

# Leisure-time Physical Activity Among Different Social Groups of Estonia: Results of the National Physical Activity Survey

## Authors' contribution:

- A) conception and design of the study
- B) acquisition of data
- C) analysis and interpretation of data
- D) manuscript preparation
- E) obtaining funding

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## ABSTRACT

According to the Eurobarometer (European Commission, 2010), 39% of the Estonian adult population is not physically active at all. This percentage is relatively high compared to other countries that are culturally close to Estonia; the corresponding figure of close neighbors Finland and Sweden is below 10%. The article aims to present the results of a survey of physical activity (n=1,009) conducted in Estonia in 2013 and analyzes physical activity levels across various social groups. The results of the article show that employment, age, education, and ethnicity are important factors for engaging in leisure-time physical activity in Estonia. Non-ethnic Estonians, the less educated, the elderly, the unemployed, and those on maternity leave are less engaged in regular leisure exercise than people in other social groups. The results of the article were used to develop Estonia's Sports 2030 strategy.

## KEYWORDS

physical activity, national survey, social groups

## Introduction

Regular physical exercise may be considered an inseparable component of the sustainability and wellbeing of society, fulfilling the functions of the improvement of health and physical capability, socialization, and economic efficiency. At the same time, physical exercise also satisfies the generally increasing need of society for efficient rest, communication, and self-actualization.

In Estonia, sports federations have recently begun to show signs of increased activity, as new exercise formats are being implemented, media campaigns are being conducted, and several top-level events are emerging and expanding. However, not even half of the population has been involved in regular physical activity thus far (Raudsepp, Ööpik, & Lusmägi, 2013). Based on the Eurobarometer (European Commission, 2010) study, 39% of the Estonian population is not involved in any kind of physical exercise. The respective indicator was 6% in Sweden, 7% in Finland, 18% in Denmark, 44% in Latvia, 44% in Lithuania, and 49% in Poland.

Research on the physical activity of the entire Estonian society has been conducted fairly rarely. The previous comprehensive study was conducted in 2003. The purpose of this article is to introduce the results of the physical activity study conducted in 2013 and to describe the levels of leisure-time physical activity among different social groups.

The survey organized by the Estonian Olympic Committee (EOC) had 1,009 participants, and the research was carried out as face-to-face interviews by research company TNS Emor. The first part of the article provides an overview of prior research findings about different social groups' participation in sports. The second part introduces the data of the study and the analysis methods employed. The third part provides an overview of the study results and describes the demographic and economic factors influencing physical activity among the Estonian adult population. In the final part of the article, proposals are made with regard to the development of policies aimed at increasing the level of physical activity among Estonian adults.

### **Prior research findings: Participation in sports among different social groups**

In today's society, where the level of development of information technology and transportation no longer allow people to naturally be engaged in the necessary physical exercise, regular training and exercise have become indispensable. Physical exercise which is available to all people requires more in-depth attention and specific treatment, as it does not develop automatically as a by-product of professional sports. Increasing a population's physical activity requires a change of thought from all of the people involved as well as up-to-date information about the possibilities of physical exercise (Estonian Sport For All Development Plan, 2006).

A physically active lifestyle has many social and psychological benefits. There is a direct connection between physical activity and life expectancy. By changing one's lifestyle, it is possible to reduce the impact of risk factors caused by insufficient movement (Physical Advisory Committee Report, 2008). Lifestyle is a phenomenon that has been studied for a long time: lifestyle studies were commenced in the early twentieth century when Max Weber (Weber, 1978 [1922], pp. 932-935) defined lifestyle as a way of differentiating between status groups in society. One of the most well-known theorists who studied connections between lifestyle and status was Pierre Bourdieu, who asserted that the dominating class decides which taste preferences and lifestyles are acceptable.

Bourdieu (1984) argued that people's preferences in sports - just like in arts and music - are based on social and cultural reproduction and belonging to a particular class. The higher the social class and the education level are, the more engaged people become in regular sports. A selection of specific sports is influenced by preferences and taste as well as by skills and knowledge that together form a common notion of "cultural capital". Cultural capital is unevenly distributed between different social classes. Engagement in sports is also influenced by "economic capital", that is, possession of productive property. Many sports require both money and spare time, and, therefore, Bourdieu found that different sports have different positions in the social and cultural hierarchy.

