



Emotional Challenges and Resilience Resources for Paramedics During the Early Stages of the COVID-19 Pandemic

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Abstract

The COVID-19 pandemic introduced significant challenges for healthcare systems worldwide, with Emergency Medical Services (EMS) and paramedics facing heightened stress and rapidly changing job demands. This review systematically examines the emotional experiences of paramedics during the early stages of the pandemic and identifies key resources that supported their mental health. Thematic analysis of paramedics' narratives revealed that feelings of anxiety and frustration were prevalent, largely due to unclear guidelines and insufficient personal protective equipment (PPE). However, positive work-related factors, such as effective communication, leadership support, and peer assistance, were crucial in fostering resilience. The findings highlight the importance of organizational adaptability and the need for comprehensive psychological support systems to safeguard paramedics' well-being. The review emphasizes the necessity for healthcare organizations to prioritize mental health in crisis management strategies, ensuring

that EMS personnel are equipped with the resources and support needed to maintain operational effectiveness. Further research is recommended to explore the relationship between organizational resilience and personnel mental health, especially in the face of future healthcare challenges.

Keywords: Paramedics, COVID-19 pandemic, mental health, resilience, crisis management

Introduction

The onset of the COVID-19 pandemic presented unprecedented challenges for healthcare systems globally, placing paramedics and other emergency medical professionals at the epicenter of the crisis. Paramedics, as critical providers of prehospital emergency care, were required to navigate multifaceted challenges in an environment fraught with uncertainty (Drennan et al., 2021). These professionals faced dramatic changes to their daily work routines, including the rapid implementation of personal protective equipment (PPE) mandates and the necessity to adapt to evolving protocols and guidelines (Boechler et al., 2021; Lerner et al., 2020; O'Connor et al., 2021; Azbel et al., 2021).

During the early phases of the pandemic, Emergency Medical Services (EMS) personnel experienced heightened levels of stress attributable to various factors. These included insufficient protective measures, a surge in demand for services, staff shortages, fear of COVID-19 exposure, concerns about transmitting the virus

Significance | This study highlights the emotional challenges paramedics faced and the resources crucial for supporting their mental well-being during COVID-19

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to family members, and dissatisfaction with swiftly changing work policies (Lane et al., 2021; Shukla et al., 2020; Andrew et al., 2021; Eskol et al., 2022; Schumann et al., 2023). The cumulative burden of these stressors underscored the pressing need for effective coping mechanisms and institutional support systems to safeguard the well-being of these frontline workers.

Research efforts have highlighted the importance of robust communication and leadership strategies in mitigating stress and promoting resilience among healthcare workers during crises. Sangal et al. (2021) underscored the correlation between clear, bidirectional communication and reduced work-related stress, emphasizing the necessity for consistent messaging and the strategic dissemination of information. Similarly, Dickson et al. (2022) identified leadership practices—such as relational engagement, visible presence, and an emphasis on compassion and authenticity—as pivotal in fostering a supportive work environment. Additionally, Awais et al. (2021) advocated for measures to alleviate mental distress, including access to psychological support, peer assistance, and the development of evidence-based protocols.

The COVID-19 pandemic has also illuminated broader systemic vulnerabilities in healthcare systems. Observations from Finland revealed that the accessibility and well-being of medical personnel are critical determinants of system resilience (Kihlström et al., 2022). Effective crisis management strategies—such as crisis communication, flexible work arrangements, and error tolerance—are essential for bolstering organizational adaptability. Furthermore, Barasa et al. (2018) and Coetzee et al. (2016) emphasized the significance of learning from past crises to enhance preparedness and resilience at organizational and systemic levels.

This study aimed to explore the emotions and resources that paramedics identified as pivotal for maintaining their mental health during the initial stages of the COVID-19 pandemic. Emotions were conceptualized as complex reactions involving emotional, physiological, and behavioral components triggered by significant events (Demerouti et al., 2001; Ericsson et al., 2022; Rinkinen et al., 2024). Resources were defined as material, psychological, social, or organizational assets that facilitate goal attainment, alleviate stress, and mitigate associated costs (Braun & Clarke, 2006; Prezant et al., 2020; Alwidyan et al., 2022). By examining these elements, the study contributes to a nuanced understanding of the factors influencing paramedics' well-being during pandemics, thereby informing future strategies for crisis preparedness and support.

