LEISURE TIME, OCCUPATIONAL, DOMESTIC, AND COMMUTING PHYSICAL ACTIVITY OF INHABITANTS OF THE CZECH REPUBLIC AGED 55–69: INFLUENCE OF SOCIO-DEMOGRAPHIC AND ENVIRONMENTAL FACTORS

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The assessment of multiple domains of physical activity is considered to be necessary for global physical activity surveillance and might be useful for the recognition of the effects of physical activity on health.

The aims of this study were twofold: firstly to analyze moderate physical activity and walking within the leisure time, domestic, occupational and transport related domains of the inhabitants of the Czech Republic aged 55–69, and secondly, to investigate the socio-demographic and environmental factors which can influence meeting physical activity recommendations in leisure time, domestic, occupational and transport related domains.

The long version of the International Physical Activity Questionnaire (IPAQ) was used to assess physical activity in 320 randomly selected inhabitants of the Czech Republic aged 55–69. They also answered additional questions on socio-demographic and environmental factors.

Meeting moderate physical activity recommendations was significantly associated with elementary education, the age group 55–59 (compared to the age group 65–69), living in a house and non smoking whereas the likelihood of meeting the walking recommendation was connected only with having an occupation. Different socio-demographic and environmental factors were associated with moderate physical activity and walking within different domains.

These factors should be taken into consideration, particularly when creating a successful PA promotion strategy tailored to Czech national specifics.

Keywords: Physical activity, older people, socio-demographic and environmental factors, IPAQ, lifestyle domains.

INTRODUCTION

Physical inactivity is an important risk factor of chronic diseases worldwide, although there are substantial variations across countries (Guthold et al., 2008). Therefore increasing overall physical activity is a health priority in many nations (World Health Organization, 2002). Although the Czech Republic belongs among countries with the most prevalent high physical activity (Bauman et al., 2009), the Czech epidemiological study of adults (Frömel, Mitáš, & Kerr, 2008) showing 60% of males and around 40% of females being overweight or obese is alarming.

The assessment of multiple domains of physical activity is considered to be necessary for global physical activity surveillance (Bauman et al., 2009) and might be useful for the recognition of the effects of physical activity on health (Abu-Omar & Rütten, 2008). An analysis of physical activity within different lifestyle domains can be also relevant during periods of life transitions when they could lead to changes in physical activities, mainly on a daily basis. The age between 55–69, which is examined in this study can be considered to be a period of preretirement and retirement including the life transition from work to retirement.

The results of the study investigating meeting moderate and vigorous physical activity and walking guidelines in adults aged 24–64 in the Czech Republic (Frömel, Mitáš, & Kerr, 2008) suggest that only meeting vigorous physical activity requirements is inversely related to age. Hence, further examination of moderate physical activity and walking in late adulthood of the inhabitants of the Czech Republic might be important.

Since studies investigating physical activity within multiple lifestyle domains and emphasizing preretirement and retirement periods are missing in the Czech Republic, the aims of this study were therefore twofold. Firstly, to analyze moderate physical activity and walking within the leisure time, domestic, occupational and transport related domains in the inhabitants of the Czech Republic aged 55–69, and secondly, to investigate the socio-demographic and environmental factors which can influence meeting physical activity recommendations within leisure time, domestic, occupational and transport related physical activities.

METHODS

Participants and Setting

This study was participated in by 320 participants (173 male and 147 female) aged 55–69. The sample included adults and older adults from all 14 regions of the Czech Republic. A systematic random sampling from the Czech national address point database was used to identify the participants. Residents of every tenth house in housing areas or every tenth apartment in apartment block areas in a selected location were visited. If the resident at the selected address refused to participate, the inhabitants in the next house (apartment) were approached. All inhabitants who agreed to participate provided written consent and received a questionnaire to complete.

