

SOCIO-ECONOMIC FACTORS AND PSYCHO-PHYSICAL WELL-BEING AS PREDICTORS OF SAUNA USE AMONG MALE UNIVERSITY STUDENTS

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ABSTRACT

The aim of this study was to assess the influence of socio-economic factors and psycho-physical well-being on the popularity of sauna usage among male university students. The research was conducted in 2012 on 550 first-year male university students aged 19 to 20 years (20.23±0.83yrs). The participants were asked to complete an anonymous questionnaire in which they described their frequency of sauna usage and their psycho-physical well-being on the day of use and on the following day. Firstly, the findings revealed that these students rarely used the sauna and that most of the evaluated socio-economic factors, including place of permanent residence, mother's educational background, the monthly budget of the student and the type of secondary education, had no significant influence on sauna usage. However, two factors did contribute significantly to the frequency of sauna usage, namely the father's educational background and the location of secondary school. Secondly, psycho-physical well-being (impressions on the day of sauna usage and on the following day), significantly influenced the sauna usage and had a significant positive influence on the respondents' well-being.

Key words: Sauna usage; First-year male students; Socio-economic status; Psycho-physical well-being.

INTRODUCTION

Socio-economic factors, such as monthly income, parents' educational and cultural background, time management and relaxation, physical activity, type of social environment, social relations and customs and traditions significantly influence lifestyle. Urbanisation seems to be a key factor because urban, small town and rural residents differ considerably in their physical development (Eiben *et al.*, 1996). Children raised in urban environments grow and mature faster due to better health care and living conditions (nutrition, hygiene, medical care) (Eiben & Mascie-Taylor, 2004). Wolański *et al.* (1991) identified the following characteristic features of metropolitan residents: stronger body build; better nutritional status; lower blood pressure; and better perspiration characteristics, excluding higher respiration rate which probably results from higher air pollution.

In human ecology, the family is the fundamental social unit that forms the basic environment for a growing child (Wolański *et al.*, 1991). Income determines the financial status of a family or a social or professional group (Roche & Sun, 2003). Diversified incomes and expenditures involve different cash management strategies (Tanner, 1994). A study of family types that have evolved under different cultural and economic conditions of Poland, Bulgaria, Japan, Korea and Mexico revealed that a child's development is largely influenced by the civilizational context (Wolański *et al.*, 1994). Children from families with a high educational status tend to have a more ectomorphic body type and are more likely to be taller than the offspring of farmers, who are characterised by a stocky build. Children of more educated parents mature faster and are characterised by higher values of somatic features (Eiben & Pantó, 1988). It would appear that children from upper class families are more often enrolled in secondary schools (Podstawski *et al.*, 2013c).

An individual's biological status is reflected in his/her physical, mental and social health (Tanner, 1994). In highly developed countries, motor fitness is an important determinant of biological status (Eiben *et al.*, 1996). Motor fitness takes on a new significance in view of the global decline in physical activity levels, in particular in developed countries (Singhal *et al.*, 2007). Research clearly indicates that the deterioration of biological status increases susceptibility to lifestyle diseases (Church *et al.*, 2007).

