

# THE YEAR OF STUDY AND THE PHYSICAL ACTIVITY OF STUDENTS OF SELECTED FIELDS OF STUDY AT STATE SCHOOL OF HIGHER EDUCATION IN BIAŁA PODLASKA

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**Abstract.** The aim of the study was to analyze the level of physical activity of students of selected fields of study at Biała Podlaska University depending on the year of study. The study involved 450 people, studying at the first and second stages of education at the State School of Higher Education (PSW) in Biała Podlaska. In the study, a method of diagnostic survey was applied, with the use of the International Physical Activity Questionnaire IPAQ – short version. Based on the analysis it was concluded that the surveyed students were characterized by a moderate level of physical activity. The diversity of types of physical activity of students in relation to the year of study were statistically significant in terms of total activity, moderate activity and walking – in favor of students of the second year of undergraduate studies.

**Key words:** physical activity, IPAQ – short version, students, year of study

## Introduction

In recent years, we have observed the retention of a positive upward trend in society's physical activity, both in Poland and internationally (Baumann and Craig 2005; Drygas et al. 2005; Cavill et al. 2006; Bouchard et al. 2007; Haskell et al. 2007; Piątkowska 2010; Biernat et al. 2011). We have the lowest percentage of people declaring high physical activity (about 6–8% of adults), with the simultaneously highest percentage of those who lead a sedentary lifestyle. These data are confirmed by the results of the national WOBASZ research from the years 2002–2004 (Drygas et al. 2005). The majority of adults in Poland do not reach the recommended by the experts level of physical activity. A report from GUS (2009) shows that every fourth Polish citizen (27,9%) declared low level of physical

activity, whilst in other EU countries this percentage was higher and amounted to 31%. Currently observed dramatic reduction in physical activity is one of the most important problems of health risks in the society.

Physical activity among academic youth is a matter that has been increasingly addressed by both the scientific community at home and abroad (Haskell et al. 2007; Marchewka and Jungiewicz 2008; Sokołowski 2008; Pańczyk and Sądecka 2009; Baj-Korpak et al. 2010; Piątkowska 2010; Biernat et al. 2011; Zadarko et al. 2011; Bergier 2012; Niżnikowska et al. 2012; Bergier 2013; Sochocka and Wojtyłko 2013). These are the studies primarily related to the assessment of physical activity undertaken in everyday life, at work, and in spare time.

Higher education is the last stage of the learning period when you can develop and monitor physical activity on a large scale to ensure better quality of life. In accordance with the widely accepted findings proposed in 2007 by the American College of Sport Medicine, adults aged 18–65 should take up 30 minutes of moderate physical activity 5 days a week, or alternatively 20 minutes of intensive physical activity 3 days a week. It is advisable that adults take additional weight training for 2 days a week. With age, the roles of physical activity change, and it is closely related with leisure, relaxation and pleasure.

Still, most physical activity taken up by the academic youth falls to learning or performing daily activities, and rapidly evolving civilization progress as well as technological gadgets cause the continuous decrease in the energy expenditure intended for this activity. Currently, many countries concerned about continuously spreading sedentary way of life simultaneously specify the recommendations to limit the time spent in front of the TV to no more than 2 hours a day (EU Physical Activity Guidelines 2008). In the US, it was estimated that the cause of around 9–16% of premature deaths can be attributed to the sedentary lifestyle. The situation in Europe is only little different from the US statistics, and in the European Union alone about 40–60% of the population leads a sedentary lifestyle (Leon et al. 2007). This was confirmed by a study published in 2012 by Australian scientists, where it turned out that people who are in a sitting position for at least 11 hours a day have up to 40% higher risk of dying compared to people who are seated for no more than 4 hours a day.

Academic youth should be aware of the impact physical activity has on the human body, taking especially into account the fact that soon they will be the intellectual elite of the country, responsible for promoting physical activity (Motylewski and Poziomska-Piątkowska 2006; Mędreła-Kuder 2011). A lot of data has been collected pointing to the fact that systematic physical activity plays an important role in the prevention of overweight and obesity, as well as cardiovascular, metabolic and possibly cancerous diseases. There is evidence that systematic participation in physical activity can affect the improvement of general well-being, reduce stress and the risk of depression.

Despite numerous studies on the issue, it is still intentional to seek and collect information on the psychical activity of students.

