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Paramedic Well-Being: Investigating Occupational Factors Influencing Psychological Health and Injury Risks

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ABSTRACT

Paramedics face significant challenges in their demanding work environment that can negatively impact their psychological and physical well-being. This review synthesizes current knowledge on the occupational factors influencing paramedic health, focusing on shift work, mental health issues, exposure to critical incidents, and the profession's impact on physical health. Shift work is a major contributor to fatigue and sleep disturbances among paramedics, which can lead to reduced perceived well-being, mental health issues, and decreased job satisfaction. Paramedics also experience high rates of mental health challenges, including depression, anxiety, post-traumatic stress disorder (PTSD), and burnout, with exposure to critical incidents being a significant risk factor. The physically demanding

nature of the job, coupled with irregular work schedules, contributes to increased risks of musculoskeletal injuries, cardiovascular issues, and other chronic health problems. Furthermore, the unpredictable and mobile nature of paramedic work often hinders access to healthy nutrition and regular physical activity. Addressing these challenges requires a comprehensive approach that includes systemic support from ambulance services, targeted interventions to mitigate the effects of occupational stressors, and ongoing research to better understand the unique factors influencing paramedic health. By prioritizing the well-being of paramedics, emergency medical services can foster a healthier workforce capable of delivering high-quality patient care.

Keywords: paramedics, well-being, Psychological Health

Introduction

Paramedics are registered healthcare professionals in many countries. The field of paramedicine, the modern term for professional paramedic practice, has developed a strong clinical research foundation, showing that evidence-based practice can enhance patient outcomes. While ambulance services prioritize patient care, they also need healthy personnel to deliver the highest standard of care. However, concerns about paramedic health outcomes persist. It is essential that research aims to improve paramedic health and wellbeing, which would enable ambulance services to meet their duty of care by ensuring a safe and healthy workplace, ultimately supporting high-quality patient care.

Ambulance services operate continuously, 24 hours a day, 7 days a week, with shift work recognized as a health risk factor irregular hours negatively affects the health and wellbeing of healthcare workers and may lead to compromised patient care (Bonnell et al., 2017). High utilization rates in ambulance services mean that paramedics work in unpredictable environments, performing complex clinical tasks and handling critically ill patients. These conditions contribute to health challenges within the profession, including mental health issues, sleep disturbances, poor nutrition, limited physical activity, and high rates of musculoskeletal injuries (Anstey et al., 2016; Gan et al., 2015).

Awareness is growing around the psychological impact of prolonged exposure to emergency service work. This concern was underscored in an Australian study led by the mental health advocacy group ‘Beyond Blue’. Their report, Answering the Call, surveyed 21,014 Australian emergency services personnel, revealing concerning statistics: 39% of these employees had been diagnosed with a mental health condition, compared to 20% of the general Australian adult population services workers reported suicidal thoughts at twice the rate of the general population and were more than three times as likely to have a suicide plan. A lot of employees had experienced traumatic events that significantly impacted them during work, and among former, one in four exhibited probable post-traumatic stress disorder (PTSD), while one in five experienced severe psychological distress (Blue, 2018).

Although ambulance ser introduced initiatives to address paramedic mental health, a comprehensive approach that considers all health and wellbeing factors is essential. Currently, there is limited research on systemic health, and improving mental health outcomes requires acknowledging the diverse factors that influence wellbeing.

For optimal health and functioning, adults are generally recommended to get 7–9 hours of sleep per night (Consensus Conference Panel et al., 2015). However, achieving sufficient and sleep can be challenging for paramedics due to overnight and early morning shifts. These schedules disrupt the circadian rhythm by requiring alertness during the circadian low point and sleep during peak alertness hours, leading to misalignment of the sleep–wake cycle, decreased sleep duration and quality, and increased sleepiness (Courtney et al., 2013). Paramedics report high rates of sleep disturbances, including reduced sleep, sleep disorders, and excessive sleepiness. Shift work schedules also vary significant in and between ambulance services. Further research is required to identify the aspects of shift work, as well as other stressors and individual differences, that make paramedics either vulnerable or resilient to sleep issues. Additionally, understanding how sleep patterns impact paramedics' physical and mental health remains limited. Therefore, longitudinal studies assessing sleep and health outcomes over the course of paramedics' careers are essential to determine the relationship between sleep patterns and chronic health outcomes in this workforce.