Influence of sauna on the human body

Sauna bathing is not only a popular form of relaxation, but also a treatment that delivers numerous health benefits (Cohen & Bodeker, 2008; Rouhiainen, 2008; Smith & Puczkó, 2008). Sauna delivers numerous health benefits by improving cardiovascular parameters and lowering blood pressure (Hannuksela & Ellahham, 2001). Sauna activates thermoregulatory mechanisms that trigger reactive changes throughout the body (Podstawski *et al.*, 2013b). Sauna bathing promotes the secretion of adrenalin (Kukkonen-Harjula & Kauppinen, 1988; Pilch *et al.*, 2003), ACTH, cortisol and prolactin, which could be attributed to acclimatisation to high temperature (Pilch *et al.*, 2003). The endocrine system is activated to increase water retention in the body and maintain thermal equilibrium, because perspiration lowers serum sodium levels (Kauppinen, 1989). Sauna bathing improves the cholesterol profile by reducing the concentrations of low-density lipoproteins and increasing the levels of high-density lipoproteins (Pilch *et al.*, 2010). Regular sauna treatment alleviates pain associated with musculo-skeletal injuries and improves joint mobility in patients suffering from rheumatism (Hannuksela & Ellahham, 2001; Kukkonen-Harjula & Kauppinen, 2006). Scoon *et al.* (2007) demonstrated that a three-week sauna treatment after exercise led to noticeable improvement in endurance running performance, and they attributed those results to increased blood volume. A study conducted with scuba divers revealed that one sauna treatment before diving significantly reduced circulating venous bubbles after a chamber dive, which lowered the risk of decompression sickness (Blatteau *et al.*, 2008).

The health status of university students deserves special attention. Graduates are role models, who exert a significant impact on their social environment, and they play important roles in the economic and social development of a nation. A university degree is generally synonymous with social prestige and graduates are more likely to embark on professional careers and enjoy higher life prospects (Ansari *et al.*, 2011). Educated individuals are more likely to be opinion

leaders who can visibly contribute to healthy lifestyle trends (Lee *et al.*, 2005). The first year of university is a time of great change for most students whose physical and emotional well-being can be significantly compromised during that time. Students are expected to rise up to the challenges of a new social and educational environment (Podstawski *et al.*, 2013c). They are deprived of parental care and support, and many of them find it difficult to cope with the pressure. University students should be educated about the importance of physical and mental well-being because they are still young enough to adopt more proactive attitudes towards a healthy lifestyle.

The health habits of university students are largely determined by the social, physical and economic environment of their families (Koivusilta *et al.*, 2003). According to Basch (2011), low socio-economic status correlates with poor academic achievement. Health education for students has been researched widely, but not in every respect. There is a general scarcity of studies investigating the relationships between the popularity of saunas among university students, the students' knowledge about the health benefits and risks associated with sauna usage and their socio-economic status.

PURPOSE OF RESEARCH

The aim of the study was to assess the influence of socio-economic factors on sauna usage among Polish male university students. The study also determined whether sauna bathing influences the students' psycho-physical well-being and encourages them to pursue this type of treatment. An attempt was made to answer the following questions:

1. Do selected socio-economic factors, such as place of permanent residence, location and type of secondary school, educational background of parents and students' monthly budget significantly influence sauna usage and its frequency among first-year male students enrolled at a university in Poland?
2. Does sauna treatment influence the psycho-physical well-being of students during the treatment and on the following day, and does this experience encourage students to visit a sauna regularly?

METHODOLOGY

Participants

The study was conducted in 2012 involving 550 first-year male university students in Poland. The students were randomly selected from 249 groups attending physical education (PE) classes based on random selection tables to produce 56 groups. Male students aged 19 to 20 years (20.23 ± 0.83 yrs) constituted 98% of the subjects in the analysed groups. The size of the sample selected had to ensure that the survey could be completed within 1 week. Students who were absent on the day of the study due to illness or for other reasons were excluded from the experiment.

The current study on the popularity of sauna bathing was developed by a member of the Department of Physical Education and Sport at the university in question, who heads the cross-

sectional project entitled, “A Health-Conscious University”. The aim of the programme was to examine the popularity of sauna bathing among young men entering university. Sauna bathing does not form part of physical education (PE) curricula in Polish universities. Therefore, this study is a unique and pioneering undertaking, which provided students with sauna access during compulsory PE classes. The vast majority of the analysed subjects were first-year male students. The characteristics of the study group is presented in Table 1.

