



COVID-19 and Paramedics: Barriers and Enablers-An Updated Review

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Abstract:

Background: COVID-19 has significantly impacted healthcare systems, placing immense strain on healthcare workers, particularly paramedics. This updated review explores the barriers and enablers faced by paramedics responding to COVID-19 cases, with a focus on their psychological, social, and professional challenges.

Aim: To critically assess literature on the experiences of paramedics during the COVID-19 pandemic, identifying key obstacles and facilitators in prehospital care.

Methods: An integrative review methodology was used, following Whittemore and Knafl's framework. A systematic search of peer-reviewed studies yielded 361 articles, with nine studies ultimately included after screening for relevance, language, and methodological rigor. Data analysis focused on identifying recurring themes and unique findings related to paramedics' experiences.

Results: Paramedics faced numerous barriers, including communication challenges, ineffective leadership, fear of infection, PPE shortages, and inconsistent guidelines. Psychological distress, burnout, and concerns about transmitting the virus to loved ones were prevalent. Enablers included resilience, public and organizational support, and effective leadership strategies emphasizing transparency, communication, and staff recognition. Studies highlighted regional differences in challenges and responses, underscoring the need for tailored interventions.

Conclusion: The review reveals significant psychological, social, and operational barriers faced by paramedics during the COVID-19 pandemic. Effective communication, consistent guidelines, and mental health support are critical enablers. Addressing these factors is essential to enhance paramedics' preparedness and well-being during future public health emergencies.

Keywords: Paramedics, COVID-19, barriers, enablers, psychological distress, prehospital care, pandemic response.

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Introduction:

Healthcare professionals routinely operate in environments that are both physically and emotionally demanding. Frequently reported stressors include shift work, burnout, low morale, and excessive workloads [1], [2], [3]. De Cieri et al. [4] highlight that such stressors elevate the likelihood of mental and physical health deterioration among healthcare workers. Public health crises, such as pandemics, exacerbate these stressors, placing additional burdens on healthcare workers during critical periods of community need [5]. Historically, infectious diseases with the potential to cause pandemics have

periodically emerged and spread globally [6]. The documented frequency of such threats has increased, with the World Health Organization (WHO) declaring six Public Health Emergencies of International Concern (PHEIC) since 2009 [7], [8]. In Queensland, a public health emergency was declared on January 29, 2020, in response to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the virus responsible for coronavirus disease (COVID-19) [9]. Subsequently, on March 11, 2020, the WHO announced the COVID-19 pandemic as a global health emergency [10]. As of March 23, 2022, over two years after the initial case of COVID-19, the WHO reported 476,374,234 confirmed cases and 6,108,976 fatalities worldwide [11]. This pandemic has profoundly disrupted global healthcare delivery systems, heightened pressure on health service models, and significantly impacted individuals, particularly paramedics, who deliver critical frontline care [12], [13], [14].

Research exploring the experiences of healthcare workers during pandemics—both historical and prospective—has identified several challenges, including anxiety, heightened perceptions of personal and familial risk, shortages of personal protective equipment (PPE) and vaccines, and staff absences due to illness, quarantine, or safety concerns [15], [16]. Staff shortages, in particular, can severely disrupt healthcare services during pandemics [16]. Sultan et al. [5] emphasized the importance of addressing healthcare workers' concerns during public health emergencies to enhance disaster preparedness. While prior research has predominantly focused on nurses and doctors in healthcare settings, findings have often been extrapolated to prehospital care despite its distinct challenges [16], [17]. In Australia, prehospital care is delivered by diverse providers, ranging from volunteer first responders to paramedics and physicians, each with varying levels of training and qualifications. Paramedics in Australia, typically educated to diploma or degree level in paramedicine, are capable of delivering advanced life support, whereas Emergency Medical Technicians (EMTs) in other countries generally possess lower qualifications [18], [19].

