

Students motivation for engaging in physical activity: Theory for self-determination

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ABSTRACT

This study explored the relationship between self-determination in the regulation of exercise behaviour and stage of change for exercise in student population. The research is conducted on a sample of 1066 respondents randomly selected from several faculties within the University "St. Cyril and Methodius" in Skopje. They completed the Stages of Exercise Scale and the Behaviour Regulation Exercise Questionnaire. Consistent with theoretical predictions, individuals who had been active over a period of time were more self-determined in their behaviour regulation. Exercising to achieve an outcome emerged as the most influential factor in discriminating active participants from inactive ones. The results of the research will serve in building strategies and intervention that will aim to promote feelings of self-determination for exercise in student population. In the basis of the theory of self-determination, such interventions will strive to foster students' perceptions of choice, personal mastery, fun and excitement from exercise, especially in those who do not have regular physical activity. **Keywords:** Physical activity; Motivation; Students.

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INTRODUCTION

The World Health Organization states in all its acts the importance of physical activity in the preservation of health, especially in the procedures for the prevention and treatment of chronic diseases (WHO, 2004). Numerous scientific-professional studies emphasize the cause-effect connection of physical activity, physical fitness and the health of the individual (Mišigoj-Duraković, 2008; Džepina & Čavlek 2004). The above studies highlight the reasons such as: lack of physical activity, sedentary lifestyle, inadequate diet, weight gain, smoking of cigarettes, consumption of alcohol and drug and after the present dietary disorder that is manifested through anorexia or bulimia. In the previous studies, the problem of insufficient physical activity and the inclination towards risk behaviours is emphasized, especially among the student population (Džepina & Čavlek 2004; Huddleston et al., 2002). Students are part of a young people's population preparing for an important role in social life, who as educated people with their knowledge and experience will influence future generations of children and young people. The sharp decline in physical activity is particularly pronounced during adolescence (15-19 years) and in young adults (20-15 years) which puts the students at risk group (Wallace et al., 2000).

The problem of insufficient physical activity among students has been recognized in many European countries; in the United Kingdom it is popularly called "coach potato society", and in our region under the name "homo-sedentary population" or "population of young and elders".

Theoretical models that explain human behaviour are in the initial stage, but there are still information indicating the way man works and behaves. There are more theoretical models that explain the physical activity and the factors that influence it. Some of the theories and models were primarily are designed to explain the physical activity and the factors that influence it, while other theories and models were constructed in the direction of intervening in order to increase the level of physical activity in the population.

The theoretical conception on which this research is based in the trans-theoretical model and the Self – Determination Theory, SDT (Ryan & Deci, 1985, 2000). The theory of self-determination, similar to the trans-theoretical model, can help in understanding why students are involved in physical-sport activity and whether they intend to do so in the future. The most commonly identified motivations for people to engage in physical activity are: to improve or maintain health, improve physical appearance, enjoyment, desire for competition, social experiences and gaining psychological benefit. Motives that are regulated by an external motivational regulator (ex. Improving the physical appearance) cannot be as durable as those that are substantial (ex. Enjoyment, social and psychological). As an individual perceives autonomy, the decisive factor is whether or how many students will deal with physical and sports activity. In several studies, the theory of self-determination has been used as a framework for exploring physical-sport activity and the influence of socio-demographic factors on the same (Wilson et. al. 2004; Fredrick & Rajan, 1993; Wilson & Rodgers 2002).

In the Republic of Macedonia has a small number of students that have investigated the factors that affect the physical activity of young people and adolescents (Zivkovic, Gontarev & Kalac 2015; Gontarev& Kalac 2016) and at the same time there are no studies in which the student population is covered, which has its own specifics.

Specific research goals were: (a) Determine the level of emotional, external, intra-patient, identification and internal motivation among students who are at different stages of motivational readiness to change the physical activity habits? (b) If so, how do the levels of self-determination differ in the different stages of motivational readiness to change the physical activity habits of this population group?

METHODS OF WORK

A sample of respondents

The research was conducted on a sample of 1066 respondents randomly selected from several faculties within the University “St. Cyril and Methodius” in Skopje. The sample is divided into two subpopulations according to gender: 419 male and 647 female respondents. The survey is carried out in an enclave using the appropriate organization of work that is typical for such research. Respondents are treated in accordance with the Helsinki Declaration.

