

The effect of physical education on leisure sports activity and inactivity of students aged 12-18

Abstract of PhD Thesis

Ibolya Barsiné Dizmatsek

Doctoral School of Sport Sciences
Hungarian University of Sports Science



**HUNGARIAN UNIVERSITY
OF SPORTS SCIENCE**
BUDAPEST

Supervisor: Dr. Pál Hamar, professor, DSc

Consultant: Dr. István Soós, research professor, PhD

Official reviewers: Dr. István Ágoston Simon, associate professor, PhD

Dr. Miklós Bánhidi, associate professor, PhD

Head of the Final Examination Committee:

Dr. Gábor Pavlik, professor emeritus, DSc

Members of the Final Examination Committee:

Dr. Gyöngyvér Prisztóka, associate professor, CSc

Dr. László Tóth, professor, PhD

Budapest

2023

INTRODUCTION

With the development of civilization, as a result of increasingly high levels of automation and mechanization, people in modern society are not encouraged to do physical exercises during their daily life and work. Numerous studies have proven that regular physical activity is a serious health-protecting preventive tool, but at the same time, a sedentary lifestyle is a health risk factor in itself, and plays a role in the development of many diseases.

Both international and Hungarian studies on sports sociology have come to the conclusion that the level of activity decreases significantly with the age. The test results also indicate that physical activity during adolescence can be a precursor to the development of an active lifestyle in adulthood.

Physical education is the only subject that directly promotes students' healthy physical development and the maintenance and development of their motor skills. At the beginning of my career as a physical education teacher, the time spent on physical education was between 90 and 225 minutes per week, depending on the age and the type of school. Participation in extracurricular physical activity was extremely low, meaning that children were only physically active at school during physical education classes.

Incorporating physical exercise into students' daily routines has proven to be essential. Daily physical education was introduced in 2012/2013 academic year in primary and secondary schools as a social response to the recognition of the health-damaging effects of sedentary environments. We are unique in Europe with five compulsory school physical education per week. One of the goals of daily physical education is to ensure that regular physical activity plays a major role in the lives of all students, and to socialize students to a lifelong, health-conscious and active lifestyle.

The basic idea of my dissertation was the result of a previous investigation, in which my research colleagues and I searched for the changes that have taken place in the leisure activities of Hungarian students since the introduction of daily physical education. The results of the data obtained with the EMA - Ecological Momentary Assessment - method show that after the introduction of daily physical education, students spend significantly more time on sports during their free time on weekdays than prior to the introduction of daily physical education. In line with previous WHO results, girls are less active than boys. Pupils attending schools in the capital spend significantly more time in motorized transport and watching TV than pupils rural areas, but they are also more active in sports and exercise during their free time.

OBJECTIVES

The test results described in the introduction encouraged me to investigate the background of the changes. The primary goal of my dissertation is to examine whether physical education in Hungarian students aged 12-18 has an effect on the intention to participate in recreational sports activities outside of the school environment, and on the students' behavior after the introduction of daily physical education. In addition, I considered it important to identify the factors that influence students' intention to play sports in their free time. I also set out to map the correlation between autonomy support perceived by three social actors (school, family/relatives and friends), autonomous motivation in an educational context (physical education class), and sports activities performed in free time. In addition, I also looked for differences in the elements of the transcontextual model according to gender and the location of the school (in the capital or rural areas).

Questions of the investigation

1. Regarding the effect between physical education at school and the autonomous motivation of sports activities performed in free time:
 - What characterizes the effect of the physical education teacher's perceived autonomy support in terms of the autonomous motivation of sports activities in physical education and in free time?
 - What differences can be found according to gender and school location (capital or rural) in the physical education teacher's perceived autonomy support, as well as in the autonomous motivation of physical education classes and sports activities during free time?

2. In relation to the influence between the autonomy support from the physical education teacher, parents/relatives and friends and the autonomous motivation of sports activities performed in free time:
 - Which social actor's perceived autonomy support has the greatest impact on the autonomous motivation of recreational sports?
 - Are there differences according to gender and school location (in the capital or rural areas) between the autonomy support received from the physical education teacher, family/relatives and friends?

