

# Selected aspects of the lifestyles of paramedics working in the National Emergency Medical Services system and the sense of generalized self-efficacy in the peri-pandemic period COVID-19

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## ABSTRACT

**Introduction:** Chronic exposure to stress significantly affects the deterioration of health. In recent years, the occurrence of the COVID-19 epidemic condition, and with it the deterioration of working conditions and the concomitant increase in the number of patients in serious condition, has increased stress in the professional duties as well as in the daily lives of paramedics. The study attempts to analyze selected aspects of the lifestyles of paramedics working in the National Emergency Medical Service system and the impact of the pandemic on their professional and daily lives.

**Materials and methods:** The study was conducted by means of a questionnaire among 100 active paramedics.

**Results:** Statistical analysis showed that raters with active lifestyles and high levels of generalized self-efficacy were significantly more likely to consume fruits and vegetables ( $p < 0.0023$ ,  $p < 0.0035$ ), dairy products, nuts and almonds ( $p < 0.018$ ,  $p < 0.0021$ ), fish ( $p < 0.0040$ ) and isotonic drinks ( $p < 0.0001$ ) than raters with low self-efficacy.

Assessment of cigarette smoking (including e-cigarette) indicated that the majority of raters (55%) smoked. In terms of ways of coping with stress, the following ways of relieving tension were identified: smoking (27%), listening to music or watching a movie (23%), physical activity (22%), drinking alcohol after work (19%). An analysis of the IPAQ questionnaire determined a high level of physical activity in 22% of the subjects, a sufficient level in 38%, and an insufficient level in 40%. There was no statistically significant relationship between physical activity and the level of self-generalized efficacy of paramedics ( $p > 0.05$ ).

**Conclusions:** The analysis of selected aspects of lifestyle in the study group in relation to sense of generalized self-efficacy showed no significant relationships between self-assessment of health, level of physical activity, and the severity of these behaviors. The dietary assessment showed abnormalities related to infrequent consumption of whole grains, fruits and vegetables, nuts, fish, and frequent consumption of sweets, drinks with high sugar levels.

**Keywords:** emergency medical services; healthy eating; shift work.

## INTRODUCTION

The modern model of health is a holistic and comprehensive approach to life. Undoubtedly, 3 spheres play a key role here: an active (sports) lifestyle, adherence to the general principles of healthy eating, and an individual way of dealing with stress. Negligence in these areas leads to a significant weakening of health. This, in turn, contributes to the development of conditions known as diseases of civilization, such as heart attack or stroke, obesity or even depression [1]. In the group of paramedics, chronic exposure to stress may seem particularly relevant. In the past 3 years, the onset of the COVID-19 epidemic state, and with it the deterioration of working conditions and the concomitant increase in the number of patients in serious condition, has increased stress in work duties as well as in daily life [2]. At the peak of the pandemic, the number of daily cases exceeded several thousand, while the number of deaths to date is over 100,000 patients [3].

A growing number of scientific studies in this area have highlighted the problem of professional burnout and even the prevalence of depression among medical personnel during pandemic periods [4, 5].

Health-promoting behaviors in many occupational groups, especially in the emergency services, are determined by job characteristics [6]. Research has shown the importance of self-efficacy as an important factor for assessing appropriate, health-related behavior [7]. A factor for presenting our own research was the assumption of the important importance of lifestyle in creating one's own health, and the decisions made in this regard while on duty.

Research Hypothesis – the lifestyles of paramedics, including levels of physical activity, ways of coping with stress, and diet, among others, significantly correlate with levels of generalized self-efficacy during the COVID-19 peri-pandemic period.

## MATERIALS AND METHODS

The survey was conducted among 100 active paramedics, between January 2021–May 2022. The beginning of the study was a period of about 10 months after the registration of the first case of COVID-19 in Poland, while the end of the study was a period when strictures were relaxed and significant changes were made in hospital and emergency procedures. The

criterion for inclusion in the study was the following: submission of informed consent to participate in the study, complete completion of the set of questionnaires, practice as a paramedic, performance of official duties in the National Emergency Medical Service system. The study was conducted in accordance with the Declaration of Helsinki. Participation in the study was voluntary and anonymous. Respondents were also informed of the possibility of opting out of the study at any stage.