Paramedic crews are constantly on the move and face unpredictable workloads, making meal planning a challenge. In one study, paramedics reported several obstacles to accessing nutritious food (Anstey et al., 2016). These barriers include the mobile nature of their work, reliance on readily available food options such as takeout, leaving pre-prepared meals at the ambulance station only to remain out on calls throughout their shift, limited meal breaks, and the influence of colleagues on food choices. While occasional consumption of low-quality nutrition might seem negligible, chronic reliance on such foods can have long-term effects, especially as shift-related fatigue accumulates, reducing motivation to seek healthier options. Despite these challenges, the importance of diet and nutrition for paramedic wellbeing should not be overlooked.

In their commitment to delivering prompt care, paramedics frequently place their bodies in high-risk positions, often choosing to lift, pull, or push heavy loads at any hour. Consequently, paramedics face one of the highest risks for musculoskeletal injuries among healthcare workers. Roberts et al. found that paramedics have a 3.5 to 13 times higher risk of lower back injuries compared to nurses. Additionally, insurance claims for these injuries have been rising among paramedics, even as they decrease in other healthcare professions (Roberts et al., 2015).

Regular physical activity is well-documented for its role in disease prevention and its positive impact on overall health, including mental health. While physical activity benefits are evident across the general population, shift work's influence on the ability to engage in consistent physical activity requires further examination, especially given its potential to enhance paramedics' health (Chekroud et al., 2018).

Ambulance services bear the responsibility of ensuring that paramedics are physically prepared for their roles and should implement objective physical employment standards (PES).

Health and well-being are vital for successful performance in the workplace and in everyday life. The professional pressures that paramedics confront daily have been demonstrated to have a negative impact on their health and well-being (Wheeler & Dippenaar, 2020). Paramedics are frequently obliged to work long hours in difficult conditions, which has an influence on their health and well-being and may affect patient care (Meadley et al., 2020). Exploring these effects is critical to ensuring paramedics are supported in carrying out their tasks and providing high patient care standards without jeopardizing their health and well-being (Meadley et al., 2020; Wheeler & Dippenaar, 2020).

Lawn et al. (2020) highlight concerns that paramedics often represent an overlooked profession within healthcare, overshadowed by more prominent areas such as emergency departments and acute care (Lawn et al., 2020). Petrie, Smallwood, Pascoe, and Willis (2022) conducted a study examining the work environments and mental health of Australian paramedics, revealing that the COVID-19 pandemic significantly impacted their wellbeing. During this period, only 66.3% of paramedics in the study felt their workplace actively supported their wellbeing, while 33.6% expressed ambivalence or disagreement about receiving such support. Additionally, isolation from friends and family during the pandemic further affected their mental health and wellbeing (Petrie et al., 2022).

Lawn et al. (2020) also emphasize that paramedics experience high rates of both physical and psychological health issues, which severely impact their overall wellbeing. However, the literature offers only limited insight into the specific factors within the profession that contribute to these issues.

Heath, Wankhade, and Murphy identify areas of concern, noting that 29% of ambulance staff report experiencing bullying, harassment, or abuse within the workplace (Heath et al., 2021). This study further underscores the unnecessary stress placed on paramedics due to societal portrayals that frame them as heroic and masculine figures, which can increase the pressure to maintain this image, potentially at the cost of their wellbeing (Heath et al., 2021).

Much of the responsibility for supporting paramedic wellbeing rests with the organization, and research indicates that when organizations actively engage in this support, positive wellbeing outcomes can result (Wheeler & Dippenaar, 2020). Various strategies are suggested in the literature for promoting paramedic health and wellbeing. For example, Lawn et al. (2020) recommends targeted interventions to help mitigate the psychological effects of responding to highly stressful incidents, alongside programs designed to address broader organizational issues and structures.

