress management strategies employed by healthcare staff in response to the COVID-19 pandemic are of paramount importance to society and education. By recognizing the importance of social support and emotional management for their psychological health, we are strengthening social resilience. The psychological support programs offered to healthcare workers prepare them to face challenges constructively, thereby contributing to a more resilient and engaged society.

KEYWORDS

healthcare workers, COVID-19, stress management, social support, social resilience, education, psychological well-being, healthcare professionals, coping strategies

1 INTRODUCTION

The COVID-19 pandemic has highlighted the major challenges facing healthcare workers around the world. On the front line of the fight against the virus, these professionals are facing considerable stress and unprecedented pressures in the performance of their duties [1], [2] Previous research has already highlighted the essential importance of social support and emotional management for the psychological health of healthcare workers in crisis situations [3], [4]. However, an in-depth review of the literature will provide a better understanding of the specific strategies used by these professionals to cope with COVID-19-related stress and their relevance to the future of society and education. The major objective of this study is to

Elmastini, H., Abdessamad, N. (2024). Review of Healthcare Workers' Strategies for Coping with the Stress of COVID-19 and Their Relevance to the Future of Society and Education. *Journal for Future Society and Education (JFSE)*, 1(1), pp. 22–31. <https://doi.org/10.3991/jfse.v1i1.47695>

Article submitted 2023-12-31. Revision uploaded 2024-06-03. Final acceptance 2024-06-03.

© 2024 by the authors of this article. Published under CC-BY.

examine in detail the different stress management strategies adopted by healthcare professionals during the COVID-19 pandemic. By focusing on these strategies, we aim to identify best practices and lessons learned that could be applied in other crisis contexts in the future. In addition, this study aims to explore how these strategies could influence the future of society and education by strengthening individual and collective resilience.

The paper begins with an introduction justifying the study of healthcare workers' stress management strategies during the COVID-19 pandemic. A literature review examines these strategies, followed by a methodology detailing the research approaches used. The strategies are then analyzed, with a discussion of their effectiveness and uptake, and practical implications for the psychological well-being of healthcare workers are presented, followed by prospects. In conclusion, a summary of the key points is offered, with a call to action for healthier work environments.

2 MATERIALS AND METHODS

A rigorous literature review was conducted to identify, select, evaluate, and synthesize studies and research pertaining to the investigation field in a comprehensive and critical manner. For this purpose, six main steps were taken into consideration:

Step 1: Specific research question formulation: The systematic literature review was guided by the research question, "What strategies have healthcare workers used to cope with COVID-19-related stress, and how might these strategies be relevant to improving resilience and wellbeing in society and education in the future?" This question explores both the measures taken by healthcare workers during the pandemic and how these measures can be applied more broadly to strengthen society and education systems. This initial question gave rise to a series of aims. These included reviewing and analyzing the scientific literature on coping mechanisms and stress in healthcare professionals in the context of a pandemic, determining the publication date of the studies analyzed, and taking into account the geographical context of the research. It is also essential to identify the different disciplines used to analyze the relationship between adaptation and stress, as well as the methods employed in this scientific research and investigation. In addition, it is necessary to analyze the main conclusions drawn from these scientific studies and to identify the prospects for new scientific research.

Step 2: Study locations: The search strategy involved consulting online databases, including PubMed, Google Scholar, and ScienceDirect, in search of relevant studies. We have included studies in several fields, such as psychology, health, and human resources management, to develop a detailed and critical appreciation of this phenomenon.

Step 3: Research and document relevant investigations: Excluding overlaps and off-topic articles, we used keywords related to the subjects of health personnel, COVID-19, stress management, social support, social resilience, education, psychological well-being, health professionals, and coping strategies in English to identify the most relevant publications. This stage produced a total of 2560 articles.

Stage 4: Assessment of the compliance of the studies included in the survey with the inclusion criteria: A series of selection criteria were used to conduct the search. Articles had to be written in English and published between 2019 and 2023. They had to present research, results, or reflections in which coping mechanisms and pandemic-induced stress in healthcare professionals were analyzed together. The 2560 articles selected were identified on the basis of their titles, keywords, and abstracts. A detailed reading of the full text was then carried out to

assess the quality of the articles selected. The final review included 21 articles for in-depth analysis.

