LITHUANIAN SPORTS UNIVERSITY

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THE IMPORTANCE OF TEACHER'S AUTONOMY SUPPORT AND CONTROL FOR MOTIVATION AND PHYSICAL ACTIVITY AMONG HIGH SCHOOL STUDENTS

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MOKYTOJO PARAMOS AUTONOMIJAI IR KONTROLĖS VEIKSNIŲ REIKŠMĖ VYRESNIŲ KLASIŲ MOKSLEIVIŲ MOTYVACIJAI IR FIZINIAM AKTYVUMUI

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INTRODUCTION

About 80% of adolescents worldwide do not meet the recommendations (Van Hecke et al., 2016; Van Hecke et al., 2016; U.S. Department of Health and Human Services, 2018) to engage in moderate to vigorous physical activity (MVPA) at least 50% percent of physical education (PE) lesson time (NASPE, 2004; Pate et al., 2006).

It is estimated that the physical inactivity of the population requires over 50 billion dollars of health care funds each year (Ding et al., 2016).

Extreme inactivity eventually leads to a variety of chronic diseases such as cardiovascular disease, hypertension, diabetes, musculoskeletal disorders and obesity (Hruby & Hu 2015; Sallis et al., 2016; ISPAH, 2017; Centers for Disease Control and Prevention, 2017). According to the World Health Organization, lack of physical activity (PA) is the fourth major risk factor for mortality (Alpa et al., 2010; Baddeley et al., 2016).

PA has been scientifically proven to help protect against 26 chronic diseases (Pedersen & Saltin, 2015). Student PA can be encouraged by *family members* (Yao & Rhodes, 2015), *peers, and friends* (Inchley et al., 2020). The school environment can have a positive impact on students' health and well-being and mitigate the negative effects of other social factors (Joyce & Early, 2014; O'Reilly et al., 2018). The ability of a physical education teacher to motivate students to be physically active is critical not only in PE lessons, but also in their spare time and, in general, has enduring value in the student's later life.

Thus, PE teachers need to offer lifelong activities as it is the greatest value in the transition to adult life. However, it must also be taken into consideration that this proposal is not so simple. It is likely that it is not the content of the curriculum itself, but the broader learning environment (as well as the learning style, expected learning outcomes, and motivational climate) that determines the emergence of the PA goal. Some research has shown that students are more likely to continue to engage in physical activity outside of school if they are allowed to experience pleasure and autonomy in PE lessons (Cox & Williams, 2008; Cox et al., 2008).

There are many factors that can have a positive effect on students' physical activity, but there is a lack of a mechanism to explain how

teacher support relates to students' objective physical activity in PE lessons and motivation and physical activity in leisure-time.

These problems can be addressed through a variety of theories, but our goal, which is to elucidate the factors and mechanisms involved in students' motivation to engage in physical activity in PE lessons and leisure-time, is the most appropriate of all theories: the Trans-contextual model (TCM) (Hagger et al. 2003), it consists of two theories: Self-determination theory (SDT) (Deci & Ryan, 1985) and Theory of planned behavior (TPB) (Ajzen, 1985). The theoretical assumptions of TCM are based on empirical research and are characterized by a close relationship between autonomous motivation in the context of PE lessons and autonomous motivation to engage in physical activity in the context of leisure-time (Barkoukis et al., 2010; Hagger et al., 2009; Standage et al., 2012). TCM examines the effect of perceived autonomous support on autonomous motivation in PE lessons, which in turn is related to autonomous motivation for leisure-time physical activity (Hagger & Chatzisarantis, 2007; Ntoumanis, 2005; Barkoukis & Hagger, 2013).

Self-determination theory (Deci & Ryan, 1985). It is an empirically based macro theory explaining the motivation of human behavior in general in various areas of life (Deci & Ryan, 2012). SDT emphasizes a person's basic needs, autonomous or self-determined motivation (internal and well-internalized external), and non-autonomous or non-self-determined motivation (controlled) (Deci & Ryan, 2012).

Theory of planned behavior explains the interrelationships between socio-cognitive factors that help predict behavior. According to this theory, behavior is based on intent and control of perceived behavior. Intentions show how much a person is willing to put in the effort to accomplish a behavior. It can be said that the stronger the intentions to perform a certain action, the more likely it is to be performed (Ajzen, 1991).

Many studies have shown a positive perceived support of autonomy for student motivation and different learning outcomes (Hagger et al., 2009; Hein & Caune, 2014). Perceived autonomy support of teachers has been found to be associated with higher quality of PE lessons (Cox & Williams, 2008). This is thought to stimulate motivational processes, as an environment that supports autonomy increases the level of autonomy, competence, relatedness, and self-determination in general (Standage, 2006).

Thus, based on these theories, it is necessary for a PE teacher to be able to increase children's motivation, to create a close social connection through relationships reinforced by empathic, unconscious connection. Promoting autonomous motivation would develop autonomous motivation for behavior and help make an independent decision to be physically active in PE lessons and leisure-time.

The aim of the research was to evaluate the significance of teachers' perceived motivational factors for the motivation of older students to be physically active and physically active in physical education lessons and leisure-time.

Tasks:

1. To evaluate the significance of students' sociodemographic and learning factors for physical activity in physical education lessons and leisure-time.

2. To identify and compare moderate to vigorous physical activity in different content physical education lessons.

3. To compare students' perceived motivational factors of teacher and students' physical activity between groups of sufficient and insufficient physical activity in physical education lessons and leisure-time.

4. To compile a model of motivational factors predicting students' physical activity and to empirically check the direct and indirect connections of motivational factors with physical activity in physical education lessons and leisure-time.

Problematic issue. What and how factors for physical education teacher motivation are directly and through mediating student motivational factors related to objective physical activity in PE lessons and how these relationships depend on the content of the lesson. And, how and through what student motivational factors, PE teacher motivational factors are related to student leisure-time PA.

Scientific novelty. Some research has found that support for autonomy is associated with autonomous motivation and increased physical activity (Barkoukis & Hagger, 2013). However, it is not clear whether the effect of autonomy support is the same in different PE lessons. Research has shown that the level of MVPA in PE lessons varies depending on what activities the students are engaged in in the lessons.

It is also not clear how important teacher support for student leisure-time physical activity is, whether there is a direct effect, or what other factors transmit the indirect effect of supporting autonomy.

M. Ickes et al. (2012), analyzing perceived support for autonomy and the relationship between physical activity, indicate that giving students greater autonomous motivation, if they perceive it, increases their intrinsic motivation for physical activity, as well as their intentions to be physically active in their free time.

In general, the model was not tested in the Lithuanian student population. However, it cannot be denied that the role of the PE teacher and its significance for the student's physical activity may differ due to the different meanings given to the content of PE lessons in different countries.

The theory that is designed to explain personal and situational factors revealing different types of motivation in different settings is SDT (Deci & Ryan, 1985; Ryan & Deci, 2002). Mention should also be made about the TPM theory, which explains various behaviors related to physical activity (Hagger et al., 2007). These two theories form one common TCM theory that aims to explain the processes that promote autonomous motivation in PE lessons and leisure-time (Hagger et al. 2006).

The study, using TCM theory, sought to understand the mechanism by which students perceive the support of PE teachers and control behaviors related to objectively measured adolescent physical activity in PE lessons.

This would be an important addition to the literature and an integrated theoretical approach to physical activity. Because there is a lack of transcontext-based studies of objectively measured physical activity (Viciana et al., 2019), especially in objectively measured MVPA in PE lessons. In addition, there are no studies explaining the significance of perceived teacher support for autonomy in PE lessons of different content in students' MVPA.

Practical significance. The results of the research will help to understand what factors related to teachers and their behavior in the PE lesson motivate students to be more physically active in PE lessons and in their free time.