A sample of variables

The data are collected using the structured survey questionnaire. Variables are defined on the basis of survey questionnaires (scales) and are categorized into two groups: Dependent variable (Level of readiness to change the physical activity habits) and Independent variables (amotivation, external regulator, introjected regulator, identification regulator, intrinsic regulator and autonomous index of the strength of self-regulation).

Instruments

Physical Activity Stages of Change Questionnaire (PASCQ). (Marcus & Simkin, 1993) the scale consists of four items (questions) that determine the five stages of the student's current motivational readiness to change the physical activity habits. The questions are answered with yes or no, and the answers are evaluated using the scoring algorithm. For example, a student is classified in the pre-thinking phase if he answers “no” to the first questions. The student is classified in the maintenance phase if he answers “yes” to questions one, three and four. The reliability of the instrument tested with the test-retest method in the previous research is moving .78-.85 ($K=.78-.85$) (Marcus & Forsyth, 2003). The validity of the instrument was determined by comparing direct measurements of physical activity with an accelerometer, compared to other instruments for assessing physical activity and based on the maximum oxygen consumption VO_2 and it was satisfactory (Cardinal 1995; Marcus & Simkin, 1993, 1993; Wyse 1995).

Behaviour Regulation Exercise Questionnaire (BREQ-2): the motives for physical activity is presented by: Behaviour Regulation Exercise Questionnaire (BREQ-2) which is constructed by Mullan, Markland, and Ingledew (1997), it consists of 18 items and is of the Likert type, and it is divided into several sub-classes: amotivation (I do not see why should I exercise), external regulation (ex. I exercise because other people say I should), introjected regulation (ex. I feel guilty when I am no exercising), identified regulation (ex. I exercise because I have a health, aesthetic benefit), intrinsic motivation (ex. I exercise because it is funny). Of the four subclasses, an autonomous index of the self-regulation of the motivation to the physical activity is overcome by the formula: $(3) AM + (-2) (EXT) + 1J + 2ID + 3(IM)$. With the confirmative factor analysis are identified four factors: the Cronbach alpha coefficient was also quite high for the four factors (external = 0.79, introjected = 0.76, identified = 0.78, intrinsic = 0.90).

Methods for data processing

For all quantitative variables, the basic descriptive statistical parameters are calculated: arithmetic mean (\bar{X}), standard deviation (SD), kurtosis (KURT), asymmetry of distribution (SKEW). The normal distribution of the variables is tested with Kolmogorov-Smirnov test. For all qualitative variables, frequencies, relative frequencies and percentages of individual responses were calculated and χ^2 tests were applied. In order to determine which motivation regulators are important in differentiating the respondents who have different levels of motivational readiness to change the physical activity habits, a multivariate and univariate analysis of the covariance (MANKOVA and ANKOVA) with the partialisation of the gender (the gender was treated as a covariance in order to neutralize the eventual impact), and post-hoc tests (LSD - tests). A canonical

descriptive analysis is also applied. The data are processed with the statistical package SPSS for Windows Version 22.00.

RESULTS

Table 1. shows the classification of the respondents in 5 (five) categories according to their motivational readiness to change the physical and activity habits. From the overview of the table it can be seen that 11.8% of the respondents are in precontemplation phase (respondents who are not physically active and do not even think about the need for physical activity), 43,5% of the respondents are in the contemplation phase (respondents who are not physically active but think about the need for physical activity), 12,1% of the respondents are in the preparation phase (respondents who occasionally are physically active or are ready to start regular physical activity), 17,6% of the respondents are in the phase of action (respondents who are physically active for less than 6 months), 14,9% of the respondents are in the maintenance phase (respondents who are physically active for more than 6 months). The values of the χ^2 test ($\chi^2 = 3,22$; $p = .200$) indicate that there are statistically significant differences between male and female students. From the values in Table 1 it can be seen that a much larger percentage of male students (47,0% from male versus 23,2% female) are in the phase of action and maintenance, while a much larger percentage of female students (66,2% of female versus 38,7% male) are in the stage of rethinking and thinking.

Table 1. Classification of respondents in 5 (five) categories, according to their motivational readiness to change the physical activity habits

	Male		Female		Total	χ^2 tests
PC	40	9.50%	86	13.30%	126	92.311
C	122	29.10%	342	52.90%	464	.000
P	60	14.30%	69	10.70%	129	12.10%
A	93	22.20%	95	14.70%	188	17.60%
M	104	24.80%	55	8.50%	159	14.90%

In order to determine which motivational regulators are important in differentiating the subjects with different levels of physical activity, a multivariate analysis of covariance (MANCOVA), with partialisation of the gender, was applied. The results of the multivariate and univariate analysis of the covariance and the size of the partial effect of the determinants (partial η^2), are presented in the Table 2.

