ORIGINAL ARTICLE

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A comparative study of body posture, lifestyle and physical activity patterns among students of health sciences in Poland, Lithuania, and Portugal

Badanie porównawcze postawy ciała, stylu życia i wzorców aktywności fizycznej wśród studentów nauk o zdrowiu w Polsce, na Litwie i w Portugalii

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Abstract

Introduction and objective. Exercise during study at university improves both academic performance and quality of life. Good physical health, improved self-esteem and social life are all benefits. Students often sit for long periods due to academic activities, studying, and computer use. This can have implications for physical and mental health The aim of this study is to compare how much students in Poland, Lithuania and Portugal understand about the prevention of back pain, body posture, and leisure activities.

Materials and Method. A total of 486 students from Poland, Lithuania and Portugal completed the survey using an online questionnaire. The survey was addressed to students in a selection of health science degree programmes: Physiotherapy (263), Nursing (134) and Occupational therapy (89). Chi-squared tests and the contingency coefficient were performed to determine whether there were significant differences in the mean scores of physiotherapy, occupational therapy and nursing students.

Results. The results of the chi-square test, which is statistically associated with the interconnectedness due to viral spread, identified the defect as correct ($p = 0.00$). The survey shows that 58.14% of respondents experiencing pain were active, while 41.86% described themselves as physically inactive but suffering from pain. Physiotherapy students spent the most time on activity (58.94%), while nursing students (39.55%) and occupational therapy students (33.71%) spent the least time on activity.

Conclusions. The importance of education in promoting a healthy lifestyle among university students is both evident and necessary. The sample comprised only a half of the health science students, which limited generalisations. It is recommended that future research should be conducted on a larger group of people.

Key words
students, physical activity, body posture

Streszczenie

Wprowadzenie i cel pracy. Aktywność fizyczna na studiach jest ważna dla kształtowania zdrowych nawyków i poprawy jakości życia. Pomaga utrzymać dobre zdrowie, a nawet może poprawić wydajność, samoocenę i życie towarzyskie. Studenci spędzają dużo czasu w pozycji siedzącej, często z powodu zajęć na uczelni, nauki i korzystania z komputera. Spadek aktywności fizycznej i częste przyjmowanie pozycji siedzącej są niekorzystne zarówno dla ich zdrowia psychicznego, jak i fizycznego. Celem niniejszego badania jest porównanie poziomu wiedzy studentów w Polsce, na Litwie i w Portugalii na temat profilaktyki bólu pleców, postawy ciała i sposobów spędzania wolnego czasu.

Materiał i metody. W badaniu ankietowym online wzięło udział łącznie 486 studentów z Polski, Litwy i Portugalii. Ankietę skierowano do studentów wybranych kierunków studiów z zakresu nauk o zdrowiu: fizjoterapii (263), pielęgniarstwa (134) i terapii zajęciowej (89).

Wyniki. Wyniki testu chi^2 wykazały statystycznie istotny związek między zgłaszanym przez badanych bólem dolnej części pleców a zidentyfikowaną wadą postawy ($p = 0,00$). Badanie pokazało także, że 58,14% respondentów odczuwających ból było aktywnych fizycznie, podczas gdy 41,86% określiło się jako osoby nieaktywne fizycznie, ale odczuwające ból.

Wnioski. Edukowanie studentów w zakresie zdrowego stylu życia ma duże znaczenie, jak i jest konieczne. Praca ma pewne ograniczenia. Obejmowała wyłącznie studentów nauk

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o zdrowiu, więc zawarte w niej uogólnienia są ograniczone. Zaleca się przeprowadzenie w przyszłości badań na większej grupie osób.

