

SITTING TIME AND SPORT PARTICIPATION OF THE EMPLOYED POPULATION IN HUNGARY AND EUROPE

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ABSTRACT. Introduction. The aim of our study was to examine the participation, motivation and locations of sport activity of adult employed population in Hungary and Europe, highlighting the differences in sport participation among different occupation groups. **Methods.** The Eurobarometer (EB) is a set of international surveys conducted on behalf of the European Commission. The survey consisted of two modules, the 'Standard EB' which contains the core set of questions which are similar in every survey, and the 'Special EB' which included physical activity (PA) and sitting time (ST). In our research we used the Eurobarometer 2013 database. **Results.** According to ST we found significant differences between the European and Hungarian employed adults. Hungarian respondents spent less time with sitting. The proportion of respondents not doing any sports is the highest among Hungarian women (67,44%, CI: 64,24 - 70,64), and those who's occupation is "supervisor", "unskilled or skilled manual worker", or whose job is an "employed position - travelling" or "employed position at desk"(62,64% (CI: 55.58 - 69.70) - 72,41% (CI: 64,11-80,71). **Conclusion.** Our results show that more than one-third of Hungarian employees do not do regular sports, but overall spend less time sitting than the EU average. The amount of sitting and the proportion of inactive respondents is higher among women. Based on our analysis of job types we highlight office administrators' work - with higher rate of females -which includes very little PA. Thus, the increase of PA among women and among administrative workers is the key focus of our further research.

Keywords: *physical activity, sport participation, employees, Eurobarometer*

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Introduction

Sedentary lifestyle is an emerging health risk that is associated with more than three million deaths annually worldwide (Gerovasili et al., 2015, Bennie et al., 2013). Several researches proved that physically active adults are healthier and face significantly lower risk of various chronic diseases compared to those with sedentary lifestyle (Ács et al., 2011; Ács et al., 2014; Jirathananuwat et al., 2017; Szalai et al., 2014; Bergier et al., 2014; Járomi et al., 2012). Furthermore, leisure-time physical activity (LTPA) and sport participation is positively associated with self-rated health and inversely with obesity (Abu-Omar et al., 2008). LTPA is closely correlated with healthy habits taken from home or socioeconomic situation, and a childhood led by healthy lifestyle means a more active adult life (Zeńczak-Praga et al., 2017).

Health status is also influenced by the daily average sitting time (ST). In the research of Lakerveld et al., 18.5% of the respondents reported sitting >7.5h/day, especially higher educated participants and those with white collar jobs (Lakerveld et al., 2017).

In the majority of European countries (25 countries, N=23909) sport participation (SP) among adults is less than 40% (Tuyckom et al., 2010). Demographic data shows that more men engage in physical activity than women. This is confirmed by the research of Velde et al., claiming that men are more engaged in physical activity (PA) during free-time than women (Velde et al., 2010). Research by Gerovasili aptly summarizes the socio-demographic factors in play, arguing that males, younger persons, and those living in rural areas, possessing higher education degrees or having at least moderate financial circumstances were independently associated with higher physical activity, especially LTPA (Gerovasili et al., 2015).

Sport participation is determined by different psychological motivation factors. Among other aspects, the Eurobarometer PA survey examined European respondents' motivation for sport. It revealed that the most motivated respondents lived in Sweden, Denmark and Finland, while Hungary – as most Central- and Eastern-European states – belonged to the countries with lower level of motivation. However, the least motivated county in the research proved to be the Netherlands. The results revealed two main motivational factors: physical appearance (including weight management) and social reasons (social activity and the need to be with friends) (Rios et al., 2013).

However, the frequency of sports participation of males and females appear to be affected by different factors. Women are affected more by a need to improve self-esteem, while men are more keen to produce social integration (Downward et al., 2014).

Yet, when we examine PA participation, it is important to evaluate environmental factors as well, such as the availability of sport facilities or the climatic features of the given country (Watanabe et al., 2017).

Lavery (2018) et al found association between higher mean annual temperatures and levels of physical activity: an increase in the mean annual temperature by 1°C was associated with 0.94 fewer minutes of vigorous-intensity activity per week (Lavery et al., 2018). Furthermore, the perception of opportunities for physical activity locally was associated with increased levels of all types of PA (Filippidis et al., 2016).