Table 1. CHARACTERISTICS OF 550 MALE STUDENTS PARTICIPANTS

Place/Location:		Rural area	Small town	Large town	Small city	Large city
Permanent residence	n	145	205	105	44	51
	%	(26.36)	(37.27)	(19.09)	(8.00)	(9.27)
Secondary school	n	6	106	291	86	61
	%	(1.09)	(19.27)	(52.91)	(15.64)	(11.09)
Type of school						
		Gen. education school		Vocational school		
n		437		113		
%		(79.45%)		(20.55)		
Educational background						
		Primary	Secondary	Higher		
Father	n	112	211	227		
	%	(20.36)	(38.36)	(41.27)		
Mother	n	146	324	80		
	%	(26.55)	(58.91)	(14.55)		
Students' monthly budget						
		<1000 PLN	1000-1500 PLN	1501-2000 PLN		
n		305	240	5		
%		(55.45)	(43.64)	(0.91)		

This study complements cross-sectional projects that have been conducted biannually since 2000 with the involvement of first-year students at the university in Poland to determine the lifestyle and motor fitness levels among young male adults (Podstawski *et al.*, 2013a). The experiment was performed on homogeneous male groups for ethical reasons. Visitors to a sauna have to undress, and female participants could feel uncomfortable in the presence of men. Men and women have different preferences with regard to relaxation treatments, which can be partly attributed to the fact that women dedicate much more time to personal care (hair styling, make-up, etc.). Female participants could also be menstruating during the study, which would negatively affect their sense of well-being and influence the results of the experiment. A homogeneous sample supported accurate determination of relationships between sauna usage

and psycho-physical well-being. The overwhelming majority of the students were permanent residents of a region in north-eastern Poland.

The largest group of the analysed students resided permanently in small towns (37.27%) and rural areas (26.36%), followed by large towns (19.09%), large cities (9.27%) and small cities (8%). More than half of the respondents attended secondary schools in large towns (52.91%), whereas the smallest number of participants graduated from secondary schools in rural areas (1.09%). Nearly 80% (79.45%) of the respondents graduated from secondary schools of general education and the remaining 20% were from vocational schools. The highest number of students had fathers who were university graduates (41.27%), and mothers who were secondary school graduates (58.01%). In the smallest group of respondents, both mothers and fathers completed their education at the primary level (20.36% & 26.55%, respectively). More than half (55.45%) of the 550 respondents had monthly budgets of PLN 1000 (approximately USD 323) and the budgets of 43.64% of the subjects ranged from PLN 1000 to 1500 (USD 323-484). Only 1 student had a monthly budget of PLN 1501 to 2000 (USD 485-645), and budgets higher than PLN 2000 (USD 645) were not encountered.

Ethics

The study was conducted with the prior approval of the Ethical Committee of the university. All participants were volunteers who signed informed consent forms before the study.

Self-administered questionnaires

Two anonymous questionnaires were used in the study. The first questionnaire was completed by the respondents immediately after a visit to the sauna, while the second questionnaire was completed based on the answers given by the respondents during a telephonic survey on the following day. The first questionnaire (completed immediately after a visit to the sauna), constituted of closed-ended questions, as well as open-ended questions, such as:

- “Please grade your psycho-social well-being on a 10-point scale, where 1-4 points denote low satisfaction, 5-6 points moderate satisfaction and 7-10 points high satisfaction”;
- “How would you describe your feelings right now?” In this open-ended question, the respondents were asked to describe their feelings in their own words;
- In a closed-ended question, the participants were asked to indicate whether they would be willing to visit a sauna in future;
- In the last part of the questionnaire, the students were asked to state their gender, age and provide the following information describing their socio-economic status (independent variables): place of permanent residence; educational background of parents; students’ monthly budget; location of their secondary school; the type of secondary school; and the influence of the above factors on the frequency of sauna usage.