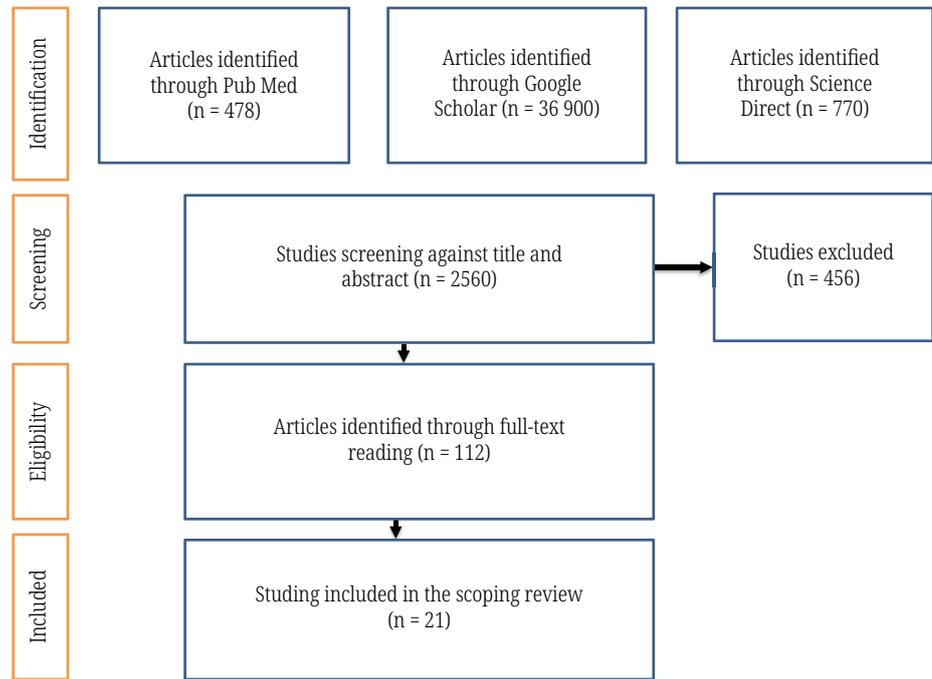


Fig. 1. Different stages in the article search

Step 5: Research and analysis of the pertinent evidence: The data collected from the selected paper was then organized, extracted, and categorized based on the objectives of this search, including the date of publication, case and geographical context, and disciplines. Articles identified through Pub Med (n = 478), Articles identified through Google scholar (n = 36900), Articles identified through Science Direct (n = 770), Articles located based on title and abstract (n = 2560), Articles located via complete reading (n = 112), Articles excluded (n = 456), Articles included in the literature review (n = 21).

Step 6: Interpretation of the data: The results are presented in two sections: a descriptive analysis highlighting the publication date, author origin, research themes, study context and cases, and methodologies used. The second section is a cross-analysis detailing the disciplinary approaches, concepts, and theoretical models employed. This analytical synthesis goes beyond a simple summary of the scientific studies selected and includes a critical perspective to provide insight for future research directions.

3 RESULTS

3.1 Descriptive analysis

Of all the articles targeted by this systematic review (n = 21), over 80% were published between 2019 and 2021 (n = 16), while only 4 articles were published between 2021 and 2022 and a single article during 2023. At the same time, we note that the vast majority of authors of these articles come from China (n = 8), followed by Italy (n = 3), the USA (n = 2), and the remainder is divided between Malaysia,

Croatia, Switzerland, Jordan, India, Spain, Singapore, and Poland, for $n = 1$ each. Sample sizes ranged from 100 to 1364 members. In relation to gender, there was a distinct female predominance, from 49% to 100%. All the articles selected were published in English, which may be explained by the origin of the authors mentioned. Of the 21 articles reviewed, two main themes are particularly relevant to our study of healthcare workers' strategies for coping with COVID-19 stress and their potential impact on society and education. The first theme explores the role of coping strategies in the way healthcare workers deal with the stress caused by the pandemic. The other section analyzes the possible psychological repercussions for these workers during the pandemic, as well as the cognitive process by which they assess how a particular situation may threaten their well-being and the resources they have at their disposal to cope. It should be noted that the majority of references to empirical articles show that the geographical contexts in which the studies are conducted are mainly Chinese. Indeed, this observation can be cross-referenced with the origin where the coronavirus first appeared at the end of 2019. We also note that the articles reviewed come from a range of fields. The majority, 55%, came from the health field, due to the interest of practitioners and theorists in understanding the degree of stress caused by the COVID-19 pandemic, as well as the specific coping strategies used by this population to deal with particularly stressful situations. Thus, the field of psychology is increasingly interested in this 40% theme, and the rest of the studies are aimed at individuals. In terms of the methods employed by the authors, 90% of the articles are based on quantitative studies, 5% on a mixed-approach exploratory study, and 5% on a systematic review.