The aim of the research was the analysis of physical activity of students of selected fields of study at Biała Podlaska State School of Higher Education based on the year of study. The equivalent goal was the assessment of students' free time and self-evaluation of their physical fitness.

## Material and methods

The research involved 450 people, students of the first and second stage of education at The State School of Higher Education (Państwowa Szkoła Wyższa PSW) in Biała Podlaska. Table 1 shows a detailed characteristics of the examined material.

**Table 1.** Surveyed students according to demographic and social features

|                                |                    |                           |                    |                              |                    |
|--------------------------------|--------------------|---------------------------|--------------------|------------------------------|--------------------|
| Sex                            | Female             |                           | Male               |                              |                    |
|                                | n = 237<br>(52.7%) |                           | n = 213<br>(47.3%) |                              |                    |
| Age                            | 18–21              |                           | 22–23              |                              | ≥ 24               |
|                                | n = 203<br>(45.2%) |                           | n = 124<br>(27.6%) |                              | n = 122<br>(27.2%) |
|                                |                    |                           |                    |                              |                    |
| Place of residence             | Countryside        |                           |                    | City                         |                    |
|                                | n = 193<br>(43.1%) |                           |                    | n = 255<br>(56.9%)           |                    |
| BMI classification             | Underweight        |                           | Normal weight      |                              | Overweight         |
|                                | 39<br>(8.6%)       |                           | 320<br>(71.0%)     |                              | 92<br>(20.4%)      |
|                                |                    |                           |                    |                              |                    |
| Field of study                 | IT Studies         | Tourism<br>and Recreation | Nursery            | Emergency Medical<br>Service | Public Health      |
|                                | n = 105<br>(23.3%) | n = 173<br>(38.4%)        | n = 57<br>(12.6%)  | n = 44<br>(9.8%)             | n = 72<br>(16.0%)  |
| Level (undergraduate/graduate) | Undergraduate      |                           |                    | Graduate                     |                    |
|                                | 332<br>(73.6%)     |                           |                    | 119<br>(26.4%)               |                    |
| Year of study                  | I                  | II                        | III                | I graduate                   | II graduate        |
|                                | n = 190<br>(42.1%) | n = 87<br>(19.3%)         | n = 55<br>(12.2%)  | n = 55<br>(12.2%)            | n = 64<br>(14.2%)  |

The research was conducted in the spring of 2013 utilizing the method of diagnostic survey with the use of the International Physical Activity Questionnaire IPAQ – short version, which is recommended in the Polish conditions (Bergier 2013). In the analysis, the level of physical activity was evaluated on the basis of MET (Metabolic Equivalent of Work), which informs about the individual rate of metabolism during exercise in relation to the same changes that occur at rest.

Statistical analysis was performed utilizing the STATISTICA program version 7.1. The following basic descriptive statistics have been calculated: arithmetic mean, standard deviation, median, coefficient of variation. To assess the relevance of differences, nonparametric Kruskal-Wallis (H) test was used, assuming that a significance level is  $p = 0.05$ .

## Results

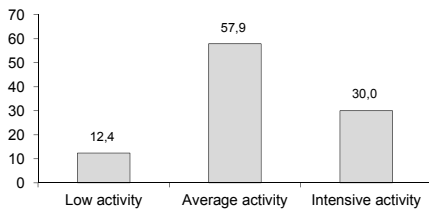
The short version of the IPAQ questionnaire used gave the overall assessment of the physical activity undertaken in the last week – that related to everyday life, work, and leisure. When calculating the level of physical activity, the following information has been taken into consideration: the time spent sitting, walking, as well as the time devoted to both intense and moderate physical activity, lasting at least 10 minutes (without intermission).

The average total energy expenditure for all students tested was MET 2356.9 min/week (Table 2). Total energy expenditure consisted of various types of activity: intensive 899.4 MET min/week, moderate 534.0 MET min/week, and walking 958.4 MET min/week.