In this century, participation in sports and involvement in sports as an observer, as well as factors related to the social classes and social groups, have been described by several authors based on Bourdieu's theory (Thrane, 2001; Wilson, 2002; Stempel, 2005; Warde, 2006). Based on the results of several studies at the national level, Van Tuyckom and Scheerder (2010) concluded that engagement in sports depends on sex, and that men are engaged in sports more actively than women. The analysis of Hartmann-Tews (2006) based on the results of the Eurobarometer (European Commission, 2004) demonstrated that in six European countries - Finland, Sweden, Denmark, the Netherlands, Malta, and Estonia - sex has no significant effect on regular engagement in sports. Findings of the article demonstrate that although the percentage of men (48.5%) and women (51.5%) who are regularly engaged in physical activity is somewhat different, the difference is not statistically significant. Thus, we can argue that the results of the Hartmann-Tews analysis were also confirmed by the physical activity study conducted on the national level in Estonia.

According to Van Tuykom and Scheerder (2010), engagement in sports depends on age: older persons are engaged in sports to a lesser degree. They have also demonstrated that groups of a higher social and economic status (education, occupation, income, etc.) engage in sports more actively, and that place of residence also plays an important role: residents of cities are more physically active than those living in rural areas. These generalizations have recently been confirmed by studies conducted in Finland, the United Kingdom, and Hungary.

Nina Kahma (2012) has studied the relationship between sports and social and economic status in Finland, where the residents are among the most active sports enthusiasts in the European Union (European Commission, 2004; European Commission, 2010). Kahma disserted education as an indicator of cultural capital and level of income as an indicator of economic capital. Using the logistic regression analysis, she found that the probability of not being involved in sports decreases by 67% as one moves from working-class occupations to intermediate occupations. The difference is similar in comparison to professional executives. The differences between occupational classes remained when the effect of sex was controlled. Men in Finland were 50% more likely to report not being involved in sports. Adding age into the analysis did not change the differences between the occupational classes. Involvement in sports changed with age so that the older the age group in question, the greater the probability of not being involved in sports. Kahma also found that the probability of not engaging in any form of physical exercise decreased when moving from less educated groups to groups with a higher level of education. Taking income into account provided similar results, so that the respondents with higher incomes were less likely to be inactive in the field of sports.

The survey results in England (Farrell et al., 2013) showed high levels of physical inactivity and clear separate associations with important dimensions of socioeconomic position. Education, household income, and local area deprivation were all independently and strongly associated with inactivity, controlling for local availability of physical recreation and sporting facilities, the local weather, and regional geography. It is important to note that local area facilities and geographical factors explain very little of the variation in physical inactivity in England. The authors of the survey stressed that the income gradient increased with age, and more financially costly forms of physical activity were associated with larger socioeconomic position differences, suggesting that financial as well as cultural barriers need to be overcome to reduce the prevalence of inactivity.

Similar trends can be found in studies conducted in post-communist countries. According to the results of the national survey in Hungary (Szabo Földesi, 2011), socio-economic factors made the strongest impact in terms of sports participation. In all age groups and among both sexes, the lowest participation rates were registered in social groups with low education, low income, and low-ranking blue collar occupations. Living areas also played a significant role for sports participation in Hungary. Inhabitants of rural areas were in a gravely disadvantageous situation - about one third of women living in urban settlements and half of women from the rural areas country never participate in any sport or exercise.

## **Data and methods**

The National Physical Activity Survey (NPAS) was organized by the Estonian Olympic Committee and carried out in the course of two fieldwork periods of TNS Emor's bi-monthly CAPI-bus survey (August 28, September 4, and September 11-18, 2013).

Interviews were conducted by using the CAPI (computer assisted personal interviewing) method at respondents' homes. In CAPI interviews, the questions appear on a laptop screen and the answers are inserted in the computer immediately during the interview. The population of the NPAS was composed of the permanent residents of Estonia, aged 15-74 years old (with a total of 975,214 people as of January 1, 2013).

