

PREVALENCE AND CORRELATES OF PHYSICAL ACTIVITY AMONG PUBLIC HEALTHCARE WORKERS IN HUNGARY

POWSZECHNOŚĆ I KORELATY AKTYWNOŚCI FIZYCZNEJ WŚRÓD PRACOWNIKÓW PUBLICZNEJ OCHRONY ZDROWIA NA WĘGRZECH

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- A. Study design/planning
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- B. Data collection/entry
zebranie danych
- C. Data analysis/statistics
dane – analiza i statystyki
- D. Data interpretation
interpretacja danych
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- F. Literature analysis/search
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- G. Funds collection
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Summary

Background. Due to unfavorable working conditions, health professionals often suffer several psychosomatic and somatic symptoms. Although these symptoms could be relieved by physical activity, their lifestyles are often inadequate. We assessed the physical activity levels of workers in the Hungarian healthcare system through the lens of occupational health.

Material and methods. We surveyed the physical activity levels of 285 healthcare workers using the International Physical Activity Questionnaire (IPAQ – Long Form). SPSS 24.0 was used to perform statistical analysis.

Results. According to their overall MET/minute/week values, participants were divided into 3 groups based on physical activity levels: insufficient, sufficient, and high physical activity. The most populated activity category was the high physical activity category with a result of 90.68%. Occupational activity accounted for one-third (32.01%) of total activity scores while leisure time activity accounted for 11.52% of total activity. Correlation analysis was carried out focused on Body Mass Index (BMI), age, and physical activity (PA). Only leisure time activity showed a significant correlation ($p < 0.05$).

Conclusions. Our research acknowledges that physical activity during working hours with respect to the target group does not contribute to physical activity in leisure time.

Keywords: physical activity, occupational health, health promotion, healthcare workers, IPAQ

Streszczenie

Wprowadzenie. Ze względu na niekorzystne warunki zatrudnienia pracownicy ochrony zdrowia często odczuwają wiele skutków somatycznych i psychosomatycznych. Chociaż można je złagodzić dzięki aktywności fizycznej, ich styl życia często okazuje się niewłaściwy. W niniejszej pracy zbadano poziom aktywności fizycznej pracowników węgierskiego systemu ochrony zdrowia z punktu widzenia zdrowia zawodowego.

Materiał i metody. Za pomocą Międzynarodowego Kwestionariusza Aktywności Fizycznej (ang. International Physical Activity Questionnaire, IPAQ – forma rozszerzona) przeanalizowano poziom aktywności fizycznej 285 pracowników ochrony zdrowia. Do analizy statystycznej zastosowano SPSS 24.0.

Wyniki. Zgodnie z ogólnymi wartościami MET/minuta/tydzień uczestnicy badania zostali podzieleni na trzy grupy w zależności od ich aktywności fizycznej (aktywność niewystarczająca, wystarczająca i wysoka). Spośród wszystkich trzech kategorii najczęściej występującą okazała się ta, w której deklarowano wysoką aktywność fizyczną (90,68%). Aktywność zawodowa stanowiła jedną trzecią wyniku całkowitego (32,01%), a aktywność w czasie wolnym – 11,52%. Przeprowadzono analizę korelacji z uwzględnieniem czynnika BMI, wieku i aktywności fizycznej (ang. physical activity, PA). Znaczącą korelację ($p < 0,05$) wykazała jedynie aktywność w czasie wolnym.

Wnioski. Wyniki potwierdzają, że aktywność fizyczna grupy docelowej w czasie pracy nie przyczynia się do aktywności fizycznej w czasie wolnym.

Słowa kluczowe: aktywność fizyczna, zdrowie zawodowe, promocja zdrowia, pracownicy ochrony zdrowia, IPAQ

Tables: 5

Figures: 0

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Introduction

Physical activity (PA) has positive effects on the human body [1,2]. It reduces the risk of circulatory and heart problems, prevents illnesses, and can help maintain the right level of blood pressure and blood sugar. Adequate physical activity is also critical for mental health because it helps defuse tension, therefore releasing stress [3-6]. However, more than one-third of the European population does not get adequate physical activity, even though the World Health Organization (WHO) and the European Union (EU) has implemented several initiatives in connection with physical activity in strategic action plans and proposals [7].