Murray et al. [15] conducted an integrative review that analyzed 40 studies examining factors influencing healthcare workers' willingness to respond during infectious disease outbreaks and bioterrorism events. However, this review excluded Australian paramedics, focusing instead on the experiences of American Emergency Medical Services (EMS) personnel and EMTs. Given the critical role paramedics play during public health emergencies, the unique challenges associated with prehospital care delivery in pandemic contexts, and the paucity of research on their experiences, there is a pressing need to address this gap in knowledge and explore strategies to better support paramedics and EMTs [20], [21], [22]. This integrative review aims to critically assess existing literature on the experiences of paramedics, identifying barriers and enablers in their response to suspected or confirmed COVID-19 cases. An integrative review methodology was employed, as it is the most comprehensive type of research review, facilitating a detailed analysis of critical healthcare issues [23]. According to Whittemore and Knafl [23], integrative reviews incorporate experimental, non-experimental, theoretical, and empirical research, enabling a holistic understanding. Given that Petrie et al. [24] identified paramedics as underrepresented in COVID-19-related research, this methodology allowed for the inclusion of diverse studies. The review followed Whittemore and Knafl's [23] framework, comprising the following steps: problem identification, literature search, data evaluation, data analysis, and data presentation.

Studies About COVID-19 and Paramedics:

The study by **Alqahtani et al. (2021)** in Saudi Arabia aimed to evaluate the psychological and social well-being of paramedics during the COVID-19 pandemic, along with the therapeutic assistance provided to them. A cross-sectional survey using convenience sampling included 106 paramedics and EMTs. The findings highlighted significant social and psychological distress among paramedics, emphasizing the role of social assistance in mitigating these effects. Recommendations included offering psychological support and social counseling services to paramedics. However, the study was limited to Riyadh City, and the sample was predominantly male (95.3%), restricting generalizability. The study did not meet Criteria 4.4 for quantitative descriptive studies. Barriers included high stress levels due to infection risk, stigma, PPE shortages, and isolation from family, while social support acted as an enabler.

The research by **Boechler et al. (2021)** in Canada explored the lived experiences of paramedics during COVID-19, particularly focusing on leadership strategies. Conducted through an online survey with 428 paramedics, it identified that effective communication, engagement, transparency, and follow-up were critical in reducing stress during prolonged emergencies. Recommendations included fostering engagement, seeking feedback, recognizing staff efforts, and ensuring visible frontline leadership. The survey lacked detailed questions and descriptions, although all qualitative criteria were met. Barriers included overwhelming and inconsistent email updates, deteriorating inter-professional relationships, and lack of trust in leadership. Enablers were diverse communication strategies and public support. The study by **Chang et al. (2021)** in Taiwan aimed to examine factors influencing physical and mental health among EMTs and paramedics during a COVID-19 surge. Using a mixed-methods design with 187 participants, the findings revealed increased perceived pressure, burnout, and health burdens, posing a public health concern. The authors recommended integrating EMTs into the broader healthcare system to provide better resources. The study faced limitations, including a narrow, predominantly male (92.5%) sample. Barriers included heavy workloads, response time pressure, inadequate PPE, and insufficient recognition as healthcare professionals.

In Germany, **Dreher et al. (2021)** investigated stressors and attitudes among EMS workers during the pandemic, with repeated surveys (N=1124 and N=413). Key stressors, such as infection risk and childcare challenges, decreased over a five-week period. Recommendations included addressing childcare needs, stocking PPE, and providing pandemic training. Limitations included response rate ambiguity, demographic imbalances, and reliance on a self-devised questionnaire with untested psychometric properties. The study did not meet Criteria 3.1 for non-randomized quantitative studies. Barriers included infection risks and childcare issues, while fewer financial burdens were an enabler. In Australia, **Li et al. (2021)** examined knowledge, preparedness, and experiences among 430 emergency nurses, physicians, and paramedics during COVID-19. Despite overall preparedness, challenges included inconsistent communication, PPE issues, and transmission fears. Recommendations highlighted the need for clear communication and enhanced support services. The study had low response rates, lacked longitudinal data, and did not verify scale reliability. Barriers included inadequate PPE training and unclear communication, while public and organizational support served as enablers. The study by **Petrie et al. (2022)** in Australia reported significant mental health impacts and occupational disruptions among 95 paramedics during the pandemic. Recommendations included fostering a prepared and adaptive workforce with mental health support. The study faced limitations such as small sample size, self-reported data, and potential bias. Barriers encompassed disruptions in work and safety concerns, while solidarity and secure employment were enablers.

