

# ASSESSMENT OF PHYSICAL ACTIVITY OF MEMBERS OF THE HELICOPTER EMERGENCY MEDICAL SERVICE (HEMS)

Agata Gaździńska<sup>1</sup>, Paweł Jagielski<sup>2</sup>, Robert Gałązkowski<sup>3</sup>

<sup>1</sup> LABORATORY OF DIETETICS AND OBESITY TREATMENT, DEPARTMENT OF PATHOPHYSIOLOGY AND FLIGHT SAFETY, MILITARY INSTITUTE OF AVIATION MEDICINE, WARSAW, POLAND

<sup>2</sup> DEPARTMENT OF NUTRITION AND DRUG RESEARCH, FACULTY OF HEALTH SCIENCE, JAGIELLONIAN UNIVERSITY, MEDICAL COLLEGE, CRACOW, POLAND

<sup>3</sup> DEPARTMENT OF EMERGENCY MEDICAL SERVICE, WARSAW MEDICAL UNIVERSITY, WARSAW, POLAND

## Abstract

**The aim:** Assessment of physical activity of members of the Helicopter Emergency Medical Service.

**Material and methods:** The study was conducted in a group of 131 people (65 paramedics, 66 pilots), members of HEMS teams from all bases in Poland, aged 27-59. The characteristics of physical activity was obtained using the author's questionnaire.

**Results:** The mean age of the study population was  $42.73 \pm 9.58$  years. Pilots were significantly older than paramedics and had significantly higher BMI values ( $p < 0.05$ ). No significant relationship between the age and BMI in the analyzed groups was found ( $p > 0.05$ ), while the relationship between the frequency of physical activity and BMI was demonstrated. 70% of subjects undertook physical activity less than three times a week. The most frequently chosen forms were cycling, walking and swimming. Paramedics statistically significant more often than pilots chose wall climbing ( $p = 0.001$ ). Downhill skiing (61%) was the most common declared winter sport played by pilots, while hiking in the mountains – by paramedics (49%). The most important reason for pilots to take up physical activity was concern for their health (47%), while for paramedics – the pleasure (63%). Paramedics statistically significant more often than pilots indicated a large number of other activities (90.6 vs. 74.2%) and financial issues (18.8 vs. 6.1%) as barriers that prevented more involvement in physical activities.

**Conclusions:** The frequency of physical activity undertaken by HEMS members is insufficient. Low physical activity of HEMS team members has an adverse effect on their nutritional status. It is necessary to take initiatives to promote physical activity in this professional group.

## Key words

HEMS,  
physical activity,  
motivation,  
barriers

## INTRODUCTION

Physical activity is one of the main components of a healthy lifestyle. Insufficient physical activity is an important, though still underestimated, factor affecting health, morbidity, and mortality. It should be emphasized that physical effort is a protective factor independent of genetic conditions and other recognized risk factors – biological and socioeconomic [1]. Systematic physical exertion is crucial in the prevention of many chronic diseases [2]. Although we know more and more about physical activity and its beneficial effects, still over 30% of European adults, including Poland, characterize its low level [3]. It is connected with technical progress, where the increase of work automation, development of means of transport and everyday life facilities allow people to meet the needs with limited physical effort [4].

According to the Report of the Minister of Sport and Tourism from, only 39% of Poles are physically active in their free time to the extent recommended

by the World Health Organization [5]. The report also shows that physical activity of Poles is strongly associated with age and education. Young people are more active than older ones. Higher education also favors greater physical activity [5]. European studies have shown that the physical activity of Polish citizens is similar to that of other European countries [6]. A very important issue is undertaking research on the assessment of physical activity of various social and professional groups in our country.

This article presents the results of research on physical activity conducted among the personnel of the Helicopter Rescue Service (HEMS). The work of a HEMS crew in changing atmospheric conditions requires both physical and mental fitness. This is a professional group that is exposed to frequent stressful situations. The HEMS crew includes a pilot, a rescuer (paramedic or nurse) and a doctor. Their tasks include flying flights for accidents and sudden illnesses and helping their victims, transporting

patients requiring medical care between health care facilities, as well as air medical transport outside the country. The crew during duty must be ready to fly at any time, so proper physical condition is extremely important to carry out the rescue operation efficiently.

The study aimed to assess the physical activity of HEMS crew members. An attempt was also made to indicate the factors motivating the subjects to active rest and barriers hindering their participation in physical activity. To our knowledge, this is one of the first studies on physical activity in this professional group.

**MATERIALS AND METHODS**

The study was conducted in a group of 131 people (65 paramedics, 66 pilots), members of HEMS crews from all bases in Poland, aged 27 – 59. Most subjects were men, and women stand for 3.8% (only among paramedics). To assess the frequency of overweight and obesity in HEMS crew members, the BMI index was calculated and interpreted on the basis of the WHO classification [7]. The characteristics of physical activity was made using a diagnostic survey with a proprietary questionnaire. The questions concerned, inter alia, the frequency of undertaking physical activity, the choice of forms of physical activity, motivation for undertaking physical activity, as well as barriers preventing regular activities.

For statistical analysis of results, the PS IMAGO PRO program (IBM SPSS Statistics 25) was used. Chi<sup>2</sup> and Mann-Whitney U tests were used for comparative analyzes between groups (type of occupation), and relationships between variables were checked using Spearman rank correlation. The statistical significance value was adopted at the level  $p < 0.05$ .