Słowa kluczowe

postawa ciała, studenci, aktywność fizyczna

INTROCUCTION AND OBJECTIVE

Physical activity is a fundamental element of health and an integral part of society›s lifestyle in contemporary European culture. As a key determinant of well-being, it has been incorporated into health policy systems in both developing and accessible countries. The role of physical education in health promotion stems from its direct impact on the biological and psychosocial potential of the individual. However, in parallel with educational programmes promoting exercise, a 'sedentary culture' is developing – preceding exclusion and striving for a separate security, which is a consequence of the development of modern civilization [1]. Physical inactivity poses a direct threat to public health, contributing to the development of chronic diseases, premature mortality, and generating a significant economic burden. Growing scientific evidence also indicates that high levels of sedentary behaviour independently increase the risk of death and morbidity [2].

Poor body posture, in conjunction with prolonged use of mobile phones and subsequent lifestyle changes, has been demonstrated to result in musculoskeletal abnormalities involving the spine. In addition, researchers have reported that the use of smartphones is significantly associated with the presence of other upper limb abnormalities and functional disorders. It is evident that smartphones have progressively become an inextricable element of everyone›s daily lives, playing an instrumental role in alterations to spinal alignment [3].

The experience of back pain significantly impacts the capacity of adolescents to engage in daily activities, including those related to their academic studies, compelling them to seek professional assistance. A study by Lewandowski and Łukaszewska found that back pain most frequently affected the lumbar-sacral spine, reported by 39% of the study participants. This pain was frequently attributed to intense physical activity in combination with a sedentary position. The majority of respondents reported that their back pain had a detrimental effect on their daily activities [4]. It has also been documented that students of physical education have been experiencing physical pain. According to Kędra et al., 70.7% of respondents reported experiencing back pain in the previous 12 months. In addition, students who were physically inactive reported experiencing back pain at a rate similar to that of their peers studying physical education (70.4 and 71.2, respectively). In 87.4% of respondents, back pain occurred primarily in the lumbar spine, and was most often moderate in intensity, reported by 42.3% of respondents [5].

The importance of exercise at university for developing healthy habits and quality of life is well-known; it helps maintain good health and can even improve academic performance, self-perception and social life [6]. University students tend to spend a lot of time sedentary, often due to a combination of sitting in classes, studying, and using computers. It has been shown by different studies that a decrease in physical activity, and an increase in sedentary behaviour are usually associated with the transition to university studies. Lifestyle changes and psychosocial factors have been indicated as the cause [7].

The aim of this study was to compare how much students in Poland, Lithuania and Portugal understand about the prevention of back pain, body posture, and leisure activities.

MATERIALS AND METHOD

The targeted survey addressed to students of health faculties was conducted at the University of Health Sciences in Kaunas, Lithuanian, in Poland at the University of Physical Education in Kraków, and at the University of Rzeszów, and in Portugal at the Polytechnic Institute of Beja. Information about the research was provided to students during classes and sent by e-mail. The study involved students of health sciences who were present at the university on the day of the study. Students completed an online, anonymous questionnaires in class under the supervision of a researcher. All students were provided with the same information in order to avoid any potential conflicts of interest and to maintain the quality of the data. An original questionnaire was used in the research, which was divided into a metric section, and sections on the prevalence of lumbar back pain, and physical activity.

The methodology of the project was approved by the Bioethics Committee at the District Medical Chamber in Kraków, Poland (Approval No. 71/KBL/OIL/2024).

Statistical analysis. For the evaluated parameters, the following were determined: arithmetic means (x) and standard deviations (SD). Chi-squared tests and the contingency coefficient were performed to determine whether there were significant differences in the mean scores of physiotherapy, occupational therapy, and nursing students. The coefficient values between 0–1. Values close to zero indicate a weak association between row and column variables, and values close to 1 indicate a strong association between these variables. A p value of less than 0.05 was considered statistically significant. All statistical analyses were performed with the Statistica 14 software (StatSoft, Inc., USA).

