



Factors Determining Participation in Leisure Time Physical Activity among Former Athletes and Male non Athletes

by

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The aim of the study was to compare the impact of socioeconomic factors and self-rated health on participation in leisure time physical activity (LTPA) among former athletes and male non athletes. In the spring-summer of 1997 – 2002, two groups of males between the ages of 18 – 51 years were enrolled in the study: former athletes (n=175) and men without any (past or present) competitive sports experience (n=197). Sample selection was deliberate according to the “easy access” criterion. An anonymous, postal self-return survey included questions concerning the variables of frequency, time spent on LTPA and form of participation in LTPA, socioeconomic variables (age, marital status, residence, educational level, occupation, income level) and self-rated health (categories: very good, good, moderate, poor and very poor). Statistical analysis of the study included test of differences between two structural components and X^2 test. In both groups, poor participation in LTPA was significantly associated with a negative self-rated health and low socioeconomic status (blue-collar work or unemployment, low income, low educational level), and in the group of men without any competitive sports experience, also with the age range of 35 – 51 years, and residence in a rural area. Furthermore, the impact of poor socioeconomic status on participation of men in LTPA was found to be weaker among former athletes than in men without any past competitive sports experience. The results of the study indicate that the following are necessary to improve participation of men in LTPA: propagation of competitive sports among boys and young men, and elimination of socioeconomic barriers for their physical activity.

Short title: Determinants of leisure time physical activity among men

Keywords: leisure time physical activity, former athletes, non-athletes, socioeconomic status, self-rated health

Introduction

Many studies have proven that physical inactivity is associated with all-cause mortality (Kaplan et al., 1996; Haapanen et al., 1996; Hirvensalo et al., 2000a), lower quality of life (Bijnen et al., 1999; Pennix et al., 1999; Leveille et

al., 1999; Brown et al., 2003), and higher risk of obesity, diabetes, hypertension, coronary heart disease, osteoporosis, fractures, colon cancer, breast cancer, prostate cancer, and mental disorders (Kaplan et al., 1996; Pennix et al., 1999; Snitker et al., 2003) and an overall higher risk of hospitalization (Haapanen-Nemi et al., 1999).

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On the other hand, regular physical activity has been found to reduce and prevent cardiovascular and all-cause mortality (Barengo et al., 2004; Myers et al., 2004) and risk factors for CVD among men (Tanasescu et al., 2002). Routine physical activity has also been associated with reductions in the incidence of several types of cancer (Kampert et al., 1999), and with a lower risk of diabetes, osteoarthritis, obesity, and mental health problems (US Department of Health and Human Services, 1996). Furthermore, research on physical activity has shown that dynamic exercise may result in transient reduction in triglyceride level, increase in HDL cholesterol level, decrease in blood pressure, reduction in insulin resistance, and improvement in glucose control (Thompson et al., 2001). However, the beneficial effect of physical exercise on health maintenance and improvement is not restricted to a direct effect of this exercise on human health, but also leads to correction of other behaviors: restriction of stimulant use, dietary improvement and improvement of sleep quality (Ferrucci et al., 1999; Emmons et al., 1994; Laaksonen et al., 2001a; Varo et al., 2003), which jointly facilitate coherent and comprehensive pro-health patterns. Physical activity not only has a beneficial effect on an individual's well-being, but is also beneficial for the society as a whole (Leigh et al., 1992).

Epidemiological studies conducted in many countries indicated that poor participation in LTPA was dictated by unfavourable socioeconomic factors and was associated with the following parameters: female gender, older age, low educational status, low income, and residence in a rural area (Folsom et al., 1991; Macera et al., 1995; Droomers et al., 2001; Kaplan et al., 2001; Norman et al., 2002; Dowda et al., 2003; Varo et al., 2003; Bopp et al., 2006; Chung et al., 2007; Weiss et al., 2007). Inactivity is also associated with a negative self-rated health, which has been documented for females in Poland (Woitas-Ślubowska, 2007), Korea (Chung et al., 2007) and males and females in the USA (Ransford et al., 1996) and Canada (Allison, 1996).