**RESULTS**

The mean age of the subjects was  $42.73 \pm 9.58$  years. Pilots were statistically significantly older than paramedics ( $49.12 \pm 7.52$  vs.  $36.23 \pm 6.64$  years;  $p < 0.0001$ ). In addition, no statistically significant differences between paramedics and pilots in terms of body weight ( $83.10 \pm 11.81$  vs.  $89.20 \pm 16.75$  kg,

$p = 0.0478$ ) and BMI values ( $25.84 \pm 3.17$  vs.  $28.27 \pm 4.95$  kg/m<sup>2</sup>,  $p = 0.0023$ ) were found. Analyzing the obtained mean values of the tested parameters, one could observe that pilots characterized a definitely less favorable nutritional status compared to the group of paramedics. Detailed data are presented in Table 1 and Figure 1. There was no statistically significant relationship between the age of the subjects and BMI values in the study groups ( $p > 0.05$ ).

When asked about the frequency of undertaking any form of physical activity, only 30.8% of subjects indicated the answer “3 times a week”, the others performed physical activity less often (Fig. 2). Data analysis showed a relationship between the frequency of physical activity and BMI only among paramedics. In those who performed physical activity three times a week, according to BMI statistically significant more people with normal body weight were found in comparison with paramedics who exercised less often ( $p = 0.043$ ) (Fig. 3).

The most frequently chosen forms of physical activity by pilots and HEMS paramedics were cycling, walking and swimming. Paramedics statistically more often than pilots chose wall climbing (16.9 vs. 1.5%,  $p = 0.0010$ ) (Fig. 4). Downhill skiing (60.6%) was the most frequently declared winter sport practiced by pilots, while by paramedics – hiking in mountains (49.2%) (Fig. 4). Paramedics statistically more often than pilots chose cross-country skiing (9.2% vs. 0%,  $p = 0.012$ ).

Analyzing the results of study on the reasons for undertaking physical activity among subjects, it was noted that paramedics statistically significant more often than pilots indicated answers: it gives me pleasure (63.1% vs. 40.9%,  $p = 0.0110$ ), an opportunity to check myself (26.2% vs. 7.6%,  $p = 0.0040$ ), spending time with friends (21.5% vs. 9.1%,  $p = 0.0480$ ) and learning about a new hobby (7.7% vs. 0.0%,  $p = 0.0216$ ) as motives for undertaking physical activity (Fig. 6). For pilots, the main motive for undertaking physical activity was maintaining or improving health (47%).

Table 1. General anthropometric characteristics of HEMS members.

Variables	All respondents			Paramedics			Pilots			p
	N	X	SD	N	X	SD	N	X	SD	
Age [years]	131	42.73	9.58	65	36.23	6.64	66	49.12	7.52	<0.0001
Height [cm]	131	178.36	5.86	65	179.23	6.09	66	177.50	5.53	0.0712
Body weight [kg]	131	86.17	14.78	65	83.10	11.81	66	89.20	16.75	0.0478
BMI [kg/m <sup>2</sup> ]	131	27.07	4.32	65	25.84	3.17	66	28.27	4.95	0.0023

N – number of respondents, X – mean, SD – standard deviation, p – U Mann-Whitney test result, BMI (Body Mass Index)

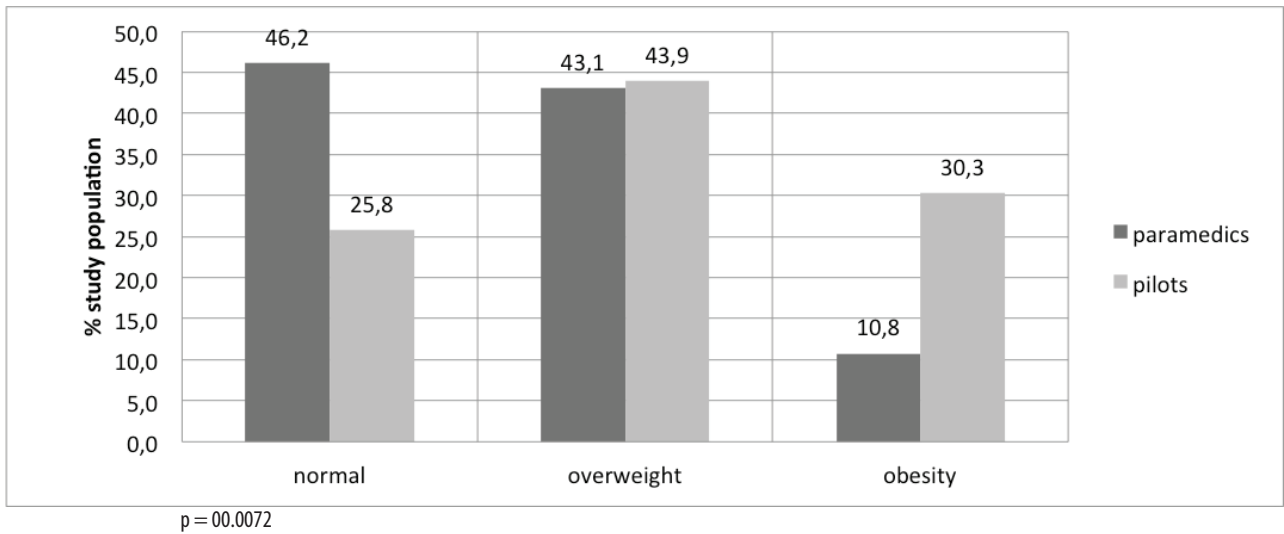


Fig. 1. Nutrition status of the respondents according to the BMI index and the occupation.