2. The Observations and Experiences of Paramedics

This study explored the observations and experiences of Emergency Medical Service (EMS) personnel during the early stages of the COVID-19 pandemic. Specifically, it investigated the emotional challenges faced by EMS workers in response to new working

conditions and the workplace factors that served as assets to their mental health. These topics were analyzed using three overarching themes, emphasizing the emotional toll on EMS personnel, work-related challenges, and the resources that supported them.

3. Types of Emotions Encountered by Emergency Medical Service (EMS) Staff

Previous research highlights that the COVID-19 pandemic significantly increased the workload of emergency personnel, necessitating adjustments in their operational frameworks to align with new pandemic-related demands (Drennan et al., 2021; Lerner et al., 2020). Paramedics participating in this study reported facing ambiguous and often insufficient guidelines. They expressed frustration over having to adhere to rapidly changing directives with minimal support for comprehension. The constant influx of information, though overwhelming, was occasionally perceived as a resource when the information was current and well-organized. Sangal et al. (2021) identified similar issues, noting that excessive information led to heightened anxiety among frontline workers. Their findings emphasized three critical strategies to mitigate the effects of information overload: integrating information before dissemination, maintaining consistent communication, and enabling bidirectional exchanges.

McAlearney et al. (2022) found that first responders, particularly EMS personnel, experienced significant frustration with COVID-19-related information due to discrepancies across sources, misinformation on social media, and political influences. Health services were largely unprepared to handle the unprecedented flow of information within the contemporary media environment (Kihlström et al., 2022). These findings underscore the importance of effective crisis communication as a core component of organizational preparedness. Ensuring that communication supports the actual needs and actions of employees in crisis scenarios is essential. Additionally, explicit rules and comprehensive execution plans are critical for avoiding confusion in future emergencies (Isakov et al., 2022).

4. Workplace Challenges for EMS Personnel

The COVID-19 pandemic also introduced significant changes to EMS job descriptions (Azbel et al., 2021; O'Connor et al., 2021). Paramedics in this study voiced concerns over these alterations, particularly regarding the increased frequency of pre-arrival calls (Shukla et al., 2020) and extended mission durations (Andrew et al., 2021; Eskol et al., 2022). The persistent use of personal protective equipment (PPE) and heightened hygiene requirements imposed additional physical and mental strain (Schumann et al., 2023). Notably, Finland, like many other countries, was unprepared for the widespread use of PPE during the pandemic's early phases (Kihlström et al., 2022). Paramedics reported feelings of fear and



Figure 1. A conceptual model for reducing the impact of COVID-19 on healthcare and care workers. (Image courtesy of Blake et al 2021)

frustration stemming from inadequate PPE, compounded by insufficient training. This heightened their sense of responsibility for maintaining aseptic practices and delivering appropriate patient care.

Conversely, the provision of sufficient PPE, clear operational guidelines, and proper training was found to boost both motivation and perceptions of safety among paramedics. McCann-Pineo et al. (2022) and Vanhaecht et al. (2021) similarly emphasized that well-executed training programs and effective management of PPE usage are essential for ensuring staff well-being during pandemics.

The paramedics in this study also described additional challenges that impacted their lives holistically. Consistent with previous research, the pandemic negatively affected the general well-being of healthcare workers (Zolnikov & Furio, 2021; Spychala et al., 2023). Leisure activities were restricted, and concerns about personal and family health were pervasive. These stressors exacerbated burnout and stress among frontline healthcare workers, including paramedics (Roberts et al., 2021; Chang & Hu, 2022). Participants highlighted a lack of adequate support and guidance, echoing findings from other studies that underline the importance of strong institutional support for mitigating mental health challenges during crises (Mausz et al., 2022).

5. Resources Supporting EMS Personnel

This study identified several key resources that contributed to the resilience of EMS personnel during the pandemic. Prior research has documented that EMS workers often lacked adequate support in such crises (McAlearney et al., 2022; Awais et al., 2021). For instance, Dickson et al. (2022) proposed six provisional theories for effective management during pandemics, focusing on authentic engagement, preparedness, and strategic use of information. Similarly, Eaton-Williams and Williams (2023) emphasized the importance of compassionate leadership and effective operational changes in supporting frontline workers.