The sample size, i.e., the number of respondents included in the survey during the period of fieldwork, was 1,009 people. To compile this sample size, the proportional model of the population was used, where all

had an equal opportunity of becoming a respondent. Afterwards, the socio-demographic structure of the sample in the breakdown of sex, age, ethnicity and place of residence with the corresponding statistical characteristics of the universe was compared.

The main socio-demographic characteristics of the NPAS sample are presented in Table 1.

Table 1. Socio-demographic characteristics of the survey respondents

<b>Socio-demographic groups</b>	<b>%</b>	<b>n</b>
<b>Gender</b>		
Male	47.5	479
Female	52.5	530
<b>Age</b>		
15-24	15.6	158
25-34	18.6	187
35-49	26.8	270
50-64	26.4	267
65-74	12.6	127
<b>Ethnicity</b>		
Estonian	68.8	694
Russian	27.7	279
Other	3.5	36
<b>Education</b>		
Basic or primary	16.5	166
General secondary or vocational	58.8	593
Higher	24.7	250
<b>Place of residence</b>		
Capital	31.3	316
Big town	18.0	182
Small town	19.0	191
Village	31.7	320
<b>Average monthly gross income per capita in household</b>		
Low (less than 300€/ month)	24.6	246
Average (301€-550€/ month)	30.1	301
High (more than 551€/ month)	21.1	211
No income/ refused to answer	24.2	242

Note: n=number of respondents

Source: own study based on National Physical Activity Survey in Estonia 2013.

There were 11 questions in the first part of the questionnaire. Information was collected concerning the respondent's body height and body weight, satisfaction rate with life and health, participation in sports events, and barriers and facilitators of sports participation. Questions about sports participation intensity and forms of participation were also asked. Several questions were identical to the questions that were used in the study of physical activity among Estonian adults in 2003 (Arvisto et al., 2004) to acquire comparable data and analyze trends over the past nine years.

A separate set of questions was used to collect data on sex, age, ethnicity, area of residence, education, occupation/ main activity, size of settlement, personal income, and family monthly budget.

A description of the data is presented using cross tabulations (see Tables 2-4). Interrelation between physical activity and socio-demographic variables is studied using the ordinal regression model. The dependent variable here is the level of physical activity (coded in three categories: 2=physically active, 1=moderately active, 0=inactive), and the independent variables are mentioned above. The regression results are presented as beta coefficients and odds ratios; the latter indicate the odds of the observed group relative to the odds of the reference group in their level of physical activity. The odds ratio of 1 shows that the odds for being physically active are equal, and odds above 1 indicate how many times the odds of the observed group are higher compared to the odds of the reference group and vice versa if the odds ratio is below 1.

To find the model with the highest predictive power, several models were constructed. In addition to models with main effects, several custom models were tested where the most important two-way interactions were analyzed (see Table 4). The final model is presented in Table 5.

## Results

According to the WHO recommendations on Physical Activity for Health (WHO, 2010), adults aged 18-64 should do 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.

Analysis of the NPAS data (Table 2) showed that 36.8% of women and 38.3% of men who participated in the study were sufficiently physically active according to the WHO definition. Slightly more than one-third of both sexes (34% of women and 33.8% of men) were physically inactive. Thus, the current study shows no significant differences in physical activity between the sexes.

Table 2. Respondents' leisure-time physical activity by demographic characteristics

Socio-demographic characteristic	Physically active %	Moderately active %	Inactive %	Total %	n
<b>Gender</b>					
Female	36.8	29.2	34.0	100	530
Male	38.3	27.9	33.8	100	479
<b>Age</b>					
15-24	57.6	34.8	7.6	100	158
25-34	42.2	38.5	19.3	100	187
35-49	35.4	34.7	29.9	100	270
50-64	29.2	18.7	52.1	100	267
65-74	27.6	14.2	58.3	100	127
<b>Ethnicity</b>					
Estonian	42.4	26.7	30.9	100	694
Russian or other	26.7	33.0	40.3	100	315
<b>Education</b>					
Basic or primary	38.9	22.2	38.9	100	166
General secondary or vocational	32.5	28.5	39.0	100	593
Higher	48.4	33.2	18.4	100	250
<b>Place of residence</b>					
Capital	40.8	35.1	24.1	100	316
Big town	34.3	24.3	41.4	100	182
Small town	34.0	30.9	35.1	100	191
Village	38.1	23.1	38.8	100	320
<b>Marital status</b>					
Single	43.8	33.3	22.9	100	268
Married/ cohabiting	38.3	28.1	33.6	100	559
Divorced/ widowed	25.1	22.9	52.0	100	179
Other	66.7	33.3		100	3

Note: n=number of respondents

Source: own study based on National Physical Activity Survey in Estonia 2013.