The transfer of factors leading to increased physical activity from PE lessons to leisure-time can be applied to nurturing basic psychological needs that encourage being physically active outside of school (Hagger & Chatzisarantis, 2016).

After clarifying the significance of teacher support for autonomy for students' physical activity in PE lessons and leisure-time, it will be possible to develop intervention programs, include the training of

autonomy support skills in study programs for future PE teachers, and so on.

Hypothesis: Greater perceived teacher support for autonomy is associated with greater autonomous motivation and physical activity of students in physical education lessons and leisure-time.

The object of the research is the interrelations between students' perceived teacher motivational factors, students' motivation to be physically active and physical activity in physical education lessons and leisure-time.

1. SUMMARY OF THE LITERATURE REVIEW AND JUSTIFICATION OF THE RESEARCH MODEL

The aim of this research is to elucidate the factors and mechanism that are related to the intention to engage in sufficient physical activity in PE lessons and leisure-time. To achieve the goal, an extended trans-contextual model (based on Hagger et al., 2003) is used in the study, the extension is the inclusion of needs satisfaction and different PE lessons in the model (Fig. 1).

The design of this study is a one-moment study. The design of a one-moment study is the most appropriate to determine the relationships between variables without manipulating them, i. e. without performing an experiment. The aim of this study is to assess the current situation, bearing in mind that all measured constructs are more or less constant. Behavior in this work is understood as a daily, repetitive action, i. e. physical activity in PE lessons and leisure-time. Neither PE lessons nor leisure-time contexts involved behavioral change interventions, so there are no preconditions for a study design other than one-moment. The study aims to provide guidelines for further in-depth experimental research, manipulating the effect of support for autonomy, and for further research to determine the effect of student perceived teacher support for autonomy / control on leisure-time physical activity in the long run.

Motivational factors of teachers perceived by students and motivational factors of students in this work are predictive factors in predicting students' physical activity in PE lessons and leisure time.

A review of the literature revealed that support for autonomy, linked to autonomous motivation, is related to the needs and intentions of students to be physically active in PE lessons and leisure-time. And the relationships between controlled behavioral factors are not clear. However, few such studies have been conducted in the context of PE in leisure-time (Rubak et al., 2009; Shigaki et al., 2010). Also, there is a lack of empirical evidence on how controlled motivation relates to intentions to engage in physical activity in PE classes and leisure-time. Therefore, it is important to examine the factors of teacher-controlled behavior in shaping students' intentions and behavior in order to achieve sufficient physical activity in PE lessons and leisure-time. The scientific literature reveals considerations that PE control may not be clearly perceived as pressure, an attempt to help students control behavior.

Students may rate control as a motivating factor (Rubak et al., 2009). Empirical evidence in the context of PE usually suggests that controlled motivation is not associated with PA (Brunet & Sabiston, 2011; Ng et al., 2014;). Individual studies in the context of PE and leisure-time also found no significant links between controlled motivation (Soenens et al., 2012). Theoretical assumptions indicate that controlled motivation is associated with low levels of physical activity. Therefore, this study assumes that controlled motivation, in contrast to autonomous, will be associated with lower physical activity in PE lessons and lower leisure-time PA.

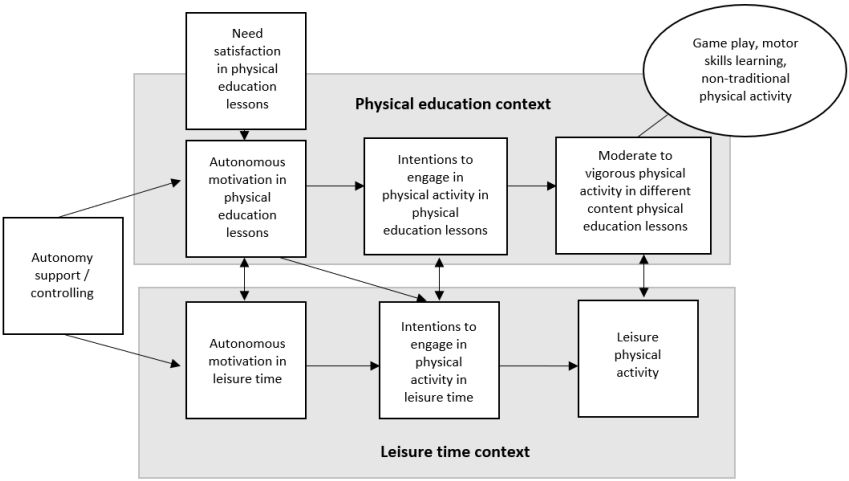

Fig. 1 *A research model based on an extended transcontextual model (based on Hagger et al., 2003)*

2. RESEARCH METHODOLOGY

2.1. Organization of the study

The study was conducted in three stages (questionnaire survey and objective study of physical activity).

The study was conducted in 2017 - 2018.

In order to select Lithuanian schools to participate in the study, a probabilistic selection method was applied.

A cross-sectional one-moment survey representing the population was conducted in all ten Lithuanian counties, proportionally representing students in the city and district. The school was considered to be the unit of selection, and in a school if there was more than one 9-10 grades, the class was considered to be the unit of random selection. Volunteering schools were also included in the study. The study was conducted in 29 Lithuanian secondary schools and gymnasiums.

The study was conducted without violating research ethics. Prior to the questionnaire survey, permits were obtained from the school management, and with the objective study of PA determination, the consents of the students' parents were obtained.

The questionnaire survey was conducted during informatics lessons by filling in a questionnaire with a computer, or during PE lessons by filling in paper questionnaires. In order to reconcile the actigraph data with the questionnaire, each participant and actigraph was assigned an identical code. Such a method was used by A. Koka et al. (2019).

In the first stage, a questionnaire survey was conducted on students' perceived motivational factors, students' motivational factors, and students' leisure-time physical activity.

A month later, **the second stage** took place - a questionnaire survey was conducted in relation to students' intentions to engage in physical activity in PE lessons and leisure-time.

In the third stage, a research was carried out (in two Kaunas city schools), during which an objective method (actigraph) of PA determination (assessment) was used. Student PA was determined in PE lessons with different content (sport, movement skills, and non-traditional PA).

PE classes were traditionally conducted according to the approved curriculum of the Ministry of Education, Science and Sports. Lessons were organized according to the annual plan of physical

education. The traditional lesson consists of three parts: a) preparatory (up to 10 minutes); b) basic (up to 35 minutes); c) final (up to 5 minutes).

2.2. The survey sample

The research sample consisted of students from different regions of the Republic of Lithuania. The study involved students in grades 9–10.

Table 1. *Sampling characteristics of the three study stages*

Variables	**Indicators (Avg. ± SD or N (%)**		
	1 stage	**2 stage**	**3 stage**
Sociodemographic indicators			
Age Avg. ± SD	15,75 ± 0,765	15,64 ± 0,659	15,61 ± 0,664
Gender (boys) N (%)	686 (46,4)	518 (55,2)	109 (44,0)
Gender (girls) N (%)	793 (53,6)	421 (44,8)	139 (56,0)
9 grade:			
9 (or 1 gymnasium) N (%)	783 (52,9)	579 (61,7)	133 (53,6)
10 grade:			
10 (or 2 gymnasium) N (%)	696 (47,1)	360 (38,3)	115 (46,4)

2.3. Research instruments

In order to determine students' perceived motivational factors (support for autonomy and control), students' motivational factors (satisfaction of basic psychological needs and autonomous motivation) and intentions to engage in physical activity in leisure-time and leisure physical activity, a research tool was developed using original and modified questionnaires by foreign authors. In this study, an internal compatibility check was performed, traditionally based on the Cronbach's alpha coefficient. Confirmatory factor analysis was performed for the autonomous motivation in the PE lesson and leisure-time questionnaires consisting of subscales and the needs satisfaction questionnaire. The questionnaires were double translated into Lithuanian and again into English. The final Lithuanian versions of the questionnaires were agreed with the researchers working with SDT and TPB.