Inadequate physical activity in Poland is considered a main health risk in the society. CINDI WHO Bridging the East-West Health Gap studies, provided comparable results of as-

essment in physical activity among adults in Poland and six countries of Central-Eastern and Western Europe. It has been concluded from these studies that the Polish society had the lowest physical activity (among the studied societies). As many as 70% of Poles had not performed any physical exercise, while only approximately 10% had participated occasionally (less often than once a week). Only 6.4% of the study group had high physical activity. Approximately 11% of the study population said that they did not participate in LTPA because their physical labor replaces recreational physical activity (Laaksonen et al., 2001b). Poor leisure time activity has also been confirmed on a representative female and male sample of European Union (EU) citizens. This study demonstrated that 27% of males and 35% of females in the EU are not involved in any form of LTPA (Margetts et al., 1999).

Results of a few studies involving former competitive athletes are an exception to this general hypokinesia. The results support their marked, as compared to the general population, participation in physical activity (Menotti et al., 1990; Sarna et al., 1993). Hirvensalo et al. (2000b) has proven that formerly competitive men and women athletes, who started in athletics even as early as 10 years, maintain a high level of physical activity at an older age, and that this relation was independent of the presence of chronic health conditions. Retrospective data demonstrates that participation in competitive sports even once was highly predictive of future participation in physical activity. For example, those who reported that they had participated in competitive sports between the ages of 10-19 years, were 21 times more likely to report that they had exercised also between the ages of 20-39 years, and 13 times more likely to report participation in physical activity between the ages of 40-64 years. Telama et al. (1997), in a 12-year prospective study, showed that participation in LTPA between the ages of 9-18 years, predicted adulthood activity between the ages of 21-30 years. Participation in competitive sports and physical education were the best predictors of later life physical activity. A study of Swedish adolescents and adults has also proven that membership in a sports club significantly decreased the risk of inactivity at the

age of 34, to about one-third for women, and is important for establishing exercise patterns in later life (Barnekow-Bergkvist et al., 1996).

No data has been found in available literature that would analyze relations between participation of former athletes in LTPA and their social status and self-rated health. It has not yet been established whether determinants of participation in LTPA of former athletes and men from general population are similar and whether playing competitive sports for many years decreases adverse effect of socio-economic factors and poor self-rated health, on LTPA. Knowledge of factors that limit access of men to LTPA may facilitate better orientation of interventional activity which, taking into account the unequivocal role of physical exercise in the maintenance and improvement of health, will decrease social inequality with regard to a chance for good health.

The aim of this study was to establish an effect of socio-economic factors and self-rated health on LTPA in former athletes and non athletes.

Materials and methods

In the spring-summer of 1997 – 2002, two groups of males were enrolled in the study: former athletes (FA) and men without any (past or present) competitive sports experience (NA). The definition of FA was taken from a previous study (Telama 1994) and was defined as subjects who (in the past) participated in competitive sports.

Sample selection was deliberate according to the “easy access” criterion. An anonymous, postal self-return survey included questions concerning: participation in LTPA, socioeconomic status and self-rated health. The return rate for the questionnaires was 51%. Questionnaires of individuals meeting the age criterion (18 – 51 years) were eligible for statistical analysis and included: n=175 FA and n=197 NA.

The following variables were considered:

- participation in LTPA, with three defining categories:
 - frequency of LTPA undertaken in a week preceding the survey,
 - time spent on LTPA in a week preceding the survey,

- LTPA forms practiced on a day preceding the survey;
- socioeconomic status with the following categories: age, marital status, place of residence, educational level, type of work and net income in PLN per 1 family member in the last month;
- self-rated health: a positive one (very good and good) and a negative one (mediocre, poor and very poor).

Statistical analysis

Inter group differences in distribution of individual socioeconomic variables, self-rated health and participation in LTPA were assessed using the test of differences between two

Distributions (%) of socioeconomic and self-rated health			
Variables	FA	NA	P ^a
Age category:			
18-34	45.7	34.5	*
35-51	54.3	65.5	*
Educational level:			
higher and secondary	90.4	66.5	***
vocational and elementary	8.6	33.5	**
Type of work:			
non-employment	13.1	26.0	n.s.
white-collar worker	54.3	28.0	***
physical worker	22.3	30.0	n.s.
pupil/student	10.3	16.0	n.s.
Marital status:			
married/living as married	70.3	54.0	**
single/divorced	29.7	46.0	*
Place of residence:			
Rural area	13.1	15.2	n.s.
Town	54.9	53.3	n.s.
City	32.0	31.5	n.s.
Net income level^b:			
< 600	53.1	58.4	n.s.
≥ 600	46.9	41.6	n.s.
Self-rated health:			
positive	89.71	69.85	***
negative	10.29	30.15	*

