

## Original Article

# Generalised sense of self-efficacy and the level of physical activity among Polish and Spanish physical education students

MARIA K. GACEK<sup>1</sup>, GRAŻYNA M. KOSIBA<sup>2</sup>, AGNIESZKA B. WOJTOWICZ<sup>3</sup>  
<sup>1,2,3</sup>University of Physical Education in Krakow, POLAND

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### Abstract

**Problem statement:** Physical activity is one of the health factors, and the subject's personal resources are also important for the quality of lifestyle. Physical education students are a group of outstanding commitment to physical culture. **Purpose:** The research objective was to evaluate the relationship between generalised sense of self-efficacy and physical activity levels among Spanish as well as Polish physical education students.

**Approach:** The study was carried out among 499 students of physical education (280 Spanish, 219 Polish). The International Physical Activity Questionnaire (IPAQ) and the Generalised Self-Efficacy Scale (GSES) by Schwarzer, Jerusalem and Juczyński were used. Statistical analyses were conducted using Pearson's correlation coefficient as well as moderation analyses applying simple slopes. **Results:** The total physical activity level of Polish and Spanish physical education students was 8697.21 MET-min per week. Statistically significant and positive relationships were noted between generalised sense of self-efficacy intensification and the levels of total ( $p=0.005$ ) as well as vigorous ( $p=0.009$ ) physical activity, the moderating impact of the country of origin on the relationship between sense of self-efficacy and the level of total ( $p=0.002$ ) and vigorous ( $p<0.001$ ) physical activity, with an indication of an increase in physical activity along with an increase in the sense of self-efficacy, however, this was only true in the case of Polish PE students. **Conclusions:** Significant correlations were noted between sense of self-efficacy and levels of total and vigorous physical activity, for which the physical education students' home country (Poland vs. Spain) was considered a moderating factor.

**Keywords:** physical activity, personal resources, physical education students

### Introduction

Physical activity is a basic area of a healthy lifestyle, being a primary health determinant. Recreationally undertaken physical activity may strengthen health potential, prevent chronic diseases, improve emotional state and delay aging processes (Gray, 2017). Many countries around the world, Poland and Spain being among them, include physical activity, apart from the implementation of a healthy model of nutrition, in the canon of activities promoting a healthy lifestyle (<http://www.fao.org/nutrition/education/food-dietary-guidelines/regions/europe/en/>).

According to the applicable WHO recommendations (2004) concerning the performance of physical activity, being the minimum for adults to maintain health, it is stated that at least 150 minutes of moderate, or 1 hour of vigorous exercise as well as strength training which engages large muscle groups, should be undertaken twice a week at the very least. Exercises that shape balance, coordination and agility should also be included in training (WHO, 2004).

A group that stands out in terms of physical activity comprises physical education students who represent its higher level compared to students of a different educational specialisation (Fagaras, Radu & Vanvu, 2015; Yager, Gray, Curry & McLean, 2017; Kosiba, Gacek, Wojtowicz & Majer, 2019a). In the future, the professional activity of these students will include active participation in the health education of children and youth. School health education (at all its levels) has the objective of shaping adolescents' pro-health attitudes. This should include shaping positive attitudes towards physical activity being an essential area of maintaining a healthy lifestyle, which further influences the proper development of children and youth. Within the context of deteriorating health among school youth (Bakiko, Savchuk, Dmitruk, Radchenko & Nikolaev, 2020; Yarmak, Buhaienko, Zhukov, Cherniakova, Vorona, Bilenkova & Blagii, 2020), this assumes great significance. How effective the teachers' work in this area depends, among others, on their own individual approach to behavioural determinants regarding health.

Implementing health education by teachers has been noted in core-curriculum documents in many countries worldwide. In Poland, this specific role: teacher as health educator, can be found in the general core-curriculum for education (Journal of Laws of 2009, No. 4, item 17; Journal of Laws 2017, item 356) as well as in educational standards which are applied in the preparation for undertaking the profession of teaching (Journal of Laws of 2012, No. 25, item 131; Journal of Laws of 2019, item 1450). In Spain, decrees concerning general

education objectives also include activities connected with shaping attitudes as well as habits conducive to health. These emphasise the performance of physical activity and applying a model for rational nutrition (Decreto 97/2015 from 3 March).