At the end, respondents were given a slip of paper with the ID number of their questionnaire, and they were asked to present the ID number to a researcher who would contact them by telephone on the following day. This procedure was used to maintain anonymity and match the responses provided in the first and second questionnaire. On the following day, after the respondents had used the sauna, they were contacted by a researcher by telephone and asked to

complete the second questionnaire. The questions were identical to those used in the first questionnaire:

- Closed-ended question: “Please grade your psycho-social well-being on a 10-point scale, where 1-4 points denote low satisfaction, 5-6 points moderate satisfaction, and 7-10 points high satisfaction”;
- Open-ended question: “How would you describe your feelings right now?” The researcher wrote down the exact answer provided by the participants in their own words.

In this study, socio-economic status is defined as “an economic and sociological combined total measure of a person’s work experience and of an individual’s or family’s economic and social position in relation to others, based on income, education and occupation” (APA, 2015:1). The concept of psycho-physical well-being is part of the WHO’s definition of health: “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” (Grad, 2002:984).

Analysis of data

The results were processed by the Statistica PL v. 10 programme using basic statistical procedures (Stanisz, 2008). Descriptive statistics were obtained and the structure indicator was determined at a significance level of $\alpha=0.05$. Differences were regarded as statistically significant when the calculated p-value was lower than α ($p<\alpha$). The following residential categories were established for the needs of this study: village and small town (population less than 20,000); large town (population of 20,000 to 50,000); small city (population of 50,000 to 100,000); and large city (population higher than 100,000).

RESULTS

A statistical analysis of the relationships between the evaluated environmental factors (place of permanent residence, mother’s and father’s educational background, students’ monthly budget, location of their secondary school and type of secondary school), and the popularity of sauna among male students revealed statistically significant differences ($p<0.05$) in most cases (subcategories within a given factor). The number of respondents who had not visited a sauna in the past was significantly higher than the number of participants who had. The only exception ($p>0.05$) were students who resided permanently in a small town ($p=0.1225$), whose mothers were university graduates ($p=0.2432$), who had monthly budgets of PLN 1501-2000 ($p=0.0877$), and who graduated from secondary school in a rural area ($p=0.2023$).

Factors such as place of permanent residence ($p=0.16$), mother’s educational background ($p=0.55$), students’ monthly budget ($p=0.17$) and type of secondary school ($p=0.17$) were not significantly correlated with the frequency of sauna usage by the surveyed students. For this reason, further analyses of the frequency of sauna usage were narrowed down to statistically significant correlations between the evaluated factors. The influence of selected socio-economic factors (father’s educational background and secondary school location), on the frequency of sauna usage and the influence of psycho-physical well-being resulting from sauna usage on the popularity and frequency of sauna usage are presented in Tables 2 to 4.

Table 2. INFLUENCE OF EDUCATIONAL BACKGROUND OF FATHERS ON FREQUENCY OF SAUNA USAGE

Frequency of sauna usage	Father's educational background		
	Primary n (%)	Secondary n (%)	Higher n (%)
1-2 times in life	19 (54.29)	50 (60.24)	43 (46.24)
3-20 times in life	10 (28.57)	16 (19.28)	15 (16.13)
1-2 times a week	3 (8.57)	7 (8.43)	7 (7.53)
1-3 times a month	0 (0.00)	6 (7.23)	17 (18.28)
1-6 times a year	3 (8.57)	4 (4.82)	11 (11.83)
Total	35 (100)	83 (100)	93 (100)
Degree of freedom = 8 Probability of exceeding the calculated value of chi-square $p = 0.04$ Chi-square value = 16.344			

Differences are statistically significant at $p < 0.05$

The influence of educational background of the parents on the frequency of sauna usage among male students is presented in Table 2. The results of an analysis of the frequency of sauna usage indicate that the highest percentage of participants had visited a sauna once or twice in their lives regardless of their fathers' educational background. Students who visited a sauna more often (1 to 3 times a month and 1 to 6 times a year), were more likely to have fathers with a university degree. The results of the above analysis suggest that the educational background of the father significantly influenced ($p = 0.04$) the frequency with which their sons used the sauna.