The survey was conducted by a diagnostic survey method using a questionnaire technique. Due to the COVID-19 pandemic and in view of the Polish government's recommendations to minimize contact with others, potential respondents were invited electronically (a closed, dedicated forum for active paramedics) to participate in the study – volunteers completed survey questionnaires in Polish via an electronic form (<https://docs.google.com/>).

Standardized survey instruments were used to assess selected aspects of lifestyle among active paramedics performing duty in the PRM system:

- An abbreviated version of the International Physical Activity Questionnaire (IPAQ). The first and fourth parts of the questionnaire were used in this study – work-related physical activity (7 questions) and recreation, sports and leisure-time physical activity (6 questions). The questions are about physical exertion performed in the past 7 days in the context of unpaid or professional work and study. Respondents consider only effort that lasted at least 10 min at a time.
- Schwarzer, Jerusalem and Juczynski's Generalized Self-Efficacy Scale (GSES). This scale contains 10 statements. The higher the score (range 10–40 points), the higher the sense of generalized self-efficacy. Classification of the surveyed respondents into groups with different levels of efficacy was based on the median value of the raw scores on the GSES scale, which was 32. Scores below the median marked a low and above the median a high sense of self-generalized efficacy [8].
- An abbreviated version of the Food Frequency Questionnaire (FFQ). The FFQ is an advanced tool that assesses the frequency (times/person/day) and quantity (g/person/day) of food habitually consumed during the year. The core part of the FFQ questionnaire includes questions on the habitual frequency of consumption of 165 products and their quantities. The frequency of consumption of products is determined by respondents by freely indicating the frequency of consumption per day, per week, per month. The frequency of consumption of food products was assessed on a scale of 1–7 (1 – never, 7 – 2 or more times a day). In the analysis of the mean values of the frequency of consumption of products, the ranges were adopted: 2 and more times a day (6.5–7.0), once a day (5.50–4.49), 4–6 times a week (4.5–5.49), 2–3 times a week (3.5–4.49), several times a month (2.5–3.49), once a month (1.5–2.49), once a month or never (1.0–1.49) [9].
- An author's questionnaire containing questions on socio-demographic data, smoking and alcohol consumption, and ways of coping with stress.

In terms of stress management, active methods such as undertaking physical activity, therapy with a psychologist, social gatherings, and passive methods such as stimulants, listening to music/watching a movie, overeating, were analyzed.

Statistical analysis was carried out using the PQStat package, ver. 1.6, using the chi-square test of independence and Student's t test. The level of statistical significance was taken at  $p < 0.05$ , and was considered highly significant when  $p < 0.01$ .

## RESULTS

### Characteristics of the respondents

The study included 100 active paramedics working in the National Emergency Medical System. The surveyed group was composed of people aged 23–60 years, mainly men – 92%. In the surveyed group, 42% of the respondents described their health condition as very good, while 58% described it as good.

The average BMI of paramedics was determined to be  $27.85 \pm 2.63 \text{ kg/m}^2$ . Such a value is defined as overweight. The individual values were respectively: 55% showed overweight, 40% normal weight, 5% obese. Statistical analysis showed no statistical significance in this regard ( $p > 0.05$ ).

Analysis of food and beverage consumption habits showed consumption of mineral water (carbonated and non-carbonated) an average of once a day. Beverage consumption of 2–3 times a week was determined for: energy drinks like red bull, pepsi or coca-cola, and sweetened beverages (including juices). On average, they consumed the following several times a month: fish, beer, fast food and high-alcoholic beverages. On average, they consumed once a month: nuts, wine, wholemeal bread (Tab. 1).