The questionnaire consisted of 25 questions.

1. **Support for autonomy** - Sport Climate Questionnaire (SCQ) (Brickell, Chatzisarantis & Pretty, 2006; Hagger, Chatzisarantis, Culverhouse & Biddle, 2003), modified version in the context of physical education was measured (Hein, Emeljanovas & Mieziene,

2017) (Cronbach α 0.808).

Responses were made on a seven-point Likert scale ranging from 1 ("strongly disagree") to 7 ("strongly agree").

2. **Control** - was measured by the Multiple Controlling Teacher Behavior Scale (CTBS) (Bartholomew et al., 2010), modified for physical education to assess students' perceptions of PE teacher-controlled behavior (Hein et al., 2015).

   The statements consisted of four integrated scales: Negative control, Control by rewards, Intimidation threatening and Excessive control. The Cronbach α of each scale ranged from 0.677 to 0.876.

   Responses were made on a seven-point Likert scale ranging from 1 ("strongly disagree") to 7 ("strongly agree").

   The psychometric characteristics of the questionnaire in the Lithuanian student population were checked and presented in 2018 in a publication (Hein, Emeljanovas & Mieziene, 2018).

3. **The satisfaction of basic needs in the PE lesson** was measured by The Learning Climate Questionnaire (LCQ), (adapted from Standage, Duda & Ntoumanis (2005).

   The statements consisted of three integrated scales: autonomy, competence and relatedness. The Cronbach α of each scale ranged from 0.577 to 0.936.

   Responses were made on a seven-point Likert scale ranging from 1 ("strongly disagree") to 7 ("strongly agree").

   The confirmatory factor analysis (CFA) performed for Lithuanian adolescents demonstrated satisfactory parameters ($\chi 2$ = 525.99; df = 101; RMSE = 0.122 [0.112 - 0.132]; CFA = 0.971; TLI = 0.965; SRMR = 0.057) confirming the structure of the original scales.

4. **Intentions to engage in physical activity in physical education lessons** (Cronbach α 0.880) **and leisure-time** (Cronbach α 0.921). To measure them, Chatzisarantis, Biddle & Meek (1997) questionnaire was used, which was adjusted to fit the statements developed by the authors in the context of PE.

   Responses were made on a seven-point Likert scale ranging from 1 ("strongly disagree") to 7 ("strongly agree").

5. **Autonomous motivation in a physical education lesson** was measured using the *Perceived Locus of Causality* scale (PLOC) (Vlachopoulos et al., 2011) (pioneers of the scale Goud, Biddle & Fox, (1994), based on the work of Ryan & Connell (1989).

   The question consisted of 19 sub-questions and five integrated

scales: Amotivation, External regulation, Introjected regulation, Identified regulation, Intrinsic regulation.

Responses were made on a seven-point Likert scale ranging from 1 (“strongly disagree”) to 7 (“strongly agree”).

The confirmatory factor analysis (CFA) performed for Lithuanian adolescents demonstrated satisfactory parameters ($\chi 2$ = 514.47; df = 143; RMSE = 0.096 [0.087 - 0.105]; CFA = 0.978; TLI = 0.974; SRMR = 0.053) confirming the structure of the original scales. The Cronbach α of each scale ranged from 0.847 to 0.953.

6. **Autonomous motivation in leisure-time** was measured in The Behavioral Regulation In Exercise Questionnaire - 2 (BREQ-2) (Markland & Tobin, 2004).

   The question consisted of 19 sub-questions and five integrated scales: Amotivation, External regulation, Introjected regulation, Identified regulation, Intrinsic regulation.

   The Relative Autonomy Index (RAI), which indicates the degree of motivation of students for physical activity, was also used in this study. RAI was calculated using the formula: (Intrinsic regulation x +2) + (Identified x +1) + (Introjected regulation x -1) + (External regulation x -2) + (Amotivation x -3).

   Responses were made on a five-point Likert scale ranging from 1 (“strongly disagree”) to 5 (“strongly agree”).

   The confirmatory factor analysis (CFA) performed for Lithuanian adolescents demonstrated satisfactory parameters ($\chi 2$ = 262.64; df = 86; RMSE = 0.042 [0.036 - 0.048]; CFA = 0.993; TLI = 0.986; SRMR = 0.014) confirming the structure of the original scales. The Cronbach α of each scale ranged from 0.847 to 0.953.
7. **Leisure-time physical activity** was measured by Health Behavior in School-aged Children (HBSC).
   Responses ranged from "no hours per week" to "7 hours or more per week".
8. **Engagement in physical activity** was assessed with questions about attending after-school sports classes.
9. **Sociodemographic factors** were examined by asking questions. Gender, age, school, etc. were requested.
10. **Body composition questions.** Body weight (in kilograms) and height (in meters) were requested. Body mass index (BMI) was calculated according to the formula: body weight (in kilograms) divided by height (in meters) squared (kg / m2).

Objective instrument for determining physical activity in PE lessons (actigraph)

Student PA during PE lessons was determined with accelerometers on a ***Tri-axis ActiTrainer Activity Monitor*** (ActiGraph GT1M) (27g; 3.8 x 3.7 x 1.8 cm). They are used to assess the level of physical activity of children. The device registers physiological or mechanical impulses of body movement, these signals are used for variables that reflect PA (Bassett et al. 2012).

The PA level was determined according to the five intensity level scales and physical activity thresholds provided in the *Actilife* computer program: passive from 0 to 99 in 1 minute, mild activity100–1951 in 1 minute, moderate activity 1952–5723 in 1 minute, vigorous and very vigorous activity ≥ 5724 in 1 minute (Freedson et al., 1998).

Students' PA levels during PE lessons (45 min.) were assessed by summing the number of passive, mild, moderate, vigorous and very vigorous intensity levels per minute. Throughout the study, the MVPA is expressed as the proportion of each of the PA levels compared to the total lesson time. The total PA of the PE lesson was also calculated, which was obtained by summing all activity units every minute.

Objective physical activity was assessed during three different PE lessons (movement training, sports, and non-traditional physical activity).

2.4. Statistical analysis

Calculations were performed using *SPSS Statistics 24.0* and *Mplus 8*. All scale-type variables used in the data analysis met the scale normality requirements when, after verification, exclusions exceeding three standard deviations were removed and scale asymmetries and excess coefficients ranged from -1 to 1. In order to compare the means of the indicators the Student's t-criterion for data distributed according to the normal distribution was used. The Pearson r correlation coefficient was used to determine the interrelationships between the two scale-type variables. In assessing the frequency ratio of categorical data, a suitable chi-square criterion was used to analyze such data. Logistic regression was used to predict the odds ratios of independent factors in predicting a dependent variable. For prediction in a more than one variable model, structural modeling of equations was used, estimating full mediating relationships as well.

Confirmatory factor analysis (CFA) was used to confirm structure of questionnaires in Lithuanian sample of adolescents.

Structural equation models (SEM) were performed to identify direct and indirect relationships. Among goodness of fit indices for CFA and SEM, the χ 2/df was used, which indicates acceptable fit if it fits the interval: $2 < \chi$ 2/df < 3; root mean square error of approximation (RMSEA) with a 90% confidence interval (CI) was used, which is a population-based fit index that is not sensitive to sample size; the standardized root mean square residual (SRMR), which is a direct assessment of how well an a priori model reproduces the sample data. Values for RMSE and SRMR of < .05 were considered indicating a very good fit, and values < .08 were interpreted as indicating a good fit. Also, the comparative fit index (CFI) and Tucker–Lewis index (TLI) both are the incremental indices that compare the fit of a hypothesized model with that of a baseline model (i.e., a model with the worst fit), for which a value > .90 indicates a good model fit, and a value > .95 reflects a very good model fit (Arbuckle, 2006).