Measurements

Physical activity

The self administrative version of the "International Physical Activity Questionnaire" IPAQ (Craig et al., 2003) was used to assess physical activity levels. The Czech version was translated from English and complied with standardized translating guidelines, including back translation into English (www.ipaq.ki.se). The IPAQ long version investigated walking in free domains: work related (paid jobs, farming, and voluntary jobs), leisure time (recreational and sport activities) and the active transportation domain; and moderate PA and vigorous PA in three life domains: work related (paid jobs, farming, and voluntary jobs), house and gardening work (outside and inside the home), and the leisure time domain (recreational and sport activities). Physical activity was measured in frequency (days) and duration (in minutes; at least 10 minutes at a time) as a level of PA in the past seven days (www.ipaq.ki.se).

Socio-demographic and environmental variables

Participants also provided socio-demographic information on their age, gender, family status, number of years of completed schooling, employment, material conditions (owning a bike, a car, and a weekend house), dog ownership, and smoking, and environmental information on location (size of town where respondents lived) and type of residence. Body mass indexes of all respondents were obtained, too, calculated from subjectively recorded data (weight in kg and height in cm). Detailed characteristic of the participants according to these variables are shown in TABLE 1.

Data analysis

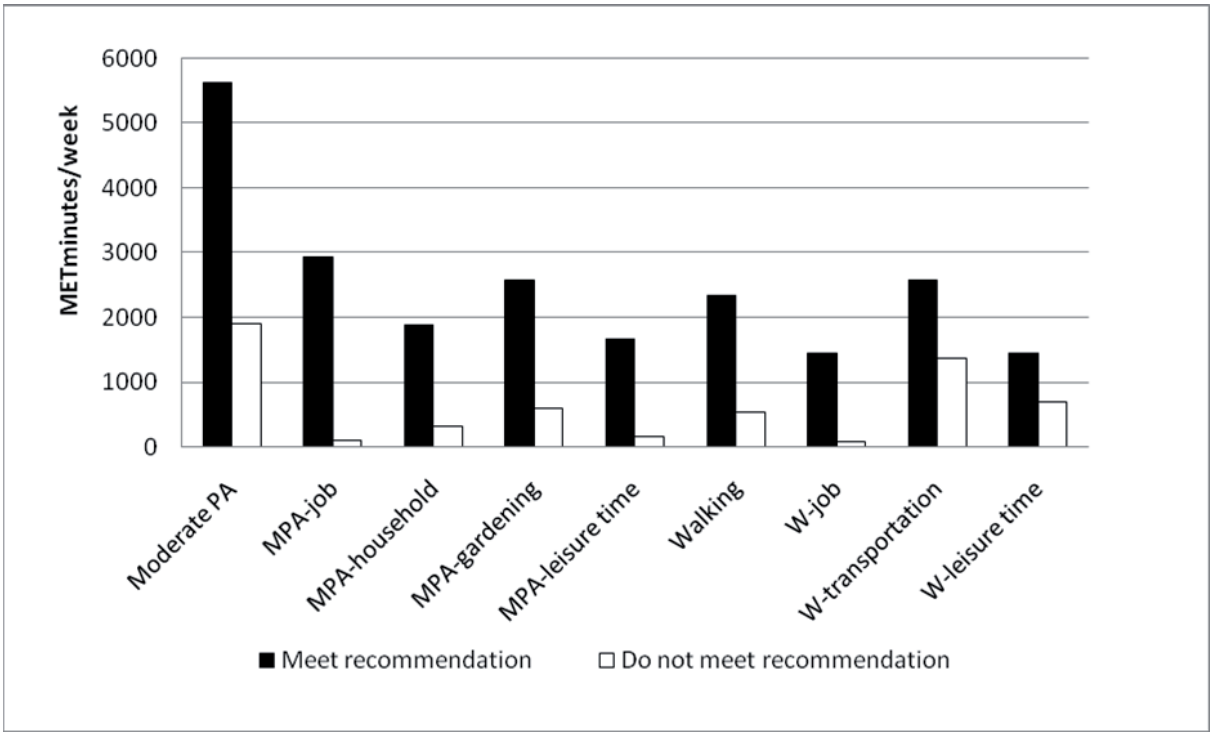
The results of physical activity were processed according to the guidelines of the "IPAQ Research Committee" www.ipaq.ki.se). Physical activity was translated into MET-min./week. Moderate and vigorous physical activity and walking were quantified by the amount of time spent in each activity and then summed up according to the intensity of the physical activity.