3. In relation to the effects of attitude, subjective norm, perceived behavioral control and sports activities performed in free time on intention and behavior:
 - Which of the elements of the theory of planned behavior exerts the greatest influence on the intention and behavior of sports activities performed in leisure time?
 - Are there differences between gender and location of school (in the capital or rural areas) between attitude, subjective norm and perceived behavior control in the intention and behavior of sports activities performed in free time?

Hypotheses of the study

1. Regarding the effect between physical education at school and the autonomous motivation of sports activities performed in free time:
 - H1: I assume that physical education at school has a positive effect on the autonomous motivation of sports activities performed in free time.
 - H2a: I assume that there is no difference in the autonomous motivation of the studied male and female students for sports activities performed during physical education classes and during free time.
 - H2b: I assume that there is no difference in the autonomous motivation of the students' sports activities during physical education classes and their free time (in the capital or rural areas).
2. In relation to the influence between the autonomy support from the physical education teacher, parents/relatives and friends and the autonomous motivation of sports activities performed in free time:
 - H3: According to my assumption, despite the introduction of daily physical education, parents/relatives still have the most positive influence on the autonomous motivation of students' sports activities in their free time.
 - H4a: According to my assumption, there is no difference in the effect of the three social actors (school, parents/relatives, friends) and sports activities performed in free time on autonomous motivation in the studied male and female students.
 - H4b: According to my assumption, there is no difference in the effect of the three social actors (school, parents/relatives, friends) and sports activities performed in free time on autonomous motivation among the students in the capital and from rural areas.

3. In relation to the effects of attitude, subjective norm, perceived behavioral control and sports activities performed in free time on intention and behavior:
 - H5: I assume that among the elements of the TPB (Theory of Planned Behavior), attitude has the greatest positive effect on the intention and behavior of sports activities performed in free time.
 - H6a: I assume that I find a difference in the studied male and female students as an effect of the elements of the Theory of Planned Behavior on the intention of sports activities performed in free time.
 - H6b: I assume that there is no difference between the students in the capital and the countryside as a result of the elements of the Theory of Planned Behavior, on the intention to do sports during their free time.

METHODS

The survey took place in the 2015/2016 academic year, which is an important circumstance because for this academic year five physical education classes per week had to be organized for every grade of the Hungarian school system.

To answer my research questions, I found the transcontextual model to be the most suitable, which was specifically developed to identify the factors that determine physical activity. This model defines the processes through which the motivation for educational activities is transferred to the motivation for extracurricular activities in a leisure environment. The transcontextual model integrates three social psychological theories:

1. The self-determination theory attributed to Deci and Ryan defines the environmental and interpersonal factors influencing motivated behavior. Its central element is the distinction between self-determination or autonomous motivation versus non-autonomous or controlled motivation.

2. Vallerand's hierarchical model of intrinsic and extrinsic motivation presupposes the "transmission" of motivation among different situations. This model publishes concrete effects on three levels of motivation (global, contextual, and situational), which link motivation to its antecedents and consequences.

3. Ajzen's theory of planned behavior is a great help in predicting human behavior and measuring human decision-making and subsequent behavior. The strength of the intention determines the probability that the behavior itself will occur, how much energy and effort the

individual will put into its implementation and the achievement of the intended goal. Intention is a function of attitudes, subjective norms and perceived behavioral control.

Research subjects

When selecting the schools, it was an important aspect that the institutions should include schools from the capital and countryside, and that a survey should be carried out among the schools in the rural areas in big cities and smaller ones as well. For this purpose, I used stratified sampling, so I managed to get a usable sample from every region and every type of school. Classes were randomly selected in the schools.