In Poland, **Piotrowski et al. (2021)** examined resilience and stress among paramedics during COVID-19 using repeated surveys (N=75 and N=84). Stress levels were lower overall, but those in direct contact with COVID-19 patients experienced higher stress. The authors recommended monitoring psychological conditions and promoting personal resources. Limitations included small sample size and demographic homogeneity. Barriers included prolonged stress depleting coping resources, while resilience acted as an enabler. **Rees et al. (2021)** in Wales explored paramedic experiences through semi-structured interviews with 20 participants. Emergent themes included rapid adaptation, communication trust, and solidarity. Recommendations focused on improving PPE quality, communication, and staff well-being. Limitations included the small sample size and single ambulance service representation. Barriers included infection risks, mental health challenges, and loss of personal connection in care delivery, while public support and secure employment served as enablers. The study by **Shahzad et al. (2020)** in Pakistan used a structured questionnaire to assess the psychological impact of COVID-19 on 345 paramedics. Findings showed that perceived threat led to anxiety, depression, and emotional exhaustion, potentially resulting in antagonistic behavior. Social support reduced these negative outcomes. Recommendations included identifying high-risk groups and offering counseling. Limitations involved lack of differentiation by age and sex. Barriers included cognitive and emotional stress, while perceived social support was an enabler.

Results

The systematic literature search yielded 361 articles. After removing 136 duplicates, 225 articles remained for screening in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flowchart [25]. Applying the inclusion and exclusion criteria during the title and abstract screening phase led to the elimination of 111 articles. Subsequently, the first full-text screening excluded 76 articles as they did not specifically focus on COVID-19, paramedics, emergency medical technicians (EMTs), or their experiences in responding to COVID-19 cases. During the second full-text screening, an additional 19 articles were removed because they presented combined data on various healthcare professions without providing separate results for paramedics or EMTs. Five articles were excluded as their full text was either not in English or comprised conference proceedings. However, one study that included physicians, nurses, and paramedics was retained as it clearly separated the data for paramedics. Following a critical review by three researchers, five more articles were excluded as they were not classified as primary research. A manual reference check of the included studies did not identify any additional articles. Ultimately, nine studies were deemed suitable for final inclusion.

Barriers

Communication Challenges and Ineffective Leadership

Studies highlighted the challenges associated with communication during the COVID-19 pandemic, particularly the impact of leadership styles. Li et al. [21] reported that paramedics primarily relied on state or territory Department of Health websites for information, with organizational emails serving as their secondary source. However, the overwhelming volume of communication during the rapidly evolving pandemic environment led to information overload for paramedics [24], [27]. Boechler et al. [28] emphasized the necessity of concise, streamlined communication from trusted sources to mitigate this inundation. Strategic and relevant communication methods, such as regular updates, were gradually adopted by ambulance services, which paramedics found beneficial [28]. While modern communication styles demonstrated managerial efforts, the predominance of one-way communication hindered transparency and limited feedback opportunities for addressing staff concerns [27], [28]. Notably, Li et al. [21] observed that 74.5% of paramedics either "somewhat" or "strongly agreed" that their organizations provided clear, timely, and authoritative COVID-19 information through daily updates. Despite these efforts, leadership challenges persisted. Boechler et al. [28] and Petrie et al. [24] documented a disconnect between management and staff, exacerbated by managers transitioning to remote work during social distancing or quarantine mandates. Paramedics often perceived this physical distancing as fear-driven, which further diminished morale and resilience [28]. The difficulty of contacting managers and their heavy workloads intensified these perceptions of disconnection [28].