Jirathananuwat et al (2017) summarized in their review the five factors which together can be used as the basis of a well-established intervention to increase PA. The five factors are: predisposing factor (information, self-motivation, program training), enabling (instrument resource and enabled health service), reinforcing (campaign, competition, prizes, money/financial incentive, and rewards for participants), social support (family support, group meeting, group support), policy regulatory domain (protocols), and the environmental development domain (for example lunchtime walking or cycling groups, promoting stairway signs, etc).

Another 12-week worksite physical activity intervention's aim was to target a goal of 10,000 steps per day on reducing anthropometric indices, blood pressure indices, and plasma biomarkers of cardiovascular disease (CVD) risk among the employees who participated in the 12-week physical activity intervention (3x60 min/week). On average, 28% of participants adhered to the goal of 10,000 steps per day and according to the study's results there was no benefit for compliance to the goal of 10,000 steps per day (Corbett et al., 2018).

Skogstad's (2018) research focused on facilities and leisure time PA-initiatives. The study described a 15-month follow-up after an 8-week PA-initiative delivered at the workplace, investigating if improvements in cardiovascular risk status are sustainable. Participants reported an increase in LTPA during the 8-week follow-up, but the PA was back to baseline levels at the final, 15-month follow-up.

A workplace intervention was conducted over 40 days targeting insufficiently active and/or obese adults; separated in two groups in the after-work (n = 25) or in-work group (n = 23) with a goal as 60 min PA/day, or a control group (n = 23). The after-work group undertook more vigorous PA and had greater weight loss and lasting blood glucose improvement, relative to the in-work participants and controls (Burn et al., 2017).

A number of research programs examined PA of adult employees and several interventions aimed to maintain employees' health and increase their PA. However, the above references prove that a short-term PA intervention is not sufficient – it is not enough to encourage employees to sit less or walk more during work. The results show that long-term results can only be achieved by systematic, weekly sport participation after working hours, as part of the overall lifestyle.

Objectives

The aim of our study was to examine the sport participation, sitting time, sport motivation and sport location of adult employed population in Hungary and Europe (EU) and to explore the differences in various occupational groups to form a well-aimed intervention promoting increased PA among the target group.

Methods

The Eurobarometer (EB) is a set of international surveys conducted on behalf of the European Commission. The survey consists of two modules: the 'Standard EB' which contains the core set of questions that are similar in every survey, and the 'Special EB' which includes physical activity and sitting time. For each survey independent samples were drawn from each EU member state using a multi-stage, random sampling design with probability proportional to population size and population density. The research included 27 countries in 2013 with 27,919 respondents altogether. Data was collected in November-December 2013. All interviews were conducted face-to-face in the respondent's home and in the respective national language. Computer-assisted personal interview (CAPI) technique was used in countries where it was available and, where unavailable, paper and pencil questionnaires were conducted (Eurobarometer, 2013). Our research based on Eurobarometer 2013 database and we examined the sport participation, sport motivation - barriers and sport location, and demographic questions such as gender, age, marital status, place of living, and occupation. To compare PA and demographic variables we applied chi-square tests using SPSS 22.0 software.

Results

Demographic data reflected by Table 1 revealed that both genders were equally represented in the study. More than half of the respondents were married. Our results proved similar to the European average in terms of age and residence as well. One-third of the participants lived in villages or towns, another third of them lived in medium- or major cities of Hungary. Majority of the respondents were middle-aged. In light of all the above we claim that our sample sufficiently represents the population in focus (Table 1).

Table 1. Demographic parameters of the Hungarian (HU) and European (EU) sample

	HU		EU	
N	474 N/%		11514 N/%	
Gender				
Male	259	54.65	5475	47.55
Female	215	45.35	6039	52.45
Marital status				
Married	253	53.43	6390	55.50
Single living with partner	99	20.95	1728	15.01
Single	72	15.24	1967	17.08
Divorced	43	9.09	1023	8.88
Widow	6	1.29	264	2.29
Other/not responded	-	0.00	142	1.23
Place of living				
Village	163	34.33	3650	31.70
Small or middle town	130	27.38	4364	37.90
Big cities	181	38.29	3494	30.35
Age groups				
15 - 24	50	10.55	721	6.26
25 - 34	114	24.10	2571	22.33
35 - 44	156	33.01	3064	26.61
45 - 54	106	22.34	3121	27.11
55 - 64	46	9.62	1762	15.30
65 years or more	2	0.38	275	2.39