RESULTS

The survey was addressed to students in health science degree programmes: Physiotherapy (263), Nursing (134) and Occupational therapy (89) – a total of 486 students. Of these, 268 were from Poland: 250 were enrolled from the Academy of Physical Culture in Kraków, and 18 from the University of Rzeszów. In Lithuania, the 88 students were enrolled at the University of Health Sciences in Kaunas, and in Portugal, 130 students were enrolled from the Department of Health at the Beja Polytechnic Institute. The arithmetic means of selected somatic parameters of students are presented in Table 1.

Table 1. Characteristics of respondent group (average ± standard deviation)

Characteristics	Total (n=486)	Lithuania (n=88)	Poland (n=268)	Portugal (n=130)
Age (y)	21.27±3.4	21.53±4.03	20.75 ±1.91	21.10±2.94
Body mass (kg)	65.59±13.74	64.06±12.56	63.92±10.40	66.70±14.61
Height (cm)	166.05±10.77	168.52±8.42	169.07±7.75	164.18±11.91
BMI (kg/m^2)	23.85±0.34	22.71±0.74	22.42±0.67	24.88±0.61

BMI: Body Mass Index

The first question concerned the postural defect that had been diagnosed. Among the respondents diagnosed with a spine disease or posture defect, 30.22% were from Poland, 27.27% from Lithuania and 27.27% from Portugal (Fig. 1). Due to the field of study, postural defects were noted in students of physiotherapy – 79, nursing – 28 and occupational therapy – 25.

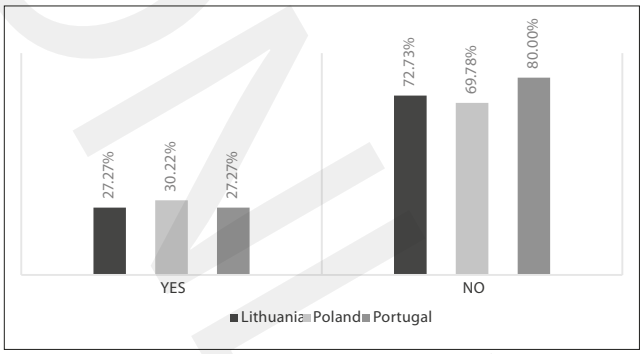

Figure 1. Have you been diagnosed with a posture defect?

The second and third research questions focused on back pain and frequency of occurence. In response to the question regarding the prevalence of lumbar pain, 258 students selected the 'yes' option. In Poland, 134 respondents reported experiencing pain, while in Lithuania – 48, and in Portugal – 76 (Tab. 2).

Table 2. Do you suffer from low back pain? versus country

Do you suffer from low back pain?			
Country	YES	NO	Total
Lithuania	48	40	88
%	54.55%	45.45%	
Poland	134	134	268
%	50.00%	50.00%	
Portugal	76	54	130
%	58.46%	41.54%	
Total	258	228	486

The remaining respondents reported an absence of such pain. In the physiotherapy degree, 130 students reported lumbar pain, 71 in the nursing degree and 57 in the occupational therapy degree (Tab. 3).

The next question concerned the intensity of pain. Respondents rated the severity of the pain using the VAS scale, which showed that in Poland, Lithuania and Portugal, most of the responses were in the mild to moderate range (Fig. 2). Regarding fields of study, the most commonly

Table 3. Do you suffer from low back?

Field of study	Do you suffer from low back pain?		
	YES	NO	Total
Physiotherapy	130	133	263
%	49.43%	50.57%	
Nursing	71	63	134
%	52.99%	47.01%	
Occupational therapy	57	32	89
%	64.04%	35.96%	
Total	258	228	486

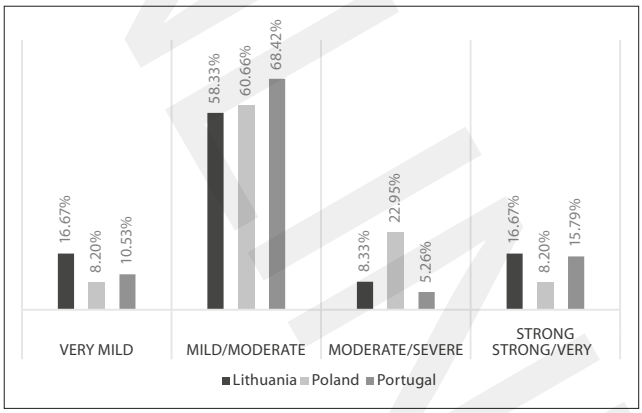

Figure 2. Pain intensity rating (VAS scale)

reported response was also ‹mild/moderate› across all fields (61.11%).