550 students received the questionnaires. I was able to use a total of 465 questionnaires to evaluate the data. The reason for the non-accepted questionnaires was the absenteeism from class and the completion of the questionnaires too early. The examined persons were selected from 25 (15+10) classes of five schools in Budapest and four schools in the rural areas. I received completed questionnaires from 207 students (44.5%) from rural areas and from 258 students (55.5%) in the capital. The number of female students examined was 320 (68.8%), the number of male students examined was 145 (31.2%). This gender ratio reflects the composition of the examined schools and classes. The age of the students fell between 12 and 18 years, the average age was 15.5 years (countryside 15.6; capital 15.3 years, boys 15.7; girls 15.4 years). Sports schools were not included in the survey.

Applied methods

To examine the students participating in the research, I used a three-part questionnaire following the 2009 study protocol of Hagger et al.

With the first questionnaire, I first assessed the frequency of previous leisure sports/exercise. In addition, I measured the perceived autonomy support of physical education teachers with a modified version of the Sports Climate Questionnaire for physical education teachers. To measure autonomous motivation in physical education classes, I used Ryan and Connell's Perceived Locus of Causality - PLOC - modified version for physical education classes. Finally, the students stated their future intentions regarding the frequency of their leisure time sports activities/exercise.

The second questionnaire was completed one week after the first one. To measure the perceived autonomy support of parents/relatives and friends, I used the PASSES (Perceived Autonomy Support Scale for Exercise Settings) questionnaire by Hagger et al. To measure

autonomous motivation in the context of leisure-time physical activity, I used the very first version of the BREQ (Behavioral Regulations in Exercise Questionnaire) questionnaire by Mullan et al.

The students could answer the questions on the first two questionnaires on a seven- or four-point Likert scale.

I completed the third questionnaire four weeks after the assessment of the second questionnaire. In this, I first assessed the current, i.e. realized frequency of sports activities/exercise in free time. I also examined the components of the Theory of Planned Behavior based on Ajzen's recommendation. (I assessed student attitudes related to leisure sports activities using five pairs of bipolar adjectives. The subjective norm was examined based on four questions, and the assessment of perceived behavioral control included three questions. The students could answer these questions on a seven-point Likert scale.)

Data processing

The data were analyzed using IBM SPSS v. 23 software. Kolmogorov-Smirnov and Shapiro-Wilk tests were used to test the normality of the data distribution. Where the responses to the questionnaire produced ratio scales with a non-normal distribution, I used the Mann-Whitney U test to compare groups by gender and school location. In the case where I found a normal distribution in both groups, I used a two-sample t-test. The correlations between the components of the Transcontextual model were tested using Spearman's correlation. The correlation coefficient was used to determine the strength of the correlations between the different factors (a correlation coefficient of 0.7 to 1.0 represents a strong association, 0.7 to 0.3 a moderate correlation, and a value less than 0.3 a weak correlation).

After measuring the components of autonomous motivation in both contexts (physical education classes and free time), in order to produce a single measure, I calculated the Relative Autonomy Index (RAI), as recommended by other researchers (Guay et al. 2003). To obtain a single direct measure of autonomous motivation, I assigned weights to each intrinsic motivation (+2), identified regulation (+1), introjected regulation (-1) and extrinsic regulation (-2). The resulting mean scores reflected the autonomous motivation of the students participating in the study, in both contexts.

RESULTS

Correlation between school physical education and the autonomous motivation of leisure sports

The results of correlation analysis between perceived autonomy support of the PE teacher, the autonomous motivation of the PE classes and the leisure time sports activities at school showed a significant moderate negative correlation between the perceived autonomy support of the PE teacher and the autonomous motivation of the PE classes ($r=-0.460$; $p<0.000$). There was also a significant moderate negative correlation between autonomous motivation in PE classes and autonomous motivation in leisure time sports activities ($r=-0.330$; $p<0.000$). However, a weak, almost negligible positive correlation was found between perceived autonomy support of the PE teacher and the leisure time context of autonomous motivation ($r=0.118$; $p=0.011$).

Based on the Mann-Whitney U test, no significant difference was found between the autonomous motivation of boys (median=4.733) and girls (median=4.333) in physical education classes when comparing the two gender groups ($U/463/= 22923.000$ $z=-0.206$ $p=0.837$).