While identifying statistics on paramedic wellbeing and the strategies in place to address health and wellbeing challenges is valuable, there remains insufficient

evidence that these strategies, when generalized, will effectively support the broader paramedic population across various services (Lawn et al., 2020). To genuinely address paramedic wellbeing, it is crucial to understand how working in this profession specifically affects health and wellbeing, given the unknowns surrounding individual variations. et al. (2020) argue that prioritizing this understanding will optimize paramedic health and wellbeing, enabling ambulance services to fulfil their duty of care in providing a safe and healthy work environment (Meadley et al., 2020). This review aims to synthesize current knowledge on occupational factors influencing paramedic wellbeing and offer recommendations for improving workplace conditions to support employee health and wellbeing.

Occupational factors influencing paramedic health and wellbeing

Shift work

Due to the demands of paramedic work, shift work and rotating schedules are unavoidable. Numerous studies reviewed in this analysis report that shift work contributes to fatigue and sleep disturbances (Aasa et al., 2005; Betson et al., 2022; Blau, 2011; Courtney et al., 2013). A field study conducted by Khan, Jackson, Kennedy, and Conduit (2021) explored how rotating shifts affect sleep, mental health, and physical activity among Australian paramedics (Khan et al., 2021). Findings revealed that night shifts were linked to increased fatigue, sleepiness, and stress, while rotational shifts led to sleep restriction in participants (Khan et al., 2021). An earlier study by Aasa et al. (2005) identified fatigue and sleep disturbances as primary indicators of how paramedics perceive their health, with rural paramedics facing elevated risks of fatigue associated with poor sleep quality (Courtney et al., 2013). Poor sleep patterns significantly impacted general health perceptions and retention intentions among American paramedics, according to self-reported data (Blau, 2011). More recently, an Australian study found a 35.4% increase in poor sleep quality within the first five months of a paramedic's career (Betson et al., 2022). The literature strongly underscores how shift work-induced fatigue and sleep disturbances affect paramedic health, including the broader impact of shift work on mental health and overall wellbeing.

Mental health issue

Numerous studies have explored the mental health of paramedics (Bennett, 2004; Iranmanesh et al., 2013; Jonsson, 2003; Roberts et al., 2015). Jonsson et al. reported that one-third of 362 survey respondents exhibited high levels of psychopathology, burnout, and post-traumatic symptoms (Jonsson et al., 2003). More recently, Roberts et al. found that paramedics experience the highest rates of mental injury among healthcare professionals, with a risk approximately 13 times greater than that of nurses (Roberts et al., 2015). Similarly, a study by Iranmanesh et al. (2013) indicated that 94% of Iranian paramedics and emergency hospital staff (n=400) reported moderate levels of post-traumatic stress disorder (PTSD), a figure considerably higher than Bennett et al.'s earlier study in the UK, where 22% of 617 paramedics reported PTSD, and one in ten reported “probable” clinical depression (Bennett et al., 2004). Differences in working conditions between these studies may account for some of these variations. Comparing paramedics to the general Australian and Western populations, Khan, Conduit, Kennedy, and Jackson (2020) reported

significantly higher levels of fatigue, anxiety, depression, and PTSD among paramedics (all $p < .05$) (Khan et al., 2020).

Other studies have investigated the connection between paramedic mental health and organizational behaviour (Petrie et al., 2018). Petrie et al. found that managerial psychosocial safety climates significantly affected mental health outcomes among employees, yet only 7.6% of 1,622 Australian participants were reported to have a mental health disorder a lower prevalence than in other studies (Petrie et al., 2018). This study emphasized the protective role of supportive managerial behavior in maintaining employee mental health.

Research has also shown PTSD rates of 14.6% among paramedics (n=668), compared to 1.3–3.5% in the general Swiss population, though contributing factors were unclear (Streb et al., 2014, 2014). Depression, anxiety, obesity, cardiovascular disease, and sleep disorders are also noted as significantly prevalent among paramedics (Courtney et al., 2013). An Australian study comparing resilience levels between working paramedics (n=146) and paramedic students (n=73) found higher resilience among working paramedics, though resilience tended to decrease after five years on the job (Gayton & Lovell, 2012). Another study in Norway highlighted that paramedic had a higher prevalence of PTSD than the general population, with 77% (n=370) reporting personal growth through their work experiences (Reid et al., 2022). Paramedics exposed to a severe airplane crash experienced higher rates of acute stress disorder, PTSD, and depression at 13 months post-exposure, with 25.6% (n=53) showing acute stress disorder compared to 2.4% (n=10) of a comparison group, and 16.7% (n=19) showing PTSD compared to 1.9% (n=4) (Fullerton et al., 2004).