The results were considered statistically significant when their confidence factor p was <0.05.

3. RESULTS OF THE RESEARCH

3.1. Significance of sociodemographic and learning factors in physical education lessons and leisure-time

The significance of students' sociodemographic, BMI and leisure-time characteristics in predicting sufficient physical activity in a physical education lesson, the results of logistic regression, revealed that only gender predicts a higher PA in a PE lesson. Boys are more often sufficiently physically active in class than girls. Other sociodemographic indicators - BMI, age, parents' education, leisure sports - are not related to physical activity in PE lessons.

Thus, in further calculations, only gender will be taken into account in the context of physical education lessons and leisure-time.

3.2. Analysis of Physical Activity Factors in Physical Education Lessons of Different Content

3.2.1. Comparison of moderate to vigorous physical activity between different content physical education lessons

Pairwise comparison of objective moderate to vigorous physical activity expression in different types of physical education lessons in the general group of students, the results show that MVPA in different types of PE lessons does not have a statistically significant prognostic value because p value is higher than 0.05. Thus, it can be stated that all the studied students were equally physically active in all lessons (from 34.11 to 37.16%). *Comparing by gender*, the results show that there were statistically significant differences only in the group of boys and boys achieve higher MVPA in physical education lessons by participating in sports lessons ($47.58 \pm 22.01\%$, $p<0.01$). Boys reach as much as 19% more MVPA during a sports lesson than girls.

3.2.2. Relations between motivational factors and physical activity in physical education lessons of different content and physical activity in leisure-time

Next, we performed a correlation analysis of motivational factors and MVPA in different content physical education lessons. The results show that when evaluating the correlations between physical activity factors in PE lessons and leisure-time, it was found that MVPA in leisure-time is related only to sports lessons MVPA (0.230, $p<0.05$).

The higher the MVPA in a sports lesson, the higher the leisure-time MVPA. MVPA of different lessons are also positively correlated, i. e. if students are more physically active in one lesson, they are also more active in lessons of other content.

Among the motivational factors, higher perceived PE teacher negative (0.167, $p<0.05$), intimidation threatening (0.181, $p<0.01$) and excessive control (0.146, $p<0.05$) are significantly associated *with higher sports lesson* MVPA. Higher introjective motivation (0.150, $p<0.05$) is also associated with higher MVPA in sports lessons. Higher intrinsic motivation (0.151, $p<0.05$) and identified motivation 0.131, $p<0.05$) are significantly associated with MVPA of *higher movement training lessons*. Higher excessive control (0.171, $p<0.01$), intrinsic motivation (0.197, $p<0.01$), identified motivation (0.130, $p<0.05$), and introjective motivation (0.127, $p<0.05$) are significantly associated with higher MVPA of *non-traditional physical activity lessons*.

3.3 Factors of students‘ perceived teacher support and control and comparison of motivational factors of students between sufficient and insufficient physical activity in physical education lessons and leisure-time

A comparison of students' perceived teacher motivational factors, motivation, satisfaction of needs and intentions to be physically active in a physical education lesson between sufficient and insufficient physical activity in general groups of students reveals that for those students who are more than 50% of lesson time engaged in MVPA, characterized by higher intentions (5.63 ± 1.58 vs 5.02 ± 1.74, $p<0.01$), higher internal (5.57 ± 1.74 vs 4.82 ± 1.72, $p<0.01$) and identified motivation (5.60 ± 1.64 vs 4.71 ± 1.80, $p<0.01$), as well as greater satisfaction with autonomy needs (5.15 ± 1.15 vs 4.72 ± 1.13, $p<0.01$), weak negative control (2.71 ± 1.67 vs 1.90 ± 1.24, $p<0.05$), and lower excessive control (2.63 ± 1.20 vs 3.12 ± 1.50, $p<0.05$), be physically active in PE lessons than those who are less than 50% of lesson time engaged in MVPA.

Students‘ perceived teacher motivational factors, motivation, satisfaction of needs and intentions to be physically active in leisure-time, comparison between sufficient and insufficient physical activity in general groups of students. Comparing the means of the groups with sufficient and insufficient physical activity in leisure-time (engaging in physical activity for more or less than 6 hours per week), it can be seen

that higher support for autonomy (4.54 ± 1.47 vs 4.22 ± 1.42, p<0.01) promotes higher physical activity in leisure-time. Higher physical activity is related to intentions (6.01 ± 1.67 vs 4.88 ± 1.80, p<0.01) and to motivational factors: intrinsic motivation (4.35 ± 0.93 vs 3.57 ± 1.20, p<0.01), identified motivation (4.05 ± 0.87 vs 3.34 ± 0.93, p<0.01) and introjective motivation (2.88 ± 1.10 vs 2.36 ± 0.98, p<0.01). Higher physical activity is also affected by control factors: control by rewards (4.16 ± 1.58 vs 3.78 ± 1.41, p<0.01), negative control (2.98 ± 1.83 vs 2.67 ± 1.58, p<0.05), intimidation threatening (2.77 ± 1.97 vs 2.34 ± 1.64, p<0.01) and excessive control (3.48 ± 1.70 vs 3.07 ± 1.43, p<0.01).

3.4. Motivational factor models, empirically tested direct and indirect correlations of motivational factors with physical activity in physical education lessons and leisure-time

Table 2. *Indicators of the suitability of the motivational factors model of physical activity during physical education lessons*

X^2	l.l.	p	RMSEA [PI]	CFI	TLI	SRMR
25.663	9	0.002	0.048 [0.27-0.070]	0.991	0.962	0.009

Model fit results presented in the 2 table reveal that the model is well matched to the data and its results can be reliably interpreted.

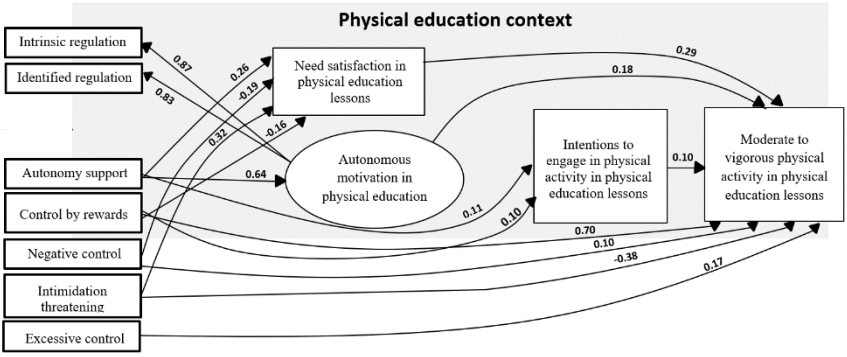

Fig. 2 *Results of model constructs interrelationships in the context of physical education*

Factors directly related to higher MVPA in PE lessons. The interrelationships of the constructs presented in the model reveal that the intention to participate in PE lessons (β = 0.10), autonomous motivation in PE lessons (β = 0.18) and satisfaction of needs in PE lessons (β =

0.29) are directly but weakly related to higher MVPA in PE lessons. MVPA in PE lessons is also directly related to controlled motivation: higher MVPA is directly and strongly associated with greater control by rewards (when the teacher praises, etc.) (β = 0.70), weakly - with greater excessive control (when the teacher wants a student to value their lesson more than other lessons, etc.) (β = 0.17) and greater negative control (when the teacher does not pay attention to students) (β = 0.10), negatively associated with intimidation threatening behavior in PE lessons (when the teacher uses punishment to control student's behavior) (β = –0.38).