3.2 Cross-analysis

Lorente [5] and Secer [6] used a structured equation model to explore the facilitating functions that both resilience and adaptation perform in positively correlating pandemic illness and psychological disorders. They examined approximately the 421 nurses in this study (93.6% women) and observed, contrary to the anticipated association, problem-oriented adjustment showed a favorable effect, whereas both emotion-oriented coping and resistance were negatively associated with psychological stress. Taken together, stress factors linked directly to the pandemic, such as work intensity, inappropriate levels of training, insufficient levels of support, and fear of infection and death, were all significantly and positively correlated with problems of intellectual well-being. They studied the role of resilience as a mediator of the impact of coping and found that it is involved in emotion-focused coping strategies, not problem-focused ones.

The study by Vagni [7], which surveyed 513 crisis staff (55.8% of whom were women), found that resilience and emotion management strategies, such as "avoiding uncomfortable thoughts/feelings," reduce symptoms of post-traumatic stress disorder, including hyperarousal, intrusiveness, and avoidance. The effects of problem-oriented adaptation failed to achieve statistical significance, and the effects of emotion-based adaptation strategies were modest. Within COVID-19, the impact on excitement and 25% of its impact on avoidance can be significantly moderated through resilience, coping focused on the problem, and emotional coping. However, the impact of "overall stress" on intrusiveness wasn't mitigated by resistance, coping, and adaptation. The language is clear, objective, and neutral, and the formal register has been respected. Two studies, one cross-sectional [8] and the other longitudinal [9], concentrated on the ability to adapt and to provide support to others

in order to deal with the symptoms associated with post-traumatic distress and with the burden of the pandemic. Chew [9], working on a longitudinal study of two hundred and twenty-one healthcare workers, 49.8% of whom were women, reported that coping was a major protective variable against stress through time. Recourse to avoidance, higher degrees of perceived stigmatization, and less in social care are all associated with greater post-traumatic stress.

In addition, Si [8] noted that the coefficient of passive accommodation involving elevated degrees of engagement in COVID-19, stigma/discrimination, and fear of infection and being in a higher-risk employment positively correlated with increased PTSD symptoms for the 863 employees (70.7% were women). No significant correlation between PTSD and positive adjustment behavior or social support was identified. Chen [10] found through stepwise multiple logistic regression analysis that a primarily negative coping style posed the greatest risk of depressive symptoms among 902 healthcare workers (68.6% women). Additional factors, such as heightened workload, respiratory or digestive symptoms over the past fortnight, COVID-19-related tests, and symptoms of burnout, were also considered. Chow [11] examined the relationship in a sample of two hundred workers (60.5% women) with positive or negative coping and symptoms of depression. They discovered that positive religious adaptation significantly protected people against probable depression, in contrast to negative religious coping, which was identified to be a significant contributor to the risk of depression. Krammer [12] used their original survey to conduct a transverse analysis of one hundred healthcare workers (74.4% of them women). Using hierarchical regression models, the study established meaningful predictive variables for symptoms and incorporated adaptation strategies such as “positive thinking.” Once the impact of pandemic events was taken into consideration, along with psychosocial resources, the researchers came up with the only significant indicator of depression to be general distress. However, thoughts of positivity, traumatizing events, worrying about being infected, threatening to infect family members, social contacts, job stress, and alcohol and nicotine consumption did not achieve any statistical significance. Overall, Krammer [12] conducted a hierarchical regression analysis in which one hundred healthcare professionals were selected to assess the association between adjustment disorders, epidemic disease burden, and coping measures. The results showed that general stress and the recording of disruptive events were significantly associated with adjustment disorders. On the other hand, coping strategies such as positive thinking and epidemic burden such as fear of contagion were significantly correlated. However, fear of contagion from within one’s household, fear of exposure and work stress were not statistically significant.