### Statistical analysis

Statistical analysis showed that raters with active lifestyles (training 2–3 times a week) and high levels of generalized self-efficacy were significantly more likely to consume fruits and vegetables ( $p < 0.0023$ ,  $p < 0.0035$ ), dairy products, nuts and almonds ( $p < 0.018$ ,  $p < 0.0021$ ), fish ( $p < 0.0040$ ) and isotonic drinks ( $p < 0.0001$ ) than raters with low self-efficacy.

Assessment of smoking habit (including electronic e-cigarette) indicated that the majority of raters (55%) smoked. Among smokers, 25% of respondents declared smoking about 1 pack a day or more. The remaining 30% declared smoking far less than 1 pack a day. There was no statistical significance between smoking and raters' level of generalized self-efficacy ( $p > 0.05$ ).

In terms of ways of coping with stress, the following ways of relieving tension were identified: smoking (27%), listening to music or watching a movie (23%), physical activity (22%), drinking alcohol after work (19%), making a phone call or meeting with friends or a loved one (10%), overeating (5%), and a session with a psychologist (4%). No statistical significance in stress coping and its forms, and the level of generalized effectiveness of paramedics ( $p > 0.05$ ).

**TABLE 1. Frequency of food intake in a group of active paramedics on duty in emergency medical services according to the level of generalized self-efficacy (M ±SD)**

Variables	Level (median)			Level of significance P
	total n = 100	low n = 50	high n = 50	
Food products				
Wholemeal bread	1.89 ±1.19	1.85 ±1.24	1.93 ±1.15	0.7344
Fruits	3.98 ±1.79	3.15 ±1.77	4.81 ±1.81	0.0023
Vegetables	3.38 ±1.90	2.56 ±1.85	4.21 ±1.95	0.0035
Dairy products	3.80 ±1.71	3.05 ±1.62	4.55 ±1.80	0.0018
Fish	3.43 ±1.73	2.65 ±1.67	4.21 ±1.80	0.0040
Nuts, almonds	2.44 ±0.86	2.32 ±0.87	2.56 ±0.86	0.0021
Sweets	3.74 ±1.62	4.24 ±1.67	3.25 ±1.58	0.0154
Fast food	3.28 ±1.54	3.45 ±1.53	3.11 ±1.55	0.6528
Water	5.68 ±1.07	5.92 ±0.59	5.45 ±1.55	0.2853
Juices	3.75 ±1.43	3.62 ±1.58	3.89 ±1.29	0.6287
Sweetened carbonated beverages	3.88 ±1.33	4.01 ±1.11	3.75 ±1.55	0.0001
Energy drinks	3.16 ±1.71	3.89 ±1.65	4.42 ±1.78	0.1588
Isotonics	3.89 ±1.06	2.89 ±1.17	3.44 ±0.95	0.0001
Beer	3.31 ±1.61	3.28 ±1.12	3.35 ±0.98	0.5321
Wine	2.95 ±1.11	2.01 ±0.99	1.88 ±1.23	0.7552
Strong alcohols	3.10 ±0.94	3.22 ±0.78	2.99 ±1.11	0.2389

An analysis of the IPAQ questionnaire determined a high level of physical activity in 22% of the subjects, a sufficient level in 38%, and an insufficient level in 40%. There was no statistically significant relationship between physical activity and the level of self-generalized efficacy of paramedics ( $p > 0.05$ ) – Table 2.

## DISCUSSION

The work of paramedics is burdened with a large number of psychological stimuli in the negative range (severe injuries to the injured, working under time pressure or deaths of patients) [10]. Some studies even show a higher rate of occurrence of post-traumatic stress disorder (PTSD), than police officers or firefighters [11]. In addition, a large number of medical personnel (in our study 78%) work on civil-legal contracts, so-called contracts, which translates into work in the average number of about 230–250 h per month (the standard work is 160 h per month). Such a system of work limits the possibility of “normal” functioning or undertaking many planned activities (shift work, on-call duties in the range of 36–48 h without a break fatigue after sleepless nights).