Factors directly related to the intention to participate in PE lessons. Higher intentions of students to participate in PE lessons are explained by greater control of teachers by rewards (β = 0.10) and greater support of teachers for autonomy (β = 0.11).

Factors directly related to autonomous motivation to be PA in PE lessons. Higher autonomous motivation to be PA in PE lessons is strongly associated with greater support for autonomy (β = 0.64), which was included in the model as a latent variable consisting of intrinsic motivation (β = 0.87) and identified motivation (β = 0.83).

Factors directly related to meeting demand in PE lessons. Greater satisfaction with basic needs (autonomy, competence and commonality) is associated with greater support for autonomy (β = 0.26) and with intimidation threatening behavior (β = 0.32), and with lower negative control (β = –0.19) and lower control by rewards (β = –0.16).

The results of **indirect correlations** reveal that *support for autonomy is indirectly related to MVPA in PE lessons* with positive mediation of autonomous motivation (β = 0.114, p<0.01) and satisfaction of needs in PE lessons (β = 0.012, p<0.01). *Intimidation threatening is indirectly related to MVPA in PE lessons* with positive mediation of satisfaction of needs during PE lessons (β = 0.091, p<0.01).

Table 3. *Indicators of the suitability of the motivational factor model for leisure time physical activity*

X^2	l.l.	p	RMSEA [PI]	CFI	TLI	SRMR
67.757	13	0.0001	0.072 [0.056–0.090]	0.970	0.884	0.014

Model fit results presented in the 3 table reveal that the model is well matched to the data and its results can be reliably interpreted.

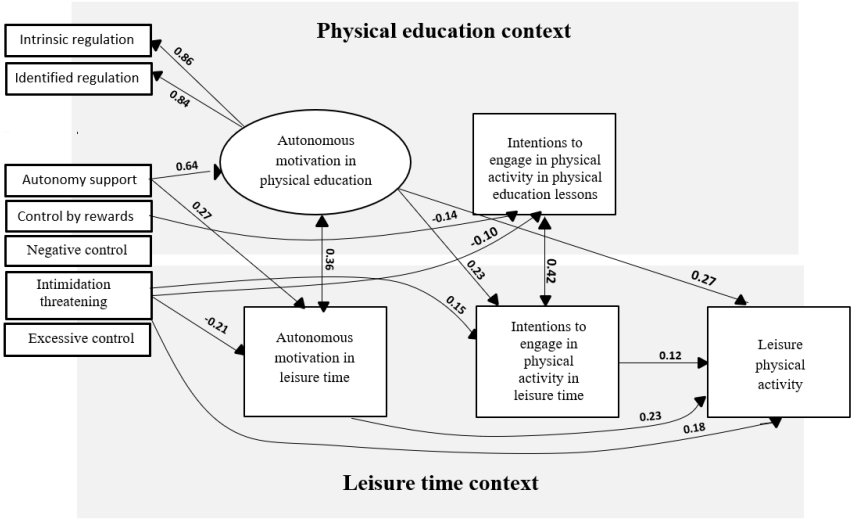

Fig. 3 *Results of model constructs interrelationships in the context of leisure-time*

Factors directly related to increased PA in leisure-time. The interrelationships of the constructs presented in the model reveal that the intention to be PA in leisure-time (β = 0.12), autonomous motivation to be PA in leisure-time (β = 0.23) and autonomous motivation to be PA in PE lessons (β = 0.27) are directly related to higher PA in leisure-time. PA in leisure-time is also directly related to controlled motivation: higher PA is directly but weakly associated with intimidation threatening behavior (β = 0.18).

Factors directly related to the intention to be a PA in leisure-time. Higher intentions of students to engage in physical activity in leisure-time are explained by higher intentions to be PA in PE lessons (β = 0.42), higher autonomous motivation in PE lessons (β = 0.23) and intimidation threatening (β = 0.15).

Factors directly related to autonomous motivation to be PA in leisure-time. Higher autonomous motivation to be PA in leisure-time is associated with higher autonomous motivation in PE lessons (β = 0.36), higher support for autonomy (β = 0.27), and negatively associated with intimidation threatening (β = -0.21).

Factors directly related to the intention to be in PA in PE lessons. Controlled motivation explains students' higher intentions to engage in physical activity in PE lessons: it is negatively associated with

intimidation threatening (β = –0.14) and with control by rewards (β = –0.10).

Factors directly related to autonomous motivation to be PA in PE lessons. Higher autonomous motivation to be PA in PE lessons is associated with greater support for autonomy (β = 0.64), which was included in the model as a latent variable consisting of intrinsic motivation (β = 0.86) and identified motivation (β = 0.84).

The results of indirect correlations reveal that autonomy support is indirectly related to PA in leisure-time by positively mediating autonomous motivation to be PA in leisure-time (β = 0.063, $p<0.01$), autonomous motivation to be PA in PE lessons (β = 0.174, $p<0.01$). It should be added that the positive effect of autonomy support in leisure-time PA is transmitted through the path of autonomous motivation to be PA in lessons and intentions to be PA in leisure-time (β = 0.018, $p<0.01$).

DISCUSSION

The main goal of this research is to evaluate the significance of teachers' motivational factors for the motivation and physical activity of senior students in PE lessons and leisure-time by applying a trans-contextual model. Applying the trans-contextual model, a more detailed understanding of how perceived factors of PE teachers' support for autonomy or control through students' motivational factors are related to physical activity in PE lessons and leisure-time is expected.

Relations between physical education lessons and motivational factors

The results of this study revealed that more boys (34%) than girls (3.4%) are sufficiently physically active in PE lessons. This shows that boys were ten times more physically active than girls. But neither boys nor girls reach the recommended norm to engage in MVPA by at least 50% of lesson time. The results obtained are in agreement with the studies of other authors, which state that MVPA of students during PE lessons corresponds to only 25% of lesson time and boys (18.8%) were more physically active than girls (7.9%) (Aelterman et al., 2012). And the methodological results of quality assessment by Y. Zhou and L. Wang (2019) showed which variables have a positive effect on students' MVPA in PE lessons. Gender (boys), as well as physical activity (team games) and the location of the lesson (outdoors) as well as the attractiveness of the lesson have the greatest influence. Many studies have revealed that girls in PE classes were less physically active than boys (Fernandes, 2018; Steenholt et al., 2018; Corder et al., 2019).

The results of the expression of objective MVPA in different types of PE lessons *in the general group* showed that there were no statistically significant differences in different types of PE lessons among senior students. Thus, it can be stated that all students were equally physically active in all lessons (sports, movement education, and NPA). According to I. Soos et al. (2019), rigorously formulated curricula provide older students with few opportunities to choose tasks during PE lessons. Therefore, PE lessons do not give students the pleasure of engaging in sufficient physical activity. However, an objective study of MVPA among younger students (11–12 years) revealed a difference between PE lessons with different content - higher MVPA was found in sports lessons (33.24%), but students did not reach

the recommended MVPA norm during PE lessons (Emeljanovas et al., 2015).

Comparing the results *in the groups by gender*, statistically significant differences were observed only in the group of boys, and the higher MVPA in PE lessons is achieved more by boys participating in sports lessons. N. Smith et al. (2014) study results also show that boys are more active than girls - they achieve the recommended MVPA level in PE lessons by playing sports games (47%). Sports games are one of the most effective ways to increase students' physical activity and they may help to reach recommended MVPA level during PE lessons (McKenzie et al., 2006; Wickel & Eisenmann, 2007). However, the activity level of girl groups differs greatly depending on the type of the lessons, e.g., girls are more physically active in fitness classes (aerobics, pilates, etc.) (59% of lesson time) (McKenzie et al., 2006). However, according to T. McKenzie et al. (2004), girls may be more physically active when exercising not alone but with boys. Therefore, teachers need to find activities in which all students, regardless of gender, have similar opportunities to be physically active in PE lessons.