The Global Action Plan for the Prevention and Control of Noncommunicable Diseases 2013-2020 by the WHO sets out the objective to reduce inadequate physical activity by 10%. Inadequate physical activity is defined as less than 150 minutes of moderate-intensity or (its equivalent) aerobic physical activity throughout the week. A person who does not have adequate physical activity may be exposed to health risk factors [8].

Currently, several methods are available to measure the intensity and frequency of physical activity. We can also get sufficient information on physical activity by deploying questionnaires. The International Physical Activity Questionnaire (IPAQ) seems to be the most popular, together with some accelerometer measurements [9-11].

Promoting healthy behaviors is particularly important for those working in the healthcare system, as they serve as role models for their patients, their community, and their colleagues, and they also work in conditions that have a significant impact on their physical and mental health. These conditions include mental and emotional strain as well as strenuous physical activity that affects them negatively. Several studies also confirm that the lifestyle and health behaviors of healthcare professionals is not optimal and because of the unfavorable working conditions, they suffer from a number of psychosomatic and somatic symptoms [12-18].

In our research, we examined the characteristics of health workers' physical activity participation in order to promote healthy behaviors at work.

Material and methods

Recruitment and participants

We assessed the physical activity of 285 health professionals using the International Physical Activity Questionnaire – Hungarian Long (IPAQ-HL) questionnaire. Respondents who took part in vocational training organized by the University of Pécs between February 2018 and November 2018 were voluntarily sampled. Candidates had at least three years of experience in healthcare. Participants were required to not have been diagnosed with any mobility impairments to participate in the study.

The survey was approved by the Regional and Institutional Research and Ethics Committee of the Clinical Centre of the University of Pécs, Hungary (no.: 6955/2017). Participation in the research was voluntary; participants gave their informed consent before the study.

Measurement tools

Socio-demographic characteristics were obtained using questions regarding age, educational level, income, marital status, BMI, and lifestyle habits. Respondents self-reported their body weight and height. BMI was calculated by the authors of the study using the WHO adult classification for BMI.

WHO's recommendation for adults states that people aged 18-64 years should participate in at least 150 minutes of moderate-intensity aerobic physical activity throughout the week, or at least 75 minutes of vigorous-intensity aerobic physical activity throughout the week, or an equivalent combination of moderate- and vigorous-intensity activity to maintain health [6,8].

The validated Hungarian long version of IPAQ-HL questionnaire was used [19], which evaluates physical activity in four specific areas (leisure, workplace, transportation, and home activity), and record the time spent on sitting. In each category, the amount of time spent on physical activity per minute in the past 7 days was multiplied by the scoring Metabolic Equivalent of Task (MET) values, so weekly physical activity results were expressed as MET/min/ week. Based on total scores, participants can be categorized into 3 physical activity categories. High physical activity means at least 3 days of vigorous physical activity of at least 1500 MET/min/week, or at least 3000 MET/min/week for 7 days from a combination of walking, moderate and vigorous physical activity.

Sufficient physical activity covers a combination of walking, moderate and vigorous activity for at least 5 days and a total score of at least 600 MET/min/week. Participants who did not meet the criteria of moderate or high physical activity (<600 MET/min/week) were categorized under insufficient physical activity.

Data analysis

SPSS 24.0 statistics software was used for statistical analysis. Descriptive statistical results are reported as mean \pm standard deviation and number of elements, frequency (%), and median (IQR). According to the results of the normality test (Kolmogorov Smirnov test), the Mann-Whitney test and Spearman correlation analysis were used for statistical analysis of the data. Our results were considered significant ($p < 0.05$).

Results

Respondents included 247 females and 38 men, aged between 21 and 66 (mean age: 44.37 ± 10.38 years). 32.50% of them have higher education qualifications, 67.50% of the respondents have secondary education. Their body weight was an average of 71.26 ± 14.25 kg and their average BMI was 25.45 ± 4.37 kg/m². According to BMI, 49.81% of the respondents were overweight (15.35% of them are obese). Only 22.80% of the respondents do sports in their spare time and the remaining 77.20% are inactive. It is vital to note that this is worse than the national average. The biometric characteristics of the examined group are shown in Table 1 by gender.

