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EFFECT OF PHYSICAL EDUCATION STUDIES ON SELECTED ASPECTS OF PREPARATION OF UNIVERSITY STUDENTS FOR IMPLEMENTATION OF HEALTH EDUCATION IN POLISH SCHOOLS

Key words: health education, physical education students, health-related behaviours.

ABSTRACT

On 1 September 2009, a compulsory educational module ‘health education’ was introduced into the curricula of junior secondary schools and secondary schools in Poland to be realized by physical education teachers in their role of ‘health leaders’ in the school communities. The present study was aimed at an assessment of the impact of physical education university courses on selected aspects of PE student preparation for performing these duties. An opinion poll was carried out among 223 male and female sophomore and senior full-time PE students to determine their involvement in physical activity, healthy diets and awareness of recommendations in these areas. In both groups, a frequent occurrence of the studied behavioural factors of health risks as well as ignorance of recommendations concerning key health-related behaviours were found. The obtained results point to the necessity of improvement in preparation of physical education students for implementation of physical education and performance of their new role of ‘health leaders’ in schools.

INTRODUCTION

The health status in Polish society as compared with other 15 EU countries is rather unfavourable [26]. This is caused by social and economic conditions in Poland which are not conducive to proper healthcare and increasingly widespread unhealthy behaviours in society i.e. low level of physical activity during leisure, unbalanced diets, smoking and excessive alcohol consumption [14]. Negative health-related effects of these behaviours have been already discussed by a number of authors [3, 5, 9, 12, 13, 18, 19, 20, 22]. The great efficiency of planned and systematic intervention activities to promote health-related

behaviours in particular groups, including adolescents, has been stressed as well [1, 7, 11].

The best period for forming health-related behaviours is the school age [16], thus schools seem to be the most suitable places for health promotion. The importance of schools for promotion of health is also strengthened by the following facts: schools of different levels are attended by all types of students; schools have staff and capacities to implement homogeneous curricula connected with health; schools can cooperate with a number of organizations and associations for support in health-related education; and finally they can exert an influence on schoolchildren’s families.

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Health education is a fundamental right of each child. Passing knowledge about health to children and instilling suitable abilities, attitudes and beliefs in them can make it easier for them to enjoy healthy lifestyles, improve health and quality of life. Therefore, health education in schools is the most beneficial, long-lasting investment in societies' health. The need for this kind of education can also be justified by the existing deficiencies in the area of health-related behaviours among children and adolescents [28].

Health education has a long tradition in Polish schools [4]; however, the present-day effects of realization of such policies are highly unsatisfactory [28]. In the face of low efficiency of health education in schools, the Polish Minister of Education adopted on 23 December 2008 an ordinance obligating junior secondary schools to implement a 'health education' module consisting of 30 school lessons into their curricula. The responsibility for implementation of this module rests on physical education teachers who are also supposed to perform the role of 'health leaders' in their school community [17]. However, the level of preparation among physical education graduates to perform this role is still questionable.

The considerable importance in communities promoting health among students lies with personal role models who are an essential element of effective educational activities. It is teachers who should become these role models and healthy lifestyle leaders. Students' identification with their teachers and their views instills the system of values adopted by teachers into students [16]. Personal health-related behaviours of teachers becomes not only patterns for students, but they also involve teachers' actions taken toward promotion of health among their pupils. A study of physical education teachers (n = 1,320) showed they promoted those health-related behaviours which they espoused [25]. Due to the abovementioned reasons, lifestyles of graduates from universities of physical education (i.e. prospective health leaders in schools) should become a focus for these universities.

Health-related behaviours among physical education university students have been already investigated [6, 10]; however, no attempts have been made to assess the educational impact of PE university courses on popularization of such attitudes.

The present study aimed at:

- determination of popularization of selected behavioural factors of health risk and their conditions among university students in their second and fourth year of physical education courses;
- objective assessment of the investigated behaviours using students' self-assessment and determination of respondents' awareness of recommendations concerning the investigated behavioural factors.

METHODS

In the spring of 2008, an opinion poll using author's questionnaire was carried out among 223 male (n = 157) and female (n = 66) full-time second- and fourth-year university students of the Branch Faculty of Physical Education in Gorzów Wielkopolski, Poland, majoring in physical education teaching. The survey was anonymous and conducted on a voluntary basis. The questionnaire contained 22 closed-ended, semi-open and open-ended questions concerning personal data, involvement in physical recreation and healthy diets. Only a part of the collected material was used in this study.

Personal data

The following variables were considered: sex, year of studies, and factors limiting leisure time such as commuting to the university, working during school year and practicing competitive sports.

Physical recreation

The following definition of physical recreation was adopted: "Physical recreation means all the activities of physical, movement and sport-related or tourist nature, in which people are voluntary involved during their leisure time in order to relax, have fun and develop their personalities" [27].

