

UNIVERSITY SCHOOL OF PHYSICAL EDUCATION IN POZNAN

## **HEALTH BEHAVIOURS AND THEIR DETERMINANTS AMONG PHYSICAL EDUCATION AND PEDAGOGY STUDENTS AS WELL AS SCHOOL TEACHERS – A COMPARISON STUDY**

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### ABSTRACT

The aim of this study is to analyze social and individual determinants of health behaviour. The following factors are evaluated: nutrition, physical activity (PA) and smoking behaviour. The examined determinants of health behavior include: health-specific self-efficacy and health locus of control. Material and Methods: The survey was carried out among 298 students at state and private universities in Poznań and 342 teachers in primary and secondary schools in the Wielkopolska Province in Poland. The author's questionnaire was used to assess nutrition and smoking status and the International Physical Activity Questionnaire (IPAQ) served to evaluate PA. The health related self-efficacy questionnaires and Multidimensional Health Locus of Control Scale (MHCL) were employed. Results and Conclusion: Health oriented physical education studies favour a more healthy lifestyle both during the studies and employment. The worst health behaviour patterns have been found among pedagogy students. The issue of healthy life style should be given more prominence in the curriculum at the undergraduate level to better develop health-sensitive personality in future teachers.

**Keywords:** health behaviour; self efficacy; health locus of control; students; school teachers

### INTRODUCTION

Health behaviour is one of the most significant factors determining health. According to the first indications in this respect, developed in the Lalonde Report (1974), their influence is as high as 53%. Nutrition, physical activity (PA) and smoking play particularly important roles from the point of view of prevention against civilisation related diseases. Each of the areas of behaviour above has been discussed in a number of reports in terms of behaviour patterns beneficial for health or health consequences of not complying with them. Another direction is the analysis of various combinations of accumulation of behaviours, both beneficial and adversely affecting health, which has not got so many reports. Patterns in this respect may be determined by socialising processes related to the direction of education, professional status, age, sex etc.

In the area of health science the issue of psychosocial determinants of specific human behaviour towards health is particularly interesting. Self-efficacy is one of the important determinants of health behaviour. It is used in Social Cognitive Theory explaining the realisation of health behaviour (Bandura, 1977). Many things indicate that in the context of developing health behaviour not only general self-efficacy is important, but rather health-specific self-efficacy (Schwarzer, 1995). This is an individual characteristic which is built on the basis of a person's experience, is a consequence of their personality, education, etc. Thus, it may evolve under the influence of educational activities, hence many educational interventions (programmes) relating to health behaviour are directed to improve self-efficacy (Łuszczynska, 2007). In respect to various types of health behaviour it may have a varied degree of predictiveness (Von Ah, 2004; Łuszczynska, 2004). Many studies indicate that the feeling of self-efficacy is related to undertaking and continuing health behaviour, such as prevention of uncontrolled sexual behaviour, undertaking regular physical exercise, controlling weight and nutritional behaviour, prevention and quitting of smoking and other addictions (AbuSabha, 1997; Schwarzer, 2007).

Health locus of control (HLC) informs about the role a person allocates to himself/herself and external factors (authorities or coincidence) in responsibility for his/her health. People are categorised as "external" or "internal" depending on how they perceive the effect of external (e.g. powerful others, chance, God etc.) or internal (e.g. the self) factors on their health (Wallston, 1978a). It is generally assumed that people with an internal health locus of control have better health habits (Norman, 1998) than people with an external locus of control. Its relations to health behaviours are not as strong as self-efficacy, although worth attention. In particular for health educator they may mark the direction of necessary educational activities.

## PURPOSE

The aim of this study is to analyse the patterns of coexistence of the three main health behaviours (PA, nutrition, smoking) among physical education and pedagogy students as well as school teachers. The social and individual determinants of health behaviour will also be investigated. The examined determinants of health behaviour include: health-specific self-efficacy and health locus of control. We are looking at differences between university students, studying to be teachers in the future, and actual working school teachers.

## MATERIAL AND METHODS

### **Study participants**

The survey was carried out among 298 students at state and private universities in Poznań and 342 teachers in primary and secondary schools in the Wielkopolska Province in Poland. There were 126 Physical Education (PE) students and 172 Pedagogy (P) students, 95 PE teachers and 247 Other Subjects (OS) teachers. The stratification of the participants is presented in Table 1.