Pro-health behaviours can be conditioned by various factors, including those related to culture, socioeconomics and personality (Remick, Polivy & Pliner, 2009). Current research on determinants of pro-health behaviours for students of physical education and other specialisations concern, among others, health self-assessment (Fyodorov, Erlikh, Khafizova & Bendikova, 2019), readiness for change (Kosiba, Gacek & Wojtowicz, 2019b), and hierarchy of values (Kosiba, Bogacz-Walancik, Gacek, Wojtowicz & Majer, 2019c). In these studies, statistically significant tendencies were noted regarding an increase in physical activity level along with intensification of selected features of readiness for change (confidence, passion and optimism) (Kosiba, et al., 2019b) and with an increase in the position of vital values in the students' value systems (Kosiba, et al., 2019c).

Among psychological features significant in shaping health culture, other personal resources also play an important role, including sense of generalised self-efficacy (Juczyński, 2012). The sense of self-efficacy, as a belief in the ability to achieve intended goals, is conducive to exercising control over health determinants, including various aspects of lifestyle and physical activity (Juczyński, 2012). In previous studies (Posadzki, Stockl, Musonda & Tsouroufli, 2010), a positive effect of some psychological features, including a coherence, optimism and sense of self-efficacy towards healthy behaviours among Polish students, was also shown. Moreover, in Turkish studies, it has been confirmed that there is a correlation between positioning sense of control over that related to health, and a sense of efficacy related to health with health behaviours of students (Açıkgöz Çepni & Kitiş, 2017).

Assuming that health-promoting behaviours, including undertaking physical activity, are key determinants of health, and personal resources play an important role in shaping them, research has been undertaken on chosen psychological determinants of physical activity among Spanish as well as Polish students of PE.

The research objective was to evaluate physical activity level as well the correlation between sense of self-efficacy and physical activity, and at the same time, to analyse the moderating significance regarding the country of origin of Spanish and Polish physical education students, with regard to the examined correlations.

## Materials and methods

### Participants

Research was conducted in the period from 2017 to 2019 among 499 physical education (PE) students, aged 18 to 35 ( $21.65 \pm 2.42$ ), from second- and third-year B.A. studies (undergraduate studies). The study included 219 Polish students from University of Physical Education in Krakow (n=135) and Wrocław University of Physical Education (n=84), and 280 Spanish students from University of Murcia, Faculty of Sport Sciences (n=27) and University in Granada, Faculty of Sport Sciences (n=153).

### Instruments

In the research, the diagnostic survey method and 2 research tools were applied: International Physical Activity Questionnaire (IPAQ) as well as the Generalised Self-Efficacy Scale (GSES) by Schwarzer, Jerusalem and Juczyński (Juczyński, 2012). On the basis of a condensed version of the International Physical Activity Questionnaire (IPAQ), the level of physical activity was assessed, including 4 categories: vigorous activity, moderate physical activity and walking, as well as sitting (Biernat, Stupnicki, Lebiedziński, Janczewska & 2008). To evaluate sense of efficacy, the Generalised Self-Efficacy Scale (GSES) was utilised. The GSES contains 10 statements, constructed in such a manner that the higher the result of the test (within the range of 10-40 points), the higher the obtained level of sense of generalised self-efficacy. In the analysis, a statistically significant difference in the level of self-efficacy between the students from Poland and Spain ( $t = -1.50$ ;  $df = 497$ ;  $p = 0.134$ ) was not shown. Different values (Tab. 1, 2) result from failure to complete some parts of the questionnaire by some of the subjects. Research was conducted in compliance with the principles proposed by the 1964 Declaration Helsinki after obtaining the participants' informed consent.