Participants in this study highlighted the significance of encouragement and peer support, consistent with findings from the UK and Finland (Phung et al., 2022; Rinkinen et al., 2024). These supportive interactions fostered a sense of camaraderie and resilience among EMS personnel. Compassionate leadership, clear communication, and knowledge-driven actions were identified as critical factors for enhancing morale and sustaining motivation during the pandemic.

During the early phases of the COVID-19 pandemic, emergency medical services (EMS) personnel faced considerable challenges, particularly regarding mental health support. Evidence suggests that EMS workers were inadequately trained to address their psychological needs, and there was a noticeable lack of psychosocial support systems, even though such measures could play a critical role in managing crisis-related stress (Boechler et al., 2021). Many

paramedics perceived mental health resources as insufficient and delayed, while others observed improvements during the pandemic. These mixed perceptions underline the necessity for organizations to establish standardized frameworks for mental health support (Hendrickson et al., 2022). This aligns with findings emphasizing the importance of psychological assistance as a cornerstone of health system resilience during crises (Kihlström et al., 2022).

Isakov et al. (2022) propose the development of a national policy to mitigate the mental health impacts of COVID-19 and other professional stressors on EMS workers. This perspective transcends the United States and suggests that EMS organizations worldwide should prioritize mental health planning to enhance resilience. The pandemic has highlighted the need for institutional preparedness in addressing the mental health needs of first responders (Andrew et al., 2021).

The evolving responsibilities of EMS personnel during the pandemic significantly contributed to their stress. Many paramedics expressed frustration and apprehension over abrupt changes in their roles, often dictated by higher authorities (Roberts et al., 2021). Effective crisis management requires acknowledging these emotions and fostering transparent communication to rebuild trust (Zamoum & Gorpe, 2018). Transparency and open dialogue are essential for planning future preparedness strategies (Anderson et al., 2020). Despite the challenges, foundational research in Australia has examined paramedics' professional obligations during extraordinary circumstances, highlighting the urgent need for clear guidelines defining roles in routine and crisis scenarios (Smith et al., 2018; Smith et al., 2019).

The concept of complex adaptive systems (CAS) offers valuable insights into organizational resilience during crises. CAS frameworks emphasize that resilience stems from both designed robustness and adaptive flexibility (Barasa et al., 2018). For EMS organizations, adaptability to changing circumstances was identified as an asset for maintaining staff psychological well-being (Coetzee et al., 2016). The findings of this study highlight the importance of analyzing system adaptability during crises to strengthen organizational resilience. For instance, Kihlström et al. (2022) observed that anticipated crises improved the resilience of decentralized health systems, underscoring the value of proactive crisis planning.

Maintaining the mental health of EMS workers is integral to health system resilience. Research has repeatedly demonstrated the detrimental impact of abrupt organizational changes and inadequate support systems on staff well-being (Mausz et al., 2022; Hendrickson et al., 2022). Future research should focus on creating effective frameworks for resilience, addressing both individual and organizational challenges during crises. Such efforts would facilitate improved preparedness and sustained mental health among EMS workers (Figure 1).

6. Conclusion

This review explores the complex emotional challenges faced by paramedics during the early stages of the COVID-19 pandemic. The findings reveal that while paramedics experienced significant stress and anxiety from the rapid shifts in their work environment, key factors helped maintain their mental well-being. These included strong leadership, clear communication, and peer support—resources that were critical in fostering resilience among EMS personnel.

The pandemic highlighted the urgent need for healthcare organizations to develop comprehensive crisis management strategies that prioritize employee mental health. Providing paramedics with adequate personal protective equipment (PPE), clear operational guidelines, and psychological support can create a supportive environment that enhances both employee well-being and patient care. Moreover, organizations' ability to adapt to changing circumstances is crucial for sustaining workforce resilience.

Looking ahead, further research is needed to examine the long-term mental health effects of such crises on EMS personnel and to identify best practices for supporting their needs. This includes developing innovative training programs focused on mental health resilience and establishing standardized crisis communication protocols.

Ultimately, the insights from this study can inform future preparedness strategies, ensuring that paramedics are equipped to handle the immediate challenges of public health crises while also preserving their long-term mental health and well-being. By fostering a culture that prioritizes psychological safety, healthcare organizations can enhance the effectiveness of emergency response teams, leading to improved outcomes for both patients and communities.