Table 2. Multivariate and univariate differences in psycho-social factors among students with different levels of physical activity

	Wilks' Lambda		Rao's R		df 1		df 2		Q				
	,807		9,252		24		3493		,000				
	PC		C		P		A		M		F	Sig.	partial η^2
	X	SD	X	SD	X	SD	X	SD	X	SD			
RAI	2.8	3.8	5.3	4.2	6.1	5.3	7.7	5.1	8.7	5.5	32.92	0.000	0.12
Amotivation	2.4	0.9	2.0	0.9	2.0	0.9	1.8	0.9	1.7	0.9	10.56	0.000	0.04
External regulation	1.9	0.8	1.9	0.7	1.9	0.8	1.8	0.8	1.8	0.9	0.88	0.476	0.00
Introjected regulation	2.3	1.0	2.7	0.9	2.8	0.9	3.1	1.0	3.2	1.0	16.78	0.000	0.06
Identified regulation	2.8	0.9	3.3	0.8	3.5	0.8	3.8	0.8	4.0	0.8	42.73	0.000	0.15
Intrinsic regulation	2.9	0.9	3.4	0.8	3.6	0.9	3.8	0.9	4.0	0.9	27.87	0.000	0.10

* PC - Stage Precontemplation; C - Stage Contemplation; P - Stage Preparation; A - Stage Action; M - Stage Maintenance

From the analysis of the results it is clearly seen that in the whole system of treated variables there are statistically significant differences at the multivariate level ($Q = .000$). The partial effect on interaction at the multivariate level shows the mean effect of impact (partial $n^2 = .052$). At univariate level (Table 2) are determined statistically significant differences in the variables: autonomous index of the power of self-regulation of the motivation of physical activity ($F = 32,92$; $p = 0,000$), amotivation ($F = 10,56$; $p = 0,000$), introjected regulator ($F = 16,78$; $p = 0,000$), identification regulator ($F = 42,73$; $p = 0,000$) and intrinsic regulator ($F = 27,87$; $p = 0,000$). The biggest differences are identified in the identification regulator (partial $n^2 = 0,15$), internal regulator (partial $n^2 = 0,10$) an autonomous index of the power of self-regulation of motivation to physical activity (partial $n^2 = 0,12$).

Table 3. Discriminative analysis among students with different levels of physical activity

Eigenvalue	% of Variance	Canonical Correlation	Wilks' Lambda	Chi-square	df	Sig.
0.197	95.2	0.405	0.827	193.29	20	0.000
<i>Discriminating variable</i>				<i>Structure coefficient</i>		
Identified regulation				.953*		
Intrinsic regulation				.754*		
Introjected regulation				.616*		
Amotivation				-.372*		
External regulation				-.027		
<i>Motivating regulators</i>				<i>Centroids</i>		
PC				-.876		
C				-.147		
P				-.009		
A				.459		
M				.619		

The results of the descriptive canonical analysis are shown in the Table 3. From the overview of the table it can be seen that only the first discriminating factor in the common space of all applied variables is statistically significant, that is, Wilks'- Lambda is relatively high (.827), indicating that differences between groups are statistically significant ($P = .000$). The coefficients of the canonical relation (CR) indicate that 41% is explained the significance of the canonical, that is, discriminative function. The explained part of the correlation of the coefficients for the entire system of variables has high value ($\text{Chi-sqr} = 193.29$). On the basis of the discriminatory factors, which are defined as the correlation relations of the overall sample of variable in the overall sample of respondents and based on the position of the centroids (the arithmetic mean in the entire space of student' variables), can be seen that the greatest contribution in the differences of the discriminatory function has the identification regulator, the internal regulator, the interjection regulator and the amotivation.

The positive values of group centroids indicate that the groups have positive results on the linear combination of dependent variables, while the negative results show the opposite.

The coefficients of the structure indicate that the amotivation and external motivation regulator have a negative projection of the discriminatory function, while the interjection regulator has a positive projection of the first descriptive function. From the values of the centroids it can be seen that the respondents who are in the pre-thinking phase and thinking have negative values of the centroids, the respondents who are in the

phase of readiness have relatively neutral, while the respondents who are in the phase of action and maintenance have positive values of the centroids.