Time spent sitting is lower among Hungarian respondents compared to the EU average. We found significant difference between genders among both the Hungarian and the EU respondents, men spending less time sitting. Twice as many Hungarian male respondents reported to sit 2h 30 minutes (min) or less per day on average than in the EU, and there are about 10 percentage points less Hungarian respondents who belong to the 5h 31 min – 8h 30 min and the 8h 31 min or more categories compared to the EU sample. In terms of female respondents, Hungarian women reported less time sitting than women in the EU, but the differences are smaller than those in case of men (Table 2).

Table 2. Average daily sitting time among HU and EU respondents by gender

	HU		EU	
	Male	Female	Male	Female
	p=0.049	$\chi^2=7.82$	p<0.001	$\chi^2=20.56$
2h 30min or less	33.99%	29.11%	18.34%	19.53%
2h 31min to 5h 30min	46.25%	39.91%	42.92%	38.80%
5h 31min to 8h30min	15.02%	23.94%	25.57%	28.02%
8h31min or more	4.74%	7.04%	13.17%	13.65%

We found differences in sport participation in terms of gender in both groups. Generally, sport participation is higher among men. There is no significant difference between sport participation in Hungary and the EU, although the proportion of those who never or seldom do sports is higher among Hungarian employees (58.08% confidence interval (CI): 55.01 – 61.15; 67.44% CI: 64.24 – 70.64) (Figure 1).

Although Hungarian respondents spend less time sitting compared to the EU average, respondents from the EU spend more time doing PA compared to Hungarians.

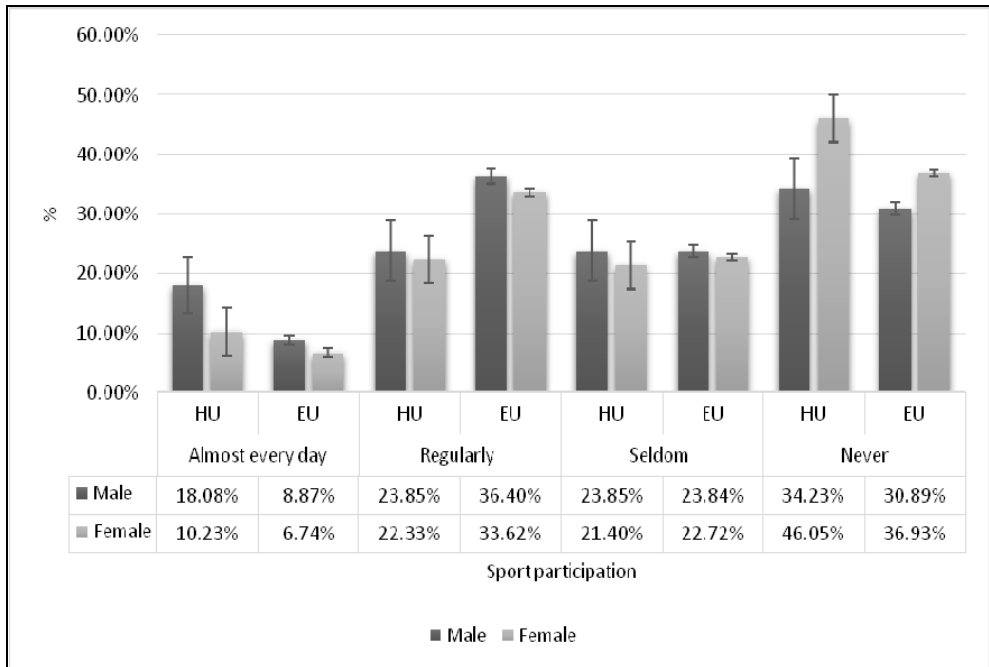


Fig. 1. Frequency of the sport participation among EU and HU employees by gender

In the following section we explore the connection between sport habits with occupational forms. The Eurobarometer survey distinguished between 9 occupational groups. One of these – the general managers – did not appear in the Hungarian sample. Figure 2 shows the Hungarian and European respondents who never or seldom play sports, grouped by various types of occupation. Our results show that the proportion of respondents not doing any sports is the lowest among top-level and general managers, and highest among supervisors, skilled and unskilled workers, employed with travelling and “at desk” position.