The level of participation in recreation was assessed on the basis of frequency, duration and intensity of exercise in leisure time recorded by the respondents during the week preceding the survey. Body perspiration and breathing was adopted as a criterion of the level of intensity of exercise. This criterion is widely used in opinion polls conducted

among larger populations. According to this criterion, intensive (vigorous) exertion means those activities which cause higher perspiration and considerably accelerated breathing which does not allow talking. The moderate exertion is connected with low perspiration and acceleration of breathing [15, 21]. Participation in physical recreation was divided into three levels of intensity:

A/ vigorous – 20 minutes of intensive exercise a day for at least 3 days a week;

B/ moderate – 30 minutes of moderate exercise 5 or more days a week;

C/ inactive – activity lower than the exercise level in A/ or B/ [2].

Levels A and B are recommended to maintain good health and physical fitness [2].

Moreover, the respondents made a self-assessment of their participation in physical recreation by giving their answers to the question: Is your physical recreation sufficient to ensure health and physical fitness? (possible answers: (0) no, (1) yes, (2) I don't know).

Nutrition

Assessment of nutrition was made on the basis of an analysis of one-day menu recorded by the respondents on the last working day preceding the survey. The quality point method developed by Bielińska was employed. Maximal assessment of menu amounted to 40 points. Improper menus were those marked with 30 or fewer points [in: 24].

Moreover, the students self-assessed their diet by answering the question: How do you assess your own nutrition? (possible answers: (0) proper, (1) improper, (2) I don't know).

Statistical analysis

The respondents were divided (1) according to their sex with regard to the year of their studies (Table 1); and (2) according to the year of their studies with regard to their sex. The significance of differences in frequency of the studied variables was evaluated by means of Pearson's chi-square test (χ^2) ($p \leq 0.05$). All statistical calculations were made with the use of Statistica PL 7.0 software package.

RESULTS

Statistical analysis of subjects' personal characteristics revealed that the year of studies did not correlate with commuting to the university and practicing competitive sports by women, men and students in general. However, a trend towards increased involvement in competitive sports by women in their second year of studies as compared to women in their fourth year and students in general in their second year as compared to fourth year students was found. Working jobs during the school year was significantly more often declared by men and students in general in the fourth year rather than in the second year (Table 1). Sex was a not a differentiating factor related to students' involvement in competitive sport in the second year, whereas the percentage of men who practiced competitive sports was significantly higher than the percentage of women ($\chi^2 = 4.67$, $p = 0.03$). Nor did sex have any significant impact on starting jobs by the students.

The analysis also concerned the subjects' level of involvement in physical recreation during the week preceding the opinion poll. It was found that female students in their fourth year of studies declared, significantly more often, the recommended amount of participation in physical recreation. Men in the second and fourth year and students in general in their second and fourth year did not significantly differ in the level of involvement in physical recreation (Table 2). Sex was a factor determining recreation behaviours in second-year students ($\chi^2 = 14.46$, $p < 0.0001$), while it did not have much impact on recreational activity in students in their fourth year of studies.

Among female students in the second and fourth year, 22% and 23%, respectively, assessed their involvement in physical recreation as sufficient for health and physical fitness, while the corresponding values for men amounted to 39% and 49%, respectively. Nearly one-third of second-year students, and one-fifth of fourth-year students were not able to assess whether their involvement in physical recreation was sufficient to ensure health and physical fitness. Year of studies did not significantly affect the results of self-assessment of involvement in physical recreation (Table 2). Within individual years, women and men did not significantly differ in self-assessment of their involvement in physical recreation.

Table 1. Subjects' characteristics with regard to sex and years of studies (%)

Personal characteristics	Women (n = 66)		Men (n = 157)		Total (n = 223)	
	II (n=39)	IV (n=27)	II (n=77)	IV (n=80)	II (n=116)	IV (n=107)
1. Commuting from location other than the university						
– no	92.31	100.00	92.21	93.75	92.24	95.33
– yes	7.69	0.00	7.79	6.25	7.76	4.67
λ^2 (p)	2.17 (0.140)		0.14 (0.710)		0.90 (0.343)	
2. Involvement in competitive sports (at present):						
– no	69.23	88.89	58.44	67.50	62.07	72.90
– yes	30.77	11.11	41.56	32.50	37.93	27.10
λ^2 (p)	3.51 (0.060)		1.38 (0.242)		2.96 (0.091)	
3. Working during school year:						
– no	58.97	59.26	62.34	43.75	61.21	47.66
– yes	41.03	40.74	37.66	56.25	38.79	52.34
λ^2 (p)	0.01 (0.981)		5.44 (0.021)		4.12 (0.040)	