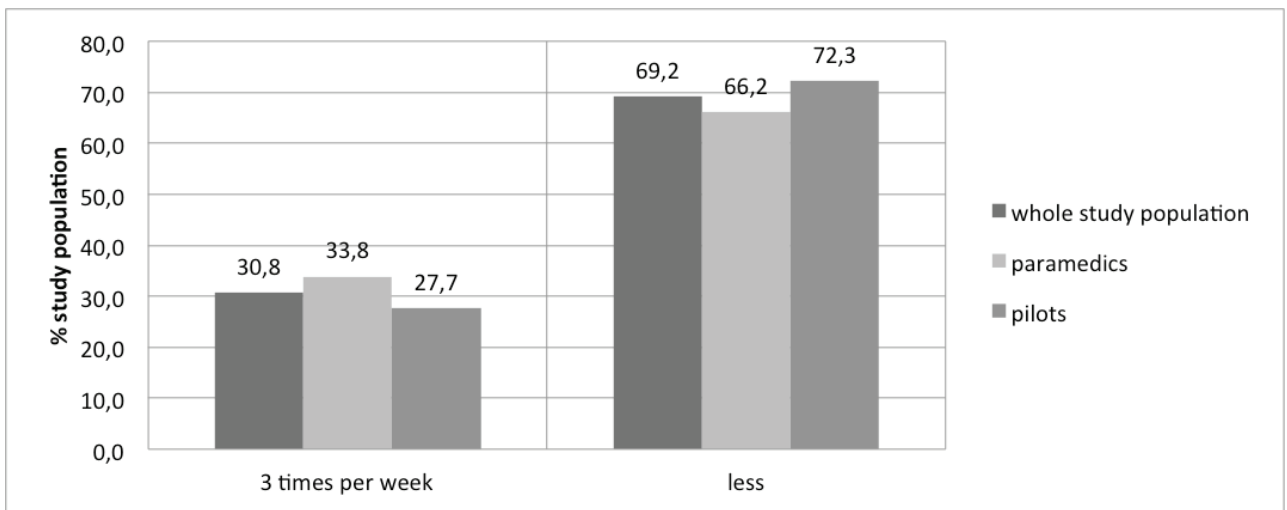


Fig. 2. The frequency of undertaking any form of physical activity by the HEMS crew.

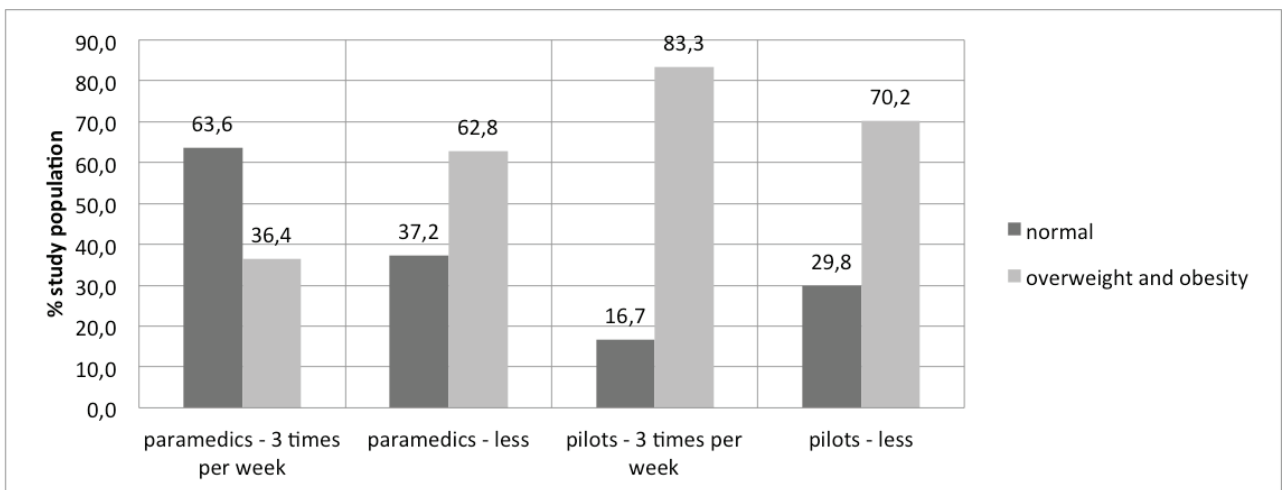


Fig. 3. Relationship between the frequency of physical activity and BMI in the studied groups of HEMS crew members.