Table 1. Age, BMI, height, and weight by gender and total (n=285)

	Male (n=38)		Female (n=247)		Total (n=285)		p
	Mean	SD	Mean	SD	Mean	SD	
Age	40.45	10.86	44.98	10.19	44.37	10.38	.024
BMI	27.04	3.58	25.26	4.43	25.45	4.38	.014
Height (cm)	179.38	7.13	165.6	5.95	167.17	7.49	<.001
Weight (kg)	87.03	11.31	69.37	13.38	71.26	14.25	<.001

The most common activity pattern was the “high” physical activity category with a 90.68% result. 7.17% of respondents were in the “sufficient” category, while only 2.15% belonged to the “inadequate” category. Gender testing did not differentiate between male and female values.

Median of the total MET/min /week was 6248.00 (2928.00-13092.00) while in each domain we received the following values: 2000.00 (0.00-28260.00) for workplace physical activity, 636.00 for transportation (0.005 to 9540.00), 1125.00 (0.00 to 11550.00) for housework, and 720.00 (0.00 to 10998.00) for leisure time. It is remarkable that the highest value was from PA at work and that PA in leisure time was far below this value. Table 2 shows the median of the total MET/minute/week value by gender in the 4 areas.

Table 2. Median physical activity in 4 domains (workplace, transportation, housework, leisure) in MET/min/week by gender measured with IPAQ-HL

	Male		Female		Total		p
	Median	IQR	Median	IQR	Median	IQR	
Work PA (IQR)	2565.00	(732.25; 8272.50)	1980.00	(0.00; 6750.00)	2000.00	(0.00; 6930.00).	0.093
Transportation PA (IQR)	690.00	(222.75; 1765.13)	600.00	(198.00; 1386.00)	636.00	(198.00; 1386.00)	0.560
Housework PA (IQR)	877.50	(112.50; 2482.50)	1140.00	(360.00; 2940.00)	1125.00	(360.00; 2940.00)	0.470
Leisure time PA (IQR)	999.00	(160.88; 2149.50)	693.00	(0.00; 1782.00)	720.00	(0.00; 1809.00).	0.337
Total PA(IQR)	7737.00	(3498.75; 17545.50)	6198.00	(2835.00; 13038.00)	6248.00	(2928.00; 13092.00)	0.363

Females took part in more activities around the house, but in other areas, males had a higher value. The scores of males at work and leisure were more than 25% higher.

The study shows clearly that there was more physical activity at work, as almost one-third of the total score is attributed to the workplace. At the same time, there are huge differences between the minimum and

maximum values. This is probably due to the difference in job descriptions. The scores of nurses and non-medical healthcare professionals shows that they engage in more physical activity during their work. Due to these differences, we looked at how schooling affects the level of physical activity at work. The results of the non-parametric difference test are shown in Table 3.

Table 3. The differences between higher and secondary education professionals and the relationship between BMI and age in terms of PAs by different domains and intensity of PA

	Education (Z value, p value)	BMI (R coefficient, p value)	Age (R coefficient, p value)
Work PA	-1.64 .100	.098 .108	-.027 .654
Transportation PA	-.40 .691	.030 .627	.006 .924
Housework PA	-3.15 .002	.112 .065	.082 .169
Leisure time PA	-1.48 .138	-.163 .007	-.132 .026
Total PA	-2.50 .012	.104 .088	-.011 .851
Vigorous activity	-.15 .885	.002 .970	-.111 .061
Moderate activity	-2.31 .021	.142 .019	.064 .279
Walking	-2.38 .017	.061 .317	-.016 .794

A significant difference in total MET scores was found between home MET values, moderate physical activity, and walking MET scores. In all cases, those with a secondary (or lower) educational qualification had a higher score. A correlation analysis was also performed for BMI, age, and four areas of activity. Only the physical activity in leisure time showed significant correlation ($p < 0.05$).