4 DISCUSSION

The COVID-19 pandemic has highlighted the major challenges facing healthcare workers and the healthcare system as a whole. The scientific literature sheds valuable light on the many facets of this global crisis, with particular emphasis on the impact on the psychological health of healthcare workers and the strategies they have deployed to cope. A systematic review of related studies reveals a particular focus on the resilience of these professionals during this unprecedented period.

A study by Maben and Bridges [1] examines the challenges faced by nurses during the pandemic and the coping strategies they used to deal with stress and fatigue. Their findings highlight the importance of social support and emotional management in maintaining the psychological well-being of healthcare workers.

Similarly, a meta-analysis by Greenberg and colleagues [4] examined the psychological effects of COVID-19 on healthcare personnel. Their results indicate a high prevalence of psychological distress among this occupational group, highlighting the need for effective support measures and interventions to prevent and treat psychological health problems.

In addition, a study by Cao et al. [3] explores the resilience factors of healthcare workers during the pandemic. Their results highlight the importance of optimism, self-efficacy, and team cohesion in promoting the psychological well-being of healthcare professionals.

A recent meta-analysis by Pappa [13] studied the psychological impact of the COVID-19 pandemic on healthcare personnel, revealing a significantly higher prevalence of psychological distress in this professional group, characterized by increased levels of depression, anxiety, and post-traumatic stress compared to the general population. This study highlights the major challenges facing healthcare workers as a result of their direct exposure to the risks and pressures associated with the pandemic. Meanwhile, a study by Wang [14] examined the coping strategies used by healthcare workers to deal with the COVID-19 pandemic, showing that social support, including support from colleagues and line managers, as well as access to psychological support resources, were key protective factors against stress and psychological distress.

In addition, a systematic review by Muller [15] examined the effectiveness of psychological support interventions for healthcare workers during the pandemic. Their results indicated that interventions focusing on stress management, relaxation, and mindfulness were effective in reducing symptoms of psychological discomfort and improving the psychological well-being of this occupational group. An analysis by Garcia [16] highlighted the importance of these programs in helping healthcare workers manage stress and maintain their psychological well-being. Similarly, the study by Li [17] investigated the impact of educational interventions on the psychological health of healthcare professionals during the pandemic. Results showed that training programs focusing on stress management, mindfulness, and relaxation techniques were associated with a significant reduction in levels of psychological distress and improved quality of life for these workers Li [17]. However, despite the proven benefits of these programs, shortcomings in their implementation and accessibility have been identified. A study by Chen [10] found that some healthcare workers faced barriers to participation in training programs due to time and resource constraints. This highlights the need for greater investment in education and training of healthcare workers to address future crises and ensure universal accessibility to these programs [10]. Healthcare workers who were directly affected and moved to combat COVID-19 exhibited a high level of persistent tiredness and severe stress throughout the pandemic [18]. Study findings from Sierakowska and Doroszkiewicz [19] indicated higher stress scores were linked to shorter careers, reduced scores on self-rated health as well as longer working hours for nurses.

Resilience and emotion-based coping strategies (avoiding feelings and thoughts) have been shown to be important protective factors against PTSD symptoms, particularly arousal, avoidance, and rejection, in a study of over 513 emergency service workers, 55.8% of whom were women [6]. Problem-oriented coping strategies failed to attain any statistically significant effect within their models, while the effect magnitude of emotional-focused adaptation strategies was very weak. On COVID-19, both emotional strain and physical strain have been identified as statistically relevant contributors for all distress-rating subscales.

Adaptation techniques are essential to assist caregivers in managing the pandemic [20]. In view of the numerous studies carried out in the context of the COVID-19 pandemic, healthcare professionals must consider adaptation as an essential strategy [20]. However, in spite of the critical situation, these professionals have ample resources to adopt positive coping strategies, as confirmed by analyses conducted by several researchers [21]. At the onset of the pandemic in China, it was found that nurses responded more efficiently when using problem-based tactics instead of emotional tactics, according to a study [22], [23]. Study has shown that people who are most stressed are more likely to use emotion-focused strategies. It was speculated that as participants felt tensions as they coped with emotion-based strategies.