The further questions concerned the taking of painkillers and use of corrective positions during everyday activities. The vast majority of respondents who suffer from pain did not take analgesics or anti-inflammatories for spinal pain – 191 students. However, 67 students did take painkillers (Fig. 3). Regarding fields of study, the most commonly reported response was also negative across all fields (62.50%).

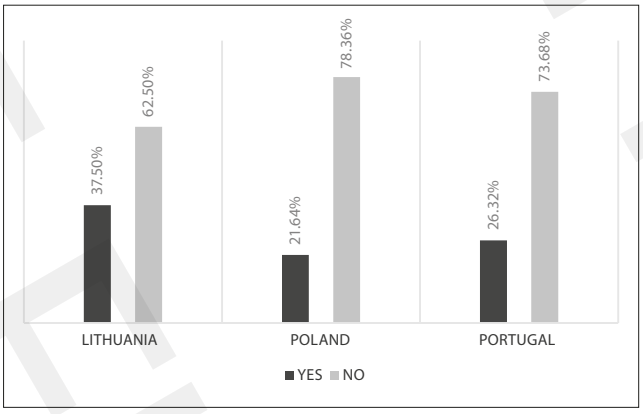

Figure 3. Do you ever take painkillers/anti-inflammatories for low back pain?

In answer to the question regarding the use of methods for the prevention of back pain and the most common position assumed while studying at home, it was evident that most students use the methods for the prevention of back pain they learnt at university (40.70%). However, 24.03% of the students did not use these methods because they had not been taught them. The vast majority of respondents studied in a seated

position (92.31%), although in contrast, 49 from Poland, 18 from Lithuania, and 5 from Portugal adopt a prone position– 3.85%. A small number of respondents adopt a standing or other position while studying. In relation to the field of study, sitting was also the most common response.

In response to the question regarding the duration of time spent in a seated position during the day, 53.36% individuals from Poland, 30.68% from Lithuania, and 26.36% from Portugal who are dependent on this position for between one and three hours provided answers. In addition, 42.16% of Poles, 57.95% of Lithuanians and 56.59% of Portuguese students reported spending between four and six hours in a seated position. Furthermore, 4.48% of Poles, 11.36% of Lithuanians, and 17.05% of the Portuguese students reported spending in excess of seven hours in a seated position. It has been established that students in the field of physiotherapy spend less time in a seated position (1–3 hours) than their colleagues in the fields of occupational therapy and nursing (4–6 hours).

Students from all countries and all fields of study had problems maintaining correct posture during the day (50%), and a high proportion (40.77%) do not pay attention to correct posture because they regard it as being too difficult.

The predominance of passive spending of free time is evident in all three countries and accross all fields of study (82.31%); conversely, 17.69% of students expressed a preference for active leisure activities. A total of 44.78% of Poles, 38.64% of Lithuanians and 37.69% of Portuguese spent up to 10 hours a week on leisure activities. A total of 37.31% of respondents from Poland, 27.27% from Lithuania, and 38.46% from Portugal declared a duration of less than five hours. Only one student from Poland, three from Lithuania, and five from Portugal devoted more than 48 hours a week on leisure activities (Fig. 4).