The nutritional status of paramedics was defined as overweight was found in more than half of the respondents. Based on their own research, most of the rescuers explain this by the nature

of their work and on-call duties. Due to the unpredictability of breaks and pace of work, they undertook very often consumption of fast food (hot-dog at the gas station, pizza, McDonald’s or KFC). A small number of respondents declared preparing lunches earlier at home and eating it while working. Juxtaposing the results with other uniformed services, paramedics showed similar levels in this regard [12, 13, 14]. It is worth mentioning that, according to the WHO, more than 1.9 bln adults aged 18 and over were overweight in 2016. Of these, more than 650 mln were obese [15]. Proper body weight is one of the primary determinants of health in medicine today. Many studies show a significantly higher incidence of so-called “civilization diseases” such as diabetes, heart attack, stroke and depression [16, 17, 18].

It can be assumed that there is only one effective factor for reducing and maintaining a healthy body weight, and that is a daily caloric balance of meals. In order to maintain this state, one should frequently consume foods such as fish, vegetables and fruits, whole grain breads, nuts. On the other hand, consumption of sweet drinks, confectionery products, salty snacks, pasta, etc. should be avoided or limited [19, 20]. A proper diet is an important factor in good health and prevention of the aforementioned diseases. Based on our own research, the analysis and evaluation of the diet of paramedics showed large irregularities in this regard. Noteworthy is the large amount of energy drinks of the red bull type drink. The choice of this type of beverages is most likely dictated by consumption during duty hours, with a particular emphasis on night times. Similarly, there was a similar incidence of coffee consumption, which was most often consumed at the beginning of duty and during nighttime hours. The situation was similar in relation to the consumption of confectionery and fast-food. As a consequence of irregular and poor quality eating, it can promote overweight and automatically worsen health. It is worth noting that similar dietary errors of paramedics have also been observed in other professional groups such as nurses, doctors and night shift workers [21, 22, 23].

The frequency of alcohol consumption, without dividing it into low or high alcohol, was determined to be 2–3 times a week. It should be noted that the vast majority of responses suggested drinking 1 or 2 beers and 1 or 2 drinks after “heavy” duty with a particular emphasis on duty of more than 36 h. According to current guidelines, such behavior does not meet the criteria of a problematic drinking pattern [24]. In addition, it should be noted that in an international comparison, such frequency and amount of alcohol consumption should not be of major concern [25].

In maintaining a normal body weight, in addition to a proper balanced diet, it is undoubtedly helpful to maintain adequate physical activity, with a particular emphasis on sports training (so-called cardio type training). Such physical activity positively influences both mental well-being, allows to relieve stress, as well as has a positive performance or morphological-metabolic effect [26, 27]. In the study group of paramedics, a third were determined to have a high level of physical activity, while almost half had a sufficient level, according to the IPAQ test methodology. Every fourth paramedic showed an insufficient level of physical activity. Overall, it should be assumed that

**TABLE 2.** Selected lifestyle aspects such as physical activity, smoking, and stress management among a group of paramedics working in the state emergency medical system (%)

Indicators	Total n = 100	Effectiveness level		p
		low n = 50	high n = 50	
Physical activity	high	22	20	0.1265
	sufficient	38	35	
	insufficient	40	34	
Smoking	does not smoke	45	34	0.2784
	less than a pack a day	30	32	
	about a pack a day	15	19	
	more than a pack a day	10	8	
Ways to deal with stress	overeating	5	4	0.5385
	smoking	27	24	0.4277
	alcohol consumption (after work)	19	22	0.2854
	listening to music/watching a movie	23	28	0.7162
	physical effort	22	20	0.1265
	social gatherings	10	12	0.5632
	session with a psychologist	4	1	0.3677

the group of paramedics presents a satisfactory however not good level of physical activity.