Fear of Infection

Fear of contracting SARS-CoV-2 emerged as a dominant theme, as paramedics felt at a heightened risk compared to the general population, particularly when colleagues became infected [13], [27], [29], [30]. Piotrowski et al. [13] highlighted that stress levels were significantly higher among paramedics with direct exposure to COVID-19 patients, as stress amplified the perceived threat to their health. The uncertainty surrounding the COVID-19 status of community cases added to the unpredictability of their duties [24], [27]. Paramedics were also concerned about transmitting the infection to family and friends, often leading to self-imposed isolation or distancing imposed by worried loved ones [21], [29]. Concerns about workspaces, such as cramped ambulance quarters and close contact with symptomatic patients, further heightened these fears [24], [27]. Additionally, patients delaying medical attention out of fear of hospital-acquired infections posed increased risks to paramedics, as these cases often required handling highly contagious individuals in severe conditions [27].

Frequent Guideline Changes and Inconsistencies Across Agencies

Paramedics faced significant challenges in adapting to rapidly changing guidelines and inconsistencies between ambulance services and healthcare facilities [24]. Organizational protocols often changed during shifts without sufficient notification or prioritization [21], [24], [28]. This dynamic created

perceptions of rushed and reactive changes, raising concerns about risks to patients and professional accountability [24], [27]. Frequent updates strained paramedics' ability to assimilate new information, compounding stress during an already challenging period [27]. Discrepancies in guidelines between ambulance services and receiving facilities often led to strained inter-agency relationships, further exacerbating stress and fatigue among paramedics [28].

Stress and Burnout

The COVID-19 pandemic exposed paramedics to numerous stressors, including fear of infection, inconsistent PPE availability, social isolation, public stigma, and prolonged uncertainty [29]. Alqahtani et al. [29] reported adverse psychological and physiological effects on paramedics, including anxiety and blood pressure fluctuations. Despite displaying resilience, Piotrowski et al. [13] noted that the protracted duration of the pandemic eroded paramedics' coping mechanisms. Stressors were holistic, encompassing professional and personal challenges, restrictions on coping strategies, and diminished social support [13]. Shahzad et al. [31] linked these stressors to defensive, avoidant, and occasionally aggressive behaviors. The evolving nature of work practices further intensified stress, as paramedics struggled with constant changes, heavier physical and emotional demands, limited mental health resources, and stringent infection prevention protocols [24], [27], [28], [31]. Additionally, the need for frequent decontamination of workspaces, often under tight time constraints, created further pressure on paramedics [19], [27]. Paramedics also dealt with emotionally taxing cases, from managing the fears of patients with mild symptoms to handling severely ill individuals who delayed seeking medical care. These extremes required paramedics to make critical decisions balancing patient safety with infection risks to themselves [27].

Insufficient Recognition and Resources for Paramedics in Taiwan

Chang and Hu [19] observed that Taiwanese paramedics faced significant resource limitations during the COVID-19 pandemic due to their exclusion from the healthcare professional category and their classification as emergency and rescue responders. This designation denied them access to critical resources, such as personal protective equipment (PPE) and priority vaccinations, which were available to healthcare providers. Consequently, paramedics experienced elevated stress levels during the pandemic. This systemic disconnect prompted many to question their professional identity and roles, leading to increased pressure, stress, and anxiety. The authors concluded that Taiwanese paramedics exhibited at least moderate burnout, exacerbated by heightened workloads and perceived professional pressures during the pandemic [19].

Challenges Related to Personal Protective Equipment (PPE)

During the pandemic, paramedics reported increased usage of PPE, raising concerns about its availability, quality, proper usage training, and adequacy of protection [27]. Li et al. [21] highlighted that only 11.8% of paramedics considered their PPE training "entirely adequate," while 37.3% deemed it "mostly adequate." Confidence in using PPE was similarly limited, with only 20.5% of paramedics feeling "entirely confident" and 49.1% being "mostly confident." The evolving PPE guidelines further complicated matters. Early conservative guidance escalated to stricter protective measures as more evidence emerged, causing frustration and uncertainty among paramedics due to inconsistencies across organizations [24], [27]. Concerns about PPE availability and fluctuating supplies also contributed to a sense of insecurity in their work environment [21], [24]. Moreover, PPE impacted the paramedic-patient dynamic. Rees et al. [27] found that applying masks immediately upon patient contact hindered rapport-building and exacerbated patient anxiety. One paramedic described the challenge of maintaining compassionate interactions while adhering to safety protocols, such as physical distancing, avoiding unnecessary contact, and prohibiting family members from accompanying patients due to local restrictions [27].

