

THE IMPACT OF WORKING CONDITIONS ON STRESS AND ITS EFFECTS IN THE GROUP OF PARAMEDICS: A SYSTEMATIC REVIEW

Katarzyna Wojtysiak^{1*}, Adriana Wielgus², Halina Zielińska-Więczkowska³

^{1*,2,3}Department of Social and Medical Sciences, Faculty of Health Sciences Collegium Medicum in Bydgoszcz of the Nicolaus Copernicus University in Toruń, Poland, ul. Świętojańska 20, 85-077 Bydgoszcz, Poland.

Email: *katarzyna.sas@hotmail.pl

Article History: Received on 30th July 2021, Revised on 15th August 2021, Published on 18th August 2021

Abstract

Purpose: This is a review to assess the working conditions that affect the stress level of paramedics and their ability to cope with stress. The profession of a paramedic is characterized by constant contact with other people and exposure to many factors, including biological (HIV, flu virus), chemical (causing allergic reactions, burns) physical (noise, low or excessive temperature), psychosocial (aggression, violence, traumatic experiences).

Methodology: This is a Systematic review paper. The PubMed, Cochrane Library, and Google scholar search were used to analyze the problem. The following keywords were used to search for information sources: paramedic, working conditions, medical rescue, ambulance, stress, coping with stress. Articles were selected according to the impact of working conditions on stress and its consequences among the group of paramedics.

Main Findings: The work of a rescuer is a constant action under the influence of a high level of stress and emotions, caused by an unforeseen sequence of events and time pressure. The long-term presence of negative factors is the cause of the appearance of burnout syndrome, rumination, PTSD, and somatic symptoms related to stress in the workplace. It can result in a deterioration of the quality of patient care.

Implications of this study: The above results should be taken into account by units of the emergency medical care system. The paper indicates the occurrence of negative psychological effects of work-related stress and as a consequence the need to train the personnel in the field of stress-coping techniques and to provide emergency medical service workers with mental health monitoring and psychological care in the workplace.

Novelty in this study: There is a lack of systematic reviews of the impact of working conditions on the mental health of workers in emergency medical care services. The paper is an attempt to assess the impact of working conditions on stress and its effects on the group of paramedics and other emergencies medical care system employees.

Keywords: Paramedic, Stress, Work Conditions, PTSD, Traumatic Situations.

INTRODUCTION

Work in a medical rescue system is associated with the constant exposure to numerous health overloads, as well as due to its specificity, with high levels of stress. In addition, paramedics are much more exposed to traumatic situations than other professional groups. Such events are characterized by experiencing a situation related to a patients' death or a life-threatening condition (rescuer or patient). This is accompanied by a sense of helplessness, fear or threat, in which, due to the escalation of emotions, dealing with traumatic situations is limited. ([Lawn, 2020](#))

The scale of the problem in Poland is very high, according to the report of the Central Statistical Office on health care from 2016, at that time 1492 teams provided medical services, including 932 Basic teams, which include 2 rescuers and 560 Specialised Teams with a doctor. From these data, 9.3 thousand employees were working in the emergency medical system ([Zdrowie I Ochrona Zdrowia w 2016 \[Health and Healthcare in 2016\], 2017](#)). Following the Law on State Emergency Medical Services dated 8 September 2006, a medical rescuer is entitled to provide emergency medical services in units of the emergency medical care system, including Emergency departments and emergency medical services, including air ambulance ([The State Medical Rescue Act 2006](#)). According to Duschek research, this group may be characterized by a pattern of emotional stability, conscientiousness, extraversion, pro-social attitudes, and a tendency to have exciting experiences ([Duschek et al., 2020](#)) but due to the difficult work conditions, it is one of the professional groups the most affected by stress.

PURPOSE OF THE RESEARCH

This is a review to assess the working conditions that affect the stress level of paramedics and their ability to cope with stress.

METHODOLOGY

The PubMed, Cochrane Library, and Google scholar search were used to find literature to analyze the problem. The following keywords were used to search for information sources: paramedic, working conditions, medical rescue, ambulance, stress, coping with stress. Articles were selected according to the impact of working conditions on stress and its consequences among the group of paramedics. The analysis has been done by the systematic review analysis method.