**Table 2.** Levels of physical activity of students

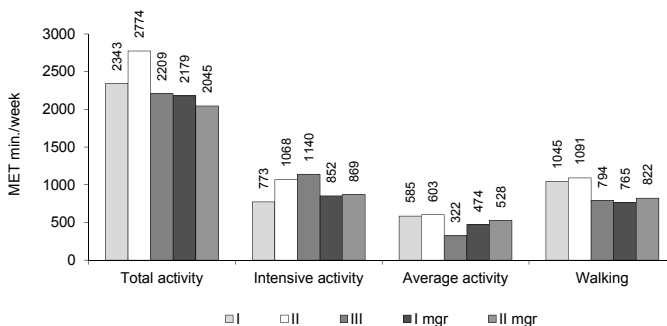
| Physical activity (MET min/week) | Arithmetic mean | Standard deviation | Median | Coefficient of variation (%) |
|----------------------------------|-----------------|--------------------|--------|------------------------------|
| Total                            | 2356.9          | 1742.4             | 1952.0 | 73.9                         |
| Intensive                        | 899.4           | 1180.2             | 480.0  | 131.2                        |
| Moderate                         | 534.0           | 743.3              | 320.0  | 139.2                        |
| Walking                          | 958.4           | 992.5              | 693.0  | 103.6                        |
| Sitting                          | 329.2           | 189.7              | 300.0  | 57.6                         |

On the basis of the obtained results, it was found that more than half of the respondents are characterized by moderate levels (57.9%) of physical activity while 30.0% by high levels respectively. The alarming fact is that as many as 12.4% of students exhibit low levels of physical activity (Figure 1).



**Figure 1.** Levels of physical activity of students (%)

Figure 2 shows the mean values of the MET min/week coefficient of students, based on the year of study.



**Figure 2.** Types of physical activity of students in relation to the year of study

Analyzing the average values of the coefficient MET min/week, it was found that the highest levels of total physical activity are characteristic for second year BA students. Noteworthy is the fact that second year MA students are characterized by the lowest level of total physical activity, which might be due to the specific studies curriculum.

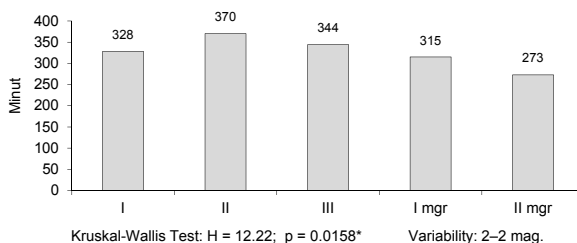
Based on the conducted analysis (Table 3), it was indicated that the diversity of the types of physical activity of students in relation to the year of study was statistically significant in terms of total and moderate physical activity, as well as walking, for the benefit of the second year BA students. Statistically insignificant differences ( $p > 0,05$ ) were noted only in terms of intensive activity.

**Table 3.** The diversity of types of physical activity of students in relation to the year of study

| activity type | Kruskal-Wallis Test |         |                  |
|---------------|---------------------|---------|------------------|
|               | H                   | p       | differences      |
| Total         | 12.33               | 0.0151* | 2–2 mag.         |
| Intensive     | 4.83                | 0.3056  | none             |
| Moderate      | 11.63               | 0.0204* | 3–1, 2           |
| Walking       | 17.66               | 0.0014* | 2–1 mag., 2 mag. |

\* statistical significance at  $p < 0.05$ .

Also analyzed was the amount of time spent in a sitting position: at home, university, vehicles, as well as other places, in the duration of one day (Figure 3). It applied mostly to sitting at your desk, while reading, meeting friends, as well as sitting or lying down while watching television.

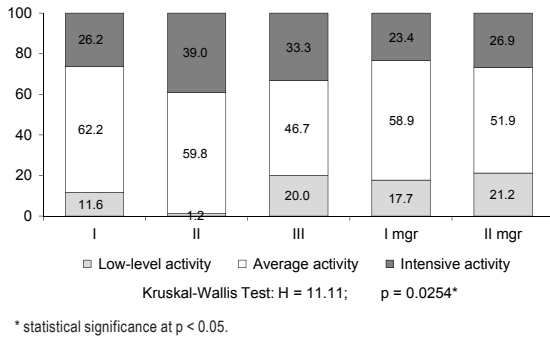


\* statistical significance at  $p < 0.05$ .

**Figure 3.** Variation of time spent on sitting by students in relation to the year of study

As a result of the conducted analysis, it was concluded that the year of study significantly differentiates the time students spent sitting. It was found that second year BA students spend much more time in a seated position than second year MA students ( $p < 0,05$ ).