Author contributions

A.H.A., A.M.A., N.A.A.A., and R.O.A.-H. conceptualized and designed the study. M.S.A., N.A.A.-A., and T.M.A. collected the data. A.T.A., F.S.A.A., and N.M.M.A. performed data analysis and interpretation. N.G.A.-S., A.A.A.-H., M.R.A., S.H.A., Z.M.A., and R.A.S. contributed to manuscript drafting and revisions. A.E.A. reviewed the manuscript critically for intellectual content. All authors read and approved the final manuscript.

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Competing financial interests

The authors have no conflict of interest.

References

- Alwidy, M. T., Oteir, A. O., & Trainor, J. (2022). Working during pandemic disasters: Views and predictors of EMS providers. *Disaster Med Public Health Prep*, 16(1), 116-122. <https://doi.org/10.1017/dmp.2020.131>
- Anderson, C., Pooley, J. A., Mills, B., Anderson, E., & Smith, E. C. (2020). Do paramedics have a professional obligation to work during a pandemic? A qualitative exploration of community member expectations. *Disaster Med Public Health Prep*, 14(3), 406-412. <https://doi.org/10.1017/dmp.2020.212>
- Andrew, E., Nehme, Z., Stephenson, M., Walker, T., & Smith, K. (2021). The impact of the COVID-19 pandemic on demand for emergency ambulances in Victoria, Australia. *Prehosp Emerg Care*, 16, 1-7. <https://doi.org/10.1080/10903127.2021.1944409>
- Awais, S. B., Martins, R. S., & Khan, M. S. (2021). Paramedics in pandemics: Protecting the mental wellness of those behind enemy lines. *Br J Psychiatry*, 218(2), 75-76. <https://doi.org/10.1192/bjp.2020.193>
- Azbel, M., Heinänen, M., Lääperi, M., & Kuisma, M. (2021). Effects of the COVID-19 pandemic on trauma-related emergency medical service calls: A retrospective cohort study. *BMC Emerg Med*, 9(1), 102. <https://doi.org/10.1186/s12873-021-00495-3>
- Barasa, E., Mbau, R., & Gilson, L. (2018). What is resilience and how can it be nurtured? A systematic review of empirical literature on organizational resilience. *Int J Health Policy Manag*, 7(6), 491-503. <https://doi.org/10.15171/ijhpm.2018.06>
- Blake, H., Mahmood, I., Dushi, G., Yildirim, M., & Gay, E. (2021). Psychological Impacts of COVID-19 on Healthcare Trainees and Perceptions towards a Digital Wellbeing Support Package. *International Journal of Environmental Research and Public Health*, 18(20), 10647. <https://doi.org/10.3390/ijerph182010647>
- Boechler, L., Cameron, C., Smith, J. C., Ford-Jones, P., & Suthers, P. (2021). Impactful approaches to leadership on the front lines of the COVID-19 pandemic: Lived experiences of Canadian paramedics. *Healthc Q*, 24(3), 42-47. <https://doi.org/10.12927/hcq.2021.26620>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qual Res Psychol*, 3(2), 77-101. <https://doi.org/10.1191/1478088706qp063oa>
- Chang, Y. T., & Hu, Y. J. (2022). Burnout and health issues among prehospital personnel in Taiwan fire departments during a sudden spike in community COVID-19 cases: A cross-sectional study. *Int J Environ Res Public Health*, 16(4), 2257. <https://doi.org/10.3390/ijerph19042257>
- Coetzee, C., Van Niekerk, D., & Raju, E. (2016). Disaster resilience and complex adaptive systems theory: Finding common grounds for risk reduction. *Disaster Prev Manage*, 25(2), 196-211. <https://doi.org/10.1108/DPM-07-2015-0153>
- Cypress, B. S. (2017). Rigor or reliability and validity in qualitative research: Perspectives, strategies, reconceptualization, and recommendations. *Dimens Crit Care Nurs*, 36(4), 253-263. <https://doi.org/10.1097/DCC.0000000000000253>
- Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). The job demands-resources model of burnout. *J Appl Psychol*, 86(3), 499-512. <https://doi.org/10.1037/0021-9010.86.3.499>
- Dickson, C. A. W., Davies, C., McCormack, B., Westcott, L., Merrell, J., McIlpatrick, S., et al. (2022). UK nurses' and midwives' experiences of healthful leadership practices