Faced with these sudden and unprecedented changes, healthcare professionals were faced with a heavy workload and information to manage, resulting in high psychological demands and possible emotional exhaustion [24]. This emotional burden is usually counterbalanced by family life, which is also severely tested by confinement, concern for loved ones, and reduced leisure and relaxation time. This situation required a major mobilization of coping capacities and the use of adjustment mechanisms through the unconscious adoption of adaptation strategies. It is therefore essential to provide psychological support aimed at consolidating and increasing resilience, managing coping strategies, and reducing the risk of negative effects of the pandemic on their psychological health [25], [26].

Finally, a number of researchers are looking at the long-term implications of the COVID-19 pandemic for the healthcare sector and society as a whole. In their forward-looking article, Patel [27] examines the challenges and opportunities we face as we strive to rebuild and strengthen our post-pandemic healthcare systems. They call for significant changes in clinical practices, care delivery models, and public health policies to better prepare our healthcare systems for future crises.

These implications are also explored by Jones [28], who highlight the structural vulnerabilities and health inequalities exacerbated by the pandemic. Their research highlights the need for a more inclusive and equitable approach to ensure equitable access to healthcare and the resources needed to support the most affected populations.

In addition, a study by Wang [14] examines the socio-economic effects of the pandemic on people's psychological health and comfort. Their findings highlight the importance of taking into account the social determinants of health when planning future interventions to reduce the secondary impact of the pandemic on the psychological health of the population.

Finally, a prospective analysis by Smith and colleagues [29] offers recommendations for strengthening society's resilience to future health crises. Their research highlights the importance of promoting cross-sector collaboration, collaborative scientific research, and community engagement to address global health challenges.

By combining the perspectives offered by recent studies, our aim is to provide a comprehensive understanding of these strategies and their implications for the future of society and education. Research by Garcia [16] highlights the importance of training and psychosocial support programs deployed to help healthcare workers cope with stress during the pandemic. Their results highlight the effectiveness of these programs in strengthening individual resilience and promoting psychological well-being [16]. Meanwhile, a study by Li [17] examined the impact of educational interventions on the psychological health of healthcare workers during the pandemic. Their findings indicate that training programs focusing on stress management and relaxation techniques are effective in reducing levels of psychological distress [17].

5 CONCLUSION

In conclusion, this paper highlights the importance of stress management strategies for healthcare workers during the COVID-19 pandemic. By exploring the different perspectives offered by recent studies, we have been able to provide a holistic understanding of these strategies and their impact on the future of society and education. The lessons learned from this unprecedented period can serve as a foundation to guide future policy and practice aimed at preparing our healthcare systems and societies for future crises.

6 PERSPECTIVES

Based on the conclusions of our literature review, a number of perspectives emerge to guide future action. Firstly, it is essential to consider strengthening psychosocial support programs for healthcare workers, offering them comprehensive assistance including counseling sessions and stress management training. Secondly, it is important to integrate stress management training into the training of healthcare professionals. Initial and continuing training programs should include specific modules on resilience and emotional management to prepare healthcare workers to cope with the pressures inherent in their profession. Finally, there is a need to promote a culture of care and support within healthcare organizations. Employers need to encourage the sharing of experiences, foster open communication, and provide easy access to support resources.

7 ACKNOWLEDGEMENTS

We would such as to express our deep gratitude to Journal for Future Society and Education for the opportunity to submit this paper for review. We also thank the reviewers for their time and valuable contributions to improving this work.