Based on the results of the NPAS, it can be argued that the sports activities of a person decrease significantly as his/ her age increases. Over one half of respondents 50 years of age and older were not physically active. The number of non-active people among those below 25 years of age was 7.6%, while in the next age group (25-34 years old), this figure reached around 20%.

According to the census conducted in 2011, people of 192 nationalities live in Estonia. The native population of Estonia consists of 68.7% Estonians, 24.8% Russians, and 1.7% Ukrainians. The proportion of other nationalities remains below 1%. The physical activity study highlighted that Estonians are much more actively engaged in sports than non-Estonians, as 42.2% of Estonian respondents engage in enough

physical activity, while the same indicator among non-Estonians is only 26.7%. About 30% of Estonians and 40% of non-Estonians are not engaged in any sports at all.

In Tallinn, the capital of Estonia, 24.1% of residents are not engaged in regular sports activities. This indicator is less than in other large cities (41.4%), small towns (35.1%), or rural regions (38.8%) of Estonia.

Differences emerged between various educational groups. Almost half of respondents with higher education (48.4%) are physically active, and about one fifth (18.4%) are not active. The share of non-active people is similar among those with primary and basic education (38.9%) and secondary and vocational education (39%).

According to the study, over one half (52%) of divorced or widowed people are not engaged in sports, which is significantly higher compared to people living alone (22.8%) or those who are married or in a civil marriage (33.6%).

Besides the demographic characteristics, economic aspects also influence physical activities in Estonia (Table 3). Among respondents with a higher income level per family member (in the context of Estonia, over 550€/ month), 46.8% are physically active. At the same time, 28.9% of people with a lower income level per family member (less than 300€/ month) responded that they are sufficiently engaged in sports activities.

Among university and school students, 60.9% are sufficiently physically active, while only 2.2% responded that they are not engaged in sports at all. The share of non-active people is also low (17.0%) among managers/ self-employed people and among professionals (15.0%).

Approximately half of managers (53.8%) and professionals (48.8%) are engaged in sufficient physical activities. Among the retired/pensioners, 58.8% are not engaged in any physical activities. This figure is lower than among unemployed people, 40.4% of whom are not engaged in any sports activities.

Table 3. Respondents' leisure-time physical activity by economic characteristics

Demographic characteristic	Physically active %	Moderately active %	Inactive %	Total %	n
<b>Average monthly gross income per capita in household</b>					
Lower (up to 300€)	28.9	32.1	39.0	100	246
Average (300.01-550€)	35.5	26.9	37.5	100	301
Higher (over 550€)	46.7	31.6	21.7	100	212
No income/ refused to answer	40.1	25.2	34.7	100	242
<b>Occupation or main activity</b>					
Managers/ self-employed	53.8	29.2	17.0	100	107
Professionals	48.8	36.2	15.0	100	80
Technicians or associate professionals	43.9	32.9	23.2	100	81
Clerical workers	41.0	30.8	28.2	100	77
Skilled workers, machine operators, drivers	30.3	27.5	42.1	100	178
Elementary occupations	43.3	13.3	43.3	100	61
On maternity leave/ fulfilling domestic tasks	22.4	46.6	31.0	100	58
Unemployed	23.1	36.5	40.4	100	52
Retired/ pensioners	24.6	16.6	58.8	100	199
Pupils/ students	60.9	37.0	2.2	100	92
Other	17.4	30.4	52.2	100	23

Note: n=number of respondents

Source: own study based on National Physical Activity Survey in Estonia 2013.

There are three separate independent influences on levels of physical activity: age, ethnicity, and wealth. The latter factor includes three closely related indicators: economic status based on occupation or main activity, income, and education. In order to explain the potential effects of socio-demographic and economic factors on involvement in physical activity, ordinal regression analysis was conducted. In the first phase, different factors were entered in the model and only the main effects were studied. As can be expected, successively adding independent variables to the model somewhat increases the predictive power from 19.8% to 22.2% (Table 4, models 1 and 2). The inclusion of the two-way interactions in the model

improves the predictive power up to 23.6% (Table 4, models 3-5). However, because the increase in predictive power is small and none of the tested interactions were statistically significant, a more detailed interpretation of the results is based on Table 4, model 2 (see Table 5).