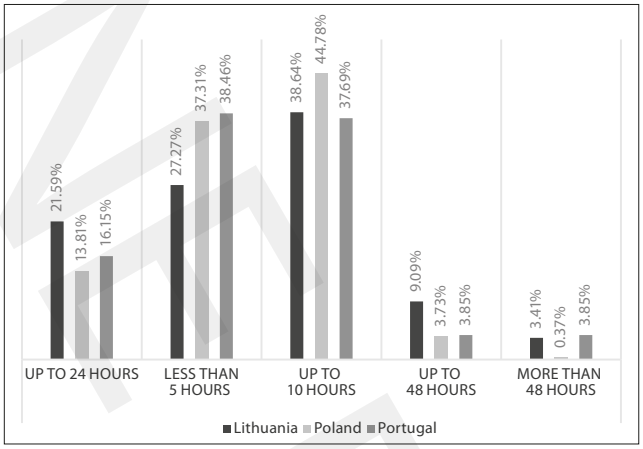

Figure 4. How much time do you spend on leisure activities on a weekly basis?

In the next question, respondents were asked to decide whether or not they considered themselves to be physically active. The answer 'yes' was selected by 204 respondents from Poland, 49 from Lithuania, and 57 from Portugal. On the other hand, 64 from Poland, 39 from Lithuania and 73 from Portugal considered themselves to be physically inactive. Physiotherapy students were the most active (77.19%), while nursing students the least active (57.46%) (Fig. 5).

The largest percentage of respondents participated in physical activity several times a week – in Poland 58.96%, 40.91% in Lithuania, but in Portugal 'not often' was the most frequent answer (47.69%). Physiotherapy students spent the most time on activity -58.94%, nursing students – 39.55%, and occupational therapy students – 33.71%, spent the least time on activity.

Comparison of the occurrence of back pain, physical activity and postural defects. Results of the chi-square test showed there was a statistically significant association between the subjects› reported low back pain and the identified postural defect (p=0.00) (contingency coefficient – 0.28). Back pain was experienced by 39.53% of respondents who noted postural defects.

No statistically significant relationship was noted between the subjects› reported low back pain and amount of time spent sitting during the day outside the university, and between the subjects› reported low back pain and leisure-time activity. There was, however, a statistically significant association between the subjects› reported low back pain and whether they considered themselves to be physically active (p=0.00), contingency coefficient 0.12. The survey shows that 58.14% of respondents who experienced pain were active, while 41.86% described themselves as physically inactive but suffering from pain.

There was also a statistically significant association between the subjects› reported low back pain and the problem of maintaining a correct posture during daily activities (p=0.00) (contingency coefficient – 0.18). The respondents who experienced back pain were not concerned about body position because attempting to maintain correct posture was exhausting and uncomfortable (41.47%); and sometimes they simply forgot about it (52.33%). Only 6.20% of respondents used corrective positions.

Relationship between students' field of study and leisure time. A statistically significant difference was found between the field of study and way of spending leisure time (p=0.00) (contingency coefficient – 0.2) and between the field of study and self-identification as an active person (p=0.0) (contingency coefficient – 0.3). Physiotherapy students described themselves as active people – 77.19%, nursing students – 42.54% and occupational therapy students 56.18%.

DISCUSSION

The field of health and quality of life has always considered the benefits offered by physical exercise to be extremely attractive, especially among people of university-age, which is a crucial period for forming habits that will be maintained throughout adult life [8].

The aim of this study was to compare how much students in Poland, Lithuania and Portugal understand back pain prevention, body posture and leisure activities. The study revealed that the majority of students from all academic disciplines reported experiencing back pain and assessed the intensity of the pain as moderate. As indicated by the findings of other studies, 77% of first-year physical education students and 69% of first-year physiotherapy students reported experiencing back pain. A subsequent study conducted in the fourth year of the programme, encompassing both fields, revealed a decline in the incidence of low back pain among physical education students (50%) and an increase in the number of physiotherapy students (87%). These findings