Table 3. INFLUENCE OF SECONDARY SCHOOL LOCATION ON FREQUENCY OF SAUNA USAGE

Frequency of sauna usage	Location of secondary school				
	Rural area n(%)	Small town n(%)	Large town n(%)	Small city n(%)	Large city n(%)
1-2 times in life	2(100)	30(69.77)	65(50.39)	8(29.63)	7(70.00)
3-20 times in life	0	1(2.33)	20(15.50)	17(62.96)	3(30.00)
1-2 times a week	0	0	16(12.40)	1(3.70)	0
1-3 times a month	0	11(25.58)	11(8.53)	1(3.70)	0
1-6 times a year	0	1(2.33)	17(13.18)	0	0
Total	2(100)	43(100)	129(100)	27(100)	10(100)
Degree of freedom = 16 Probability of exceeding the calculated value of chi-square $p \approx 0.0001$ Chi-square value = 1,09195E ⁻⁰⁸					

Differences are statistically significant at $p < 0.05$

The influence of the location of their secondary school on the frequency of sauna usage is presented in Table 3. Based on an analysis of the frequency of sauna usage relative to the location of secondary school, students who attended secondary schools in rural areas were excluded from the study due to the small size of the sample (6 persons, of whom only 2 had visited a sauna). The highest percentage of students who had frequented a sauna once or twice in their lives completed their secondary education in small towns (69.77%), large towns (50.39%) and large cities (70%). Most students who graduated from secondary schools in small cities had visited a sauna 3 to 30 times in their lives (70%). The above findings indicate that the frequency of sauna usage among male students was significantly linked ($p=0.0001$) with the location of their secondary school.

Table 4. **PSYCHO-PHYSICAL WELL-BEING AND ITS INFLUENCE ON STUDENTS' PROPENSITY TO SAUNA USAGE IN FUTURE**

Rating	Would you use a sauna again?	Level of well-being during sauna usage			Level of well-being on following day		
		n	Structure indicator	p-Value	n	Structure indicator	p-Value
1	Yes	1	0.0018	0.1598	2	0.0036	0.2826
	No	0	0.0000		1	0.0018	
2	Yes	2	0.0032	0.0795	2	0.0036	0.5000
	No	0	0.0000		2	0.0036	
3	Yes	3	0.0055	0.1545	6	0.0109	0.1604
	No	1	0.0018		3	0.0055	
4	Yes	2	0.0036	0.2826	6	0.0109	0.1604
	No	1	0.0018		3	0.0055	
5	Yes	7	0.0127	0.1841	11	0.0200	0.1106
	No	4	0.0073		6	0.0109	
6	Yes	8	0.0145	0.0668	10	0.0182	0.0967
	No	3	0.0055		5	0.0091	
7	Yes	21	0.0382	0.0030	23	0.0418	0.0001
	No	4	0.0073		4	0.0073	
8	Yes	50	0.0909	0.0000	47	0.0855	0.0000
	No	3	0.0055		2	0.0036	
9	Yes	45	0.0818	0.0000	43	0.0782	0.0000
	No	2	0.0036		3	0.0055	
10	Yes	53	0.0964	0.0000	30	0.0545	0.0000
	No	1	0.0018		2	0.0036	

Differences statistically significant at $p<0.05$

The students' psycho-physical well-being on the day of the sauna treatment and on the following day is presented in Table 4. The vast majority of the students ($N=179$) gave very

high ratings to their sauna experience (7 to 10 points). In the above group, significantly more respondents would be interested in visiting a sauna in future based on ratings: 7 ($p=0.0030$), 8 ($p=0.0000$), 9 ($p=0.0000$) and 10 ($p=0.0000$). Similar results were noted in the group of 154 students who described their psycho-physical well-being as “very good” on the day following the sauna treatment, namely ratings: 7 ($p=0.0001$), 8 ($p=0.0000$), 9 ($p=0.0000$) and 10 ($p=0.0000$). Interestingly, in the group of students who ranked their psycho-physical well-being as moderate (5 to 6 points) or low (1 to 4 points), the percentage of respondents who would be inclined to use a sauna in the future was higher than the percentage of students opposed to the idea, yet the differences were not significant. The above observations indicate that a sense of well-being after sauna bathing significantly contributed to sauna usage.