### Statistical analysis

The IBM SPSS 21 programme and J.T. Newsom's macro were applied for statistical calculations. Basic statistics of the examined variables were assessed (mean and standard deviation). To determine inter-variable correlations Pearson's correlation coefficient analysis was implemented, and moderation analysis with simple comparisons (simple slopes) was used to determine the differences in correlations between personality traits and physical activity of physical education students. The Student's *t*-test was used for determination of differences in self-efficacy levels between students from Poland and Spain. The significance level  $\alpha=0.05$  was adopted.

## Results

Among the physical activity categories (IPAQ questionnaire), Spanish and Polish physical education students obtained the highest values in the field of vigorous exercise and the lowest in the area of sitting. The total physical activity level among physical education students (IPAQ Total) was 8697.21 ( $\pm 8285.49$ ) MET-min/week (Tab. 1).

Table 1. Physical activity levels among Spanish and Polish students of physical education (descriptive statistics)

IPAQ	N	Minimum	Maximum	Mean	Standard deviation
Vigorous	435	0.00	96,960.00	4,036.51	5,461.66
Moderate	401	0.00	21,840.00	1,908.93	2,333.63
Walking	419	0.00	20,196.00	2,917.82	3,484.79
Sitting	399	30.00	780.00	266.69	150.55
IPAQ Total	348	819.00	99,108.00	8,697.21	8,285.49

Analysing correlations between generalised sense of self-efficacy as well as physical activity for the whole group comprising Spanish and Polish physical education students, it was demonstrated that vigorous and total physical activity levels experienced an increase along with the rise in sense of self-efficacy (Tab. 2).

Table 2. Sense of self-efficacy regarding physical activity for Spanish and Polish students of physical education (Pearson's correlation analysis)

IPAQ	GSES		
Vigorous	r	0.12**	
	p	0.009	
	n	435	
Moderate	r	0.08	
	p	0.103	
	n	401	
Walking	r	0.09	
	p	0.053	
	n	419	
Sitting	r	-0.07	
	p	0.186	
	n	399	
IPAQ Total	r	0.15**	
	p	0.005	
	n		

\*\* - statistically significant dependencies

An attempt was also made to determine how the relationship between the sense of self-efficacy and the activity changes depending on the country of origin of the physical education students (Tab. 3). It has been shown that the country can be considered a moderating factor for correlations between self-efficacy and vigorous ( $p<0.001$ ) as well as physical as a whole ( $p=0.002$ ). Among Polish physical education students, the higher the level of self-efficacy, the higher the level of vigorous and total physical activity, while among Spanish students, this relationship was not significant and was slightly negative in the case of vigorous activity (Fig. 1 and 2).

Table 3. Moderation analysis – moderating variable: country; independent variable: GSES

Independent variable	Moderator	Dependent variable	E	SE	t	p	Interaction
GSES	Country	IPAQ Vigorous	-0.30	0.08	-3.85	<0.001	$\beta_P=0.37$ ( $p<0.001$ ) $\beta_S=-0.01$ ( $p=0.914$ )
		IPAQ Moderate	-0.11	0.08	-1.41	0.160	$\beta_P=0.18$ ( $p=0.026$ ) $\beta_S=0.03$ ( $p=0.592$ )
		IPAQ Walking	-0.10	0.07	-1.32	0.187	$\beta_P=0.18$ ( $p=0.014$ ) $\beta_S=0.06$ ( $p=0.335$ )
		IPAQ Sitting	-0.12	0.08	-1.52	0.129	$\beta_P=0.03$ ( $p=0.747$ ) $\beta_S=-0.13$ ( $p=0.039$ )
		IPAQ Total	-0.25	0.08	-3.19	0.002	$\beta_P=0.35$ ( $p<0.001$ ) $\beta_S=0.02$ ( $p=0.781$ )

Legend:  $\beta$  - standardised coefficient Beta; SE - standard error; p - significance; P - Poland; S - Spain