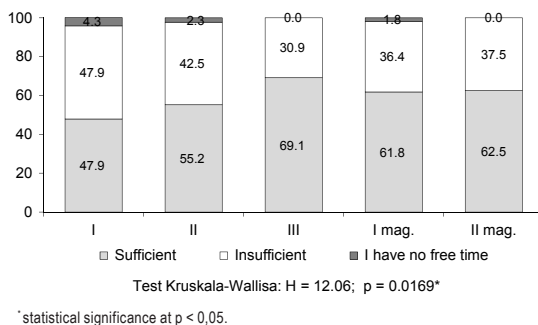
On the basis of the obtained MET min/week average in the area of total activity, students have been assigned with three levels of physical activity (low, moderate, high) (Figure 4).



**Figure 4.** Levels of physical activity of students in relation to the year of study (%)

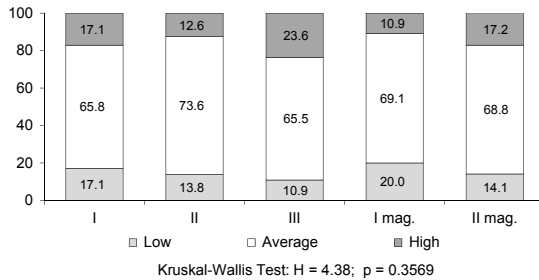
The performed analysis showed statistically significant year-of-study-related differences in the level of physical activity. It was concluded that people with moderate level of physical activity constituted the largest group, both at undergraduate and graduate courses. A high level of physical activity at Bachelor degree courses ranged from 26% to 39%, while at Master's degree courses it was represented by more than  $\frac{1}{4}$  of students total. In the case of low-level physical activity, the obtained results were significantly lower primarily in undergraduate students but also in graduate students, and amounted consecutively from 1.2% to 20.0% and from 17.7% to 21.2%.

Another important issue addressed in the study was the assessment of the availability of free time by the students in relation to the year of study (Figure 5). By utilizing Kruskal-Wallis test, significant differences were observed in the amount of free time students have in relation to their year of study. It was concluded that both undergraduate and graduate students have sufficient amount of time off, which, in the case of undergraduate students oscillated from 47.9% to 69.1% and in graduate students from 61.8% to 62.5% respectively. It is worth noting that with every next year of study the more visible is the increasing amount of free time among undergraduate students and the stabilization period in graduate students. Noteworthy are the results obtained by the students in last years of study who have a significant amount of time off.



**Figure 5.** Assessment of the extent of free time which surveyed students have in relation to the year of study (%)

The research also included the self-assessment of physical fitness in relation to the year of study (Figure 6).



**Figure 6.** Self-assessment of physical fitness of students in relation to the year of study (%)

The utilized Kruskal-Wallis test pointed out to the statistically insignificant differences in terms of the self-assessment of physical fitness among various years of study students – both undergraduate and graduate.

## Discussion

Physical activity is a very important factor in human's health and development. NATPOL studies (2011) revealed that about 65% adult Poles undertake physical activity in their free time. However, detailed analysis indicated that only 48% exercise more than twice a week for 30 minutes. Thus, it is important to determine the level of physical activity characteristic for the academic youth of today in subsequent stages of education.

In recent years, many experts (Drygas et al. 2005; Haskell et al. 2007; Sokołowski 2008; Baj-Korpak et al. 2010; Piątkowska 2010; Biernat et al. 2011; Bergier 2012, 2013) in the fields of medical sciences and physical culture utilize in their research the International Physical Activity Questionnaire (IPAQ) – short and long versions. It is however not advisable to compare the results of both questionnaires due to the probability of obtaining higher results in the long version which indicates the areas of physical activity.

Although the problem of physical activity continues to be an issue of great importance, there is still no conclusive data based on the short version of IPAQ questionnaire that would confirm the current state of knowledge about physical activity, especially that related to the year of study. Hence, the aim of the study was to analyze the physical activity of students from selected fields of study at Białą Podlaska State School of Higher Education in relation to the year of study.

Firstly assessed was the level of physical activity of the examined students from PSW in Białą Podlaska. The average total physical activity amounted to 2356.9 MET min/week. Similarly, in the research of Bergier et al. (2012), the total physical activity of female students from Ukraine oscillated at 2156 MET min/week. By contrast, Biernat et al. (2011) in their research among the inhabitants of Warsaw and surrounding towns, calculated total physical activity at around 1440–2772 MET min/week. These results suggest that moderate physical activity is the dominant one among students.