DISCUSSION

The results of this study have significant theoretical and practical implications and can be used to promote sauna bathing among university students in Poland and other countries. In this study, socio-economic factors, such as the place of permanent residence, mothers’ educational background, students’ monthly budget and type of secondary school had no significant influence on sauna usage among males 19 to 20 years old residing in a region in north-eastern Poland.

It could come as a surprise since dry sauna is widely used in sport, recreation and rehabilitation, therefore, its popularity would be expected to be equally high in Poland. Most sport and recreational centres and water parks in Poland are equipped with spa facilities, dry and steam saunas. This is also the case in the specific region in Poland, a popular tourist destination that abounds in recreational facilities promoting health and physical fitness. The vast number of hotels, sport and recreational centres, spas and sauna parlours provide local inhabitants with extensive access to such amenities in both urban and rural areas. Students who find seasonal employment in such facilities are usually allowed access to a sauna for health reasons. In Finland, saunas are immensely popular, and they were even included in a national survey of the most popular pastimes (OSF, 2013).

At the university where the current study was conducted, all students have free access to spa facilities during PE classes held at the swimming pool, including sauna, whirlpools and other equipment. After a 60-minute swimming class, students are allowed to use spa facilities (sauna, whirlpool, etc.) for 30 minutes. It could seem that such a wide range of recreational options would encourage students to visit a sauna on a regular basis. In the student community, sauna bathing could also be expected to be a popular pastime that promotes a healthy and physically active lifestyle. Therefore, male students who attend swimming classes could be expected to take up sauna bathing as a regular leisure activity after exercise (Podstawski *et al.*, 2013b). The low popularity of sauna among the students at the university in question, despite free access to modern facilities and free-swimming lessons, could indicate that most students are poor swimmers or have never learned to swim (Podstawski *et al.*, 2014). In fact, students regard swimming as more difficult than other activities offered as part of PE classes, and enrolment in swimming courses is usually low. Research has also revealed that very few students use the sauna at home, which indicates that sauna bathing at home is still uncommon and rather incidental (Podstawski *et al.*, 2013b).

Most Polish university students have a sedentary lifestyle (Lisicki, 2006; Umiastowska, 2007), and are not engaged in sport outside the compulsory PE classes, which could also explain the low popularity of sauna in this study. This highly undesirable trend was confirmed by cross-sectional studies of male students in the current study (Podstawski *et al.*, 2013a; Podstawski & Choszcz, 2014). Research also demonstrated that the majority of Polish students are not aware of the numerous health benefits of sauna bathing (Hannuksela & Ellahham, 2001; Kukkonen-Harjula & Kauppinen, 2006).

The frequency of sauna usage was very low among the surveyed students, and most respondents had visited a sauna several to about 20 times throughout their lives. The two socio-economic factors that were strongly linked with the frequency of sauna usage were the father's educational background (in favour of fathers with a university degree), and location of secondary school (in favour of secondary school graduates from small cities). Perhaps better educated middle-class parents are more likely to visit a sauna with their children. As for the higher frequency of sauna usage in small cities, it should be noted that many small cities in the specific region in Poland have secondary schools that are attended by students from satellite villages and small towns.

The respondents' impressions following a visit to the sauna were interesting and they significantly influenced their interest in future sauna usage. Significantly more students who positively evaluated their psycho-physical well-being on the day of the treatment and on the following day (high ratings on the 10-point scale), were willing to visit a sauna in the future in comparison with the number of students who were less enthusiastic (lower ratings on the 10-point scale). Interestingly enough, some respondents who gave a lower ranking to their psycho-physical well-being on the day after the treatment were still interested in visiting a sauna, which could be attributed to curiosity, the desire to follow a trend or improve their health. The vast majority of students were of the opinion that sauna bathing significantly contributed to their psycho-physical well-being, leaving them refreshed and relaxed. Consequently, sauna treatment can be regarded as a positive contributor to mental health, which is a very important consideration during their attendance of the university. A study investigating male students of the same university demonstrated that only 0.53% of the participants visited a sauna to relieve tension (Podstawski *et al.*, 2013c). University years generally involve high levels of stress, in particular during the examinations (Bayram & Bilgel, 2008).