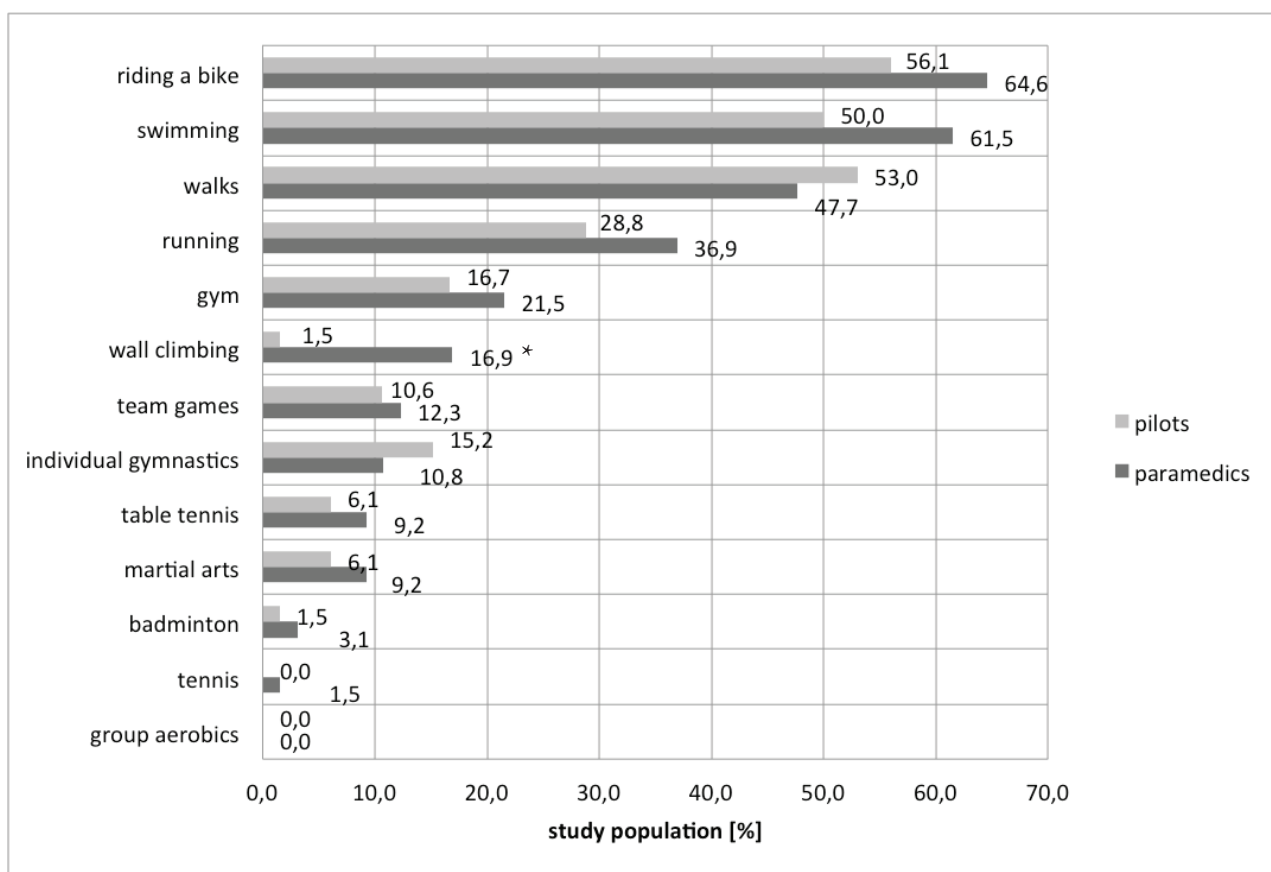


Fig. 4. Forms of activity undertaken by HEMS pilots and paramedics.