Next important issue raised in the research study concerned the sedentary way of spending free time. The average time spent sitting in the examined group oscillated around 273–370 minutes a day. The research subjects are characterized by quite low participation in the sedentary lifestyle, with approximately 5–6 hours of sitting a day. Baj-Korpak et al. (2010) obtained similar results in the studies of physical activity of selected social-occupational groups, with time spent sitting among students being around 5 hours and 24 minutes a day.

Way of spending leisure time is a key element of physical activity. To academic youth, leisure time is a form of freedom and a way to give time to their hobbies and interests, as there are yet no work or family related responsibilities. A report from GUS (2009) shows that over 50% of adult Poles spend their leisure time passively. The obtained results showed that 1st and 2nd year undergraduate students have the least amount of free time, which might be due to the weak organizational or time-management skills. Graduate students, on the other hand, declared having a great amount of free time, which might be a result of less amount of classes in the curriculum. These results are supported by the research conducted by Danilenko et al. (2006), who examined all students aged 17–24, residents of Brześć.

The key factor in the completion of study's aim was the assessment of information on the fitness self-evaluation of students in relation to the year of study. The results allowed to conclude that more than 80% of students have low or average level of fitness in relation to their year of study. These results could be associated with the reduction of mandatory physical activity classes which not only maintain and increase the level of fitness but also encourage physical activity during study period (Haskell et al. 2007). It is worth noting that undergraduate education curriculum provides only 60 hours of mandatory PE classes, with no need or place for continuation of such classes during graduate studies. Taking into consideration the fact that academic period is the last stage of education when one can freely develop and monitor physical activity, it is thus so important to take all possible actions aimed at encouraging students to take up daily physical exercises – both under the mandatory study curriculum as well as outside of it.

## Conclusions

1. The subjected group of students is characterized by the average level of fitness.
2. Diversification of physical activities among students in relation to the year of study was statistically significant in terms of total and average physical activity as well as walking in favor of 2nd-year undergraduate students.
3. 1st and 2nd year undergraduate students have the least amount of free time, resulting mainly from insufficient time-management skills. Last year students, on the other hand, declared having substantial amount of free time, which may result from a less number of classes in the curriculum.
4. Statistically insignificant differences were also found in the self-evaluation of fitness among individual years of both undergraduate and graduate studies.

## References

- American College of Sport Medicine 2007, [www.ascm.org/physicalactivity](http://www.ascm.org/physicalactivity).
- Baj-Korpak J., Soroka A., Korpak F. Aktywność fizyczna wybranych grup społeczno-zawodowych (w szkolnictwie). *Human and Health*. 2010; 4 (1): 152–161.
- Baumann A., Craig C. The place of the physical activity in the WHO Global Strategy on Diet and Physical Activity. *International Journal of Behavioral Nutrition and Physical Activity*. 2005; 2 (10): 9–15.
- Bergier J. Aktywność fizyczna społeczeństwa – współczesny problem (przeгляд badań). *Human and Health*. 2012; 6 (1): 3–12.
- Bergier J. O ocenie aktywności fizycznej z wykorzystaniem polskiej wersji Międzynarodowego Kwestionariusza Aktywności Fizycznej (IPAQ) – udział w dyskusji. *Human and Health*. 2013; 7 (1): 91–94.
- Biernat E., Tyburscy M., Gajewski A.K. Uczestnictwo w sporcie wyczynowym i w sporcie dla wszystkich mieszkańców Warszawy na przykładzie wybranych grup. *Polish Journal of Sport and Tourism*. 2011; 18 (4): 17–32.
- Bouchard C., Blair S., Haskell W. Why study physical activity and health? In: *Human Kinetics*, C. Bouchard (ed). Champaign, IL 2007.
- Cavill N., Kahlmeiner S., Racioppi F. Physical activity and health in Europe. Evidence for Action, WHO. 2006.