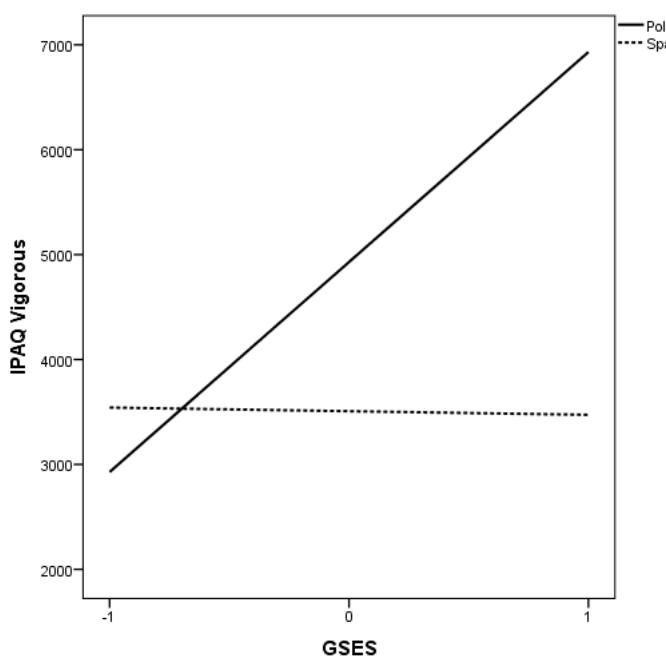


Fig. 1. Correlations between generalised self-efficacy sense as well as physical activity intensity according to students' home country (Poland vs. Spain)

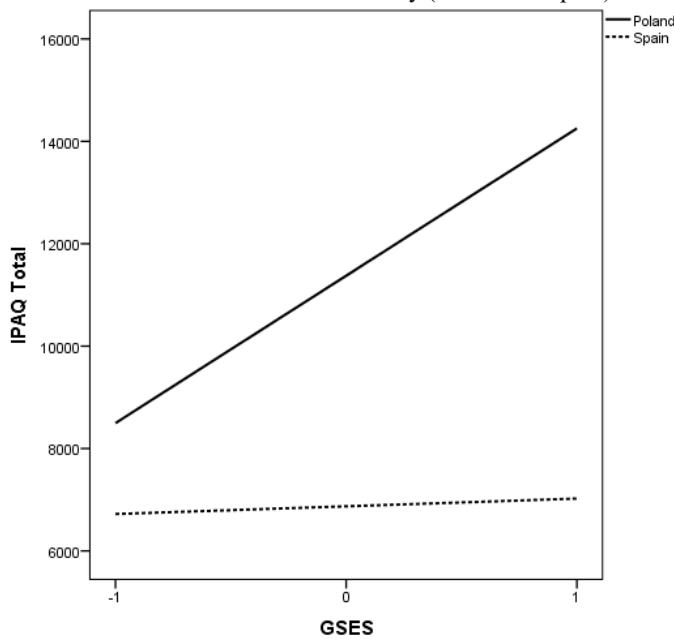


Fig. 2. Correlation between generalised self-efficacy sense as well as total level of physical activity according to students' home country (Spain vs. Poland)

### Discussion

In the discussed research, it was demonstrated that Spanish and Polish physical education students were having high level of physical activity. The highest results found within the domain of vigorous exercise, while the lowest being in the field of sitting. Furthermore, statistically significant correlations were exhibited between generalised sense of self-efficacy intensification and the total and vigorous physical activity levels. This was also true for the moderating significance of home country with regard to sense of self-efficacy and total as well as vigorous-type physical activity.

The high levels of undertaken physical activity noted for Spanish and Polish students of physical education (IPAQ Total=8697.21 MET-min/week), which included dominance of vigorous exercise, is connected with the respondents' field of education. High levels of physical activity among students (future P.E. teachers) may be helpful in effectively shaping positive attitudes towards an active lifestyle by these subjects as part of health education at schools. The achieved results further correspond to trends described by other authors

confirming higher physical activity levels among students of PE than those in other fields of study (Fagaras, et al., 2015; Yager, et al., 2017; Kosiba, et al., 2019a). Similar trends are described in Spanish studies (Grima & Blay, 2016; Lopez-Sanchez, et al., 2019). The increased physical activity of Spanish physical education students was generally associated with a more healthy lifestyle, as well as more favourable body composition and blood lipid profile compared to students of other university specialisations (Grima & Blay, 2016).