**Table 1.** Description of the study samples

n		All	PE teachers	OS teachers	PE students	P students
		640	95	247	126	172
age	$\bar{x} \pm SD$	31.9 $\pm$ 11.8	39.5 $\pm$ 9.0	41.2 $\pm$ 9.8	21.6 $\pm$ 1.4	22.8 $\pm$ 4.8
gender	♂ n (%)	499 (78)	56 (59)	213 (86)	84 (67)	146 (85)
	♂ n (%)	141 (22)	39 (41)	34 (14)	42 (33)	26 (15)

## MEASURES

The author's questionnaire pool was used to assess nutrition and smoking status. The nutrition status was calculated as a mean of answers to 12 questions relating to the number and quality of meals rated on the scale from 1 (unhealthy behaviour) through 2 (moderate) to 3 (healthy behaviour). Smoking status was evaluated in two categories: as currently smoking or as non-smoking respondents (used to smoke or never smoked). The International Physical Activity Questionnaire (IPAQ) (Biernat, 2005) was used to assess the respondents' physical activity. Metabolic Equivalents (METs) values per week were calculated for individuals and the respondents were divided into three categories of PA (low, moderate, high). We also used two Schwarzer's (2000) questionnaires: the Nutrition Self-Efficacy Questionnaire and the Physical Exercise Self-Efficacy Questionnaire, Velicer and others' (1990) Smoking Self-Efficacy Questionnaire; to assess the health locus of control we used the Multidimensional Health Locus of Control Scale (Wallston, 1978b; Juczyński, 2001: 79–86).

### Statistical analyses

The data were analysed using STATISTICA 10.0 software (StatSoft Inc., Tulsa, OK). Statistical significance was defined as  $p \leq .05$ . One way analysis of variance (ANOVA) was used to compare the analysed groups for PA, nutrition, smoking. The eta-squared ( $\eta^2$ ) effect size was calculated. The effect size indicates the percent of variance explained by the particular effects of the dependent variable. To compare the average values of mean health behaviour Tukey HSD test detailed post hoc comparisons were conducted. Cluster analysis was used to group the individuals with the similar behaviour (healthy or unhealthy). Forward stepwise regression was used to find psychological variables related to nutrition and PA. The logistic regression and Pearson's correlation coefficient were calculated for smoking status and psychological variables.

## RESULTS

The findings from the analysed behaviour are reported in Table 2. There are significant differences in smoking status between the analysed groups ( $p = .012$ ). The P students

significantly more often smoke cigarettes than Other Subjects teachers ( $p = .026$ ). There are significant differences in nutrition behaviour ( $p < .0001$ ). Pedagogy students have the worst nutrition habits. Other Subjects teachers, PE teachers and PE students have better nutrition behaviour than Pedagogy students ( $p = .054$ ,  $p = .001$ ,  $p < .0001$ , respectively). PE students have better nutrition than Other Subjects teachers ( $p = .016$ ). PE students have the highest score of PA. They differ significantly from Pedagogy students ( $p < .0001$ ) and Other Subjects teachers ( $p < .0001$ ). The PE teachers also have a better score than Pedagogy students ( $p = .018$ ) in reference to PA.

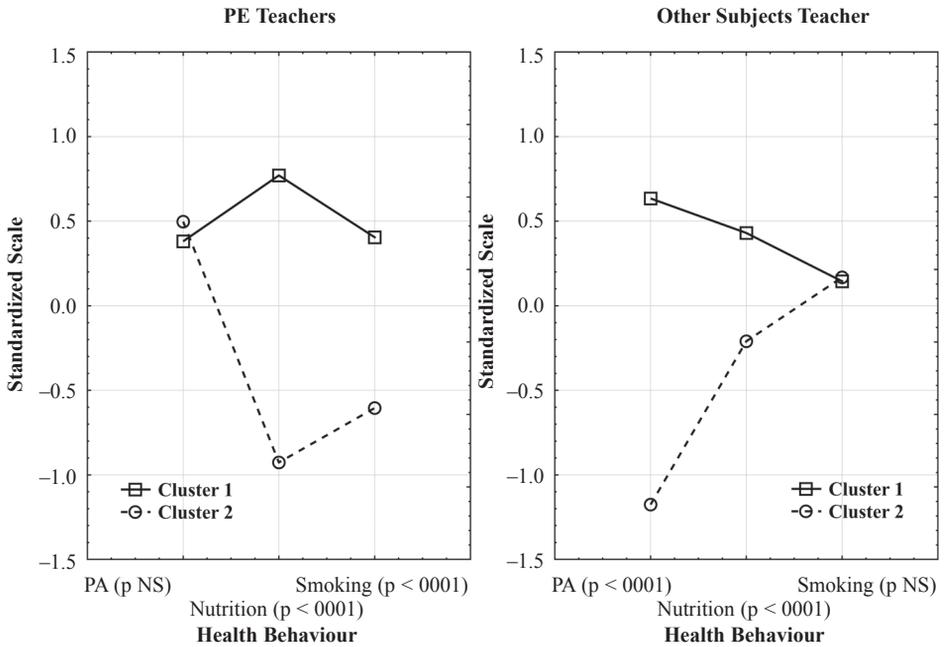
**Table 2.** F statistics for differences among analyzed groups