The articles were selected in terms of the impact of working conditions on stress and its effects on the group of paramedics and the emergency medical care system personnel. 26 articles were being reviewed.

REVIEW ANALYSIS / DISCUSSION

Stressors of paramedic work

Rescuers working in the system are exposed to numerous overloads. The most common stressors in this professional group can be listed in Table 1. This work is associated with high responsibility, the pressure associated with saving human life, exposure to countless stressful and traumatic situations ([Jakubowska et al., 2017](#)). The reconciliation of work and family life is extremely difficult, due to the shift system at work and the huge number of hours especially when rescuers are employed on sole proprietorship. According to Bińczycka-Anholcer, among the respondents, as many as 33% of paramedics work more than 12 hours a day. A high hourly load may result in a reduction of the body's efficiency and is the cause of one or more of the physical and psychological symptoms listed below ([Binczycka-Anholcer & Lepieszka, 2011](#)). What is more, paramedics are at an increased risk of sleep disorders, mental health issues, accidents, injuries, and fatigue due to the nature of their job ([Khan et al., 2018](#)).

Table 1: Stressors occurring in the work of paramedics ([Ostrowska & Michcik, 2014](#))

Quantitative workload	A large number of tasks to do, time pressure, over time, high work speed, haste
Qualitative work overload	Big responsibility, the need to make difficult decisions and solve moral dilemmas,
Small control over the work being done	-
Rigid working hours	Constant performance of tasks under time pressure, co-workers, and management
Ambiguities related to the work being done	Lack of precise determination of duties and responsibilities, fears, and threats related to dismiss
No support from management and colleagues	Interpersonal conflicts
Bad work conditions	Poor lighting, noise, atmospheric factors
There are no conditions for professional development	-
Discrimination in the workplace, mobbing	-
Rapidly implemented changes	Technology
Professional contact	Dispatcher - rescue team and rescue team - SOR

In Poland, health care workers are not appreciated. Low employer expenditures on career development, equipment and personnel shortages, interpersonal conflicts, lack of understanding on the part of chiefs, too low competencies concerning the learned profession, low salaries and lack of support in medical environments may lead to the rapid development of burnout syndrome ([Jakubowska et al., 2017](#)) ([Leszczynski, 2014](#)). The result of this is the inhibition of professional development, the feeling of overwork, and dissatisfaction with the activity that was once pleasant, which has the consequence of reducing the quality of services ([Leszczynski, 2014](#)).

Working conditions of paramedics in Poland

In recent years, as part of the emergency medical reforms, and with them the organizational changes in ambulances in Europe, paramedic education has gone through an academic process and a transition from post-secondary vocational schools to a university undergraduate program ([Givati et al., 2018](#)). Interactions between educational level, completed duties, management, and organization of the work process in the emergency medical system, and the needs and competencies of system employees have a significant impact on the assessment of job satisfaction. Satisfactory levels of satisfaction are affected by good working conditions and fair remuneration.

Israeli study shows that lack of career options, extensive physical demands, unrewarding salaries, unusually long work hours, and shift work negatively affects family and personal life and leads to resigning from work ([Dopelt et al., 2019](#)). A low level of satisfaction may also result in occupational burnout, change of profession, or emigration to achieve self-fulfillment, respect, and recognition and to increase the socio-economic status. In addition, work in an emergency medical care system is associated with numerous threats.

They include burnout syndrome (high level of stress), sensory organs overload (noise, insufficient lighting), physical load (necessity of lifting patients and equipment, repetitive movements, uncomfortable forced position), social pathologies (aggression of patients and witnesses of an aggression event), threats related to infections with biological material (contact with COVID-19, HIV, influenza virus, HBV, HCV, herpes virus, measles), accidents and fortuitous events ([Wnukowski et al., 2015](#)).