The discussed results of the authors' research showed statistically significant positive correlations between generalised sense of self-efficacy and total as well as vigorous levels of physical activity among Spanish and Polish students of PE. The established regularities can be explained by characteristics of the analysed personality dimension and refer to the results of studies by other authors on the psychological determinants of health behaviours among various population groups.

The higher levels of physical activity undertaken by students with higher sense of self-efficacy can be attributed to the belief that specific goals, i.e. those related to health, are possible to reach by exercising control over determinants of health, an active lifestyle occupying a greatly significant position. Physical activity is the basic behavioural factor conducive to raising human health potential (WHO, 2004; Gray, 2017). In other studies, the significant and positive impact of self-efficacy, coherence as well as optimism on pro-health behaviours of students from Poland has been demonstrated (Posadzki, et al., 2010). The predictive significance of self-efficacy for the physical activity has also been confirmed among Chinese (Chung-Yan, 2014; Xu, et al., 2017) and Malaysian students (Ler, Wee & Ling, 2017), as well as high-school students from South Korea (Lee, Park, Lee, Kim & Park, 2018), Macedonia (Gontarev & Kalac, 2016), and Australia (Plotnikoff, Costigan, Karunamuni & Lubans, 2013).

Referring to the results indicating positive relationships between generalised level sense of self-efficacy and physical activity, it needs to be highlighted that strengthening self-efficacy, i.e., through psychological techniques, may be viewed as conducive to the performance of regular physical activity, and thus, additionally health promotion, as was confirmed by German (Zhou, Wang, Knoll & Schwarzer, 2016), Asian, South African (Ah Hong, Peltzer & Wimonpeerapattana, 2017) as well as American scientists (Voskuil & Robbins, 2015). American researchers, apart from the significance of sense of self-efficacy, also found that taking up and maintaining the performance physical activity is positively influenced by a sense of pleasure derived from physical exercise (physical activity from a hedonistic perspective) (Lewis, Williams, Frayeh & Marcus, 2016).

The results obtained in the discussed study on the moderating effect of the physical education students' home countries (Spain vs. Poland) in relation to the examined correlations (sense of efficacy vs. physical activity level) implied that the country of origin can be considered moderating factor in the correlation between self-efficacy and total as well as vigorous physical activity, although the increase in self-efficacy along with physical activity level experienced an increase only in the case of students from Poland.

Considering personality as an intercultural characteristic, the correlation between physical activity and personality traits in different cultures could be analogous. In a systematic review of research (up until 2013) regarding personality-dependent physical activity determinants (from Canada, USA, the Netherlands, Norway, Germany, Japan and South Africa), it was not possible to unambiguously identify factors moderating correlations between personality and physical activity, so the authors pointing to a need for further research (Wilson & Dishman, 2015). A different study that aimed to compare the health behaviour of Spanish and Polish (Murcia vs. Gdansk) physical education students confirmed the diversity of certain aspects of lifestyle, with an indication of a higher level of physical activity among Spanish than Polish students, associated with a larger amount of vigorous and moderate physical activity, and a smaller amount of time spent in a sitting position (Lopez-Sanchez, et al., 2019). According to the authors of the study, these differences may result from climatic and cultural conditions (Northern vs. Southern Europe), but also from the implementation of effective health strategies since the year 2000 (Lopez-Sanchez, et al., 2019).

Further studies are needed regarding physical activity psychological determinants among physical education students should take the wider spectrum of the group (also other years and levels of study) and a larger number of analysed variables into account.

## Conclusions

1. Spanish and Polish physical education students were characterised by a high level of total physical activity, which was mainly composed of high results in the domain of vigorous exercise.
2. A statistically significant and positive correlation was noted between intensity of generalised sense of self-efficacy and total and vigorous physical activity levels among Spanish and Polish physical education students.
3. Among Spanish and Polish PE students, a moderating effect of the country of origin on relationships between sense of self-efficacy and total as well as vigorous physical activity levels has been demonstrated, with an indication of the increase in physical activity along with the intensification of the sense of generalised self-efficacy only among Polish students.

## Conflict of interest

The authors declare no conflict of interest.

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