- during the COVID-19 pandemic: A rapid realist review. *J Nurs Manag*, 30(8), 3942-3957. <https://doi.org/10.1111/jonm.13790>
- Drennan, I. R., Blanchard, I. E., & Buick, J. E. (2021). Opportunity for change: Is it time to redefine the role of paramedics in healthcare? *CJEM*, 23(2), 139-140. <https://doi.org/10.1007/s43678-021-00105-y>
- Eaton-Williams, P. J., & Williams, J. (2023). See us as humans. Speak to us with respect. Listen to us. A qualitative study on UK ambulance staff requirements of leadership while working during the COVID-19 pandemic. *BMJ Lead*, 7(2), 102-107. <https://doi.org/10.1136/leader-2022-000622>
- Ericsson, C. R., Lindström, V., Rudman, A., & Nordquist, H. (2022). Paramedics' perceptions of job demands and resources in Finnish emergency medical services: A qualitative study. *BMC Health Serv Res*, 22(1), 1469. <https://doi.org/10.1186/s12913-022-08856-9>
- Eskol, J. R., Zegers, F. D., Wittrock, D., Lassen, A. T., & Mikkelsen, S. (2022). Increased ambulance on-scene times but unaffected response times during the first wave of the COVID-19 pandemic in Southern Denmark. *BMC Emerg Med*, 9(1), 61. <https://doi.org/10.1186/s12873-022-00623-7>
- Hendrickson, R. C., Slevin, R. A., Hoerster, K. D., Chang, B. P., Sano, E., McCall, C. A., et al. (2022). The impact of the COVID-19 pandemic on mental health, occupational functioning, and professional retention among health care workers and first responders. *J Gen Intern Med*, 37(2), 397-408. <https://doi.org/10.1007/s11606-021-07252-z>
- Isakov, A., Carr, M., Munjal, K. G., Kumar, L., & Gausche-Hill, M. E. M. S. (2022). Agenda 2050 meets the COVID-19 pandemic. *Health Secur*, 20(S1), S97-S106. <https://doi.org/10.1089/hs.2021.0179>
- Kihlström, L., Huhtakangas, M., Karreinen, S., Viita-Aho, M., Keskimäki, I., & Tynkkynen, L. K. (2022). Local cooperation has been the cornerstone: Facilitators and barriers to resilience in a decentralized health system during COVID-19 in Finland. *J Health Organ Manag*. <https://doi.org/10.1108/JHOM-02-2022-0069>
- Lane, D. J., Blanchard, I. E., Buick, J. E., Shaw, M., & McRae, A. D. (2021). Changes in presentation, presenting severity, and disposition among patients accessing emergency services during the first months of the COVID-19 pandemic in Calgary, Alberta: A descriptive study. *CMAJ Open*, 9(2), 592-601. <https://doi.org/10.9778/cmajo.20200313>
- Lerner, E. B., Newgard, C. D., & Mann, N. C. (2020). Effect of the Coronavirus Disease 2019 (COVID-19) pandemic on the U.S. emergency medical services system: A preliminary report. *Acad Emerg Med*, 27(8), 693-699. <https://doi.org/10.1111/acem.14051>
- Mausz, J., Donnelly, E. A., Moll, S., Harms, S., & McConnell, M. (2022). Mental disorder symptoms and the relationship with resilience among paramedics in a single Canadian site. *Int J Environ Res Public Health*, 17(8), 4879. <https://doi.org/10.3390/ijerph19084879>
- McAlearney, A. S., Gaughan, A. A., MacEwan, S. R., Gregory, M. E., Rush, L. J., Volney, J., et al. (2022). Pandemic experience of first responders: Fear, frustration, and stress. *Int J Environ Res Public Health*, 13(8), 4693. <https://doi.org/10.3390/ijerph19084693>
- McCann-Pineo, M., Li, T., Barbara, P., Levinsky, B., & Berkowitz, J. (2022). Factors influencing use of personal protective equipment among emergency medical services responders during the COVID-19 pandemic: A retrospective chart review. *West J Emerg Med*, 23(3), 396-407. <https://doi.org/10.5811/westjem.2022.2.55217>
- O'Connor, A. W., Hannah, H. A., Burnor, E. A., Fukutaki, K. G., Peterson, T., Ballard, D. W., et al. (2021). Emergency medical service utilization and response following COVID-19 emergency and stay-at-home policies: An interrupted time-series analysis. *Cureus*, 21(11). <https://doi.org/10.7759/cureus.19794>