Facilitators for Paramedics During the Pandemic

Social Support and Solidarity:

Public appreciation and solidarity among paramedics significantly boosted morale during the pandemic. Community support fostered a sense of unity amid hardship, helping to mitigate feelings of isolation caused by quarantine protocols and fear of transmitting the virus [27], [28], [29]. Although some paramedics expressed discomfort with being labeled as heroes and struggled with employers' recognition efforts, the public's acknowledgment reinforced their sense of solidarity [27], [28]. Shahzad et al. [31] emphasized that such social support is crucial during public health crises to alleviate anxiety, depression, and emotional exhaustion, thereby reducing the likelihood of defensive or avoidant behaviors among paramedics.

Resilience and Job Security:

Despite elevated stress levels, Piotrowski et al. [13] observed that paramedics who attended to COVID-19 patients generally exhibited moderate stress levels, indicative of their resilience. The study attributed this resilience to the inherent demands of their profession, which require perseverance and adaptability in the face of emotional and external stressors. Furthermore, paramedics acknowledged the stability of their employment during the pandemic, with fewer than 20% reporting financial strain [27], [30].

Integration of Modern Technology in Organizational Communication:

While communication barriers posed challenges, ambulance services' adoption of modern technology has introduced notable benefits. These included improved access to telehealth services, enabling patients to receive care without hospital visits, and enhanced organizational communication. Modernized communication channels facilitated greater transparency and enabled staff to share relevant information and feedback more effectively [27], [28].

Future Perspective and Limitations:

The literature review highlighted both shared and distinct barriers and enablers experienced by paramedics and other healthcare workers, underscoring the unique challenges of prehospital care. Addressing these barriers requires targeted, field-specific interventions to bring meaningful improvements. Leadership and communication emerged as particularly influential in the prehospital setting. Paramedics reported that the constant influx of rapidly changing information heightened stress and strained relationships with other healthcare workers [21], [24], [27], [28]. Additionally, remote managerial support—implemented to ensure safety—left paramedics feeling isolated and under-supported. These findings emphasize the necessity for centralized, transparent communication systems that allow stakeholders across various healthcare domains to share updates effectively. Such systems would minimize discrepancies between hospital and ambulance guidelines, alleviating tensions and ensuring consistent patient care during public health crises [28]. Concerns about PPE availability and quality were prevalent across healthcare professions. However, paramedics reported receiving less training and having lower confidence in PPE use compared to nurses and physicians [21]. The restrictive nature of PPE also hindered paramedics' ability to communicate nonverbally and provide tactile reassurance to patients. Restrictions on family accompaniment further compounded the emotional strain, as paramedics often left distressed family members behind, contributing to a perceived lack of humanity in their work [27].

Despite demonstrating resilience, as noted by Piotrowski et al. [13], paramedics risked resource depletion over time, leading to burnout. To prepare for future public health emergencies, resilience training is recommended. Fear of infection was widespread among healthcare workers but particularly pronounced for paramedics due to their confined workspaces and unpredictable environments [24]. Investigating the specific stressors associated with prehospital care could provide valuable insights into managing such challenges. Stress and burnout affected healthcare professionals throughout the pandemic, driven by factors such as workload, isolation, stigma, fear of infection, and childcare responsibilities. Alqahtani et al. [29] highlighted increased psychological distress and reduced social well-being among paramedics, advocating for enhanced mental health support and measures to reduce barriers. Focusing on enablers such as solidarity, job security, and organizational adaptability could further improve morale. The review

revealed a scarcity of research focusing exclusively on paramedics, with many studies examining broader healthcare populations. While similarities in barriers and enablers exist across professions, the unique challenges of prehospital care merit deeper investigation to strengthen the resilience of paramedics in their critical frontline role. The review included all available studies regardless of quality, reflecting the limited literature on paramedics. Cultural variations were not considered, and only English-language studies were included, potentially excluding experiences from non-English-speaking countries [30-32].