Software SPSS Statistics, version 17.0 (SPSS Inc., Chicago, USA) was used to statistically process the data. Descriptive statistics (mean and standard deviation) were calculated for each variable. Binary logistical regression (forward stepwise method) was used for dichotomous outcomes: reaching recommendations for moderate physical activity within different domains and for walking within different domains as dependent vari-

TABLE 1
Characteristic of the respondents according to socio-demographic and environmental factors

Characteristics of participants							
		n	**%**			**n**	**%**
Gender	male	173	54.1	**Education**	Elementary	87	27.2
	female	147	45.9		Secondary	177	55.3
Age	55–59	165	51.5		University	56	17.5
	60–64	86	26.9	**Smoking**	No smoker	237	74.1
	65–69	69	21.6		Smoker	83	25.9
Residence	House	174	54.4	**Family status**	Alone	39	12.2
	Block	146	45.6		In family	179	55.9
Employment	No	162	50.6		In family with children	102	31.9
	Yes	158	49.4	**Dog**	No owning	192	60.0
Location	> 100	63	19.7		Owning	128	40.0
	30–100	98	30.6	**Bike**	No	96	30.0
(thousands)	1–29.9	111	34.7		Yes	224	70.0
	< 1	48	15.0	**Car**	No	95	29.7
BMI	> 25	82	25.6		Yes	225	70.3
	< 25	238	74.4	**Cottage**	No	201	62.8
					Yes	119	37.2

Fig. 1
Difference in MET-minutes per week between respondents who meet and do not meet recommendations in different domains of moderate physical activity and walking



Legend:
MPA – moderate physical activity
W – walking

ables. For moderate physical activity and walking cut offs, the U. S. Healthy People 2010 guidelines, recommending 30 minutes five times a week were used. Binary logistical regression was not applied in the case of vigorous physical activity domains, since over 80% of the participants did not accomplish the recommendation for vigorous physical activity.

The independent variables were entered into the model in binary logistical regression – forward stepwise method, including age (split into three groups 55–59, 60–64, 65–69), gender**,** BMI (< 25, ≥ 25), family status (alone, in family, family with children), completed education (elementary school, secondary school, university), employment status (employed, unemployed), smoking (smoker, non smoker), dog ownership and ownership of a bike (yes, no), car (yes, no) and cottage (yes, no), residential status (house or flat in large block of flats) and location (large city – more than 100,000 inhabitants, small city – 30,000 to 99,999 inhabitants, medium town – 1,000–29,999 inhabitants and location with less than 1,000 inhabitants). The first group in each category was the referent group in each binary logistical regression analysis.

TABLE 2
Meeting moderate PA and walking guidelines within four life domains

			Walking		Moderate PA	
			n	%	n	%
Work		Men	45	26.0	32	18.5
		Women	28	19.0	16	10.9
		Total	73	22.8	48	15.0
Active transportation		Men	69	39.9		
		Women	58	39.5		
		Total	127	39.7		
Domestic and garden domain	**Household**	Men			21	12.1
		Women			50	34.0
		Total			71	22.2
	Gardening and yard work	Men			40	23.1
		Women			44	29.9
		Total			84	26.3
Leisure time		Men	28	16.2	6	3.5
		Women	28	19.0	4	2.7
		Total	56	17.5	10	3.1

TABLE 3
The socio-demographic and environmental factors significantly influencing the recommended values of moderate physical activity within different domains