- Phung, V. H., Sanderson, K., Pritchard, G., Bell, F., Hird, K., Wankhade, P., et al. (2022). The experiences and perceptions of wellbeing provision among English ambulance services staff: A multi-method qualitative study. *BMC Health Serv Res*, 15(1), 1352. <https://doi.org/10.1186/s12913-022-08729-1>
- Prezant, D. J., Lancet, E. A., Zeig-Owens, R., Lai, P. H., Appel, D., Webber, M. P., et al. (2020). System impacts of the COVID-19 pandemic on New York City's emergency medical services. *J Am Coll Emerg Physicians Open*, 9(6), 1205-1213. <https://doi.org/10.1002/emp2.12301>
- Rebmann, T., Charney, R. L., Loux, T. M., Turner, J. A., Abbyad, Y. S., Silvestros, M. (2020). Emergency medical services personnel's pandemic influenza training received and willingness to work during a future pandemic. *Prehosp Emerg Care*, 24(5), 601-609. <https://doi.org/10.1080/10903127.2019.1701158>
- Rinkinen, T., Kinnula, M., & Nordquist, H. (2024). Technological development roles and needs in pre-hospital emergency care from the advanced level paramedics' perspective. *Int Emerg Nurs*, 73, 101406. <https://doi.org/10.1016/j.ienj.2024.101406>
- Roberts, R., Wong, A., Jenkins, S., Neher, A., Sutton, C., O'Meara, P., et al. (2021). Mental health and well-being impacts of COVID-19 on rural paramedics, police, community nurses, and child protection workers. *Aust J Rural Health*, 29(5), 753-767. <https://doi.org/10.1111/ajr.12804>
- Sangal, R. B., Bray, A., Reid, E., Ulrich, A., Liebhardt, B., Venkatesh, A. K., et al. (2021). Leadership communication, stress, and burnout among frontline emergency department staff amid the COVID-19 pandemic: A mixed methods approach. *Healthc (Amst)*, 9(4), 100577. <https://doi.org/10.1016/j.hjdsi.2021.100577>
- Schumann, H., Böckelmann, I., & Thielmann, B. (2023). Relaxation and strain among emergency medical service personnel and emergency control center dispatchers during the first two waves of the SARS-CoV-2 pandemic. *Med Pr*, 15(5), 353-362. <https://doi.org/10.13075/mp.5893.01401>
- Shukla, V., Lau, C. S. M., Towns, M., Mayer, J., Kalkbrenner, K., Beuerlein, S., et al. (2020). COVID-19 exposure among first responders in Arizona. *J Occup Environ Med*, 62(12), 981-985. <https://doi.org/10.1097/JOM.0000000000002027>
- Smith, E., Burkle, F. M., Gebbie, K., Ford, D., & Bensimon, C. (2018). Acceptable limitations on paramedic duty to treat during disaster: A qualitative exploration. *Prehosp Disaster Med*, 33(5), 466-470. <https://doi.org/10.1017/S1049023X18000857>
- Smith, E., Burkle, F., Gebbie, K., Ford, D., & Bensimon, C. (2019). A qualitative study of paramedic duty to treat during disaster response. *Disaster Med Public Health Prep*, 13(2), 191-196. <https://doi.org/10.1017/dmp.2018.15>
- Spychala, A., Piowowska, M., & Piekut, A. (2023). The COVID-19 pandemic as a stress factor in the work of a paramedic. *Med Pr*, 8(1), 9-17. <https://doi.org/10.13075/mp.5893.01278>

- Vanhaecht, K., Seys, D., Bruyneel, L., Cox, B., Kaesemans, G., Cloet, M., et al. (2021). COVID-19 is having a destructive impact on healthcare workers' mental well-being. *Int J Qual Health Care*, 20(1), mzaa158. <https://doi.org/10.1093/intqhc/mzaa158>
- Zamoum, K., & Gorpe, T. S. (2018). Crisis management: A historical and conceptual approach for a better understanding of today's crises. In *Crisis Management - Theory and Practice* (pp. 1-18). InTech <https://doi.org/10.5772/intechopen.76198>
- Zolnikov, T. R., & Furio, F. (2021). First responders and social distancing during the COVID-19 pandemic. *J Hum Behav Soc Environ*, 31(1-4), 244-253. <https://doi.org/10.1080/10911359.2020.1811826>