8 REFERENCES

- [1] J. Maben and J. Bridges, "COVID-19: Supporting nurses' psychological and mental health," *Journal of Clinical Nursing*, vol. 29, nos. 15–16, pp. 2742–2750, 2020. <https://doi.org/10.1111/jocn.15307>
- [2] A. Shechter *et al.*, "Psychological distress, coping behaviors, and preferences for support among New York healthcare workers during the COVID-19 pandemic," *General Hospital Psychiatry*, vol. 66, pp. 1–8, 2020. <https://doi.org/10.1016/j.genhosppsych.2020.06.007>
- [3] J. Cao *et al.*, "A study of basic needs and psychological wellbeing of medical workers in the fever clinic of a tertiary general hospital in Beijing during the COVID-19 outbreak," *Psychotherapy and Psychosomatics*, vol. 89, no. 4, pp. 252–254, 2020. <https://doi.org/10.1159/000507453>
- [4] N. Greenberg, M. Docherty, S. Gnanapragasam, and S. Wessely, "Managing mental health challenges faced by healthcare workers during COVID-19 pandemic," *BMJ*, vol. 368, 2020. <https://doi.org/10.1136/bmj.m1211>
- [5] L. Lorente, M. Vera, and T. Peiró, "Nurses' stressors and psychological distress during the COVID-19 pandemic: The mediating role of coping and resilience," *Journal of Advanced Nursing*, vol. 77, no. 2, pp. 1335–1344, 2020. <https://doi.org/10.1111/jan.14695>

- [6] I. Secer, S. Ulas, and Z. Karaman-Ozlu, "The effect of the fear of COVID-19 on health-care professionals' psychological adjustment skills: Mediating role of experiential avoidance and psychological resilience," *Front. Psychol.*, vol. 11, 2020. <https://doi.org/10.3389/fpsyg.2020.561536>
- [7] M. Vagni, T. Maiorano, V. Giostra, and D. Pajardi, "Hardiness and coping strategies as mediators of stress and secondary trauma in emergency workers during the COVID-19 pandemic," *Sustainability*, vol. 12, no. 18, p. 7561, 2020. <https://doi.org/10.3390/su12187561>
- [8] M.-Y. Si *et al.*, "Psychological impact of COVID-19 on medical care workers in China," *Infect. Dis. Poverty*, vol. 9, 2020. <https://doi.org/10.1186/s40249-020-00724-0>
- [9] Q. H. Chew *et al.*, "Perceived stress, stigma, traumatic stress levels and coping responses amongst residents in training across multiple specialties during COVID-19 pandemic—A longitudinal study," *Int. J. Environ. Res. Public Health*, vol. 17, no. 18, p. 6572, 2020. <https://doi.org/10.3390/ijerph17186572>
- [10] S. Chen, R. She, P. Qin, H. Chen, Y. Mao, and H. Jiang, "Psychological effects of the COVID-19 crisis on nursing staff at a tertiary psychiatric hospital in China," *The Journal of Nervous and Mental Disease*, vol. 209, no. 5, pp. 361–369, 2021.
- [11] S. K. Chow *et al.*, "Religious coping, depression and anxiety among healthcare workers during the COVID-19 pandemic: A Malaysian perspective," *Healthcare*, vol. 9, no. 1, p. 79, 2021. <https://doi.org/10.3390/healthcare9010079>
- [12] S. Krammer, R. Augstburger, M. Haeck, and A. Maercker, "Adjustment disorder, depression, stress symptoms, corona related anxieties and coping strategies during the corona pandemic (COVID-19) in Swiss medical staff," *Psychother. Psychosom. Med. Psychol.*, vol. 70, no. 7, pp. 272–282, 2020. <https://doi.org/10.1055/a-1192-6608>
- [13] S. Pappa, V. Ntella, T. Giannakas, V. G. Giannakoulis, E. Papoutsis, and P. Katsaounou, "Prevalence of depression, anxiety, and insomnia among healthcare workers during the COVID-19 pandemic: A systematic review and meta-analysis," *Brain, Behavior, and Immunity*, vol. 88, pp. 901–907, 2020. <https://doi.org/10.1016/j.bbi.2020.05.026>
- [14] C. Wang *et al.*, "A longitudinal study on the mental health of general population during the COVID-19 epidemic in China," *Brain, Behavior, and Immunity*, vol. 87, pp. 40–48, 2021. <https://doi.org/10.1016/j.bbi.2020.04.028>
- [15] A. E. Muller *et al.*, "The mental health impact of the COVID-19 pandemic on health-care workers, and interventions to help them: A rapid systematic review," *Psychiatry Research*, vol. 293, 2021. <https://doi.org/10.1016/j.psychres.2020.113441>
- [16] A. L. Garcia, S. E. Dimitrakopoulou, and J. Yius, "Impact of the COVID-19 pandemic on the mental health of healthcare workers," *Int. J. Environ. Res. Public Health*, vol. 18, no. 4, 2021. <https://doi.org/10.3390/ijerph18041435>
- [17] Z. Li *et al.*, "Vicarious traumatization in the general public, members, and non-members of medical teams aiding in COVID-19 control," *Brain, Behavior, and Immunity*, vol. 88, pp. 916–919, 2020. <https://doi.org/10.1016/j.bbi.2020.03.007>
- [18] A. S. Hammami, M. Jellazi, L. Mahjoub, M. Fedhila, and S. Ouali, "Psychological impact of the COVID-19 pandemic on healthcare professionals in Tunisia: Risk and protective factors," *Front. Psychol.*, vol. 12, 2021. <https://doi.org/10.3389/fpsyg.2021.754047>
- [19] M. Sierakowska and H. Doroszkiewicz, "Stress coping strategies used by nurses during the COVID-19 pandemic," *PeerJ*, vol. 10, 2022. <https://doi.org/10.7717/peerj.13288>
- [20] M. Bartzik, F. Aust, and C. Corinna Peifer, "Negative effects of the COVID-19 pandemic on nurses can be buffered by a sense of humor and appreciation," *BMC Nursing*, vol. 20, 2021. <https://doi.org/10.1186/s12912-021-00770-5>
- [21] L. A. Sehularo, B. J. Molato, I. O. Mokgaola, and G. Gause, "Coping strategies used by nurses during the COVID-19 pandemic: A narrative literature review," *Health SA Gesondheid*, vol. 26, 2021. <https://doi.org/10.4102/hsag.v26i0.1652>