Smoking is considered a risk factor that accounts for some of the 8 most common causes of death worldwide and a very significant factor that negatively affects overall health [28]. The number of scientific publications and widespread knowledge in this area would seem to be a sufficient argument for rescuers as well as the general public not to engage in these activities. However, studies show that both rescuers and other medical professional groups engage in similar behaviors [29]. In the study group, more than half of the respondents declared active, compulsive smoking, including e-cigarettes. It is difficult to clearly understand such behavior, especially among medical personnel. It should be mentioned here, however, that out of the entire surveyed group, more than 1/3 declared that smoking while on duty is a way to relieve a stressful situation. Considering the number of emergencies and the nature of the work, this seems to be a very important factor that easily and quickly relieves mental tension.

Strong negative mental stimuli in the work of a paramedic occur significantly often. A very important role is played here by the individual's way of coping with stress and the way of relieving it, both short-term and long-term.

The incidence as well as the course of the disease and the possibility of recovery largely depend on a person's mental state. Prolonged stress and passive coping result in the accumulation of negative emotions, resulting in excessive cortisol secretion. Hyperadaptosis occurs, leading, depending on the vegetative response pattern, to illness [30]. In this aspect, maintaining emotional distance from the work situation and psychological support, broadly speaking (family, friends, employer) seem to be important factors. While all uniformed services have the support of a psychologist, paramedics are not mandatorily covered. Based on the study, it was determined that the surveyed group used to relieve tension:

- lighting a cigarette,
- *ad hoc* listening to music between trips or watching a movie,

- undertake physical activity after duty or between duty periods,
- social gatherings,
- a session with a psychologist.

From a therapeutic point of view (short-term and long-term), each of these methods can show different individualized effectiveness. Of course, while smoking cigarettes deserves condemnation from a health standpoint, on an *ad hoc* basis for many people it can unfortunately prove to be a very effective tool. The best individual solution seems to be to take up physical activity. The effects of training on the body are wide-ranging. In addition to increasing the oxygenation of tissues and organs, there is also a release of so-called endorphins (so-called "happy hormones") [31].

The results of our own study confirmed and showed very large differences depending on the sense of generalized self-efficacy. Those showing higher levels of efficacy ate healthier and were more likely to avoid negative behaviors in terms of food and food intake. Interestingly, the health-promoting behaviors of paramedics appear to be more favorable than those of career firefighters [32] and worse compared to police officers [33].

The company's own research identified regularities that showed a more health-promoting eating style in people with a high sense of generalized self-efficacy. It seems reasonable that such people are more aware of their health status and the need for prevention in this area. Relationships with sense of generalized self-efficacy have been shown with physical activity and restriction in the consumption of high percentage alcohol. All of these factors can be seen to coincide when someone is consciously and rationally concerned about their overall lifestyle and health.

The work of a paramedic is a challenge not only to physical health but also to mental health. The tremendous amount of stimulus that accompanies this work causes a sizable group of workers to engage in negative behaviors to quickly de-stress. Studies suggest that the onset of a new disease and the introduction of an epidemic state have already exacerbated negative behavior,

and thus significantly affected the quality and stress of work in the National Emergency Medical System. Undoubtedly, however, this metric would need to be further investigated and described in detail.

## CONCLUSIONS

1. The analysis of selected aspects of lifestyle in the study group in relation to sense of generalized self-efficacy showed no significant relationships between self-assessment of health, level of physical activity, and the severity of these behaviors. It was shown that paramedics with a high sense of generalized self-efficacy were more likely to show "better" nutritional choices than those with a low level.
2. The dietary assessment showed abnormalities related to infrequent consumption of whole grains, fruits and vegetables, nuts, fish, and frequent consumption of sweets, drinks with high sugar levels.
3. Analysis of other health behaviors indicates that the studied group of paramedics undertake physical activity to a satisfactory extent and frequency.
4. Paramedics often take up smoking or e-cigarettes as a quick way to cope with stress at work.
5. Analysis of selected health indicators of a group of active paramedics showed excessive body weight.
6. On the basis of the studied group, it seems reasonable to introduce a preventive program in the field of nutrition, healthy lifestyle and methods of relieving tension and coping with stress.

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