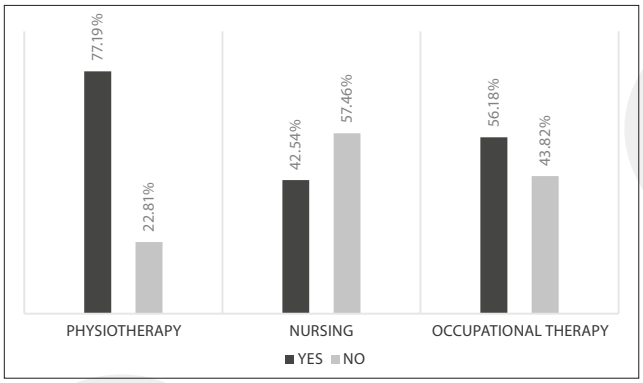

Figure 5. Do you think of yourself as a physically active person?

may be related to the students' professional subjects, which involved lifting patients or assuming static positions [9]. In a study by Yan et. al., it was noted that patients suffering from chronic neck pain have been observed to demonstrate not only abnormal head positioning, but also changes in shoulder alignment, which should not be disregarded. A rounded posture of the shoulders is generally linked to excessive tension in the shoulder muscles and incorrect alignment of the joint. Prolonged neck discomfort frequently results in muscular imbalances in the shoulder region which, in turn, can give rise to alterations in shoulder alignment [10].

In the current study, students from all countries and all fields of study had problems in maintaining correct posture during the day (50%), and a high proportion of them (40.77%) did not pay attention to correct posture because it was too difficult for them. Furthermore, the study indicated a statistically significant association between the subjects' reported cases of low back pain and the identified postural defect. The results obtained in the Batebi et al. study, indicate that the occurrence of musculoskeletal abnormalities may affect the scale of pain and quality of life of people, as well as their physical, mental and social health. A well-established correlation was also demonstrated between static deformities and pain. Pain was found to increase significantly when the pelvis changed from a normal to a lateral deviation position [11].

The current study showed that students spend a lot of time sitting while studying at home. A clear predominance of passive leisure time activities was also observed in all three countries, and across all fields of study. Other studies have shown that increased smartphone addiction is linked to poorer posture in boys with an ectomorphic body type, which suggests that as addiction increases, so does the problem. It is crucial to educate students about the risks and how to prevent them. Some solutions include improving sleeping, sitting, walking, standing and studying postures [3].

Nowak et.al noted that older participants were less likely to spend time on physical activity during their leisure time. This means that in adult life the number of duties increases (i.e., more time is needed for work or family) and the amount of free time decreases [1]. The presented study has shown that the most active group are physiotherapy students, and the least active are nursing students. Students from Poland and Lithuania participate in physical activity several times a week, while Portuguese students do so infrequently. In other studies, about 70% of respondents confirmed that they take part in physical activity, with most students (about 90%) do so during the week, with more male students declaring that they participated for fun and to meet friends. In contrast, 81.1% of male students participated in sports for the competition aspect, compared to 39.0% of female students. Both male and female students provided the same identical answers when asked why they were not physically active. The most common reasons were lack of time and laziness. Almost half of the students indicated that physical activity was not undertaken due to lack of adequate facilities or companions. About a third of respondents reported not feeling competent or enjoying exercise. The study also found that male students spend more time in front of a screen, while female students spend more time studying [12].

CONCLUSIONS

The study shows that although the majority of students are aware of preventive strategies, passive leisure-time behaviours, prolonged sedentary postures remain prevalent across all countries and fields of study. The findings also indicate a discrepancy between the theoretical knowledge possessed by the students of health sciences and their actual health-related behaviours. The study emphasises the necessity for targeted, practical interventions within university curricula that extend beyond theoretical instruction.

The inclusion of only students in health science programmes limited the generalisability to apply the findings to students from other disciplines, or to the general young adult population. The different sample sizes between countries potentially influenced cross-national comparisons, and although statistically significant associations were identified, the effect sizes were generally small to moderate.

Conflict of interest statement. The authors declare that there are no competing interests.

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