While a comprehensive understanding of paramedics' perceptions of their health is lacking, research consistently indicates that paramedics recognize the connection between their career and their health and wellbeing, particularly regarding mental health (Sofianopoulos et al., 2011).

Exposure to critical incidents

Avraham, Goldblatt, and Yafe (2014) highlighted the severe negative impact of exposure to critical incidents on paramedic mental health through interview data (Avraham et al., 2014). Aasa et al. (2005) found that 25% of female paramedics (n=60) and 20% of male paramedics (n=240) reported experiencing two or more notable health issues tied to the psychological demands of critical incidents (Aasa et al., 2005). In a study of paramedic trainees, Fjeldheim et al. (2014) reported that 94% (n=131) had encountered direct trauma, with many meeting criteria for post-traumatic stress disorder, alongside high levels of depression, alcohol misuse, and chronic perceived stress (Fjeldheim et al., 2014). Hansen, Rasmussen, Kyed, Nielsen, and Andersen (2012) found that paramedics face significant emotional demands, with exposure to critical incidents acting as a primary barrier to improving their psychosocial work environment (Hansen et al., 2012). More recently, Pyper and Paterson (2016) reinforced these findings, identifying critical care of severely ill patients as a central

stressor linked to emotional trauma among paramedics (n=134) (Pyper & Paterson, 2016).

A New Zealand comparison study of ambulance, fire, and police personnel revealed that trauma reactions from critical incidents were similarly high across these services (Brough, 2004). However, Gist and Taylor (2008) later observed that paramedics experience considerably more stress than other emergency service workers (Gist & Taylor, 2008). Maunder, Halpern, Schwartz, and Gurevich (2012) investigated paramedics' responses to critical incidents, finding that those with histories of childhood abuse or neglect were more likely to experience acute stress symptoms immediately following and in the weeks after such incidents. This subgroup also showed significantly higher burnout rates and a greater likelihood of clinically significant symptoms (Maunder et al., 2012). Backé et al. (2009) examined paramedics' salivary cortisol levels during shifts and noted that while paramedics seem to develop a tolerance for critical situations, their cortisol levels were significantly elevated ($p<0.5$) at shift start compared to patient transport officers, suggesting an anticipatory response to anticipated stress (Backé et al., 2009). An earlier study by Aasa, Kalezic, Lyskov, Ångquist, and Barnekow-Bergkvist (2006) found similar results, with the highest cortisol stress markers appearing at the beginning of shifts (Aasa et al., 2006).

Profession influence on physical activity and ailment

Aasa et al. (2005) noted that paramedics commonly experience headaches and stomach issues, which are significantly linked to their working conditions. Similarly, Courtney et al. (2013) reported low physical activity levels among paramedics, attributing these to a lifestyle that restricts opportunities for regular exercise and engagement in team-oriented sports activities. Sofianopoulos et al. (2011) also found reduced physical activity among paramedics, which contributed to physical fatigue within this population. A study conducted in Hungary suggested that engaging in physical activity during personal time served as a protective factor, enhancing paramedics' perceptions of their physical health (Pek et al., 2015). Research from Sweden identified that ambulance personnel are at an increased risk for musculoskeletal disorders and atrial fibrillation compared to other occupational groups (Karlsson et al., 2022). Tremblay, Albert, Fischer, Beairsto, and Johnson (2020), in a smaller study of 25 experienced paramedics from New Brunswick, found that only 40% of the participants were considered healthy (Tremblay et al., 2020). In a U.S.-based study, Cash, Crowe, Bower, Foraker, and Panchal (2019) observed that paramedics with optimal cardiovascular health were typically younger, female, and more educated, while a substantial proportion of paramedics were classified as obese a significant cardiovascular risk factor (Cash et al., 2019).