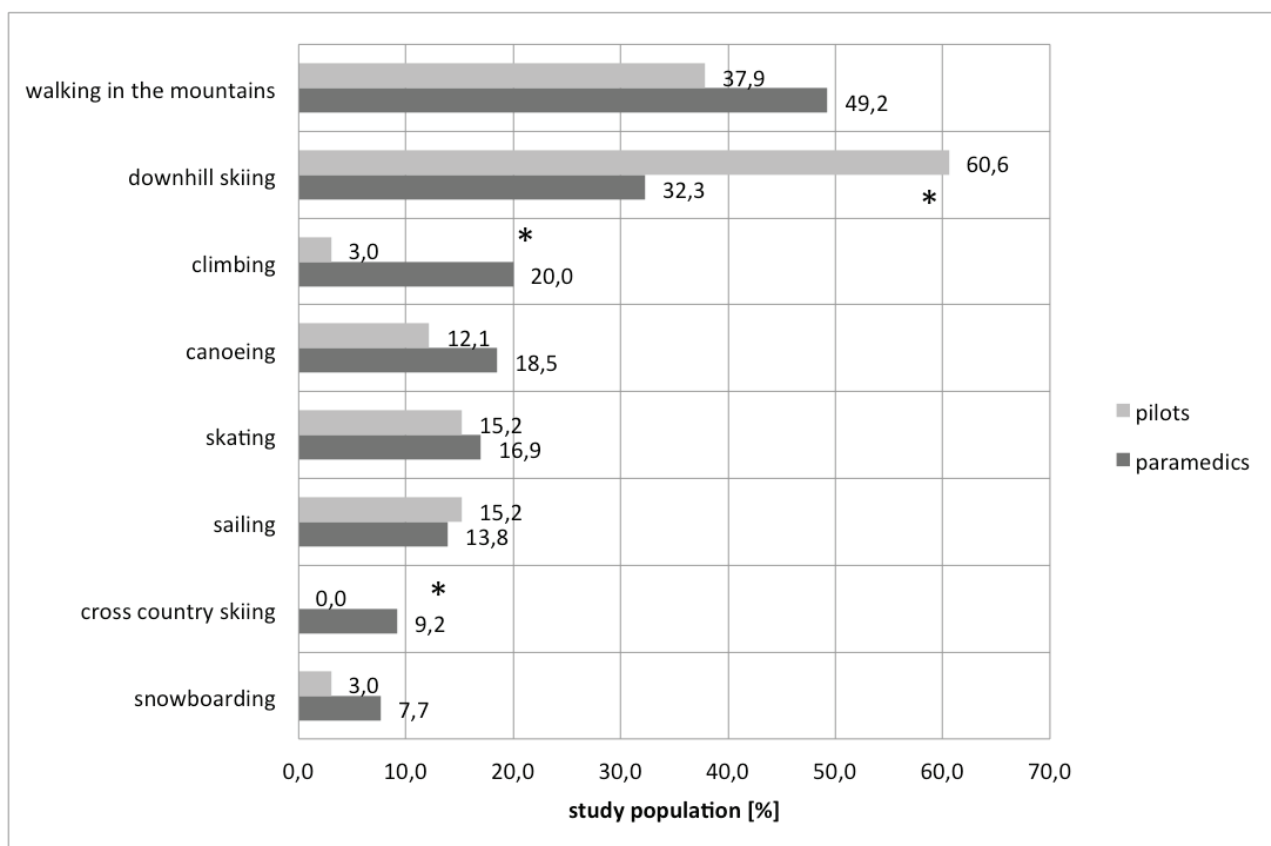


Fig. 5. Forms of seasonal activity undertaken by HEMS pilots and paramedics in summer or winter.

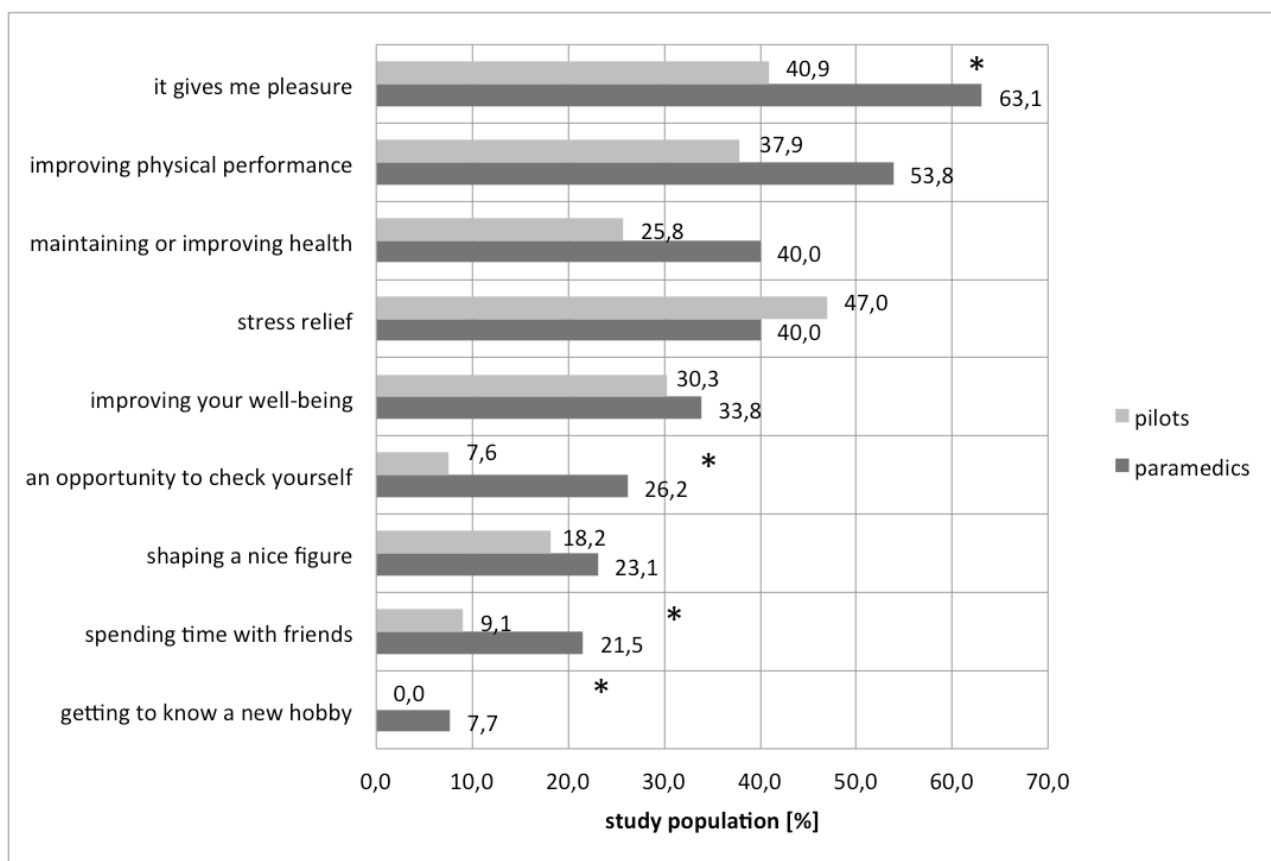


Fig. 6. Motives for undertaking physical activity by HEMS crew.