There was a significant difference in autonomous motivation for leisure time physical activity between boys (median=1.541) and girls (median=2.229) students ($U/463/=18702,000$ $z=-3.260$ $p=0.001$).

When examining the groups by school location, there is no significant difference in the autonomous motivation for physical education lessons between students attending schools in rural areas (median=-0.191) and in the capital (median=-0.297) ($U/463/= 24342,000$ $z=-1.639$ $p=0.101$).

There is a significant difference between the autonomous motivation for leisure time physical education activities of pupils attending schools in rural areas (median=2.3125) and in the capital (median=1.8750) ($U/463/= 23388.500$ $z=-2.171$ $p=0.030$).

Correlation between autonomy support from the physical education teacher, parents/relatives and friends and autonomous motivation for leisure sports activities

Among the three social actors' autonomy support, perceived autonomy support of parents/relatives showed the strongest significant but moderate correlation with autonomy support of leisure-time sport activities ($r=0.442$; $p<0.000$). A similarly significant, but moderate

correlation was found between perceived autonomy support from friends and autonomous motivation for leisure-time sports ($r=0.392$; $p<0.000$). I found a weak, almost negligible correlation between perceived autonomy support of the PE teacher and the leisure context of autonomous motivation ($r=0.118$; $p=0.011$).

Based on the Mann-Whitney U test, when comparing the two gender groups, the perceived autonomy support of male (median=4.7333) and female (median=4.3333) students by the PE teacher is significantly different ($U/463/=19391,500$ $z=-2.838$ $p=0.005$).

There is also a significant difference in the perceived autonomy support from parents/relatives of male (median=5.357) and female (median=5.821) students ($U/463/=19474.500$ $z=-2.777$ $p=0.005$).

There was no significant difference in perceived autonomy support from friends between male (median=5) and female (median=5.214) students ($U/463/= 22209.000$ $z=-0.738$ $p=.0460$).

The two-sample t-test calculation revealed that the mean of the perceived autonomy support of the PE teacher in the two school location groups was significantly different ($t/463/= -5.113$, $p<0.000$). The mean score of the perceived autonomy support of the PE teacher for pupils attending schools in the capital is 4.744 (standard deviation=1.248) and for pupils attending schools in rural areas 4.180 (standard deviation=1.098).

According to the Mann-Whitney U test, the perceived autonomy support from parents/relatives of students attending schools in rural areas (median=5.714) and in the capital (median=5.643) is not significantly different ($U/463/=24833,000$ $z=-1.299$ $p=0.194$).

There is also no significant difference in perceived autonomy support from friends between pupils attending schools in rural areas (median=5.214) and those attending schools in the capital (median=5.071) ($U/463/=25504,000$ $z=-0.833$ $p=0.405$).

Correlation between attitude, subjective norm, perceived behavioural control and intention to participate in sport in leisure time and behaviour

Based on the results of the correlation analysis between the components of Ajzen's Theory of Intended Behaviour, moderate positive correlations were found for all three components affecting intention. The strongest positive correlation was found between subjective norm and intention ($r=0.467$; $p<0.000$), with an adequate level of significance. Moderate positive correlations were found between attitude and intention ($r=0.443$; $p<0.000$).

A weak correlational association was found between perceived behavioural control and intention ($r=0.230$; $p<0.000$).

Further moderate positive correlations were also found between the three intention components, subjective norm and attitude ($r=0.382$, $p<0.000$), subjective norm and perceived behavioural control ($r=0.300$; $p<0.000$), and attitude and perceived behavioural control ($r=0.322$; $p<0.000$). The strongest positive correlation was found between intention and recreational sport activity ($r=0.634$; $p<0.000$). The weakest correlation was between perceived behavioural control and leisure sport activity ($r=0.195$; $p<0.000$).

Using the Mann-Whitney test, the attitudes of the two gender groups are not significantly different between male (median=6) and female (median=6) students ($U/463/=22144,500$ $z=-0.791$ $p=0.429$).