In order to assess **the links between students' perceived teacher motivational factors and students' motivational factors and physical activity in the PE lesson** *in the general group* of students, the results partially confirmed the theoretical assumptions that self-determined types of motivation (internal and identified motivation), meeting the needs of autonomy and greater intentions are more expressed in a group of sufficiently physically active PE lessons. The results obtained during the study coincide with the studies of other authors, which analyzed the impact of support for autonomy on students' physical activity. PA does not decrease when students maintain higher intrinsic or identified motivation, and only when they maintain higher levels of enjoyment in PE lessons (Dishman et al., 2018). This is influenced by psychological needs (Ward et al., 2008; Standage et al., 2012; Kalajas-Tilga et al., 2019) and PE teacher support for autonomy (Reeve et al., 2004; Lim & Wang, 2009; Standage et al., 2003; Mandigo et al., 2008). In addition, psychological needs satisfaction and intrinsic motivation have been found to be closely related between adolescents' perceived autonomy and objectively measured MVPA (Standage et al., 2012; Kalajas-Tilga et al., 2019). This link is confirmed by J. Ward et al. (2008) study that providing students with at least a few physical activity options stimulates their intrinsic motivation by meeting basic psychological

needs. Thus, motivation is one of the most important PE factors determining physical activity in students.

In order to achieve a complex analysis of phenomena, structural modeling was performed. Factors directly and indirectly related to physical activity in PE lessons and their interrelationships are discussed below. The paper found that **students' perceived teacher support for autonomy** is related to physical activity in PE lessons, but the nature of the link is theoretically indirect. Researchers hypothesize that intentions should not be directly related to autonomy support. Consequently, intentions must be mediated or seen as one of the mediating factors in the sequence of links supporting autonomy support (Hagger & Chatzisarantis, 2009). The results of this study reveal that autonomy support is indirectly related to physical activity in PE lessons. Students perception that teachers support their self-determination contributes to intentions and increases autonomous motivation and satisfies their needs. This is positively related to higher MVPA in PE lessons. The importance of autonomy support for physical activity in PE lessons remains significant in mediating autonomous motivation and meeting needs. This means that support for autonomy, by strengthening self-determination, which in turn is linked to the satisfaction of needs, continues to pass on an indirect effect to autonomous motivation, which encourages greater MVPA in PE lessons. Similar results were obtained by other researchers. They also found no direct link between perceived autonomy support and physical activity in the context of PE (Hagger et al., 2005). It is argued that perceived teacher support for autonomy and the relations between physical activity are related through a motivational sequence that includes basic psychological needs and autonomous motivation (Weman-Josefsson et al., 2015; Kalajas-Tilga et al., 2019). Students who value their teachers more as supportive of autonomy are also more responsive to basic psychological needs (McLachlan & Hagger, 2010b; Reeve & Jang, 2006). In addition, research from this and previous PE lessons confirmed one of the key principles of SDT (Deci & Ryan, 2000): the autonomy-friendly environment created by PE teachers is not directly related to autonomous motivation but is related to meeting basic psychological needs (Standage et al., 2005, 2012; Haerens et al., 2015; Wang, 2017). Satisfaction of psychological needs is positively and significantly related to intrinsic motivation and shifted regulation, consistent with SDT (Hagger et al., 2009) and previous research findings in PE lessons (Standage et al., 2005; Sebire et al., 2013; Ntoumanis et al., 2001).

The aim of the study was to find out how the perceived **teacher-controlled factors** affect students' physical activity in PE lessons. *The control perceived by rewards* (when the teacher praises, rewards, etc.) and negative control (when the teacher is unfriendly, does not support, does not pay attention to students) are positively related to sufficient MVPA in PE lessons, but negatively related to needs satisfaction. *Intimidation threatening* (when a teacher applies punishment to control a student's behavior, intimidates and shouts) is positively associated with need satisfaction, but negatively with sufficient MVPA in PE lessons. *Excessive control* (when a teacher wants the student to value their lesson more than others, etc.) is weakly but positively related to sufficient MVPA in PE lessons. According to the SAT, control style can be expressed in different ways (Soenens & Vansteenkiste, 2010). PE teachers tend to use both controlling and autonomy support behaviors, depending on the circumstances, when interacting with students (et al., 2008; Bartholomew et al., 2010; Bartholomew et al., 2011a). A teacher can use controlled behaviors, such as praise and rewards, to encourage more attention in the classroom, but at the same time use autonomy support behavior to allow students to express their opinion. However, students fail to perceive both teacher behavior as autonomous and as controlling at the same time (Soenens & Vansteenkiste, 2010). Teachers tend to use controlled behaviors during lessons, which are associated with lower motivation to learn, and this is associated with lower motivation (Soenens et al., 2012). Teachers use controlled behaviors when they experience stress or pressure, or when they lack time during lessons (Pelletier et al., 2002; Reeve, 2009; Stebbings et al., 2012).

There is another opinion. K. Owen et al. (2014) study found that there is a significant but weak negative association between controlled motivation and PA. For example, girls engage in physical activity for appearance and weight control, but not for pleasure, as they care more about body appearance than PA (Lamanauskas and Armonienė, 2012). Other students engage in physical activity to obtain reward or avoid punishment, or perform tasks for guilt, shame, or to enhance self-esteem (Guay et al., 2010). Such controlled factors are inappropriate because student behavior will remain positive only as long as it is externally motivated, which negatively affects the satisfaction of basic psychological needs (Deci & Ryan, 2000; Bartholomew et al., 2009; Sallis et al., 2016; Haerens et al. al., 2015).

Relations between leisure-time physical activity and motivational factors

In order to assess the relations between students' perceived teacher motivational factors and students' motivational factors and leisure-time physical activity, the perceived factors of teacher support of autonomy, controlled behavior, student motivation, needs satisfaction and intentions between sufficient and insufficient physical activity in leisure-time in general student groups were compared. The results showed that greater intentions, more significant support for autonomy, greater internal, identified and introjective motivation and control by rewards, negative control, intimidation threatening and excessive control lead to greater physical activity in leisure-time. M. Ickes et al., (2012), H. Kalajas-Tilga et al., (2019) analyzed the relations between the perceived support for autonomy and physical activity and indicated that giving students greater autonomous motivation, if they perceive it, their intrinsic motivation for physical activity and their intentions to be physically active in their leisure-time increase. And M. Hagger et al. (2006) found that students with greater satisfaction of psychological needs were more likely to report higher autonomous motivation to be physically active in their spare time. Meeting the need for competence is the most important need which promotes motivation in the context of leisure-time. Students who are active in PE lessons and expressed greater satisfaction with the need for competence were more likely to form autonomous motivation in their spare time.

In order to achieve a complex analysis of phenomena, structural modeling was performed. Factors directly and indirectly related to leisure-time physical activity and their interrelationships are discussed below. The research found that the perceived teacher **support for autonomy** is positively related to autonomous motivation to be physically active in PE lessons (which was included in the model as a latent variable consisting of intrinsic motivation and identified motivation) and autonomous motivation to be physically active in leisure-time, but indirectly related to PA in leisure-time positively mediating autonomous motivation to be physically active in leisure-time with autonomous motivation to be physically active in PE lessons. The results of the study coincide with the results of other authors' researches obtained using the trans-contextual model. Perceived support for autonomy in the context of PE affects motivation in the context of leisure-time (Hagger et al., 2003; Reeve & Jang, 2006; Hagger & Chatzisarantis, 2007). Perceived support for autonomy is depicted as the

most influential form of autonomous motivation in the context of PE (Hagger et al., 2003; Hagger et al., 2005; Hagger et al., 2006). The results of another study revealed that support for autonomy is associated with autonomous motivation, and it is associated with a more favorable attitude and perceived behavioral control over leisure-time physical activity, which in turn predicts intentions to be physically active and intentions - to behave. This study is unique in that it has been shown that support for autonomy in one setting (PE in school) may be related to behavior in other contexts through mediating factors (leisure-time PA) (Hagger et al., 2003). More importantly, autonomous motivation to be physically active in PE lessons is driven by basic psychological needs and autonomous motivation in the context of leisure-time. More specifically, competence must be satisfied because it has a direct and indirect connection to autonomously motivating leisure-time through autonomous PE motivation (Hagger & Chatzisarantis, 2007).