		OS Teachers	PE Teachers	P Students	PE Students	F (p)	$\eta^2$
		$\bar{x} \pm SD$	$\bar{x} \pm SD$	$\bar{x} \pm SD$	$\bar{x} \pm SD$		
Nutrition (score)		2.38 $\pm$ .27	2.46 $\pm$ .25	2.31 $\pm$ .26	2.49 $\pm$ .28	12.41 (.000)	.06
PA (METs)		4367 $\pm$ 4250	5944 $\pm$ 5115	3979 $\pm$ 4083	6778 $\pm$ 6556	8.66 (.000)	.05
		% (n)	% (n)	% (n)	% (n)		
Smoking	yes	14 (35)	14 (13)	26 (45)	21 (25)	3.66 (.012)	.02
	no	86 (205)	86 (78)	74 (125)	79 (93)		

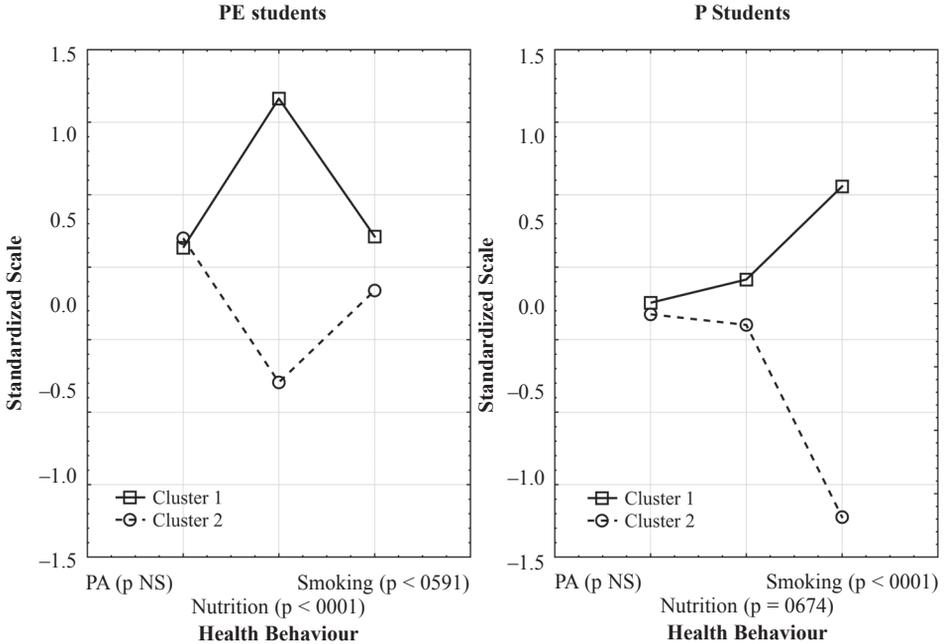
METs – Metabolic Equivalent minutes per week

Two clusters of individuals were identified in each of the analysed groups (see Figure 1 and Figure 2). The descriptive characteristics of the clusters are presented in Table 3. PA and nutrition behaviour are the significant factors of differentiation for the clusters identified among Other Subjects teachers. Cluster 1 is characterised by higher PA and better nutrition and it contains 50% of Other Subjects teachers. Cluster 2 is characterised by less healthy behaviour and it contains 50% of Other Subjects teachers. Nutrition behaviour and smoking status are significant factors of differentiation for the clusters identified in the group of PE teachers. As previously, cluster 1 is characterised by healthier behaviour (better nutrition, no smoking) and it includes 80% of PE teachers. Cluster 2 is characterised by unhealthy behaviour and it includes 20% of PE teachers.