Table 4 shows the results for males and females in terms of intensity. The average values of both genders are almost the same with respect to walking and show similar values for activities with moderate intensity. However, a significant difference was found in vigorous physical activity, as the total score for males was higher than for females (Table 4).

Table 4. Median and interquartile range (IQR) values of physical activity in MET/min/week for walking, moderate and vigorous activity, and gender difference test

	Male			Female			Total			p
	Median	IQR		Median	IQR		Median	IQR		
Vigorous activity	720.00	150.00	6120.00	1920.00	0.00	2880.00	960.00	0.00	2880.00	0.012
Moderate activity	2700.00	1102.50	5482.50	2377.50	990.00	4920.00	2680.00	1000.00	4960.00	0.892
Walking	1782.00	697.13	4170.38	1485.00	495.00	4158.00	1683.00	511.50	4158.00	0.937
Total activity	7737.00	3498.75	17545.50	6198.00	2835.00	13038.00	6248.00	2928.00	13092.00	.363

The results in Table 5 are quite low. Only 34.04% of the professionals meet WHO's criteria on physical activity, more than a half of the more physically active male healthcare workers do not meet the minimum criteria for physical activity levels.

Table 5. Percentage of participants who meet the physical activity recommendation by WHO

	male % (n=38)	female % (n=247)	total % (n=285)
completed	39.47	33.20	34.04
not completed	60.53	66.80	65.96

Discussion

In this study, the physical activity of healthcare professionals was measured using IPAQ. Only 22.80% of the respondents participate in sports in their spare time, 77.20% of them are inactive. The number of inactive healthcare professionals is higher for females (80.57%), while for males it is 55.26%.

The European population is most affected by overweight and obesity, which has links to several other diseases. Obesity means that the individual's BMI is higher than 30 kg/m². A study of 46 European countries shows that more than 50% of the population is overweight or obese, and this is up to 70% in some countries, especially in southern Europe. The average BMI of the specific population in this study is 25.45 (±4.8). Of the females surveyed, 52.52% fall into the normal or lean (2.10%) categories, 31.94% are overweight, and 15.54% are obese. Among the males, 31.03% had normal BMI, 55.18% were overweight, and 13.79% were obese. This ratio is close to the results of the Hungarian nurses reported in the 2014 survey by Advertis et al. [18]. Research by Bakhshi et al. in a nursing sample of 623 participants showed that 25% of the target group were physically inactive, 25% struggled with alcohol problems, 17% were active smokers before and 11% were currently active smokers, and 47% had normal BMI [20].

49,493 people were interviewed using IPAQ in 20 countries (aged 18-65) between 2002 and 2004 [9]. The aim of the research was to assess how much time adults spend on sedentary lifestyle and to compare these data (by country, age group, gender, educational level and physical activity). The survey showed that adults spend an average of 300 minutes sitting per day. Physical activity showed an inverse correlation: the IPAQ results showed that the less physically active respondents were three times more likely to fall into the group of those who spend the most time sitting instead of being physically active.

However, we do not have adequate literature to get a realistic view of the characteristics of physical activity of nurses in healthcare. In Hungary, a comprehensive study was last conducted in 2014 with the aim of assessing the health status, lifestyle and health behavior of healthcare professionals in occupational health services, and to understand the correlation between certain health behaviors and health promotion activities performed by nurses [18]. The data collection was based on a web-based questionnaire, using simple random sampling techniques involving 344 healthcare professionals in occupational health, who represent 12.3% of the population at national level. Based on self-reported results, the majority of respondents including 175 people (52.24%) are overweight. 57% of them participate in sports at least once a week and 43% do not exercise at all.

The Irish survey, which also examined physical activity in a sample of 203 nurses in healthcare using COPSQ and IPAQ questionnaires [21], is interesting. According to their results, the higher presence of job-related values and expectations increases the degree of physical activity that nurses perform during their work. However, this decreases with advancing age. It means that more than half of the nurses, taking into cognizance their work and leisure time do not have a level of physical activity that would be recommended.