Autonomous motivation to be physically active in PE lessons is positively related to intentions to be physically active in leisure-time and leisure physical activity. According to TCM (Hagger & Chatzisarantis, 2007; Hagger et al., 2003), autonomous motivation in PE lessons is positively related to autonomous motivation in the context of leisure-time. Thus, according to the theory of planned behavior (Ajzen, 1985; 1991; 2014), it should be provided that involvement in future activities is based on intentions, and motivation reflects the extent to which students plan to engage in activities (Eccles & Wigfield, 2002) and that autonomous motivation is an important impetus for predicting future behavior (Eccles & Wigfield, 2002). For example, students with autonomous motivation to engage in physical activity in PE classes were also autonomously motivated to engage in similar activities outside of school. Thus, autonomous motivation is related to physical activity in the context of PE and moves to autonomous physical activity motivation in leisure-time.

Autonomous motivation to be physically active in leisure-time is positively related to leisure-time physical activity. Leisure-time physical activity is positively related to the intention to be physically active in leisure-time. These links are positively related to the intention to be physically active in PE lessons. C. Armitage and M. Conner (2001) and M. Hagger et al. (2002) argue that intent is the most important link in predicting physical activity behavior in leisure-time. These results are confirmed by a study of M. Hagger et al. (2016). His results showed that intentions directly predict behavior.

Intimidation threatening is negatively associated with intentions to be physically active in PE lessons, but is positively associated with intentions to be physically active in leisure-time and leisure physical activity. Research by other authors has found that older students are more likely to engage in physical activity in order to look better or to maintain a better relationship with others (Trujillo et al., 2004; Molanorouzi et al., 2015). Such motives suggest that older students are driven by external goals that are driven by controlled behavioral motivation (Ingledew & Markland, 2008). In addition, J. Brunet and C. Sabiston (2011) argue that introjective regulation, which is one of the two parts of controlled motivation, is characteristic of older students. However, the relations between physical activity and controlled motivation is not accurate. Some studies have found negative association between controlled motivation and physical activity (Ng et al., 2014). Some researchers do not find any link between physical activity and controlled motivation at all. It is explained that perhaps controlled motivation may lead to being more physically active, but such behavior will not have a long-term perspective because it will be controlled from the outside (Deci & Ryan, 2000).

CONCLUSIONS

1. Neither age, BMI, class (learning factor), parental education, nor leisure sports predict sufficient physical activity in class. Only gender predicts higher physical activity in physical education lessons. Boys are more likely to be physically active in physical education lessons than girls.
2. In the general group of students, physical activity did not have a statistically significant difference between sports, movement education and non-traditional physical activity lessons. When compared in groups by gender, boys' moderate to vigorous levels of physical activity were higher in sports lessons than in movement training or non-traditional physical activity lessons. However, neither the group of boys nor the group of girls achieved the recommended norms of moderate to vigorous physical activity to be sufficiently physically active in a physical education lesson by at least 50% of lesson time.
3. Boys were more active in **physical education lessons** than girls. However, 34.3% of boys were sufficiently physically active in a physical education lesson and only 3.4% of girls. These students feel greater intrinsic and identified motivation, greater satisfaction with autonomy needs, express higher intentions, and perceive greater negative and excessive control.

   In the context of leisure-time, greater physical activity was also more pronounced in boys than in girls. However, sufficiently physically active in leisure-time is only 25.3% of boys, and only 12.2% of girls. Greater intentions, greater support for autonomy, stronger intrinsic and identified motivation, greater control by rewards, and less negative control, intimidation threatening, lower excessive control, and introjective motivation are associated with increased leisure-time physical activity.
4. The developed and empirically tested model of motivational factors allows to state that autonomy support is indirectly related to physical activity both in PE lessons and leisure-time.

   The significance of autonomy support in moderate to vigorous **physical activity in physical education lessons** is significant in mediating *autonomous motivation and satisfaction of needs*. Intimidation threatening is indirectly associated with moderate to

vigorous physical activity in physical education lessons with positive mediation of satisfaction of needs during physical education lessons.

Direct links show that *higher moderate to vigorous physical activity in physical education lessons* is directly related to needs satisfaction, autonomous motivation, intentions, control by rewards, negative control, excessive control, and negatively associated with stronger intimidation threatening. *Intentions to participate in physical education classes* are directly linked to autonomy support and control by rewards. Autonomy support is directly related to *autonomous motivation to be physically active in physical education lessons*. *Satisfaction of needs* is directly linked to autonomy support, intimidation threatening and are negatively linked to control by rewards and negative control.

Autonomy support is also indirectly related to **leisure-time physical activity**, positively mediating *autonomous motivation to be physically active in leisure-time* with *autonomous motivation to be physically active in physical education lessons,* and *mediating autonomous motivation to be physically active in physical education lessons* and *intentions to be physically active in leisure-time.*

Direct links show that *higher physical activity in leisure-time* is directly related to intentions to be physically active in leisure-time, autonomous motivation to be physically active in physical education lessons, autonomous motivation to be physically active in leisure-time, and control by rewards. Intentions to be physically active in physical education lessons, autonomous motivation to be physically active in physical education lessons, and intimidation threatening are directly related to *intentions to be physically active in leisure-time*. *Autonomous motivation to be physically active in leisure-time* is directly related to autonomy support, autonomous motivation during physical education lessons and negatively related to intimidation threatening. *Intentions to be physically active in physical education classes* are directly related to intentions to be physically active in leisure-time and negatively related to control by rewards and intimidation threatening. Autonomous motivation to engage in physical activity in leisure-time and autonomy support are directly related to *autonomous motivation to be physically active in physical education lessons*.

SANTRAUKA

Didžiausia visuomenės sveikatos problema XXI a. yra per mažas fizinis aktyvumas. Net 80 proc. paauglių visame pasaulyje neatitinka rekomendacijų (U.S. Department of Health and Human Services, 2018), ne mažiau kaip 50 proc. pamokos laiko užsiimti vidutiniu ir dideliu fiziniu aktyvumu (NASPE, 2004; Pate et al., 2006).

Fizinis pasyvumas paauglystėje visame pasaulyje laikomas visuomenės sveikatos našta (Sawyer et al., 2012). Yra apskaičiuota, kad fizinis populiacijos pasyvumas kiekvienais metais pareikalauja virš 50 mlrd. JAV dolerių sveikatos apsaugos lėšų (Ding et al., 2016).

Itin didelis pasyvumas ilgainiui sukelia įvairias lėtines ligas, tokias kaip širdies ir kraujagyslių ligos, hipertenzija, cukrinis diabetas, kaulų ir raumenų sistemos ligos bei nutukimas (Sallis et al., 2016; ISPAH, 2017; Centers for Disease Control and Prevention, 2017). Pasaulio sveikatos organizacijos duomenimis, nepakankamas FA yra ketvirtasis pagrindinis mirtingumo rizikos veiksnys.