There is also no significant difference in subjective norm between male (median=5.5) and female (median=5.5) students ($U/463/=22501,000$ $z=-0.522$ $p=0.601$).

There is a significant difference between the perceived behavioural control of male (median=5.666) and female (median=6) students ($U/463/= 20506.000$ $z=-2.029$ $p=0.042$).

Using the Mann-Whitney test, there is no significant difference between the attitudes of the two school location groups, students from rural areas (median=6,200) and students in the capital (median=6) ($U/463/=25136,500$ $z=-1,094$ $p=0,274$).

There is also no significant difference between the subjective norms of students attending schools in rural areas (median=5,500) and in the capital (median=5,500) ($U/463/=25852,000$ $z=-0.593$ $p=0.553$).

There is a significant difference between the perceived behavioural control of pupils from rural areas (median=6.333) and in the city (=5.666) ($U/463/=19955,500$ $z=-4.737$ $p=0.000$).

CONCLUSIONS

Testing hypotheses

I have to reject my first hypothesis, in which I hypothesized that school physical education has a positive effect on autonomous motivation for leisure-time sport activity, since I found a weak, almost negligible positive correlation between autonomy support from physical education teachers and the leisure-time context of autonomous motivation. In addition, I found

a moderately significant negative correlation between autonomous motivation in physical education classes and autonomous motivation in leisure-time sport activities.

In both sub-hypotheses of my second hypothesis, I argued that there is no difference in the autonomous motivation of the students' physical education and leisure time sporting activities, neither by gender nor by school location. I retain the part of the hypothesis that there is no difference in autonomous motivation for physical education lessons by gender and by school location. In contrast, my sub-hypothesis on autonomous motivation for leisure time physical activity cannot be retained, as I find a significant difference in both gender and school location groupings.

In my third hypothesis, I hypothesised that despite the introduction of daily physical education, parents/relatives still have the most positive influence on students' autonomous motivation to engage in leisure sports. This proved to be true. The pupils studied perceive autonomy support from parents/relatives as the most important influence on their autonomous motivation for leisure sport activities.

In my fourth hypothesis, I hypothesized that there would be no difference in the autonomy support for leisure time sporting activities by school, parents/relatives, friends, and autonomous motivation for leisure time sporting activities among the Hungarian students in the study, neither by gender nor by school location. The part of the hypothesis that there is no difference in the boy-girl grouping holds only for autonomous support from friends. Autonomy support from parents/relatives is significantly higher for girls, while autonomy support from PE teachers is significantly higher for boys. When grouped by school location, there is no difference in autonomy support from parents/relatives and friends between pupils attending school in the capital and those attending school in the rural areas. However, autonomy support from a PE teacher was significantly higher for pupils attending a school in the capital.

In the fifth hypothesis, based on the general pattern published in the literature, I hypothesized that attitude would have the greatest positive effect on leisure time sport activity intention and behaviour among the elements of the Theory of Planned Behaviour. I have to reject this assumption, because subjective norm was most strongly correlated with intention, followed by attitude, and then the weakest correlation was found between perceived behavioural control and intention.

In the first part of the sixth hypothesis, I hypothesized that I would find differences in the effects of the elements of the Theory of Planned Behaviour on the intention to engage in leisure-time sport activities between the male and female students. This hypothesis was only partially confirmed, as I only found significant gender differences in perceived behavioural

control on the intention to engage in leisure-time sport. For attitude and subjective norm, I found no significant difference by gender or by school location, but for perceived behavioural control, female students and students attending rural schools scored significantly higher.

Summary, Recommendation

The results of the research show that while the introduction of daily physical education contributes to pupils' daily physical activity recommendations - see the increase in the time allocated to physical education from 3 x 45 minutes to 5 x 45 minutes per week - it is not the medium from which pupils derive the self-motivation for leisure-time physical activity.

Of the three social actors, parents are the main positive influence on students' autonomous motivation to engage in leisure physical activity.

For the students in the study, subjective norms are the most important determinant of the intention to participate in recreational sport and influence action. With the legal requirement for daily physical education, there is also a general expectation that pupils should be more physically active in their daily lives. Pupils are interested in what is expected of them and what they would like to see in a given situation from people who are important to them (e.g. family, friends, peers).