Current research underscores the negative impact of the paramedic profession on health and well-being, with occupational demands affecting physical activity and increasing susceptibility to health issues. However, an Australian longitudinal cohort study identified disparities in health markers among paramedic subgroups; intensive care flight paramedics maintained metabolic health markers within normal ranges, likely due to higher physical activity levels compared to the general paramedic population (Meadley et al., 2022). Further, a recent Australian study monitored

graduate paramedics over the first year of their career, documenting that baseline BMI, physical activity levels, and dietary habits were suboptimal for entry into the field, suggesting the presence of pre-existing health risk factors that the profession could exacerbate (Meadley et al., 2022). This finding aligns with Tsismenakis et al. (2009), who reported that, among 370 emergency responder candidates in the U.S., 77% had a BMI over 25 kg/m², with 33% classified as obese. These results indicate a high prevalence of excess weight, contributing to an elevated cardiovascular risk in a workforce expected to perform physically demanding tasks (Tsismenakis et al., 2009).

Discussion

Shift work has been shown to negatively impact sleep quality, leading to increased fatigue and affecting perceived well-being, mental health, and job satisfaction ((Dawson et al., 2021; Donnelly et al., 2019; Sofianopoulos et al., 2011; Yung et al., 2021). The adverse effects of shift work on sleep and fatigue are well-documented across various professions, with pronounced impacts in high-stress, cognitively demanding fields like healthcare and emergency services (Courtney et al., 2013; Okechukwu et al., 2023; Sofianopoulos et al., 2011). These roles are often unpredictable, which can lead to peak demand periods and reduce opportunities for breaks, resulting in end-of-shift overtime that exacerbates the challenges of shift work (Courtney et al., 2013; Kirby et al., 2016).

Shift Work Disorder (SWD), characterized by symptoms of insomnia and excessive sleepiness, is associated with higher levels of depression, anxiety, and diminished quality of life. SWD may also impair job performance, increase the risk of workplace accidents, and elevate the likelihood of workplace violence (Eldevik et al., 2013). Research suggests that fatigue adversely affects physical health, contributing to higher rates of chronic illness, cardiovascular disease, obesity, chronic sleep deprivation, and overall poor health (Barth et al., 2022; Nguyen et al., 2023). Studies consistently report high levels of fatigue among shift workers, with one study finding that almost 90% of shift workers experienced fatigue and drowsiness while on duty (Dawson et al., 2021, 2021; Kirby et al., 2016; Sofianopoulos et al., 2011).

Circadian misalignment and sleep deprivation due to shift work raise safety risks for both clinicians, who face an increased risk of driving accidents, and patients, who may be subject to higher medication error rates, with night shifts being particularly high-risk (Donnelly et al., 2019; Ganesan et al., 2019; Pyper & Paterson, 2016; Sofianopoulos et al., 2011). The physiological effects of circadian disruption, especially from night shifts, further heighten the risk of illness and chronic disease among shift workers (Barger et al., 2018). Given these risks, it is crucial to prioritize research on the impact of varied shift patterns to mitigate fatigue and to emphasize the implementation of fatigue management programs for emergency service personnel (Barger et al., 2018, 2018; Cheng et al., 2014).

The mental health and well-being of paramedics and other first responders are affected by occupational stressors, with evidence consistently showing high rates of mental health challenges within this profession. Paramedics and emergency workers

have elevated rates of depression, anxiety, PTSD, and related psychological conditions, along with increased risks of burnout and mortality (Blau, 2011; Clompus & Albarran, 2016; McIntosh et al., 2016; Sterud, Ekeberg, & Hem, 2006). This high morbidity highlights the need for research to explore specific factors that paramedics believe impact their health and well-being (Hegg-Deloye et al., 2014). Roberts et al. (2021) found that the COVID-19 pandemic has further exacerbated rates of depression, anxiety, and burnout among Australian paramedics and first responders. In the UK, 87-93% of first responders report experiencing mental health challenges at some point in their careers (Mind, 2014), and studies indicate high levels of suicidal thoughts, with up to one-third of paramedics having considered suicide (Newland, Barber, Rose, & Young, 2015).