DISCUSSION

The purpose of this study was twofold. Firstly, to determine whether the results of BREW-2 subscales can discriminate students who are at different stages of motivational readiness to change their physical activity habits. Secondly, to determine how the level of regulation and self-determination varies in groups that differ in their willingness to change the habits of physical Mullan & Markland, 1997, activity. Contrary to the results obtained from Ingeledew, Markland and Medley (1998), but similar to those of Landry & Solmon (2004) and Mullan and Markland (1997) only one significant discriminatory function was identifying. The obtained research results are in accordance with theoretical arguments proposed by the theory of self-determination and previous research (Landry & Solmon, 2004, Rose et al., 2005, Wilson & Rodgers, 2004). That means, that the one obtained discriminatory function supports the assumption that all motivational regulators are on a single continuum in a range from low (amotivation) to high (intrinsic) self-defined motivation. In the past research it has been established that greater self-determination is a prerequisite for participation in regular exercise and classification in one of the higher stages of motivational readiness to change physical activity.

External regulation which is characterized by motivation related to coercion (I exercise because other people say I should) did not significantly affect the motivational constructs that differentiate the stages of motivational readiness to change the physical activity. Mullan & Markland (1997) also found that external motivation was not a factor that discriminated respondents who are in different stages of motivational readiness to change physical activity. The results of the research suggest that the compulsion of others to be physically active does not affect the readiness to change the physical activity habits of this sample of respondents. The arithmetic mean of the external regulation mechanism of the scale BREQ-2 gives certain information. The arithmetic environments for all groups in this study were less than two, indicating that students did not respond that they practice simply because other people say they should do it. This suggests that the use of threats, or intimidation by health care providers and/or kinesiologists, will not be considered as an effective motivational tool. Respondents did not practice because other people thought they should, and the threat of disapproval associated with refusal to exercise was not an influential factor. Another possibility is that the respondents did not have any pressure or disagreements from others, and therefore this regulator has no influence on this sample of respondents.

Introjected regulator or the so-called guilt regulator (I feel guilty, shame when I am not exercising) has contributed to the linear discriminatory function. Among the respondents in this study, guilt or shame has proved to be significant in the discrimination of individuals who exercise in relation to those who do not practice. This suggests that the demands of individuals to use the sense of guilt or obligation can increase the internal motivation of this sample of the respondents.

The identification, not the internal (intrinsic) regulation has the highest projection of the first discriminative function, which suggests that students are motivated to exercise not only because of the high intrinsic interest. In this way, exercise as a means of achieving a result, and not the essential joy of practicing in physical activity in itself, appears as the most influential motivational regulator in the discrimination of physically active than inactive students.

According to the theory of self-determination, intrinsic motivation should be linked to positive motivational consequences. However, similar to the results obtained in this research and in some previous research in

which the physical activity is researched (ex. Standage et al., 2003) and other habits (e.g. Koestner, Losier, Vallerand, & Carducci, 1996) is determined that the identification regulator better predicts the positive behavioural changes in relation to the internal regulator. Such results represent an interesting dilemma regarding the building of potential strategies for promoting physical activity among students. The dilemma exists because the theory of self-determination suggests that the essential regulation (as the most responsible regulation) is related to more favourable adaptive behaviours, cognitive and affective goals. However, it is important to take into consideration that “behaviour itself (exercise) does not call for equally high levels of internal interest” (Wilson & Rodgers, 2004). However, it should be kept in mind that although some people enjoy exercise, although it is not inherently intriguingly interesting (Ryan, Frederick, Lepes, Rubio, & Sheldon, 1997). The results obtained from the research support the proposal of Ryan (1995) emphasizing the significant contribution of other types of self-determined regulators (ex. identification regulator and to a lesser extent, and introjection regulator) in changing the positive behaviour that promotes health in the form of exercise frequency and its longevity.