Students with adaptive personalities thrive at university, whereas others lack the emotional maturity to cope with stress and rise to the challenge of university experience (Pope, 2001). Research demonstrated that problem solving and alcohol use are the most common coping strategies among men (Wang *et al.*, 2009; Esper & Furtado, 2013). A study of Polish male university students revealed high levels of bingeing and alcohol consumption, which indicates that young males have poor stress management skills (Podstawski *et al.*, 2013a). Despite such alarming data, health promotion campaigns are rarely launched in academic communities. Polish universities are in dire need of such programmes to bridge the gaps resulting from discrepancies in the socio-economic status of students.

In Poland, mortality rates among adult males have been increasing steadily since the 1990s (Zatoński, 1996), which can be attributed to the growing incidence of lifestyle diseases, exacerbated by poor nutrition and low levels of physical activity (Wojtyniak *et al.*, 2012).

Similar trends are observed around the world (Ferreira *et al.*, 2006; Hennenberg & Grantham, 2014). The continuing rise in male mortality rates (Bartosńska *et al.*, 2005) could have catastrophic consequences for Poland (Jopkiewicz, 1998). According to a World Bank report, Poland's productive output could be seriously compromised by high mortality rates among people of working age, high costs of living and medical treatment for people suffering from chronic diseases. In the experts' opinion, this trend could significantly obstruct Poland's continued economic growth (Feachem, 1994).

LIMITATIONS

To date, no other studies have examined the relationship between sauna usage and socio-economic factors, therefore, the current results could not be compared with those of Polish or foreign research. There have been no published studies into the use of saunas in PE curricula across Polish universities; therefore, the current research is a pioneering undertaking in this respect. It would be very difficult to expand this research into foreign academic communities because PE is no longer mandatory in institutions of higher education in most countries around the world. In Poland, PE classes are still compulsory at university, which provides academic instructors with a unique opportunity to promote physical activity and shape the students' pro-health attitudes.

CONCLUSIONS

The presented empirical results were obtained in a survey of a representative sample of 550 first-year male students enrolled in a state university with a varied educational profile. The respondents had varied academic interests in the area of humanities, social sciences, arts, biomedical sciences and technical sciences. The social and demographic profile of the surveyed population was representative of Polish male students attending state universities and these results could be generalised to such a population.

In this study, socio-economic factors did not exert a significant influence on the popularity of sauna among 19- to 20-year-old male university students. Statistically significant differences were observed only between the frequency of sauna usage and the following environmental factors: fathers' educational background; and location of their secondary school. The survey of the sense of psycho-physical well-being of the respondents revealed that the vast majority of students felt refreshed and relaxed during the treatment and on the following day. The above indicates that sauna has a highly positive influence on the psycho-physical well-being of students.

The results of other studies also indicate that sauna delivers health promoting effects, which justifies its use as an effective relaxation technique in health and physical activity programmes. The impact of the analysed factors was evaluated only partially because sauna enjoyed relatively low popularity among the students. Further work is needed to investigate the relationships between environmental parameters and sauna usage among university students by extending the range of examined factors to include sex and age. The popularity of sauna during obligatory and voluntary physical activity programmes could also be investigated among students of other Polish and foreign universities. Attempts could be made to popularise sauna treatments at another Polish university as part of health promotion programmes addressed to

students. Such programmes would expand knowledge about the influence of sauna on physiological and cardio-metabolic parameters.

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(Subject Editor: Prof Ben Steyn)