Table 2. Behaviours, attitudes and assessment of students' involvement in physical recreation with regard to sex and year of studies (%)

Involvement in physical recreation and their assessment	Women		Men		Total	
	II	IV	II	IV	II	IV
1. Level of involvement in physical recreation following the recommendations ^a :						
– no	84.61	48.15	49.35	50.00	61.21	49.53
– yes	15.39	51.85	50.65	50.00	38.79	50.47
λ^2 (p)	10.05 (0.002)		0.59 (0.812)		2.63 (0.114)	
2. I think my involvement is sufficient to maintain health and physical fitness:						
– no	38.46	48.15	31.17	32.50	33.62	36.45
– yes	23.08	22.22	38.96	48.75	33.62	42.06
– I don't know	38.46	29.63	29.87	18.75	32.76	21.50
λ^2 (p)	7.15 (0.671)		2.88 (0.244)		3.76 (0.155)	
3. Objective and subjective assessment of involvement in physical recreation are:						
– consistent	53.85	44.44	38.96	42.50	43.97	42.99
– inconsistent	46.15	55.56	61.04	57.50	56.03	57.01
λ^2 (p)	3.60 (0.059)		0.90 (0.341)		2.86 (0.088)	

^a by the Center for Disease Control and Prevention [2].

Objective assessment of the level of involvement in physical recreation was compared with subjective assessment of these behaviours expressed by individual students. Concordance of these assessments was adopted as an index which

confirmed the students' knowledge about recommendations regarding participation of adults in physical recreation. Objective and subjective assessments were consistent at the level from 46.15% (women, second year) to 61.04% (men,

second year). Other assessments were different. The consistency of objective and subjective assessments was not significantly dependent on the year of studies (Table 2). However, among the second-year male students, the consistency of both assessments was considerably more often found than in women from the same year ($\lambda^2 = 4.12$, $p = 0.030$).

The analysis of menus confirmed that students shared the same bad eating habits, e.g. irregular meals, lack of fruit and vegetables, excessive consumption of sweets and snacks. Objective assessment of the subjects' diets (Table 3) revealed a significantly higher percentage of women and students in general in their second year, who were following proper dietary habits than the fourth-year

Table 3. Nutrition in subjects' objective and subjective assessment with regard to sex and year of studies (%)

Nutrition	Women		Men		Total	
	II	IV	II	IV	II	IV
1. Objective assessment of nutrition:						
– improper	48.72	88.89	81.82	91.25	70.69	90.65
– proper	51.28	11.11	18.18	8.75	29.31	9.35
λ^2 (p)	11.34 (0.0008)		3.01 (0.082)		14.01 (0.0002)	
2. Subjective assessment of nutrition:						
– improper	41.03	59.26	32.47	66.25	35.34	64.49
– proper	28.21	37.04	33.77	25.00	31.90	28.04
– I don't know	30.77	3.70	33.77	8.75	32.76	7.48
λ^2 (p)	7.42 (0.012)		21.72 (< 0.0001)		27.10 (< 0.0001)	
3. Objective and subjective assessments of nutrition are consistent:						
– no	71.79	30.04	62.34	31.25	61.52	32.71
– yes	28.21	69.96	37.66	68.75	38.48	67.29
λ^2 (p)	10.18 (0.0013)		19.32 (< 0.0001)		24.15 (< 0.0001)	

Table 4. Relationship between subjects' personal characteristics and health-related behaviours (%)

Personal characteristics	Level of involvement in physical recreation following the recommendations*		Nutrition	
	No	Yes	Improper	Proper
1. Commuting from location other than the university:				
– I don't commute	54.55	45.45	81.82	18.18
– I commute	64.29	35.71	57.14	42.86
λ^2 (p)	0.50 (0.476)		5.04 (0.025)	
2. Involvement in competitive sports (at present):				
– I'm not involved	55.33	44.67	83.33	16.67
– I'm involved	54.79	45.21	73.98	26.03
λ^2 (p)	0.06 (0.941)		2.72 (0.088)	
3. Working during school year:				
– I don't work	54.92	45.08	78.40	21.31
– I work	55.45	44.55	82.35	17.82
λ^2 (p)	0.98 (0.611)		2.53 (0.276)	

*by the Center for Disease Control and Prevention [2].

students. In subjective assessment, the fourth year students (women, men and students in general) had bad eating habits more often than second-year students. Nearly one-third of second-year students were not able to assess their nutrition ('I don't know'). The analogical percentages in the fourth year varied between 4% and 9% (Table 3). Among the second-year students, women, considerably more often than men, assessed their diets as improper ($\lambda^2 = 15.28$, $p < 0.0001$).