Table 4. Change of pseudo R-square in five ordinal regression models for being physically active

No.	Model description	Nagelkerke pseudo R-Square	Pearson's goodness of fit (p-value)
1	Gender; Age; Ethnicity; Education; Monthly income; Occupation or main activity	0.198	0.027
2	Gender; Age; Ethnicity; Education; Monthly income; Occupation or main activity; Place of residence; Body mass index (BMI); Marital status; Satisfaction with life; Satisfaction with health	0.222	0.451
3	Gender; Age; Ethnicity; Education; Monthly income; Occupation or main activity; Place of residence; BMI; Marital status; Satisfaction with life; Satisfaction with health Ethnicity * Age	0.225	0.437
4	Gender; Age; Ethnicity; Education; Monthly income; Occupation or main activity; Place of residence; BMI; Marital status; Satisfaction with life; Satisfaction with health Ethnicity * Age Ethnicity * Education Ethnicity * Income	0.230	0.544
5	Gender; Age; Ethnicity; Education; Monthly income; Place of residence; BMI; Marital status; Satisfaction with life; Satisfaction with health Ethnicity * Age Ethnicity * Occupation or main activity	0.236	0.538

Note: n=number of respondents

Source: own study based on National Physical Activity Survey in Estonia 2013.

While the influence of age on physical activity levels is quite obvious (health deteriorates and motivation to engage in sports decreases with age), other relationships need some elaboration. For instance, the role of ethnicity needs more explanation here. In 1934, 3.4% of people living in Estonia were Russian speakers. This figure grew exponentially after World War II, when Estonia became a part of the Soviet Union. In 1989, Russian speakers made up 30.3% of the population of Estonia. Since the restoration of independence, this figure has decreased somewhat. According to the census of 2011, the respective figure is now 24.8%. Analysis of the results of the NPAS has revealed that the odds of an Estonian being involved in physical activity is 1.76 times higher than the odds of non-Estonians, while controlling for other socio-economic factors like education, occupation or main activity, and monthly income per capita (Table 5). It could be assumed that due to differences in media consumption, information regarding local sports clubs and events does not reach the non-Estonian population.

Our model allows for the argument that occupation or main activity and education are more important factors for physical activity levels than income per capita, as the latter has no statistically significant effect. According to education, those with basic or primary levels have 0.42 odds of being physically active compared to the odds of those with higher education, i.e., the odds for being physically active are 2.38 times higher (1/0.42) for persons with higher education. Differences in physical activity probability are smaller between persons with medium and higher educational levels; the odds of those with general secondary or vocational education are 0.64 compared to the odds of those with higher education.

Compared to managers and the self-employed, all other occupation or main activity groups have significantly lower chances of being physically active. The most pronounced differences appear for those on maternity leave or fulfilling domestic tasks (odds ratio 0.22), in retirement (odds ratio 0.34) and the unemployed and clerical and skilled workers (odds ratios about 0.44). Also, satisfaction with health expectedly increases the probability of engagement in regular sports (the odds ratio for those not satisfied

with their health is 0.59). However, satisfaction with life in general shows no significant effect on physical activity levels.

Table 5. Ordinal regression cumulative coefficients and odds ratios for being physically active with three ordered categories