Note: ^a P for the test of difference between two structural components; ^b net income in PLN per 1 family member in the last month; n.s. – no statistical significance; * statistical significance at $p \leq 0.05$; ** statistical significance at $p \leq 0.01$; *** statistical significance at $p \leq 0.001$

structural components (independent t-tests). Correlation between LTPA frequency, time spent on LTPA, LTPA forms practiced and socioeconomic characteristics and self-rated health was established basing on Chi square tests with Yates correction. The significance level for the correlation between two variables was defined as $p \leq 0.05$. To assess power of the correlation between any particular variables, the Cramer's coefficient (V) was calculated. Analyses of correlation between variables were conducted separately for FA and NA men. Statistical analysis of results was performed with the use of Statistica 6.0 Pl software.

Results

Table 1 presents a distribution of socioeconomic characteristics, self-rated health and participation in LTPA among the studied FA and NA. FA men were younger than NA men, had higher educational level and a higher percentage of them had white collar work and lived in stable relationships. Furthermore, higher percentage of FA self-rated their health as positive. There were no difference between the income level and residence between the study groups.

The analysis of frequency of respondent participation in LTPA confirmed that approximately 25% NA men and as few as 8% of FA men did not undertake any physical exercise over the whole week ($p < 0.001$). There were no differences in the remaining categories of frequency of participation in LTPA for both study groups. The analysis of time spent on LTPA demonstrated that FA more often engaged in physical exercise 3-4 times a week ($p < 0.02$). There were no differences with regard to LTPA forms practiced between the study groups, while the percentage of men that did not participate in LTPA at all was higher among NA group ($p < 0.02$) (Table 2).

Tables 3, 4, and 5 present a correlation between individual variables characterizing participation of respondents in LTPA and socioeconomic parameters and self-rated health. Frequency of participation in LTPA in both groups depended on the nature of occupation (lower among physical workers than in the remaining individuals), and was positively correlated with an educational level, income level and self-rated health. Furthermore, age was negatively correlated with frequency of participation in LTPA in

Table 2

The respondents' participation in LTPA (%)			
Participation in LTPA	FA	NA	P ^a
Frequency of participation in LTPA (times per week):			
0	8.57	24.37	
1 – 2	26.29	23.35	n.s.
3 – 4	41.71	32.49	n.s.
5 – 6	19.43	12.69	n.s.
7 ≤	4.00	7.11	n.s.
Time (hours) spent by the subjects on LTPA during a week:			
0	8.57	23.98	
1 – 2	16.57	31.63	n.s.
3 – 4	39.43	19.90	*
5 – 6	19.43	12.76	n.s.
7 ≤	16.00	11.73	n.s.
Forms of LTPA practiced by the subjects on day preceding the survey:			
No leisure time	33.71	30.46	n.s.
I do not practice physical recreation	6.86	9.64	*
Walking	22.29	30.46	n.s.
Sports	33.71	25.38	n.s.
Other responses	3.43	4.06	n.s.

Note: ^a P for the test of difference between two structural components; n.s. – no statistical significance; * statistical significance at $p \leq 0.05$; *** statistical significance at $p \leq 0.001$

Table 3

Selected determinants of frequency of participation in LTPA

Determinants of frequency of LTPA	FA (n = 175)				NA (n = 197)			
	χ^2	Df	P	Cramer's V test	χ^2	Df	P	Cramer's V test
Age	6.93	4	n.s.	0.20	9.26	4	*	0.22
Place of residence	9.99	8	n.s.	0.17	12.74	8	n.s.	0.18
Education	22.85	12	*	0.18	42.85	12	***	0.23
Type of work	23.94	12	*	0.18	41.99	12	***	0.23
Marital status	4.37	4	n.s.	0.16	7.59	4	n.s.	0.20
Income	17.06	4	**	0.18	15.66	4	**	0.16
Self-rated health	14.24	4	**	0.16	29.44	4	***	0.22

Note: Df - degrees of freedom; P - P value for test χ^2 ; n.s. - no statistical significance; * statistical significance at $p \leq 0.05$; ** statistical significance at $p \leq 0.01$; *** statistical significance at $p \leq 0.001$

NA men, but not FA men. The power of correlation between the studied parameters, measured by Cramer's coefficient, was low (<0.30) (Table 3).