- [22] L. Huang, F. Xu, and H. Liu, "Emotional responses and coping strategies of nurses and nursing college students during COVID-19 outbreak," *MedRxiv*, 2020. <https://doi.org/10.1101/2020.03.05.20031898>
- [23] M. C. Xu and Y. Zhang, "Psychological survey of the first-line clinical front-line support nurses to combat new coronavirus-infected pneumonia," *Chinese Nursing Research*, vol. 34, pp. 368–370, 2020.
- [24] M. Zine El Abidine and S. Slaoui, "Impact de la pandémie COVID 19 sur la santé mentale des professionnels œuvrant dans le domaine de la santé: étude empirique," *Revue Internationale des Sciences de Gestion*, vol. 4, no. 3, 2021.
- [25] F. Dutheil, L. Mondillon, and V. Navel, "PTSD as the second tsunami of the SARS-CoV-2 pandemic," *Psychological Medicine*, vol. 52, no. 10, pp. 1773–1774, 2021. <https://doi.org/10.1017/S0033291720001336>
- [26] C. Carmassi *et al.*, "PTSD symptoms in healthcare workers facing the three coronavirus outbreaks: What can we expect after the COVID-19 pandemic," *Psychiatry Research*, vol. 292, 2020. <https://doi.org/10.1016/j.psychres.2020.113312>
- [27] A. Patel, D. B. Jernigan, and V. R. Co, "Initial public health response and interim clinical guidance for the 2019 novel coronavirus outbreak—United States, December 31, 2019–February 4, 2020," *American Journal of Transplantation*, vol. 20, no. 3, pp. 889–895, 2020. <https://doi.org/10.1111/ajt.15805>
- [28] N. R. Jones *et al.*, "Two metres or one: What is the evidence for physical distancing in covid-19?" *BMJ*, vol. 372, 2021. <https://doi.org/10.1136/bmj.m3223>
- [29] M. P. Smith, K. G. Curran, and L. Conklin, "Interim estimates of vaccine effectiveness of BNT162b2 and mRNA-1273 COVID-19 vaccines in preventing SARS-CoV-2 infection among health care personnel, first responders, and other essential and frontline workers—Eight US locations, December 2020–March 2021," *MMWR. Morbidity and Mortality Weekly Report*, vol. 70, no. 13, 2020.

9 AUTHORS

H. Elmastini, PhD, Research group in psychology and education. Man, Society, and Values' Laboratory, Faculty of Human and Social Sciences, University Ibn Tofail Kenitra, Kenitra, Morocco (E-mail: hanaa.elmastini@uit.ac.ma).

N. Abdessamad, PES, Professor of higher education, psychology, and education research group. Man, Society, and Values' Laboratory, Faculty of Human and Social Sciences, University Ibn Tofail Kenitra, Kenitra, Morocco.