Meet moderate PA recommendation (30 minutes 5 times a week)					**Meet moderate PA recommendation within household activities**				
	n	**%**	**OR**	**CI**		**n**	**%**	**OR**	**CI**
Age					**Gender**				
55–59	95	56.5	Ref.		Male	21	12.1	Ref.	
60–64	42	25.0	.59	.34–1.03	Female	50	34.0	4.27*	2.33–7.84
65–69	31	18.5	.51*	.28–.94	**Family Status**				
Education					Alone	6	15.4	Ref.	
Elementary	55	32.7	Ref.		In family	44	24.6	3.56*	1.3–9.75
Secondary	92	54.8	.52*	.30–.90	In family with children	21	20.6	3.68*	1.23–11.06
University	21	12.5	.27*	.13–.56	**Location (thousands)**				
Residence					> 100	11	17.5	Ref.	
House	104	61.9	Ref.		30–100	18	18.4	.87	.45–2.59
Block	64	38.1	.58*	.36–.92	1–29.9	36	32.4	.05	.99–5.1
Smoking					< 1	6	12.5	.55	.23–2.22
No smoker	134	79.8	Ref		**Bike**				
Smoker	34	20.2	.50*	.29–.84	No	30	31.3	Ref	
					Yes	41	18.3	.45*	.24–.82
Meet moderate PA recommendation within gardening activities					**Meet moderate PA recommendation within job**				
	n	**%**	**OR**	**CI**		**n**	**%**	**OR**	**CI**
Education					**Employment**				
Elementary	28	33.3	Ref.		No	4	2.5	Ref.	
Secondary	49	58.3	.75*	.42–1.34	Yes	44	27.8	20.55*	7.05–59.9
University	7	8.3	.27*	.11–.69					
Residence					**Education**				
House	60	71.7	Ref.		Elementary	13	14.9	Ref.	
Block	24	28.6	.41*	.23–.71	Secondary	30	16.9	.84	.38–1.86
Smoking					University	5	8.9	.20*	.06–.63
No smoker	72	85.7	Ref						
Smoker	12	14.3	.38*	.19–.75					

Legend:
OR – odds ratio
CI – confidential interval
*p < .05

RESULTS

From the total sample, 52.5% of respondents (151 respondents) accomplished the recommended minimum for moderate physical activity and 54.4% of respondents (174 respondents) met the recommended values for walking. After dividing moderate PA and walking into four domains it was shown (TABLE 2) that almost 40% of respondents met the walking recommendation within the active transportation domain, 23% during working hours and 17.5% during their leisure time. Furthermore, the highest percentage of respondents accomplished the fulfillment of moderate PA guidelines within the framework of domestic and garden PA, 15% of respondents within the confines of their jobs and only 3% met the recommendation during their leisure time.

TABLE 3 shows that the respondents were more likely to be moderately active if they were 55–59 years old (compared to 65–69 years old), had completed elementary education (compared to people who had completed secondary and/or university education), lived in houses and were not smokers. To be elementary educated (compared to having a secondary and/or university education), to live in a house and be a nonsmoker

were associated with meeting moderate physical activity guidelines within the realm of gardening and yard activities. Different significant factors were found in the analysis of household activities. Females, people living in a family or in a family with children, in cities with more than 100 thousand inhabitants and not owning a bike were more likely to meet the recommended values of moderate PA within the household domain. The likelihood of meeting moderate PA guidelines while on the job was associated with employment (an expected factor) and elementary education (as compared to university education). Due to the low sample, to analyze meeting PA guidelines in leisure time, logistical regression could not be used.

TABLE 4
The socio-demographic and environmental factors significantly influencing the recommended values of walking and walking in leisure time

Meet walking recommendation (30 minutes 5 times a week)				
	n	**%**	**OR**	**CI**
Employment				
No	76	43.7	Ref.	
Yes	98	56.3	1.85*	1.19–2.89
Meet walking recommendation in leisure time (30 minutes 5 times a week)				
	n	**%**	**OR**	**CI**
Education				
Elementary	12	13.8	Ref.	
Secondary	40	22.6	1.83	.90–3.69
University	4	7.1	.48	.15–1.57

Legend:
OR – odds ratio
CI – confidential interval
*p < .05

TABLE 4 presents factors that are significant while meeting the walking recommendation. Employed people were more likely to meet the weekly guidelines for walking. Furthermore, secondarily educated people were more likely to accomplish walking guidelines in their leisure time. No significant factors associated with meeting the recommended values for walking within the work and active transportation domains were found.

Differences in the domains of moderate physical activity and walking between respondents who met and did not meet recommendations are presented in Fig. 1.