Smoking status is a significant factor (only statistical tendency was noted for nutrition) for the clusters identified in the group of Pedagogy students. Unfortunately, both clusters show unhealthy behaviour (low PA, unhealthy nutrition) and non-smoking status for cluster 1 or smoking cigarettes for cluster 2. The clusters include 73% and 27% of Pedagogy students, respectively. Nutrition behaviour is the significant factor (only statistical tendency was noted for smoking) for the clusters identified in the group of PE students. Cluster 1 is characterised by healthy behaviour (better nutrition, non-smoking) and it includes 67% of PE students. Cluster 2 is characterised by unhealthy behaviour and it includes 33% of PE students.



**Figure 1.** Cluster analysis diagrams for PE teachers and Other Subjects teachers



**Figure 2.** Cluster analysis diagrams for PE students and Pedagogy students

**Table 3.** Descriptive characteristics of the clusters for analyzed groups of respondents

		OS Teachers		PE Teachers		P Students		PE Students	
		cluster 1	cluster 2						
		% (n)							
PA	low	–	75 (79)	11 (7)	6 (1)	29 (33)	38 (16)	24 (17)	21 (7)
	moderate	26 (28)	25 (26)	23 (15)	25 (4)	40 (45)	29 (12)	19 (13)	21 (7)
	high	74 (79)	–	66 (42)	69 (11)	31 (35)	33 (14)	57 (40)	58 (20)
Smoking	yes	17 (18)	14 (15)	5 (3)	50 (8)	–	100 (42)	16 (11)	32 (11)
	no	83 (89)	86 (90)	95 (61)	50 (8)	100 (113)	–	84 (59)	68 (23)
		$\bar{x} \pm SD$							
Nutrition (score)		2.47 ± .27	2.29 ± .25	2.56 ± .18	2.10 ± .14	2.33 ± .26	2.24 ± .23	2.66 ± .11	2.14 ± .19

Forward stepwise regression was used in order to find the most significant factor related to nutrition and PA (Table 4). Models significant for predicting almost all behaviour in all groups were found (except PA in the group of Pedagogy students). Significant prediction was established for daily physical activity among Other Subjects teachers ( $F_{(2,210)} = 5.65$ ,  $p = .004$ ,  $R^2 = .05$ ), among PE teachers ( $F_{(3,81)} = 3.01$ ,  $p = .035$ ,  $R^2 = .10$ ), and among PE students ( $F_{(1,120)} = 26.29$ ,  $p < .001$ ,  $R^2 = .18$ ). Similarly, there is significant prediction for nutrition habits among Other Subjects teachers ( $F_{(3,189)} = 3.39$ ,  $p = .019$ ,  $R^2 = .05$ ), among PE teachers ( $F_{(2,72)} = 4.20$ ,  $p = .019$ ,  $R^2 = .10$ ), among Pedagogy students ( $F_{(2,137)} = 3.77$ ,  $p = .026$ ,  $R^2 = .05$ ) and among PE students ( $F_{(2,103)} = 5.46$ ,  $p = .006$ ,  $R^2 = .10$ ). Health specific self-efficacy was the most important factor of each health behaviour. It was positively associated with PA among Other Subjects teachers

**Table 4.** Forward stepwise regression for health locus of control (HLC) dimension, self-efficacy and health behaviours

	OS Teachers		PE Teachers		P Students		PE Students	
	PA (METs) $\beta$	Nutrition (score) $\beta$						
Self-Efficacy	.19**	.10	.14	.22*	.11	.12	.42***	.24**
HLC Internal	.10	.07	.13	-.25*		.19*		
HLC Powerful Others								
HLC Chance		-.17*	-.22*		.11			-.16

Legend:  $\beta$  – standardized regression coefficient; \*  $p \leq .05$ ; \*\*  $p \leq .01$ ; \*\*\*  $p \leq .001$

( $p < .01$ ) and PE students ( $p < .001$ ) and with nutrition behaviour among PE teachers ( $p < .05$ ) and PE students ( $p < .01$ ). In reference to the health locus of control variables “internal control” is negatively associated ( $p < .05$ ) with nutrition behaviour among PE teachers and positively associated among Pedagogy students ( $p < .05$ ). There is also negative association between “chance control” and PA among PE teachers ( $p < .05$ ) and between “chance control” and nutrition among Other Subjects teachers ( $p < .05$ ).

Additionally correlation coefficients between smoking status and psychological variables were calculated (not shown in tables). There are significant positive associations between self-efficacy and non-smoking status in all research groups (from  $r = .64$ ,  $p < .05$  to  $r = .85$ ,  $p < .05$ ). In reference to the health locus of control variables “chance control” and “powerful others control” are positively associated ( $r = .26$ ,  $p < .05$  and  $r = .35$ ,  $p < .01$ , respectively) with smoking habits in PE teachers. The results of logistic regression were not significant for prediction of psychological variables on smoking status among research groups.