The comparison of objective and subjective assessments of nutrition in individual students revealed a significantly higher consistency of both assessments in female students, male students and students in general in the fourth year as compared to second-year students (Table 3). Sex did not affect the consistency of objective and subjective assessment of nutrition during studies with a concurrent rise in the level of knowledge about the principles of proper diets, which was reflected in the higher consistency of objective and subjective assessments on the fourth-year students.

The analysis also encompassed relationships between the subjects' level of involvement in physical recreation and assessment of nutrition and personal characteristics. Due to the very low number of commuting students (e.g. women in their fourth year, $n = 0$), this analysis was conducted for students in general. It was found that the subjects' involvement in physical education was not significantly correlated with any of the studied characteristics. However, significantly better nutrition was found among commuting students as compared with those living close to the university location. Moreover, students practicing competitive sports displayed tendencies towards proper diets than the non-training subjects (Table 4).

DISCUSSION

A comparison of the obtained results with results by other authors who investigated health-related behaviours generates several difficulties resulting from the use of different assessment measures and criteria by all the authors. Despite these problems, the results seem to confirm observations by other authors pointing to insufficient spectra of health-related behaviours in physical education students. The statistical analysis revealed that the recommended level of physical recreation was typical of only half of men and 15%

of women in the second year, and half of female and male students in the fourth year of studies in the Branch Faculty of Physical Education. Similar results were obtained by Drabik [6], who found that nearly half of students attending full-time and extramural courses of physical education in Gdansk were involved in physical recreation 'at the level of health-related benefits'. The lack of regular physical activity in leisure time (more seldom than once a week) was characteristic of 20% of the second-year students of the University School of Physical Education in Kraków [10]. The percentage of second-year students of physical education participating in physical recreation was higher than the percentage of students in other majors, e.g. of the University of Technology and the Medical University [8]. Similarly, different authors also point to the fact that the lack of physical activity was more characteristic of female rather than male students [8, 10].

In the present study, the percentage of students in total who declared the recommended level of physical recreation did not significantly rise throughout the studies, however, an increase in this value was observed in women. This beneficial change was conditioned exclusively by the duration of education; the other investigated factors (practicing competitive sports, starting jobs and commuting to work) did not impact the level of physical recreation in female students. Similar, very high (42-43%) percentages of students who were not able to reliably assess their involvement in physical recreation were also found. These subjects were most likely unaware of recommendations for participation in physical recreation.

In terms of nutritional behaviours, better habits were noted in women in the second year and second-year students in general than in fourth-year students, and those commuting to the university as compared with locally based students. Furthermore, tendencies towards more suitable nutrition were observed in women rather than in men in the second year, and among training rather than non-training students. Improper nutrition was also noted in students of the University School of Physical Education in Kraków, where widespread bad eating habits were noted such as low daily consumption of sea fish, fruit and vegetables [10].

The analysis of results of objective and subjective assessment of nutrition in students from the Branch Faculty of Physical Education in Gorzów Wielkopolski confirmed that young people

in their fourth year of studies are significantly more often aware of healthy nutrition recommendations than those in their second year (67% and 38%, respectively), however, this knowledge was not implemented into their daily practice. Thus it can be concluded that awareness alone is not a sufficient condition of one's own active care of health. However, a significant role can be attributed to health education in promotion of healthy lifestyles, which can positively influence attitudes conducive to making choices focused on health and limitation of the number of health-related risk factors. According to the theory of cognitive dissonance, changes in the cognitive component of an attitude involves changes in the other components i.e. emotional, volitional and behavioural [16].

The analysis of results of the present study and other studies [6, 10] confirmed widespread popularization of behavioural health-related risk factors among students from different physical education universities. Furthermore, the attained research results proved that a considerable part of fourth year students did not acquire knowledge about recommendations related to key health-related behaviours. Thus it seems doubtful whether they ever become future role models of healthy lifestyles, and whether they are able to give professional advice about the proper patterns of health behaviour.

Since it is schools where current and future health-related problems of contemporary societies will have to be faced, the necessity arises to improve the preparation of staff responsible for realization of health education and popularization of healthy lifestyles among young people. This task is assigned to physical education universities since health education is supposed to be realized by graduates leaving these schools. These new objectives for teachers stimulate physical education universities to undertake comprehensive health education initiatives among their students. However, these efforts should be preceded by a diagnosis of behaviours unfavourable for health and development of the awareness of conditions of such behaviours in particular environments as well as assessment of health-related attitudes among young people. Irrespective of the results of this diagnosis in particular student communities, it seems necessary to focus on:

1. Development of widespread awareness of behavioural factors of health risk in university

students, which will provide the theoretical basis for propagation of health-related attitudes among them, and arguments which will allow educators to make pupils choose appropriate behaviours which are not hazardous to their health.

2. Promotion (universities, program camps, scholarships, halls of residence etc.) of healthy lifestyles conducive to future teachers' health.

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