Moderate physical activity consists of four domains (occupational, domestic, garden, leisure time) and Fig. 2 describes the percentage of respondents who met recommendations for moderate PA in a different number of domains. Most people accomplished it only in one

Fig. 2
Percentage of respondents who met guidelines for moderate PA in various numbers of domains

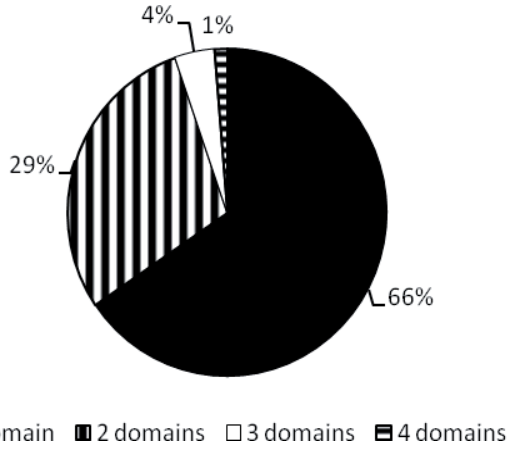
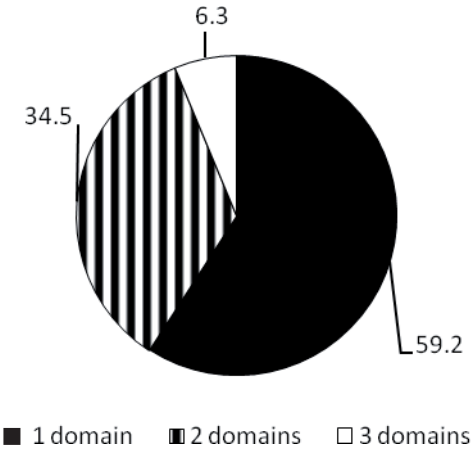


Fig. 3
Percentage of respondents who met guidelines for walking in various numbers of domains



domain (65.5%) and only 2 participants (1.3%) in all four domains. Walking consists of three domains (occupational, transport related, leisure time) and Fig. 3 shows that 59.2% of respondents met guidelines only in one domain and 6.3% of respondents (n = 11) in all three domains.

DISCUSSION

In this study, moderate physical activity and walking within different lifestyle domains and their relationship to socio-demographic and environmental factors were investigated. Results show the domain related effects on meeting physical activity recommendations. Furthermore, differences in factors influencing physical activ-

ity within particular domains indicate the legitimacy of domain specific studies, particularly when successful national promotion strategy should be conducted.

In recent years, the link between health indicators and leisure time physical activity, particularly walking, has been supported in studies in developed (Abu-Omar & Rütten, 2008) as well as developing (Hallal et al., 2005) countries. In this study, the BMI factor was not significantly associated with either moderate physical activity nor with walking in all domains. However, considering the importance of leisure time physical activity, the fact that only 3.1 of respondents reached the recommended value for moderate physical activity and 17.5% for walking might be of particular interest to the Czech health promotion strategy. On the other hand, over 50% of the sample met the walking recommendation and also a comparative international study confirms that the Czech Republic belongs among countries with substantial rates of physical activity, having 30% of their overall physical activity consisting of walking (Bauman et al., 2009).

The results of this study revealed a diversity of factors significantly influencing reaching moderate physical activity in gardening and household activities. Whereas significant factors related to moderate PA within the realms of garden and yard work are similar to the factors influencing overall moderate PA, the factors significantly associated with moderate PA within household activities differing from the first ones completely. It is an important finding since both household and gardening activities are always within the housework domain.

Education seems to be a significant factor of different domains and also in overall moderate physical activity and walking. This relationship is clear from previous studies (Ball et al., 2007), however the results vary (Bergman et al., 2008; Brown et al., 2005; Giles-Corti & Donovan, 2002). In this study, people with a lower education level were less likely to meet the recommendation within the realm of leisure time walking, but were more likely to reach recommended values within overall moderate physical activity and moderate physical activity within one's job and while gardening. This is in agreement with a study done by Fogelman, Bloch and Kahan (2004) who also found that people with fewer years of education engaged in more physical activity at work.