- Danilenko A., Gierasiewicz A., Skinder L. Czas wolny i aktywność ruchowa młodzieży akademickiej. In: Aktywność ruchowa ludzi w różnym wieku, D. Umiasłowska (ed.). PTNKF, Uniwersytet Szczeciński 2006; 10: 236–241.
- Drygas W., Kwaśniewska M., Szcześniewska D. Ocena poziomu aktywności fizycznej dorosłej populacji Polski. Wyniki programu WOBASZ. *Kardiologia Polska*. 2005; 63: 636–640.
- EU Physical Activity Guidelines: Recommended Policy Action in Support of Health – Enhancing Physical Activity. Fourth Consolidated Draft, Approved by the EU Working Group “Sport and Health”, Brussels. 2008.
- Haskell W., Lee I., Pate R., Powell K., Blair S., Franklin B., Macera C., Heath G., Thompson P., Baumann A. Physical Activity and Public Health. Update Recommendation for Adults from the American College of Sports Medicine and the American Heart Association. *Circulation*. 2007; 116: 1081–1093.
- Kijo P. Aktywność fizyczna wśród studentów kierunków pedagogicznych łódzkich uczelni publicznych. In: Aktywność przez całe życie. Zdrowie i sprawność studentów pod kontrolą, Z. Barabasz (ed.). PWSZ, Krosno 2010; 157–180.
- Leon A., Rodriguez-Perez M., Rodriguez-Benjumbeda L. Sedentary lifestyle: physical activity duration versus percentage of energy expenditure. *Rev. Esp. Cardiol*. 2007; 60: 244.
- Marchewka A., Jungiewicz M. Aktywność fizyczna w młodości a jakość życia w starszym wieku. *Gerontologia Polska*. 2008; 16 (2): 127–130.
- Mędreła-Kuder E. Ocena stylu życia studentów fizjoterapii i edukacji techniczno-informatycznej na podstawie żywienia i aktywności fizycznej. *Rocznik PZH*. 2011; 3: 315–318.
- Motylewski S., Poziomska-Piątkowska E. Aktywność fizyczna w czasie wolnym studentów I roku nauki łódzkich uczelni. *Kwartalnik Ortopedyczny*. 2006; 4: 280–283.
- NATPOL 2011. Prognoza sytuacji zdrowotnej Polaków na 2020 rok, [www.natpol.pl](http://www.natpol.pl).
- Niżnikowska E., Stępień E., Szczygielska E., Mandziuk M. Typ i rok studiów a aktywność fizyczna studentów Państwowej Szkoły Wyższej w Białej Podlaskiej. *Human and Health*. 2012; 6 (1): 144–150.
- Pańczyk W., Sądecka D. Aktywność fizyczna w stylu życia studentów a zdrowie. In: Edukacja zdrowotna szansą na poprawę jakości życia człowieka, M. Wolicki (ed.). KUL, Stalowa Wola 2009; 140–151.
- Piątkowska M. Uczestnictwo Polaków w aktywności fizycznej w porównaniu do innych krajów Unii Europejskiej. In: Współczesne metody badań aktywności, sprawności i wydolności człowieka, K. Buśko (ed.). AWF, Warszawa 2010.
- Sochocka L., Wojtyłko A. Aktywność fizyczna studentów studiów stacjonarnych kierunków medycznych i niemedycznych. *Medycyna Środowiskowa*. 2013; 16 (2): 53–58.
- Sokołowski M. Międzynarodowy Kwestionariusz Aktywności Fizycznej (IPAQ) jako miernik oceny aktywności fizycznej studentów Akademii Wychowania Fizycznego. In: Aktywność fizyczna i odżywianie się, jako uwarunkowania promocji zdrowia, E. Szczepanowska (ed.). Wyższa Szkoła Turystyki i Zarządzania. Poznań, 2008.
- Uczestnictwo Polaków w sporcie i rekreacji w 2008 roku. Informacje i opracowania statystyczne. Warszawa 2009. Główny Urząd Statystyczny, [www.stat.gov.pl](http://www.stat.gov.pl).
- Zadarko E., Barabasz Z., Nizioł E. Ocena poziomu aktywności fizycznej studentek wybranych kierunków medycznych na tle badań populacyjnych. *Przegląd Medyczny Uniwersytetu Rzeszowskiego*. 2011; 2: 188–194.

**Cite this article as:** Niżnikowska E., Bergier J., Bergier B., Stępień E. The year of study and the physical activity of students of selected fields of study at the State School of Higher education in Biała Podlaska. *Centr Eur J Sport Sci Med*. 2014; 6 (2): 67–75.