Time spent on LTPA was related to the occupation type in both groups (shortest among manual workers). It was longer among men characterized by high educational and income level and positive self-rated health. Furthermore, being single increased time spent on LTPA in FA group, while residence in a city did the same in the NA group. However, correlations between these variables were poor (<0.30) (Table 4).

The following determinants of particular forms of LTPA were found among FA group: intellectual work and high income level and positive self-rated health. Other analysed fac-

gated variables were related to forms of LTPA undertaken in NA group. However, the Cramer's coefficient, a measure of the power of correlation, was poor for most correlations (<0.30), and was moderate only for the correlation between the age of NA men and forms of LTPA undertaken (>0.30) (the percentage of men engaged in walking increased with age) (Table 5).

The results presented in Tables 3 – 5 indicate that the frequency, time spent on LTPA and forms of LTPA undertaken were adversely determined by the combination of the following features: blue-collar work, relatively low educational and income level, as well as negative self-rated health of the respondents. Furthermore, a significant but weaker correlation was found among the variables characterizing par-

Table 4

Selected determinants of time of participation in LTPA

Determinants of time of participation in LTPA	FA (n = 175)				NA (n = 197)			
	χ^2	Df	P	Cramer's V test	χ^2	Df	P	Cramer's V test
Age	2.80	4	n.s.	0.13	7.17	4	n.s.	0.19
Place of residence	4.22	8	n.s.	0.11	20.91	8	**	0.23
Education	31.83	12	**	0.21	47.67	12	***	0.25
Type of work	42.59	12	***	0.25	43.10	12	**	0.23
Marital status	10.83	4	*	0.25	1.24	4	n.s.	0.08
Income	17.06	4	**	0.18	24.50	4	***	0.21
Self-rated health	19.56	4	***	0.19	35.94	4	***	0.25

Note: Df - degrees of freedom; P - P value for test χ^2 ; n.s. - no statistical significance; * statistical significance at $p \leq 0.05$; ** statistical significance at $p \leq 0.01$; *** statistical significance at $p \leq 0.001$

tors had no such effect. However, all investi-

Table 5

Selected determinants of forms of participation in physical recreation

Determinants of forms of participation in LTPA	FA (n = 175)				NA (n = 197)			
	χ^2	Df	P	Cramer's V test	χ^2	Df	P	Cramer's V test
Age	4.55		n.s.	0.16	23.99	4	***	0.35
Place of residence	6.13	8	n.s.	0.13	21.31	8	**	0.23
Education	22.95	12	n.s.	0.18	29.50	12	**	0.18
Type of work	42.13	12	***	0.25	49.59	12	***	0.25
Marital status	5.84	4	n.s.	0.18	16.82	4	**	0.29
Income	11.47	4	*	0.15	16.52	4	**	0.17
Self-rated health	26.30	4	***	0.22	28.44	4	***	0.22

Note: Df - degrees of freedom; P - P value for test χ^2 ; n.s. - no statistical significance; * statistical significance at $p \leq 0.05$; ** statistical significance at $p \leq 0.01$; *** statistical significance at $p \leq 0.001$

ticipation in LTPA, and all the remaining variables of socioeconomic status in the NA group.

Impact of the socioeconomic status on participation in LTPA in the study groups was variable--not only was it stronger in the NA group as compared to FA group, but it depended on the type of variable characterizing LTPA. The forms of leisure activity were most prone to socio-economic considerations in the NA group, while the time spent on LTPA had the strongest correlation with the socio-economic status in the FA group. The presented observations indicate that studies of LTPA participation should include several precisely defined measures, because using a single measure could lead to obtaining random results.