Boys perceive greater autonomy support from PE teachers, while girls perceive greater autonomy support from parents/relatives.

Girls have stronger autonomous motivation in recreational sport activities and higher perceived behavioural control.

Students attending schools in the capital perceive greater autonomy support from PE teachers. Pupils attending rural schools have stronger autonomous motivation in recreational sports activities and higher perceived behavioural control.

The autonomy support from the PE teacher is so weak that it has hardly any effect on the autonomous motivation for leisure sports activities. Apart from the short-term goals of physical education in class, the long-term goals of introducing daily physical education can only be achieved with intrinsically motivated students. Physical education teachers, although not present during their students' leisure time physical activity, play a role in motivation development. Successful completion of a well-chosen, personalised task, test or challenge by a PE teacher can trigger a strong positive emotional state. The use of joint, group and individual form of team activities allows for considerable differentiation but also requires a high level of teacher organisation, attention and routine.

The use of modern tools (digital tablet, mobile phone, tablet, exergames, smart watches) and/or music, a more accessible motivational tool, is important, also for Generation Z. When choosing the music to be used in PE classes, as the age progresses, it is possible to give pupils more and more opportunities, if only to give them a sense of autonomy. Physical education teachers should always appreciate when pupils play sport competitively and even when they achieve results. As in other subjects, giving pupils homework or homework assignments and awarding them a mark can be an incentive.

It is essential that, in addition to parents/relatives and friends, PE teachers play a significant role in motivating leisure time sporting activity and thus in developing a healthy lifestyle. After family education, institutional education (nursery, primary and secondary schools) also brings pupils from less supportive backgrounds (families) into contact with physical activity. At the same time, pupils from sporting backgrounds can be introduced to other sports and forms of physical activity, thus broadening their choices.

LIST OF OWN PUBLICATIONS

List of own publications related to the topic

- Barsiné DI, Soós I, Hamar P. (2019) Magyarországi tanulók fizikai aktivitásának és inaktivitásának vizsgálata 12-18 éves tanulók körében. *Magy Sporttud Szle*, 20(1): 3-9.
- Soos I, Dizmatsek I, Ling J, Ojelabi A, Simonek J, Boros-Balint I, Szabo P, Szabo A, Hamar P. (2019) Perceived Autonomy Support and Motivation in Young People: A Comparative Investigation of Physical Education and Leisure-Time in Four Countries. *Eur J Psyc*, 15(3): 509-530.
- Barsiné DI, Hamar P, Soós I. (2020a) A tanulók szabadidőben végzett sportolási szándékát befolyásoló tényezőinek modellje Ajzen Tervezett viselkedés elmélete alapján. *Magy Sporttud Szle*, 21(4): 3-10.
- Barsiné DI., Soós I, Hamar P. (2020b) A fizikailag aktív szabadidő eltöltés helye és szerepe a 12-18 éves tanulók heti időrendjében a mindennapos testnevelés tükrében. *Fejlesztő pedagógia – Pedagógusoknak karantén idejére*, 31(1-3): 23-28.
- Barsiné DI, Ling J, Tóth L, Hamar P, Soós I. (2022) The effect of the introduction of daily physical education classes on the leisure activities of Hungarian students. *Cogn Brain Behav An Interdiscip J*, 26(1): 1-17.

List of own publications not related to the topic

- Barsiné DI, Hamar P. (2015): Rió felé félúton a magyar női torna. *Magyar Edző*, 1. 42-46.
- Barsiné DI, Versics A. (2015) Ízületi mozgékonyág, stretchingtechnikák. In: Hamar P. (szerk.). *Gimnasztika kisokos. Testnevelési Egyetem, Budapest*, 50-55.
- Machalikné HI, Barsiné DI. (2015) Bemelegítés. In: Hamar P. (szerk.). *Gimnasztika kisokos. Testnevelési Egyetem, Budapest*, 56-64.