Socio-demographic variables	Coefficient	Odds ratio	p
<b>Gender</b> (ref. Female)			
Male	-0.13	0.88	
<b>Age</b> (ref. 15-24)			
25-34	-0.49	0.61	
35-49	-0.93	0.40	***
50-64	-1.21	0.30	***
65-74	-1.17	0.31	***
<b>Ethnicity</b> (ref. Russian or other)			
Estonian	0.56	1.76	***
<b>Education</b> (ref. Higher)			
Basic or primary	-0.87	0.42	***
General secondary or vocational	-0.44	0.64	**
<b>Place of residence</b> (ref. Capital)			
Big town	-0.25	0.78	
Small town	-0.29	0.75	
Village	-0.25	0.78	
<b>Marital status</b> (ref. Single)			
Married/ cohabiting	0.07	1.08	
Divorced/ widowed	-0.21	0.81	
<b>Occupation or main activity</b> (ref. Managers/ self-employed)			
Professionals	-0.49	0.61	
Technicians and associate professionals	-0.54	0.58	
Clerical workers	-0.83	0.43	**
Skilled workers, machine operators, drivers	-0.83	0.44	***
Elementary occupations	-0.44	0.65	
On maternity leave/ fulfilling domestic tasks	-1.51	0.22	***
Unemployed	-0.83	0.44	*
Retired/ pensioners	-1.08	0.34	***
Pupils/ students	-0.38	0.69	
<b>Monthly income per capita</b> (covariate)	-0.02	0.98	
<b>Body mass index (BMI) group</b> (ref. Normal)			
Underweight	0.25	1.28	
Overweight	-0.09	0.91	
Obese	-0.09	0.91	
<b>Satisfaction with health</b> (ref. Satisfied)			
Not satisfied	-0.53	0.59	***
<b>Satisfaction with life</b> (ref. Satisfied)			
Not satisfied	-0.15	0.86	

Notes: n=737; Pseudo R-Square, Nagelkerke=0.222; -2 Log Probability=1441.634\*\*\*;

\*\*\*significant at level 0.01; \*\*significant at level 0.05; \*significant at level 0.10

Source: own study based on National Physical Activity Survey in Estonia 2013.

## Discussion and summary

Based on the findings of this article, we can argue that education plays an important part in how actively people are engaged in physical activity in Estonia, and that people with higher education are more physically active than those with primary, secondary, or vocational education. While the occupation or main activity of the respondents was a critical factor influencing engagement in physical activity, the same cannot be said about monthly income per capita. The income of Estonian residents has increased during the last decade, and while 21% of people answered that sports were too expensive in 2003, this figure decreased to 12% by 2013.

Estonia is an urbanized country; according to the census carried out in 2011, 67.9% of the population lives in cities. The findings of this article show that place of residence is not a decisive factor in relation

to engagement in physical activity. Structural funds from the European Union may be an important factor for the balanced development of sports from a geographic perspective: during the last 10 years, numerous sports facilities and outdoor tracks have been constructed in cities and rural areas with the support of such funds. In 2003, 13.6% of respondents indicated that the lack of a sports facility was a hindering factor for them. A decade later, this reason was indicated by only 6% of respondents.

Based on an analysis of the results of the physical activity study performed in 2013, it can be argued that regular recreational sports are still not an integral part of the daily life of people in Estonia and that the vast majority of people do not get enough physical activity. Demographic and economic aspects play an important part in people's engagement in physical activity, and occupation/main activity, age, education, and ethnicity are important factors in Estonia.

Sport for All development plans in Estonia for 2006-2010 and 2011-2014 prepared in cooperation with the Ministry of Culture and the Estonian Olympic Committee resulted in a great deal of attention directed towards the Sport for All sphere and improvement in respective financing (although financing is still not sufficient). State institutions (primarily ministries) should engage in cross-sectoral cooperation and provide stronger support for each other in order to develop common strategies and find resources to support programs that are aimed at promoting Sport for All principles. Improving the exercise habits of the population is related to several important areas in which the public sector has a major role to play - sports, healthcare, education, transportation, the environment, urban planning and public safety, working environments, and services for elderly people.

When developing physical activity policies and implementing respective programs on state and municipal levels, special attention should be paid to non-Estonians, the less educated, pensioners, those close to retirement age, the unemployed, and women on maternity leave. Thirty percent of the participants of the Estonian physical activity survey responded that the support of peers and family is an important factor for engaging in regular sports, while only 4% replied that better health is an important factor. Therefore, priority should be given to the support of projects focused on family, home, and the workplace, as well as on specific age groups.

At the end of 2012, the Ministry of Culture and the Estonian Olympic Committee launched preparations for a nationwide strategy called "Sports 2030", which was adopted in 2015 by the Estonian Parliament. The results of this article were taken into consideration in preparation for the section of the strategy dedicated to Sport for All and in planning further activities in this field.

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