FA gali padėti skatinti *šeimos nariai* – tų vaikų, kurių abu tėvai yra fiziškai aktyvūs, net 68 proc. vaikų taip pat yra fiziškai aktyvūs (Yao & Rhodes, 2015), *bendraamžiai ir draugai* – šiek tiek daugiau nei pusė (53 proc.) 11–15 metų amžiaus vaikų nurodė, kad bendraamžių palaikymas skatina būti fiziškai aktyviems (Inchley et al., 2020), *mokykla* – mokyklos aplinka gali teigiamai veikti moksleivių sveikatą ir gerovę bei sušvelninti neigiamą kitų socialinių veiksnių poveikį (O'Reilly et al., 2018) bei paskatina moksleivius atitikti fizinio aktyvumo rekomendacijas (Joyce & Early, 2014). Fizinio ugdymo pamokos yra viena iš veiksmingiausių intervencinių priemonių didinant/stiprinant vaikų fizinį aktyvumą (Graham et al., 2006; Kruk, 2007). Kokybiškos fizinio ugdymo programos (tuo pačiu ir pamokos) gali prisidėti prie bendro moksleivių fizinio aktyvumo lygio gerinimo (Bates, 2006; Ehrlich, 2008).

Yra labai daug veiksnių, kurie gali teigiamai veikti moksleivių fizinį aktyvumą, tačiau trūksta mechanizmo, aiškinančio, kaip mokytojo parama atsiliepia moksleivių fiziniam aktyvumui FU pamokose ir motyvacijai laisvalaikio fiziniam aktyvumui.

Šias problemas galima spręsti pasitelkus įvairias teorijas, tačiau mūsų tikslą kuris yra išaiškinti veiksnius ir mechanizmą, kurie siejasi su moksleivių motyvacija užsiimti fiziniu aktyvumu FU pamokose ir laisvalaikiu, iš visų teorijų labiausiai tinkamas yra **Transkontekstinis**

modelis *(angl. Trans-contextual model)* (TKM) **(**Hagger et al., 2003), jis susideda iš dviejų teorijų: *savarankiško apsisprendimo teorijos* (angl. *Self-determination theory*) (SAT), kuri įvertina kokybiškai skirtingą motyvaciją (Deci & Ryan, 1985; Ryan & Deci, 2002) ir *planuoto elgesio teorijos* (angl. *Theory of Planned Behavior*) (PET), kuri aiškina situacinę motyvaciją iš kiekybinės perspektyvos (Ajzen, 1985; Hagger et al., 2007). TKM modelio teorinės prielaidos paremtos empiriniais tyrimais ir joms būdingas glaudus autonominės motyvacijos FU pamokų kontekste ir autonominės motyvacijos užsiimti fiziniu aktyvumu laisvalaikio kontekste ryšys (Barkoukis et al., 2010; Standage et al., 2012). TKM nagrinėja suvokiamos autonominės paramos poveikį autonominei motyvacijai FU pamokose, kuris, savo ruožtu, yra susijusi su autonomine laisvalaikio fizinės veiklos motyvacija (Hagger & Chatzisarantis, 2007; Barkoukis & Hagger, 2013).

Taigi, remiantis šiomis teorijomis, tiektina, kad FU mokytojas galėtų padidinti vaikų motyvaciją, sukurti glaudų socialinį ryšį per santykius, sustiprintus empatiniu, nesąmoningu ryšiu. Autonominės motyvacijos skatinimas ugdytų autonominę motyvaciją elgesiui ir padėtų priimti savarankišką sprendimą būti fiziškai aktyviam FU pamokose ir laisvalaikiu.

Tyrimo objektas – moksleivių suvoktų mokytojo motyvacinių veiksnių, moksleivių motyvacijos būti fiziškai aktyviems ir fizinio aktyvumo fizinio ugdymo pamokose ir laisvalaikiu tarpusavio sąsajos.

Hipotezė: didesnė suvokta mokytojo parama autonomijai siejama su didesne moksleivių autonomine motyvacija ir fiziniu aktyvumu fizinio ugdymo pamokose ir laisvalaikiu.

Tyrimo tikslas – Įvertinti moksleivių suvoktų mokytojo motyvacinių veiksnių reikšmę vyresnių klasių moksleivių motyvacijai būti fiziškai aktyviems ir fiziniam aktyvumui per fizinio ugdymo pamokas ir laisvalaikiu.

Uždaviniai:

1. Įvertinti moksleivių sociodemografinių ir mokymosi veiksnių reikšmę fiziniam aktyvumui fizinio ugdymo pamokose bei laisvalaikiu.
2. Nustatyti ir palyginti vidutinį ir didelį fizinį aktyvumą skirtingo turinio fizinio ugdymo pamokose.
3. Palyginti moksleivių suvoktus mokytojo bei moksleivių fizinį aktyvumą sąlygojančius motyvacinius veiksnius tarp pakankamo ir nepakankamo fizinio aktyvumo fizinio ugdymo pamokose ir laisvalaikiu grupių.

4. Sudaryti moksleivių fizinį aktyvumą prognozuojančių motyvacinių veiksnių modelį ir empiriškai patikrinti tiesiogines ir netiesiogines motyvacinių veiksnių sąsajas su fiziniu aktyvumu fizinio ugdymo pamokose ir laisvalaikiu.

Probleminis klausimas. Kokie ir kaip fizinio ugdymo mokytojo motyvacijai veiksniai tiesiogiai ir per medijuojančius moksleivio motyvacinius veiksnius siejasi su objektyviu fiziniu aktyvumu FU pamokose ir kaip šios sąsajos priklauso nuo pamokos turinio. Bei, kaip ir per kokius moksleivio motyvacinius veiksnius FU mokytojo motyvaciniai veiksniai siejasi su moksleivių laisvalaikio FA.

Mokslinis naujumas. Tam tikrais tyrimais yra nustatyta, kad parama autonomijai siejasi su autonomine motyvacija ir didesniu fiziniu aktyvumu (Barkoukis & Hagger, 2013). Tačiau neaišku, ar paramos autonomijai efektas yra vienodas skirtingose FU pamokose. Taip pat nėra aišku, kiek svarbi mokytojo parama moksleivio laisvalaikio fiziniam aktyvumui, ar yra tiesioginis efektas, ar kokie kiti veiksniai perduoda netiesioginį paramos autonomijai efektą.

TKM tikslas – paaiškinti procesus, kurie paskatina autonominę motyvaciją fizinio ugdymo pamokose ir laisvalaikiu (Hagger et al. 2006). Šis modelis padeda paaiškinti procesus, kaip pastiprinta moksleivių motyvacija fizinio ugdymo kontekste transformuojasi į motyvaciją būti fiziškai aktyviam laisvalaikiu ir laisvalaikio fizinį aktyvumą.

Tai būtų svarbus literatūros papildymas ir integruotas teorinis požiūris į fizinį aktyvumą. Nes trūksta TKM pagrįstų objektyviai išmatuoto fizinio aktyvumo tyrimų (Viciana et al., 2019), ypač objektyviai išmatuoto vidutinio ir didelio fizinio aktyvumo fizinio ugdymo pamokose. Be to, nėra tyrimų, kur būtų aiškinamasi suvokiamos mokytojo paramos autonomijai reikšmė moksleivių vidutiniam ir dideliam fiziniam aktyvumui skirtingo turinio FU pamokose.

Praktinis reikšmingumas. Tyrimo rezultatai padės suprasti, kokie su mokytoju ir jo elgesiu FU pamokoje susiję veiksniai motyvuoja moksleivius būti fiziškai aktyvesniems FU pamokoje ir laisvalaikiu.

Išsiaiškinus mokytojo paramos autonomijai reikšmę moksleivių fiziniam aktyvumui FU pamokose ir laisvalaikiu, bus galima kurti intervencines programas, įtraukti autonomijos paramos įgūdžių mokymą į studijų programas būsimiems FU mokytojams ir pan.

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