New stressors among paramedics during COVID-19 pandemic

At the turn of 2019 and 2020, working conditions were also worsened by the COVID-19 pandemic. As Ilczak indicates the COVID-19 pandemic, stress among emergency medical personnel has increased considerably due to sudden new factors like the fear of contracting COVID-19, a decrease in the level of safety while conducting emergency medical procedures, and the marginalization of treatment for patients not suffering from COVID-19 ([Ilczak et al., 2021](#)). During the past 1,5 years dealing with COVID-19 has put increased stress on paramedics ([Hayes et al., 2020](#)). Vanchaecht shows that medical personnel presents symptoms of stress, hypervigilance, fatigue, difficulty sleeping, inability to relax, fear, irregular lifestyle, flashback, difficulty concentrating, feeling depressed, doubting knowledge and skills, and feeling uncomfortable within the team ([Vanhaecht et al., 2021](#)). Pandemic worsened working conditions in the emergency medical care system.

Stress in paramedic work

Forster reported that paramedics have high levels of occupational stress which is a separable part of work in emergencies. ([Forster, 2020](#)). Stress is a permanent element of emergency medicine, depending on the intensity and duration it can work in two different ways. The short-term, strong stress situation is stimulated by the sympathetic system, responsible for the fight-or-flight reaction, mobilizing to action during the action (eustress), causing, among others, acceleration of pulse and breathing.

However, long-term exposure to stress affects people with debilitating performance (distress) ([Ostrowska & Michcik, 2014](#)). A high level of cortisol affects the emotional state of employees of the emergency medical system, which affects their psychophysical balance ([Binczycka-Anholcer & Lepieszka, 2011](#)). To find a mental balance, there is a need to find the optimum level of stress at which the body functions effectively while maintaining good health. Exceeding the optimum results in an excessive load on the body and leads to mental and physical exhaustion.

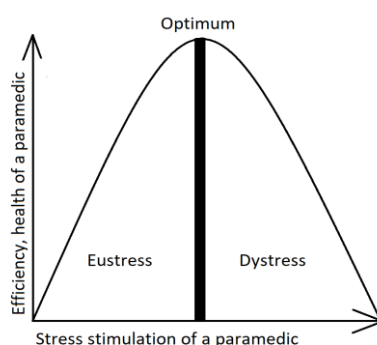


Figure 1: Stress stimulation, & the effectiveness of actions & health status of paramedics ([Ogińska-Bulik, 2014](#))

Excessive stress at work results in the appearance of somatic symptoms, which mainly concern: irritability (37%), sleep disorders (22%), headaches (26%), and uncontrollable outbursts of anger and other negative emotions (19%). Over 70% of rescuers surveyed by the employees of the Lodz Institute reported that stress during the emergency medical care operations impacts them during the action. However, it should be noted that 46% feel the impact of traumatic experiences not only on their professional lives but also on their personal lives. The level of perceived stress is assessed subjectively by the rescuer and depends on the physical and psychological mechanisms of coping with stress at a given moment ([Ogińska-Bulik, 2014](#)).

Consequences of stress among paramedic group

Jasielska study showed that more than 50% of paramedics showed symptoms of post-traumatic stress disorder, which can be a prognostic factor for the development of PTSD among that group ([Jasielska & Ziarko, 2019](#)). She indicated that personal resources such as coping strategies were not sufficient coping mechanisms for dealing with traumatic stress. ([Jasielska & Ziarko, 2019](#)). In Khan research anxiety was reported by 60% of respondents, 32% of respondents reported depression, around 50% of the respondents were exposed to shift work sleep, 33% reported insomnia, 78% reported severe fatigue, and 23% reported excessive daytime sleepiness ([Khan disorders et al., 2018](#)).

Ruminations, a kind of obsessive thoughts manifested by constant doubts about the correctness and quality of the activities performed. One can distinguish between adaptive rumination and intrusive non-adaptive rumination, which intensifies the effect of debilitating stress and plays an important role in the development of post-traumatic stress

disorder (PTSD). Thoughts may be autocritical and self-judging in situations not directly related to current activities, which do not contribute to understanding or solving the problem ([Ogińska-Bulik, 2014](#)).