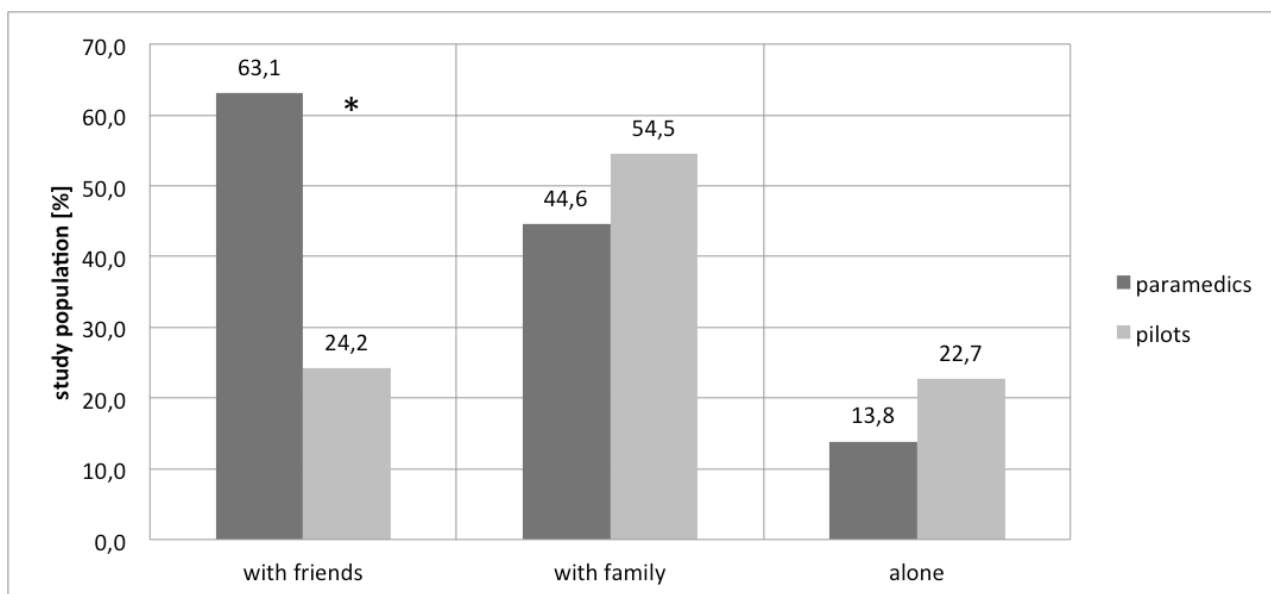


Fig. 7. Percentage of HEMS pilots and paramedics answering the question: *With whom do you most often practice selected forms of physical activity?*

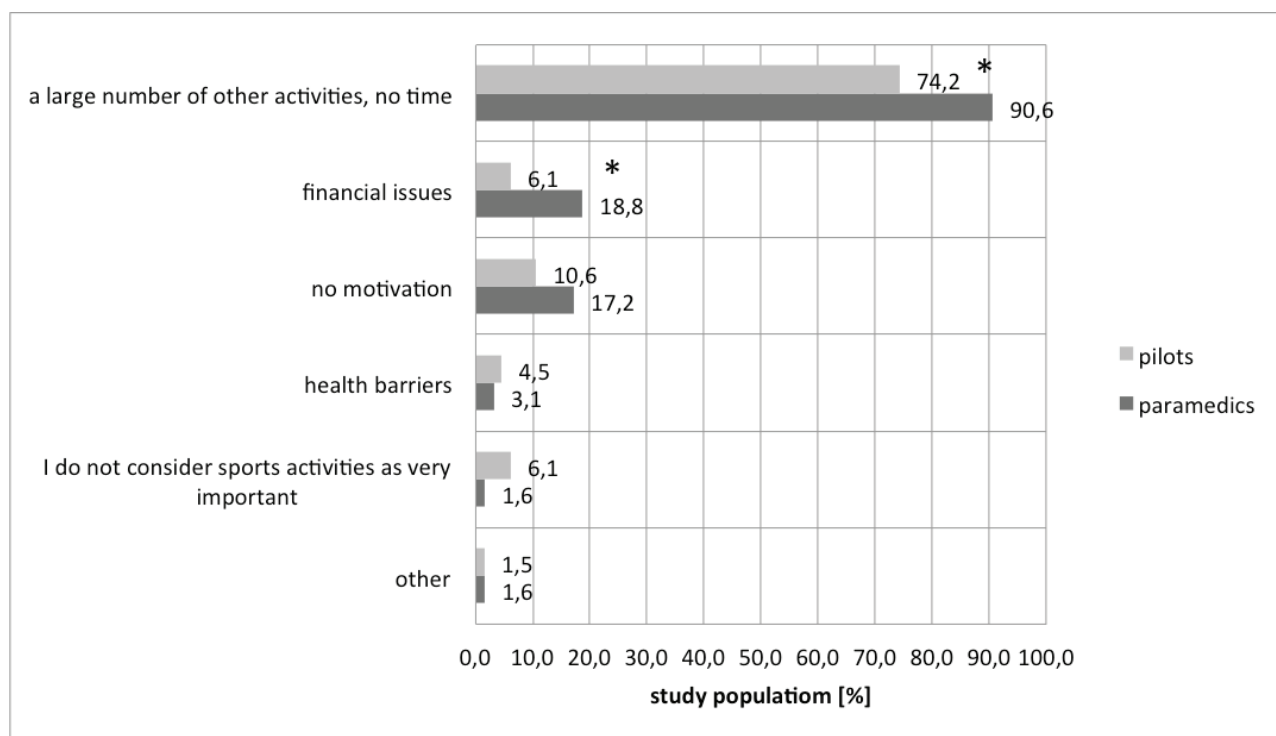


Fig. 8. Barriers in undertaking physical activity declared by HEMS crew members.