In the EU respondent group, the lowest level of sport participation was reported by unskilled manual workers, skilled manual workers, workers in service jobs, supervisors and employees who travel during work (Figure 2).

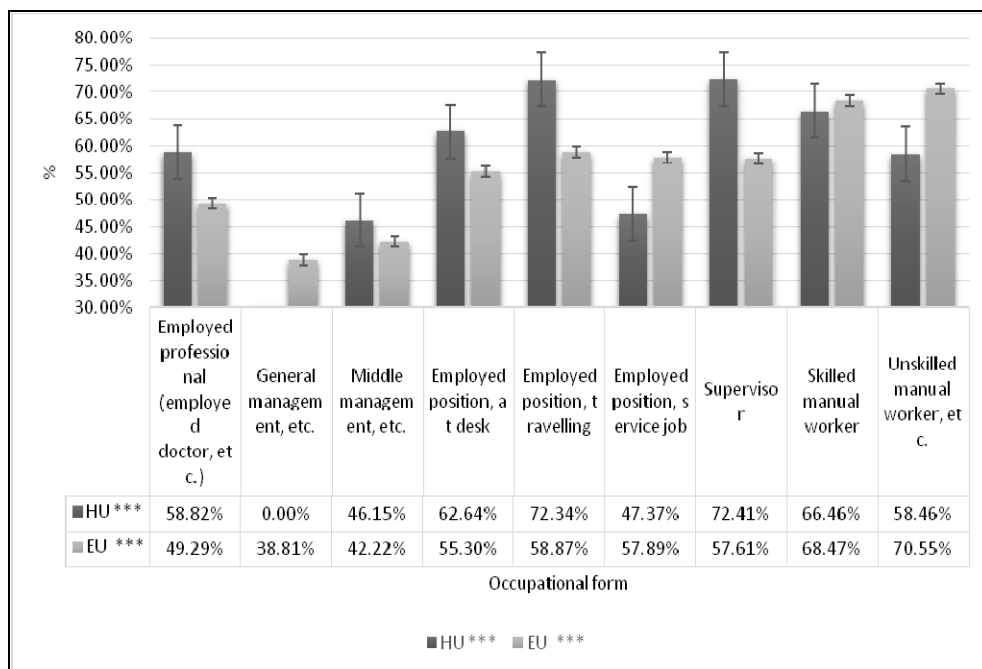


Fig. 2. Frequency of the employees who never or seldom do sports, by location and occupational form (% , * $p > 0.05$; ** $p < 0.05$; *** $p < 0.01$)

Furthermore, in this research we examined which motivational factors are considered the most important regarding sport participation. Hungarian and European respondents alike claimed that fitness, relaxation and health are the most important factors of motivation during sport.

We also examined the reasons behind the behavior of those opting out of sports. For Hungarian respondents, it was the lack of time, money and motivation (Figure 3). The first three most frequent sport barriers found in the European study are similar to the Hungarian results, and we found no differences between the two samples in terms of gender or the type of occupation.