Medical rescuers, due to the specifics of their work, are particularly vulnerable to the occurrence of trauma. The need to fight for human health and life influences the psyche and creates the need to develop a strategy for coping with stress during and after rescue operations. Research carried out at the Nofer's Institute of Occupational Medicine in Łódź showed that during performing emergency medical procedures, 72% of paramedics experienced at least one traumatic event and 64% twice and more. Similar values result from Swedish research, about 62% of rescuers employed in Emergency Medical Services experienced traumatic situations during rescue operations ([Jonsson et al., 2003](#)). Contact with these types of events may cause symptoms of depression, anxiety as well as falling into addictions harmful to health ([Ogińska-Bulik, 2014](#)).

Research conducted by Kucmin on the group of Polish paramedics indicates that PTSD affects 28% of that population ([Kucmin et al., 2018](#)). PTSD is the most serious of the negative effects of stress. The causes can be traumatic events that trigger strong emotions, such as cardiopulmonary resuscitation in children, the view of charred corpses, or help in case of crushing or amputation. Providing children with help and strong experience associated with this increases the risk of developing PTSD. The development of the disease is characterized by symptoms persisting for a minimum of one month, including experiencing a new traumatic situation in the form of intrusive, recurring memories and dreams (flashback), attitude avoiding all factors that may remind about trauma, recurrent problems with sleep (difficulties in falling asleep, restless sleep, frequent waking up in the middle of the night, nightmares), anger attacks, concentration disorders and excessive alertness, feelings of anxiety, depressed mood, and in the most serious cases, suicidal thoughts ([Dudek, 2003](#)).

Based on studies by Ogińska-Bulik and Juczyński, 45% of women and 22.5% of men working in the emergency medical system were diagnosed with PTSD-specific symptoms ([Ogińska-Bulik & Juczyński, 2016](#)). These indicators are very high, however, when analyzing statistics, it can be noted that women are much more likely to develop this disorder.

Coping with stress

A search for a way to avoid serious psychological consequences of traumatic situations, such as a psychological crisis, traumatic syndrome, or the above-mentioned PTSD was started. The Critical Incident Debriefing (CISD) technique was started in the shortest possible time after the crisis occurred in both the injured and the rescuers. Debriefing is a mental intervention process after a critical event. It is run by a team of specialist's psychologists and therapists who operate on the spot by conducting short meetings with the injured and those providing assistance. They are designed to facilitate dealing with the situation.

In addition to the immediate recovery of stress, it supports people affected by disasters to understand their reactions and find out that it is something completely natural, which increase the effectiveness of cooperation at the scene. Very important is the fact that during such short sessions you can recognize people whose mental state is the most serious and take professional care not only temporarily during the event, but also in the long-term perspective ([Rybojad et al., 2016](#)).

There is a discussion on the level of effectiveness of debriefing techniques in paramedics after traumatic events. Some psychologists believe that these sessions help to eliminate emotional, biological, and psychosocial symptoms during crises ([Talarowska et al., 2011](#)). Stress related to the work of paramedics causes a lot of losses for affected people, their relatives, and employers ([Kołodziej, 2011](#)).

Therefore, it is important to counteract or minimize the level of stress and its effects. Dow research indicates the need to develop and use stress management and prevention programs to educate paramedics to increase awareness, recognize signs and symptoms of stress, and learn coping techniques to decrease its negative impact ([Dow, 2018](#)). These interventions should be implemented immediately taking into consideration that stress levels in healthcare personnel increased during the pandemic.

CONCLUSION

In conclusion, the vast majority of paramedics have experienced traumatic events at least once in their careers. Work in a medical rescue system requires strong predispositions, not only physical but also psychological. The emotional state of paramedics is affected not only by catastrophes or mass accidents but also by single events with a strong emotional impact. This affects both professional and private life.

The long-term presence of negative factors is the cause of the appearance of psychological and somatic symptoms related to stress in the workplace. It can lead also to burnout syndrome, which results in a deterioration of the quality of patient care and job resignation of well-trained and experienced emergency medical care staff. The professional situation of employees of the emergency medical care system forces us to look for new solutions in the field of reducing occupational stress especially nowadays during such difficult and demanding times during pandemics.

It is necessary to introduce stress prevention in the group of paramedics. It is especially important to teach the techniques of coping with stress among medical personnel most exposed to stress, which is paramedics. Future research about the

impact of working conditions during the COVID-19 pandemic on mental health status, stress levels and coping strategies of paramedics should be carried out.