Paramedics statistically significant more often than pilots were more likely to engage in physical activity with friends (63.1 vs. 24.2%,  $p < 0.0001$ ). Over half of the surveyed pilots declared that they most often play sports with their families (Fig. 7).

90% of subjects answered “yes” to the question “Would you like to spend more time on sports activities?”. Paramedics were statistically more likely than HEMS pilots to disclose a large number of other activities (90.6 vs. 74.2%,  $p = 0.0140$ ) and financial issues (18.8 vs. 6.1%,  $p = 0.0240$ ) as barriers that prevent more involvement in sports activities (Fig. 8).

## DISCUSSION

This paper raises the issue of undertaking physical activity of a selected professional group, namely HEMS crew members. The professional activity of this group is a very mentally burdensome work. Research shows that high physical activity has a positive effect on the proper functioning of the mind, reduces anxiety, and improves the quality of sleep, even in an organism under stress [8]. In the research by Rasmus et al. physical activity, conversations with family and friends, and meetings with friends were the methods of coping with stress most frequently chosen by employees of the State EMS system [9].

According to current recommendations, adults should exercise at least 150 minutes to 300 minutes a week with moderate intensity, or 75 minutes to 150 minutes a week with high intensity, or an equivalent combination of aerobic activity of moderate and high

intensity. They should also do muscle strengthening exercises for 2 or more days a week [10]. The respondents were asked about the frequency of undertaking physical activity. Optimal physical activity was disclosed by less than a third of respondents (30.8%).

In Gacka’s study it was shown that doctors undertook recreational physical activity usually once a week [11]. Insufficient physical activity in free time was also described in earlier studies of another group of doctors and nurses [12]. Other results were obtained by Jasik, where 44% of health care workers performed physical activity several times a week [13]. In the studies of doctors from Poznań and Bydgoszcz, a satisfactory frequency of participation in sports and recreation classes (69.5%) was also shown [14].

According to CBOS, the most popular form of physical activity of Poles, like five years ago, is cycling [15]. Over the past year, more than two-fifths of respondents (44%) declared that they rode a bicycle. Swimming (20%) was in the second place in terms of popularity, and in the third place – hiking, walking in the mountains and hiking on tourist routes (14%). They were also the most preferred forms of physical activity selected by the studied HEMS crew members. Cycling was also the most popular way of spending free time by medical students. 40.5% of respondents declared such an answer [16]. Team games (27.1%), walking the dog (27.1%) as well as group exercises (21.2%) were also high in the aforementioned group of students, which was not confirmed by our research.

Among activities practiced seasonally, downhill skiing and walking in the mountains were the most popular among the studied HEMS crew members. According to CBOS surveys, only every thirteenth respondent did winter sports over the past year (8%) [15]. Studied pilots and HEMS paramedics declared definitely less frequently that they practiced water sports (about 15% of respondents), which was also confirmed by CBOS (5%) [15].

The authors were also interested in motivations related to the practice of sport by the HEMS crew members. The motives for choosing different forms of physical effort for pilots were, first and foremost, maintaining or improving health (47%), while the most important for paramedics was well-being (63%). This is confirmed by CBOS research where sport is practiced for health by 69% of Poles, secondly for pleasure (55%), and thirdly for better well-being and stress relief (44%) [15]. For roughly a quarter of Poles engaging in physical activity (27%), sport is primarily a way of spending time together with friends, family and friends (25%). In their own research, the respondents also most willingly practiced various forms of activity with friends and family, much less often they did it themselves. Psychophysical well-being was also the most frequently mentioned motive for undertaking physical activity by medical students (51.1%) [16]. Caring for health was also important in this study group. This was also confirmed by the

research of Drózdź and Olszewski-Strzyżowski conducted among the inhabitants of Elbląg [17].

In considerations of physical activity, one cannot ignore obstacles that stand in the way making it difficult or even impossible to participate in active leisure. Recognizing barriers allows, on the one hand, to realize how important it is to face human behavior change, and on the other hand to make us aware of the actions to be taken to eliminate them.

According to the respondents, the biggest barriers for undertaking physical activity was the lack of time. 90.6% of paramedics and 74.2% of HEMS pilots responded in this way. 90% of respondents declared willingness to spend more time on physical activity. This was confirmed by the research of Chinna et al. In a group of well-educated people who, apart from the lack of free time, also recognized a lack of motivation as a significant barrier in undertaking physical activity [18].