Conclusion:

This updated review highlights the critical challenges and enabling factors that shaped paramedics' experiences during the COVID-19 pandemic. Paramedics, as frontline responders, encountered unique obstacles, including fear of infection, PPE shortages, inconsistent communication, and frequent guideline changes. These barriers compounded the psychological strain of managing high-risk cases in unpredictable environments. Psychological distress, driven by heightened risk perceptions and isolation from loved ones, was a recurring theme across the reviewed studies. Burnout, anxiety, and emotional exhaustion further impaired paramedics' ability to provide care effectively. Fear of infecting family members often led to self-imposed isolation, exacerbating feelings of loneliness and stress. Conversely, key enablers included resilient coping mechanisms, organizational and public support, and effective leadership. Transparent communication, regular updates, and visible management engagement fostered trust and reduced anxiety. Additionally, public recognition of paramedics' contributions bolstered morale and resilience. Regional variations in challenges and enablers underscore the importance of context-specific strategies. For instance, addressing childcare needs, as identified in some studies, or improving resource allocation, such as PPE distribution, is crucial. Tailored interventions are necessary to meet the unique demands of prehospital care and enhance paramedics' readiness for future crises. Future efforts should focus on developing comprehensive support systems for paramedics. These include mental health services, leadership training, and consistent, clear communication protocols. Further research is needed to explore long-term psychological impacts and the effectiveness of implemented strategies. By addressing the barriers identified and leveraging the enablers, healthcare systems can better support paramedics, ensuring their well-being and preparedness for public health emergencies. This review serves as a foundation for informed decision-making and policy development to enhance the resilience of paramedic services in future pandemics.

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الملخص:

الخلفية: أثر فيروس كوفيد-19 بشكل كبير على أنظمة الرعاية الصحية، مما وضع عبئاً هائلاً على العاملين في القطاع الصحي، وخاصة مسغفو الطوارئ. تستعرض هذه المراجعة المحدثة العوائق والعوامل الميسرة التي واجهها المسغفون أثناء استجابتهم لحالات كوفيد-19، مع التركيز على التحديات النفسية والاجتماعية والمهنية التي واجهوها.

الهدف: تقييم الأدبيات المتعلقة بتجارب المسغفين خلال جائحة كوفيد-19 بشكل نقدي، مع تحديد العقبات الرئيسية والعوامل المساعدة في الرعاية ما قبل المستشفى. الطرق: تم استخدام منهجية المراجعة التكاملية، وفقاً لإطار عمل ويتمور وكنفل. تم إجراء بحث منهجي في الدراسات المراجعة من قبل الأقران أسفر عن 361 مقالاً، وتم تضمين تسع دراسات بعد فحصها من حيث الصلة، اللغة، والصرامة المنهجية. تم تحليل البيانات بهدف تحديد المواضيع المتكررة والنتائج الفريدة المتعلقة بتجارب المسغفين.

النتائج: واجه المسغفون العديد من العوائق، بما في ذلك تحديات في التواصل، القيادة غير الفعالة، الخوف من العدوى، نقص معدات الحماية الشخصية، والإرشادات غير المتسقة. كانت الضغوط النفسية، والإرهاق، والقلق بشأن نقل الفيروس إلى الأحياء شائعة. شملت العوامل الميسرة المرونة، الدعم العام والتنظيمي، واستراتيجيات القيادة الفعالة التي تركز على الشفافية، والتواصل، وتقدير الموظفين. وأظهرت الدراسات اختلافات إقليمية في التحديات والاستجابات، مما يبرز الحاجة إلى تدخلات مخصصة.

الخاتمة: تكشف المراجعة عن العوائق النفسية والاجتماعية والتشغيلية الكبيرة التي واجهها المسغفون خلال جائحة كوفيد-19. التواصل الفعال، والإرشادات المتسقة، ودعم الصحة النفسية هي عوامل ميسرة حاسمة. من الضروري معالجة هذه العوامل لتعزيز استعداد المسغفين ورفاههم أثناء الطوارئ الصحية العامة المستقبلية.

الكلمات المفتاحية: مسغفو الطوارئ، كوفيد-19، العوائق، العوامل الميسرة، الضغوط النفسية، الرعاية ما قبل المستشفى، استجابة الجائحة.