LIMITATION AND STUDY FORWARD

The authors reviewed only available publications. During the pandemic, the working conditions of medical personnel, including emergency medical system personnel, changed, therefore it is necessary to conduct further research in the field of impact of working conditions on stress and its effects in the group of paramedics and other emergency medical care systems personnel over the next few years and to compare the scale of the problem.

CONTRIBUTION

Paper conception and design: K. Wojtysiak (33,33%), A. Wielgus (33,33%), H. Zielińska-Więczkowska (33,33%).

Data collection: K. Wojtysiak (33,33%), A. Wielgus (33,33%), H. Zielińska-Więczkowska (33,33%).

Manuscript preparation: K. Wojtysiak (33,33%), A. Wielgus (33,33%), H. Zielińska-Więczkowska (33,33%).

All authors reviewed the results and approved the final version of the manuscript.

DISCLOSURE

The authors report no conflicts of interest in this work.

ACKNOWLEDGMENT

This study was conducted as a part of the core research activity carried out in the Department of Social and Medical Sciences, Nicolaus Copernicus University Collegium Medicum in Bydgoszcz.

REFERENCES

1. Lawn, S., Roberts, L., Willis, E., Couzner, L., Mohammadi, L., & Goble, E. (2020). The effects of emergency medical service work on the psychological, physical, and social well-being of ambulance personnel: a systematic review of qualitative research. *BMC psychiatry*, 20(1), 1-16. <https://doi.org/10.1186/s12888-020-02752-4>
2. Binczycka-Anholcer, M., & Lepiesza, P. (2011). Stres na stanowisku pracy ratownika medycznego. *Hygeia Public Health*, 46(4), 455-461.
3. Dopelt, K., Wacht, O., Strugo, R., Miller, R., & Kushnir, T. (2019). Factors that affect Israeli paramedics' decision to quit the profession: A mixed-methods study. *Israel Journal of Health Policy Research*, 8(1), 1-11. <https://doi.org/10.1186/s13584-019-0346-0>
4. Dow, D. M. (2018). Exploring Stress in EMS: A Challenge, Occupational Hazard, and Barrier: A Qualitative Study [Doctoral dissertation, Cardinal Stritch University, Milwaukee]. *ProQuest Dissertations and Theses*.
5. Dudek, B. (2003). *Zaburzenie po stresie traumatycznym*. Gdańskie Wydawnictwo Psychologiczne.
6. Duschek, S., Bair, A., Haux, S., Garrido, A., & Janka, A. (2020). Stress in paramedics: relationships with coping strategies and personality traits. *International Journal of Emergency Services*, 9(2), 203-216. <https://doi.org/10.1108/IJES-06-2019-0029>
7. Forster, C. (2020). Could mindfulness activity improve occupational health in UK paramedics? *Journal of Paramedic Practice*, 12(5), 186-192. <https://doi.org/10.12968/jpar.2020.12.5.186>
8. Givati, A., Markham, C., & Street, K. (2018). The bargaining of professionalism in emergency care practice: NHS paramedics and higher education. *Advances in Health Sciences Education*, 23(2), 353-369. <https://doi.org/10.1007/s10459-017-9802-1>
9. Hayes, C., Corrie, I., & Graham, Y. (2020). Paramedic emotional labour during COVID-19. *Journal of Paramedic Practice*, 12(8), 319-323. <https://doi.org/10.12968/jpar.2020.12.8.319>
10. Ilczak, T., Rak, M., Cwiertnia, M., Mikulska, M., Waksmańska, W., Krakowiak, A., Bobiński, R., & Kawecki, M. (2021). Predictors of stress among emergency medical personnel during the COVID-19 pandemic. *International Journal of Occupational Medicine and Environmental Health*, 34(2), 139-149. <https://doi.org/10.13075/ijomeh.1896.01688>
11. Jakubowska, A., Żuralska, R., & Mziray, M. (2017). Ocena satysfakcji z życia w grupie zawodowej pielęgniarek/pielęgniarzy Gdańskiego Uniwersytetu Medycznego oraz ratowników/ratowniczek medycznych województwa pomorskiego. *Pielęgniarstwo i Zdrowie Publiczne [Nursing and Public Health]*, 7(4), 279–284. <https://doi.org/10.17219/pzp/76717>
12. Jasielska, A., & Ziarko, M. (2019). General specific individual post-traumatic stress disorder-related mechanisms among paramedics. *Medycyna Pracy*, 70(1). <https://doi.org/10.13075/mp.5893.00757>
13. Jonsson, A., Segesten, K., & Mattsson, B. (2003). Post-traumatic stress among Swedish ambulance personnel. *Emergencine Medicine Journal*, 20, 79–84. <https://doi.org/10.1136/emj.20.1.79>
14. Khan, W., Jackson, M., Conduit, R., & Kennedy, G. (2018). The effect of shift-work and sleep disorders on the mental health of Victorian paramedics. *Journal of Sleep Research*, 27. https://doi.org/10.1111/jsr.63_12766