Based on results from this study, age was the significant factor related to moderate physical activity, where participants aged 65–69 were less likely to reach recommendations compared to participants aged 55–59. The inverse relationship between age and physical activity and on the other hand, the linear relationship between age and physical inactivity was confirmed across all European countries in a 51 country survey (Guthold et al., 2008) and in people with and without disabilities (Brown et al., 2005). However, in this study, age was not found to be a significant factor for moderate physical activity within the realm of gardening as well as for walking. These findings indicate that gardening and yard work might be a way of how to increase the daily portion of moderate physical activity regardless of age. Furthermore, the results confirm that walking could be the most appropriate activity for adults and older people, one they can benefit from and which has a great potential in PA promotion (Masurier et al., 2008).

Considering the age of the participants (55–69) and the period of preretirement and retirement, the factor of employment is crucial. In this study, being employed was associated with the likelihood of meeting walking guidelines. However, this factor was not significant in either the active transportation domain nor in leisure time walking. It suggests that walking within working hours appreciably contributes to daily walking. The study of Slingerland et al. (2007) demonstrates a decline in physical activity from work related transportation in association with retirement, which is not substituted for with any sport or non sport leisure time activity. Nevertheless, a number of studies have confirmed an increase of physical activity as a result of having more free time in the retirement period (Brown et al., 2005; Mein et al., 2005; Shepard, 1998).

Strengths of the study are its detailed characteristics and the analysis of domain related physical activity but there also some limitations. Although using a randomly selected sample, the multilevel modeling might be more valuable if we had used a larger sample. Furthermore, an analysis of vigorous physical activity related domains would bring more complex results. Another limitation is found in the measurement techniques used (Bauman et al., 2009).

CONCLUSION

Domain related effects on meeting moderate physical activity and walking were examined in this study. A diversity of factors significantly influencing meeting recommendations was found between moderate physical activity and walking and among particular domains within the moderate physical activity category. These findings should be taken into consideration, particularly when successful promotion strategies are to be conducted and tailored to national specifics.

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POHYBOVÁ AKTIVITA OBYVATEL ČESKÉ REPUBLIKY VE VĚKU 55–69 LET PROVÁDĚNÁ V RÁMCI VOLNÉHO ČASU, ZAMĚSTNÁNÍ, V DOMÁCNOSTI A PŘI PŘESUNECH: VLIV SOCIO-DEMOGRAFICKÝCH A ENVIRONMENTÁLNÍCH FAKTORŮ

(Souhrn anglického textu)

Výzkum pohybové aktivity z hlediska odlišných oblastí života se jeví jako přínosný pro celosvětové komparační studie a pomáhá detailněji zjišťovat efekt pohybové aktivity na zdraví člověka.

Cíle této studie byly dva: za prvé analyzovat středně zatěžující pohybovou aktivitu a chůzi v rámci pohybových aktivit prováděných ve volném čase, v domácnosti, v zaměstnání a při přesunech u obyvatel České republiky ve věku 55–69 let a za druhé zjistit, které socio-demografické a environmentální faktory mohou mít vliv na plnění doporučení k pohybové aktivitě prováděné ve volném čase, v domácnosti, v zaměstnání a při přesunech.

Dlouhá verze mezinárodního dotazníku k pohybové aktivitě (IPAQ) byla využita pro zjištění pohybové aktivity u 320 náhodně vybraných obyvatel České republiky ve věku 55–69 let. Respondenti také zodpověděli doplňkové otázky vztahující se k socio-demografickým a environmentálním faktorům.

Plnění doporučení k středně zatěžující pohybové aktivitě bylo spojeno se základním vzděláním, věkem 55–59 let (při srovnání s věkem 65–69), bydlením v rodinném domku a nekuřáctvím, zatímco významným faktorem pro plnění doporučení k chůzi byl pouze faktor zaměstnání. Odlišné socio-demografické a environmentální faktory významně ovlivňují plnění doporučení k pohybové aktivitě při zkoumání pohybové aktivity ve volném čase, v domácnosti, v zaměstnání a při přesunech

Tato zjištění je potřeba brát v úvahu, zejména pokud by měla být, s ohledem na česká specifika, vytvořena úspěšná strategie na podporu pohybové aktivity u lidí předdůchodového a důchodového věku.

Klíčová slova: pohybová aktivita, starší lidé, socio-demografické a environmentální faktory, IPAQ, domény životního stylu.

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