## DISCUSSION

The results of analyses indicate that health oriented physical education studies favour a more healthy lifestyle both during the studies and after starting employment. Higher physical activity related to the major of studies of PE students or profession of PE teachers is not surprising (Dinger, 1999; Chevan, 2010; Stera, 2010). The studied physical education specialists were characterised by a moderately low percentage of current smokers. The difference is particularly visible between PE and Pedagogy students. Similar differences between students of health-related majors and non health-related ones in the structure of smoking are noted by D’Abundo (2009). This may indicate that students of health-related majors have greater awareness in this respect and that physical activity and athletic participation may protect against the uptake and progression of smoking behaviours (Patterson, 2004; Emmons, 1998; Seo, 2007). In the current study we noted also a significant intergenerational differences in terms of smoking cigarettes. The percentages of smoking teachers are lower than those of smoking students. This confirms that in spite of a falling trend in smoking cigarettes it is still a cause for concern in young people (Choi, 2003; WHO, 2010).

The studied physical education specialists were also characterised by better eating habits, although they are far from ideal. The problem of deteriorating eating habits is noted among American students (La Fontaine, 2006) and among Turkish students (Karadağ, 2010). Huang (2003) found in their research that most students do not follow proper dietary guidelines, which increases the incidence of obesity in this population and Boström (2006) reported that 18–29 year-olds Swedes are the group who eats very little fruit and green vegetables. Also university students from South Africa were observed not to follow healthy dietary habits (Kazi, 2006).

Physical education specialists and school teachers are socially perceived as potential promoters of positive health behaviour. Hence it is important that their behaviour is in line with the educational message. Memis (2010) indicates that teachers in Turkey usually

meet this condition better than nurses. On the other hand, head start teachers in Texas carrying out nutritional education in the USA, need many changes in their life style first (Sharma 2013). The cluster analysis revealed differences in accumulation of health behaviour in the studied groups of respondents. For physical education teachers and students nutrition patterns and, to a slightly smaller degree, smoking cigarettes are significantly differentiating behaviours. This allows, to put it simply, to divide them into two clusters: (1) physically active, with good nutrition, rather non-smoking, and (2) most of whom are physically active, with definitely worse nutrition, more often smoking. The cluster analysis indicated that physical education students and teachers are differentiated in a similar way within the studied health behaviours. The picture of pedagogy students and teachers of other subjects is not as clear. Different health behaviours are differentiating for these groups. For teachers – physical activity and nutrition, and for pedagogy students – smoking. Here we cannot point out similarity in differentiation of both groups. This indicates that health education or health advice is necessary in all majors of studies, not only those with a health focus and that its content and methodological approach has to be fundamentally in order to meet various expectations of the groups it is meant for.

In the analysis of psychological variables it was shown that health related self-efficacy is a significant predictor for PA, nutrition almost in all studied groups (except for Pedagogy students). Also a high correlation was demonstrated between health related self-efficacy and non-smoking. The respondents who presented a higher level of self-efficacy in the area of analysed behaviour, presented at the same time more beneficial indicators. The predictiveness of self-efficacy in reference to health behaviour is indicated in literature (Luszczynska, 2004) and used in constructing educational intervention (Luszczynska, 2007).

Health locus of control dimensions (especial “internal control”) have also appeared in predicting health behaviour models in the studied groups. Usually higher feeling of “internal control” favours more beneficial health behaviour (Steptoe, 2001; Badr, 2005). We note a reverse situation among the studied physical education teachers in reference to nutrition. Comparable to the results of Grotz (2011), the findings highlights that the chance dimension is significantly associated with unhealthy behaviours. We also note that their PA increases with the decrease of the role ascribed by them to coincidental, external factors in maintaining health.

## CONCLUSION

The analysis indicates that the studied groups of current and future educators, including health educators, have different health behaviour profiles. It means that they also have different educational needs in this respect, which are not commonly diagnosed at Polish universities. We also noticed a generation gap between students and teachers manifested by worse health behaviour (especially smoking) of current students. All teachers (especially PE teachers) are responsible for health education in Polish schools. They should be deliberately involved (also during study) in activities promoting health-related skills and behaviours. This will allow them to be more effective role models for their students and create their own health potential more competently. Promotional and intervention

programmes could use social-cognitive strategies to increase psychosocial skills and competences like self-efficacy or locus of control.

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