15. Kołodziej, B. (2011). Potrzeba wsparcia psychologicznego ratowników medycznych w kontekście wsparcia psychologicznego funkcjonariuszy policji i straży pożarnej. *Journal of Ecology and Health*, 15(1), 35–38.
16. Kucmin, T., Kucmin, A., Turska, D., Turski, A., & Nogalski, A. (2018). Coping styles and dispositional optimism as predictors of post-traumatic stress disorder (PTSD) symptoms intensity in paramedics. *Psychiatria Polska*, 52(3), 557-571. <https://doi.org/10.12740/PP/68514>
17. Leszczynski, P. (2014). Analiza kompetencji zawodowych ratowników medycznych w wybranych jednostkach ratowniczych [Analysis of professional competences of medical rescuers in selected emergency services]. *Edukacja Ustawiczna Dorosłych*, 4(83), 71–82.
18. Ogińska-Bulik, N. (2014). Rola strategii radzenia sobie ze stresem w rozwoju po traumie u ratowników medycznych. *Medycyna Pracy*, 65(2), 209-217. <https://doi.org/10.13075/mp.5893.2014.024>
19. Ogińska-Bulik, N., & Juczyński, Z. (2016). Ruminacje jako wyznaczniki negatywnych i pozytywnych konsekwencji doświadczonych zdarzeń traumatycznych u ratowników medycznych. *Medycyna Pracy*, 67(2), 201-211. <https://doi.org/10.13075/mp.5893.00321>
20. Ostrowska, M., & Michcik, A. (2014). Stres w pracy – objawy, konsekwencje, przeciwdziałanie. *Bezpieczeństwo Pracy*, 5, 12–15.
21. Rybojad, B., Aftyka, A., Baran, M., & Rzońca, P. (2016). Risk factors for posttraumatic stress disorder in Polish paramedics: A pilot study. *Journal of Emergency Medicine*, 50(2). <https://doi.org/10.1016/j.emermed.2015.06.030>
22. Talarowska, M., Florkowski, A., Wachowska, K., & Gałęcki, P. (2011). Stres a debriefing–definicje i aktualne kontrowersje. *Current Problems of Psychiatry*, 12(2), 132–136.
23. The State Medical Rescue Act 2006 (pl.).
24. Vanhaecht, K., Seys, D., Bruyneel, L., Cox, B., Kaesemans, G., Cloet, M., van den Broeck, K., Cools, O., de Witte, A., Lowet, K., Hellings, J., Bilsen, J., Lemmens, G., & Claes, S. (2021). COVID-19 is having a destructive impact on health-care workers' mental well-being. *International Journal for Quality in Health Care*, 33(1), mzaa158. <https://doi.org/10.1093/intqhc/mzaa158>
25. Wnukowski, K., Kopański, Z., Brukwicka, I., & Sianos, G. (2015). Zagrożenia towarzyszące pracy ratownika medycznego-wybrane zagadnienia [The dangers of medical rescue work –selected issues]. *Journal of Clinical Healthcare*, 3, 10–16.
26. Główny Urząd Statystyczny [Central Statistical Office]. (2017). *Zdrowie i ochrona zdrowia w 2016 [Health and healthcare in 2016]*.