Another possible explanation for the dominant influence of the identification regulator in this research is related to the approach that is dominant in marketing campaigns related to public health and the promotion of physical activity in modern industrialized countries. In these marketing campaigns, health and social benefits from exercise are most often emphasized. Typical health messages in these campaigns are promoting exercise as a means to reduce weight, improve cardiovascular health, physical functioning, improve quality of life and socialize with others. It seems that the internal motivational regulator (ex. exercise is fun) is less prominent in the typical campaigns in which physical activity is promoted. Perhaps this strategic decision of health promotion agencies is based on the assumption that individuals are more likely to engage in regular physical activity if “there is something in it for them”. Namely, maybe the respondents who have greater physical activity in this research were more identified with the issues of the scale BREQ-2 which relate to the benefits of exercise (“I think it’s important to make efforts for regular exercise”, “I value the benefits of exercise”), because in this way they are selling the exercise. When comparing the results obtained with some previous research, it seems that the enjoyment may be more emphasized in younger respondents (children and adolescents), while engaging in physical activity to achieve a result (such as showing down the disease process) may have greater influence among older respondents. One of the possible explanations that has not been researched in this study is the impact of the current health status. If the individual’s health began to deteriorate and the same could be improved by exercising, it is likely that the valuation of exercise benefits will increase and become an even greater motivating factor.

Wilson and the collaborators (2003) suggest that shifting dysfunctional exercise habits (ex. a sedentary lifestyle) can be achieved by developing the identification regulatory mechanisms for engaging in physical activity. However, before making such an intervention strategy, it is important to take into account a number of issues. First, as in the current study, most research reports indicate that positive behavioural outcomes that are closely related to the identification, rather than to the internal regulator, interweave in the design. In order to better determine the advantages or disadvantages associated with any motivational regulator, it is essential to research the correlations of that regulator over time. Previous longitudinal studies in the domain of physical activity (ex. Sarrazin et al., 2002) and other activities (ex. Pelletier, Fortier, Vallerand, & Briere, 2001) found that intrinsic motivation is a key predictor on which depends whether someone will persist in the activity.

In accordance with the study Mullan and Markland (1997), levels of self-regulation, as seen from the results of the RAI index, were higher for individuals in more advanced stages of exercise. Respondents who are in the stage of readiness, action and maintenance were more self-determined in their motivation for physical

activity than those respondents who were in the pre-thinking and thinking phase. Respondents who start or are engaging in regular physical activity were more self-determined than those who do not have physical activity. According to SDT, the competence is more likely to increase internal motivation that is associated with long-term behavioural changes. Mullan and Markland (1997), also found that individuals in the pre-thinking and thinking phase are less self-determined than those in the preparation, maintenance and action phases. However, the results of this research indicate significant differences in both, the preparedness phase and the phase of action and maintenance. The respondents who were in the phase of action and maintenance have statistically significantly higher values of the autonomous index of the power of self-regulations of the motivators towards the RAI physical activity in relation to the respondents who were in the stage of rethinking, thinking and readiness.

On the basis of the results of this study, implications can be derived in terms of developing effective interventions to promote physical activity among the students population. The research findings suggest that coercive based strategies (either by a professor or a doctor) are unlikely to influence students' decisions to deal with physical activity. Threats to disapproval or the use of guilt, rather than encouraging students to engage in physical activity, may actually have the opposite effect. Instead of using techniques that control, in accordance with the theoretical prediction of SDT, the results of the survey suggest that strengthening the forms of self-motivation and the sense of autonomy are likely to be most effective in encouraging the students to choose to be physically active. Students who decides to practice regularly were those who found the reason they wanted to exercise, contrary to those who had the feeling they had to practice. This suggests that students who practice as means of improving or maintaining their current status and encouraging the belief that the exercise is beneficial is a potentially powerful element of successful intervention.

On the basis of the results obtained from this research and the results of previous research, it seems that the next step is to explore the dependencies between the motivation regulators and the persistence in physical activity. Longitudinal studies will provide an appropriate method for examining what is most likely to have recursive effects and allow more appropriate testing of the theoretically predicted integration process and behaviour change (Deci & Ryan, 2000; Ryan & Deci, 2000).

CONCLUSION

According to the theory of self-determination and the results obtained from the survey, it can be concluded that self-determination can play a significant role in regulating behaviour related to the exercise in the last stages of motivational readiness to change habits for physical activity. The results of this study and previous researches can serve in building strategies and interventions that will aim to promote feelings of self-determination for exercise. In the basis of the theory of self-determination, such interventions will strive to foster student's' perceptions of choice, personal mastery, fun and excitement from exercise, especially in those who do not have regular physical activity. In addition, it is important that the values of physical activity (in terms of physical, psychological and emotional benefits) become more explicit in strategies that promote physical activity.

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