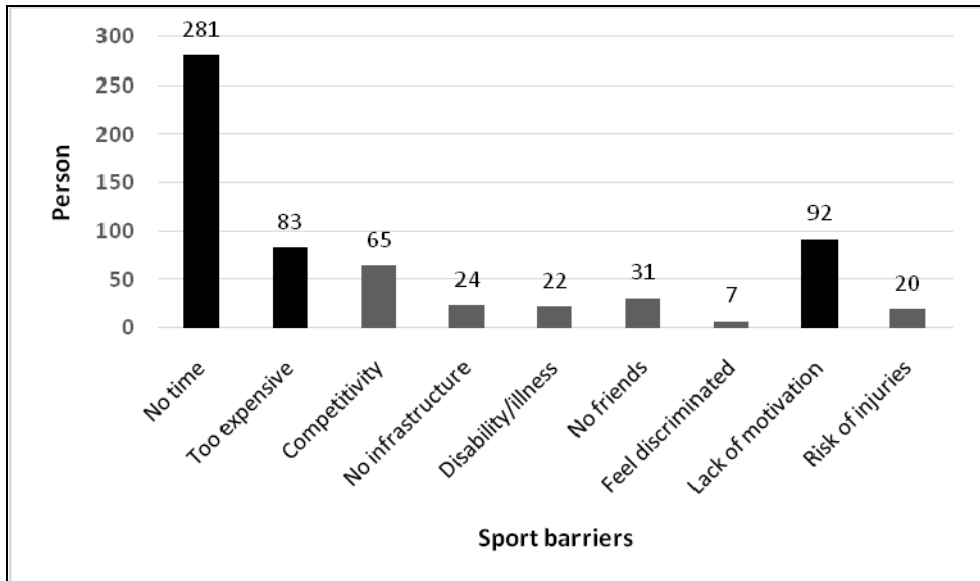


Fig. 3. Sport barriers among the Hungarian employees who not do any sport activities ($p < 0.01$)

Finally, we mention our results on the location where Hungarian respondents play sports. This reflects that more than half of both the male and female respondents claimed that the access to local sport facilities was satisfactory.

Discussion

This research revealed that 58.05% of Hungarian male employees and 67.44% of Hungarian female employees do not play sports at all or do it once a month at most. In comparison, the Eurobarometer 2013 study claims that 62% of the Hungarian population never or seldom play any sport. Tuyckom et al. (2010) research revealed that in the majority of European countries ($N=23909$ in 25 European countries) sport participation is less than 40%. We suggest that in countries with lower sport participation, policy makers should engage more in increasing PA to maintain a healthy society. Increasing PA of women should be of primary importance.

Hungarian employees spend less time sitting than the European average. Research ($N=27637$, 15-98 years old population) of Bennie et al revealed that mean reported weekday sitting time was 309 min/day (SD 184

min/day). There was a broad geographical pattern and some of the lowest amounts of daily sitting were reported in Southern- (Malta and Portugal, means 194-236 min/day) and Eastern- (Romania and Hungary, means 191-276 min/day) European countries; and some of the highest amounts of daily sitting were reported in Northern countries (Bennie et al., 2013).

However, research by Milton et al supports the claim that the proportion of those who spend more than 7h 30 min daily with sitting is decreasing among the European population, from 27.7% to 19.0%.

Proportion of respondents who do not do any sports is lowest among employed professionals and general managers, and highest among middle managers, supervisors, skilled manual workers, employees working at desk or those traveling during their work (Milton et al., 2011).

The aim of Mullane et al's 2017 research's was to identify socio-ecological correlations of objectively measured sedentary behavior at the workplace in academic, industrial, and government sectors, with an active PAL-micro accelerometer. According to their results walking at lunch was positively associated while face-to-face interaction was negatively associated with prolonged sitting. Individuals in private offices sat more than those in public offices.

Our research and the results of Mullane also underline that increasing sport participation is key for the population conducting sedentary work.

Furthermore, our research revealed lower sport participation engagement among women, thus our results support the claim that it is important to motivate female workers to participate in intervention programs aiming to increase PA (Bergier et al., 2014, Salonna et al., 2015).

Our results showed that the biggest difference to average European and Hungarian sport participation scores were found among women and employees doing sedentary work or having to travel during work. Thus, additional attention should be paid to the inclusion of these target groups during preparation of intervention aimed at adult employees. We shall note however, that it is not satisfactory to simply include these groups to sport activities – long-term increase of PA requires the initiation of complex programs.

Shift in the work environment caused effective changes in the PA increase. Short activities during working hours proved to be less effective than after-work sports conducted three times a week. Peer support and motivation is highly important in reaching long-term goals (Jirathananuwat et al., 2017).

Supportive workplaces may reach important milestones in terms of increasing PA and engagement in sports. Effectiveness of healthy and active employees comes to surface during their daily job performance as well (WHO, 2010).

Conclusion

Physical activity of the adult employed population strongly influences a country's wellbeing. Physically active lifestyle supports the increase of quality-adjusted life years. In our research, sport participation of manual and sedentary workers showed the lowest rate – PA rate of manual workers is potentially higher due to occupational features. Strengthening the engagement of sedentary workers in playing sports is a potentially key goal for intervention programs aiming to increase health at the workplace.

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