One significant contributor to these mental health issues is exposure to critical incidents and the cumulative effects over time. Studies report that exposure to critical incidents is common in the paramedic profession, with one study noting that 64% of paramedics had encountered two or more critical incidents over a five-year period, and another showing that 72-97% of paramedics had experienced at least one critical incident (E. Donnelly & Siebert, 2009; Oginska-Bulik & Kobylarczyk, 2015; Skeffington, Rees, & Mazzucchelli, 2017; Whiting, Costello, & Williams, 2019). Such exposure is linked to a heightened risk of mental health conditions, particularly PTSD and burnout, with cumulative exposure increasing these risks (Alexander & Klein, 2001; Boland et al., 2018). A study conducted in New Zealand found that trauma responses to critical incidents were similar among police, firefighters, paramedics, and emergency department staff (Brough, 2004).

There is limited research examining the mental health effects of critical incident exposure on student paramedics (Lowery & Stokes, 2005) and little data regarding early-career paramedics' mental health. However, recent studies, including the International Paramedic Anxiety and Wellbeing Study (IPAWS), are beginning to address this gap by longitudinally tracking the mental health of paramedic graduates in their first five years of practice (Asbury et al., 2018). Although exposure to critical incidents is an unavoidable aspect of paramedic work, there is potential for developing interventions aimed at reducing the mental health impacts of these exposures and preparing paramedics to better cope with associated stressors.

Paramedics often exhibit poorer physical health, with heightened risks for shift work disorder (Barth et al., 2022; Nguyen et al., 2023; Pallesen et al., 2010), chronic diseases, cardiovascular issues, hypertension (MacQuarrie et al., 2018; Torquati et al., 2018), as well as obesity and cancer (Gan et al., 2018; Pahwa, Labrèche, & Demers, 2018). Due to the demands of shift work, they are also more susceptible to conditions such as metabolic syndrome, immune system disorders, and depression (Wolkow, Ferguson, Aisbett, & Main, 2015). Prolonged exposure to occupational stress and the frequent challenges of long shifts can lead to symptoms including fatigue, headaches, and gastrointestinal issues (E. Donnelly & Siebert, 2009; Halpern, Gurevich, Schwartz, & Brazeau, 2009; Klimley, Van Hasselt, & Stripling, 2018; Knutsson & Bøggild, 2010; Rice, Glass, Ogle, & Parsian, 2014; Sterud et al., 2006).

The physically demanding nature of the paramedic role, especially in unpredictable and potentially hazardous settings, contributes to a high rate of

musculoskeletal injuries and back problems (Karlsson et al., 2022). These risks are amplified by factors like obesity, low physical fitness, and the fatigue associated with shift work (Gallagher & McGilloway, 2008; Hegg-Deloye et al., 2014; MacQuarrie et al., 2018; Rice et al., 2014; Tsismenakis et al., 2009). Additionally, paramedics face increased risk of workplace incidents, such as needlestick injuries (Flannery, 2015; Larsson, Berglund, & Ohlsson, 2016; Rice et al., 2014).

Although paramedics recognize the importance of physical fitness, they often find it challenging to maintain an active lifestyle due to the demands of shift work and resulting fatigue. The physical and cognitive demands of their role can interfere with rest between shifts, making it difficult to sustain a healthy work-life balance (Hegg-Deloye et al., 2014; Larsson et al., 2016; Regehr & Millar, 2007). Studies show that paramedics tend to have suboptimal health and fitness levels, with exceptions primarily in specialized roles such as flight medics (Meadley, Perraton, et al., 2022). Organizational support is essential for helping paramedics maintain fitness, eliminate health barriers, and promote the importance of work-life balance (MacQuarrie et al., 2018; Rice et al., 2014).

Conclusion

Enhancing paramedic well-being is crucial for ensuring both the health of these professionals and the quality of care they provide to patients. The demanding nature of their work, characterized by shift patterns, exposure to traumatic events, and inadequate access to nutrition and physical activity, significantly impacts their psychological and physical health. Addressing these challenges requires a comprehensive approach that includes systemic support from ambulance services, targeted interventions to mitigate the effects of stressors, and ongoing research to better understand the unique factors influencing paramedic health. By prioritizing the well-being of paramedics, we can foster a healthier workforce capable of delivering high-quality emergency care.

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