## CONCLUSIONS

1. The frequency of physical activity undertaken by members of the Helicopter Emergency Medical Service is insufficient.
2. The limited participation of HEMS members in physical recreation adversely affects their nutritional status.
3. It is necessary to take initiatives to promote physical activity in this professional group.

## REFERENCES

1. Rosengren A, Wilhelmsen L. Physical activity protects against coronary Heart and deaths from all causes In middle-aged men. Evidence from a 20-year follow-up of the primary prevention study in Goteborg. *Ann Epidemiol.* 1997;7:69-75.
2. Drygas W, Kwaśniewska M, Szcześniewska D, et al. Ocena poziomu aktywności fizycznej dorosłej populacji Polski. Wyniki programu WOBASZ. *Kardiologia Pol.* 2005;63:6(supl.4).
3. Puciato D, Rozpara M, Mynarski W, Łoś A, Królikowska B. Aktywność fizyczna dorosłych mieszkańców Katowic a wybrane uwarunkowania zawodowe i społeczno-ekonomiczne. *Med Pracy.* 2013;64(5):649-657.
4. Cichosz A. Regularne ćwiczenia fizyczne – zdrowie, jakość i styl życia. *Wych Fiz Zdrow.* 2013;6:4-70
5. Ministerstwo Sportu i Rekreacji. Ocena korzyści społecznych inwestycji w sport w odniesieniu do ponoszonych kosztów. Raport analityczny. Październik 2016 r.
6. Piątkowska M. Uczestnictwo Polaków w aktywności fizycznej w porównaniu do innych krajów Unii Europejskiej. In: Bzisko K, Charzewski J, Kaczorowski K (eds) *Współczesne metody badań aktywności, sprawności i wydolności człowieka.* Warszawa: Akademia Wychowania Fizycznego w Warszawie, 2010
7. WHO. Obesity: preventing and managing the global epidemic: report of a WHO consultation (ISSN 05 12-3054): WHO; Geneva, Switzerland; 1999. WHO Tech Rep Ser, 894.
8. Kozdroń E. Oczekiwania i efekty regularnej aktywności ruchowej starszych kobiet na tle ich sytuacji rodzinnej. In: Żukowska Z (ed). *Kobieta kreatorką aktywności sportowej w rodzinie.* Warszawa: PSSK, 1998, 98-107.
9. Rasmus P, Kundera S, Lipert A, Machała W. Wpływ traumatycznych wydarzeń na życie pracowników systemu Państwowe Ratownictwo Medyczne. *Anest Rat.* 2018;12:386-392.
10. Piercy KL, Troiano RP, Ballard RM, et al. The Physical Activity Guidelines for Americans. *JAMA.* 2018;320(19):2020-2028.

11. Gacek M. Zachowania żywieniowe i aktywność fizyczna w grupie lekarzy. *Probl Hig Epidemiol.* 2011;92(2): 254-25.
12. Bąk E, Koczyńska-Sikorska, J. Postrzeganie elementów promowania zdrowia wśród lekarzy i pielęgniarek w świetle reprezentowanych zachowań zdrowotnych. *Zdr Publ.* 1994;10:341-345.
13. Jasik J. Aktywność fizyczna wybranych grup zawodowych. Podobieństwa i różnice w podejściu do problematyki aktywności fizycznej pracownika korporacji, pracownika służby zdrowia oraz nauczyciela. *Med Ogol Nauki Zdr.* 2015;21(3):254-259.
14. Kielbasiewicz-Drozowska I, Pluta B. Rola aktywności ruchowej w organizacji czasu wolnego wybranych środowisk lekarskich. *Ann UMCS.* 2004;59(suppl. 14):471-473.
15. Centrum Badań Opinii Społecznej. Aktywność fizyczna Polaków. Wrzesień 2018.
16. Sochocka L, Wojtykło A. Aktywność fizyczna studentów studiów stacjonarnych kierunków medycznych i niemedycznych. *Med Srod.* 2013;16(2):53-58.
17. Drózd R, Olszewski-Strzyżowski J. Motywy podejmowania aktywności fizycznej przez mieszkańców Elbląga. *Rozprawy Naukowe Akademii Wychowania Fizycznego we Wrocławiu.* 2014;47:124-130.
18. Chinn DJ, White M, Harland J, Drinkwater C, Raybould S. Barriers to physical activity and socioeconomic position: implications for health promotion. *J Epidemiol. Community Health.* 1999;53:191-192.

#### ORCID AND CONTRIBUTIONSHIP \*

Agata Gaździńska – 0000-0001-9910-3445 **A,B,C,D,E,F**  
Paweł Jagielski – 0000-0001-7583-8965 **B,C,D**  
Robert Gałązkowski – 0000-0002-7205-2219 **A,B,E,F**

#### CONFLICT OF INTEREST

Authors declare no conflict of interest.

#### ADDRESS FOR CORRESPONDENCE

Agata Gaździńska  
Wojskowy Instytut Medycyny Lotniczej  
ul. Krasieńskiego 54/56,  
01-755 Warszawa, Poland  
tel.: +48 725 88 00 32  
e-mail: agazdzinska@wiml.waw.pl

RECEIVED  
03.02.2020

ACCEPTED  
08.05.2020

\* Contribution: A – Work concept and design, B – Data collection and analysis, C – Responsibility for statistical analysis, D – Writing the article, E – Critical review, F – Final approval.