Discussion

Studies conducted by several authors have proven that independent parameters correlated with lack of physical activity among men include: low monthly income (Weiss et al., 2007), low educational status (Caspersen et al., 1992; King et al., 1992; Droomers et al., 2001; Martinez-Gonzales et al., 2001; Bae et al., 2007; Chung et al., 2007; Zimmermann et al., 2008), and residence in rural areas (Chung et al., 2007). Furthermore, among blue-collar workers, particularly those who worked hard, reluctance to participate in LTPA was quite common (Tuomi et al., 1991). There have been conflicting results with regard to correlation between physical activity and marital status of men. Low physical activity of single men was observed by Menotti (1990) and Zimmermann et al. (2008). However,

both a US and Greek study found that single marital status was associated with increased physical activity level (Schmitz et al., 1997). A decrease of LTPA in married men was also shown (US Department of Health and Human Services, 1996). Yet, a review of behavioral determinants of exercise found that exercising with a partner predicts high physical activity levels (Sherwood and Jeffery, 2000).

This study demonstrated negative correlations between variables characterizing participation in LTPA in the NA group and such socioeconomic parameters as low educational and income level and blue-collar work. Residence in rural areas was also negatively correlated with the time and forms of LTPA undertaken in this group of men, while older age and being married determined LTPA forms of low intensity (walking). The most important socioeconomic predictor of poor LTPA participation in the FA group, as similarly seen in the NA group, included blue-collar work, low income and educational level. Marital status was only correlated with the time spent on LTPA, while age and residence had no impact on participation in LTPA in the FA group. Comparison of socioeconomic determinants of participation in LTPA in the two groups of men demonstrates that there is a significant correlation between the analyzed socioeconomic parameters and three variables that characterize participation in LTPA for the NA group. This indicates that participation in LTPA has very strong cultural and social determinants in this group of men. Identical analysis in the FA group demonstrates much weaker socioeconomic influence--only

three out of six factors had significant impact in this group (work type, educational and income level). Analogous studies conducted in Polish FA and NA women gave different results, demonstrating that past competitive sports experience did not alleviate unfavorable impact of negative socioeconomic status on participation in LTPA (Woitas-Ślubowska, 2007). However, Hirvensalo et al. (2000b), in studies of Finnish men and women, found that an independent correlation between competitive sports experience and participation in LTPA in the future persisted even after correction for socioeconomic factors.

The impact of negative self-rated health was the strongest determinant of participation in LTPA in both study groups (FA and NA). Also, a study of Korean men and women (n=5554, age 18-74) demonstrated that individuals with poor self-rated health were less prone to undertake LTPA, as compared to those with good self-perceived health status (Chung et al., 2007). The risk of poor self-perceived health status was more than 3-times higher in men confirming no LTPA, as compared to those with satisfactory LTPA (Kaleta et al., 2006). A study conducted among male and female Latino immigrants (Kepka et al., 2007), Swedish men (Norman et al., 2002), and Swedish men and women (Molarius et al., 2006) observed a significant association between self-rated health and LTPA. Respondents who reported good to excellent health were more likely to report engaging in LTPA compared to respondents reporting fair or poor health. These relationships did not change after controlling for important covariates in the multivariate analyses. Furthermore, the prospective follow-up study of middle-aged and older adults with good perceived health suggest that the amount, intensity, and type of weekly LTPA may be important protective factor against the risk of decline in perceived health status (Malmberg et al., 2005).

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Statistical analysis of collected data allows for distinguishing the group of men with difficult access to LTPA. This group includes respondents with low educational and income level, blue-collar workers, poor self-rated health and (with lower statistical significance) married men, 34 – 51-year-old residents of rural areas. These groups should receive support from the state and territorial authorities, aiming to equalize their chances of access to LTPA synonymous with access to good health. These actions, while they are necessary, may prove insufficient, because high social status increases the chance of participation in LTPA among men, but does not guarantee undertaking physical activity. Results of studies conducted by several authors indicate that improvement of physical activity could be attempted by generalization of competitive sport among boys and young men, because a competitive sports experience has a positive impact on their future participation in LTPA (Barnekow-Bergkvist et al., 1996; Telama et al., 1997; Hirvensalo et al., 2000b), and also as these studies demonstrate, limits adverse effects of low social status on undertaking LTPA among men.

Conclusions

1. Participation of men in LTPA is significantly determined by early competitive sports experience, positive self-rated health and relatively high socioeconomic status.
2. Competitive sports experience limits the adverse impact of low socioeconomic status on participation of men in LTPA.
3. The results indicate that the following are necessary to improve participation of men in LTPA: popularization of competitive sports among boys and young men, and elimination of socioeconomic barriers for physical activity.

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