A research group delved into the physical activity of nurses using IPAQ and GPAQ [22]. 43 nurses who participated in the survey had an accelerometer (Sense Wear) for 7 days, then completed IPAQ and GPAQ questionnaires on the eighth day. It was found that although all 43 nurses reported high physical activity during their work, the measured MET data and the intensity of physical activity according to the accelerometer were only classified as low physical activity. At the same time, there was no significant difference in physical activity with low and medium intensity measured by IPAQ and GPAQ ($p>0.05$), i.e. the questionnaires provided the same data. According to the research team, self-filling questionnaires include the possibility of over-measured physical activity, i.e., the classification of individuals into physical activity categories may require more close attention or the use of multiple measuring instruments [22].

A similar phenomenon was reported by another study measuring the level of daily physical activity involving 313 nurses, using a short version of IPAQ and the Sedentary Behavior Questionnaire (SBQ), wearing an ActiGraph GT3X accelerometer (≥ 4 days, ≥ 10 h/day). During the self-declaration, questionnaires produced a median value of 240 and 328 minutes per day, while the accelerometer produced a median value of 434 minutes/day. That is, participants again overestimated the level of their physical activity [23].

Only participating in physical activity during working hours is not worth much with respect to the quality of life if it is not accompanied by an adequate amount of leisure-time physical activity. Activity in the workplace is very high for healthcare professionals, and our research showed extremely high MET/min/week values (Table 2), but the correlation analysis showed significant results only in the relationship between leisure time activity and BMI values. Participating in physical activity at work can only promote healthy behaviors if it is paired with exercise in leisure time. This finding is consistent with several previous research results. One of these included Albert et al. study of the eating habits and physical activity characteristics of nurses, which found that half of the target group was healthy, but more than half showed inadequate physical activity [24]. Both of the areas studied

can only be improved if we increase self-confidence, improve the requirements for a healthier self-image, and reduce the resistance to change by increasing motivation.

Debska et al. surveyed 95 Polish people working in civil organizations about their physical activity [25]. The responses showed that only 45% of respondents meet the recommendation by WHO. In our research, we have less than stellar results (Table 5). Less than 40% of males, and only 33.19% of females met the required criteria. In the whole sample, this ratio is 34.04%. Presumably the physically more exhausting working hours generate these low data. In many cases, healthcare professionals work 12 hours a day, and many of them walk a lot, or perform moderate to strenuous physical activity during the care of patients.

In our survey we delved into whether there are differences in the MET/min/week values of those with secondary and higher education. We found that those with lower education showed activity values twice as high as those with a higher education. In the course of transport, however, the activity level was higher among those with higher education regarding occupational and housework (Table 3). We found a significant difference between walking, moderate physical activity, and home exercise. In all the three cases, those with secondary education showed higher activity. Research by Biernat et al. show similar results in a Polish convenience sample (n=133). In their cases, those with secondary education have higher physical activity than those with higher education. However, it should be noted that the activity of graduates in leisure time is higher than that of respondents of secondary education, which is most likely due to lifestyle needs and the higher proportion of disposable discretionary goods [26].

Prince et al. examined the physical activity levels of a nursing group of 313 with IPAQ and found that the results were below the national average [23]. For nurses, the time spent sedentary was 301±192 (median=240, IQR: 180, 360) minutes/day.

Limitations

The limitations of the study include the sample's non-representative nature, the missing sample size, the lack of randomization of the sampling method, and the lack of objective examination of the biometric characteristics of the respondents. A detailed objective assessment of physical activity, a larger sample size, and randomization of participants is recommended for future studies of physical activity in this sample.

Conclusions

Our study found that healthcare workers perform a lot of physical activity in their work, but the frequency and intensity of exercise in leisure time is inadequate. Although 90.68% of the respondents could be classified as having high physical activity levels. Only 22.80% of respondents participated in sports at least once a week, which is very low compared to the national average. High Physical Activity Scores were generated by the high levels of activity in the workplace and at home (2000 MET/min/week and 1125 MET/min/week), and this was due to the characteristics of the job and the family roles of the respondents. We only observed a significant correlation between BMI and activity during leisure time activity.

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