

**Robert DUTKIEWICZ**

Uniwersytet Jana Kochanowskiego w Kielcach

**Monika SZPRINGER**

Uniwersytet Jana Kochanowskiego w Kielcach

**Filip SZOŁOWSKI**

Uniwersytet Jana Kochanowskiego w Kielcach

**Jarosław CHMIELEWSKI**

Instytut Ochrony Środowiska – Państwowy Instytut Badawczy, Warszawa

**Mariola WOJCIECHOWSKA**

Uniwersytet Jana Kochanowskiego w Kielcach

**Stanisław LACHOWSKI**

Instytut Medycyny Wsi, Lublin; Uniwersytet Marii Curie-Skłodowskiej, Lublin

## **Determinants of physical activity of university students of different faculties**

Uwarunkowania aktywności fizycznej studentów studiujących na różnych kierunkach studiów

**Słowa kluczowe:** student, physical activity, health behaviour, lifestyle, determinants.

**Key words:** student, aktywność fizyczna, zachowania zdrowotne, styl życia, uwarunkowania.

**Streszczenie.** Artykuł przedstawia wyniki badań na temat stylu życia studentów różnych kierunków studiów związanego z wyborami zachowań zdrowotnych. W badaniach własnych próbowano określić, w jakim stopniu studenci nauk medycznych i studenci kierunków nauczycielskich są aktywni fizycznie oraz czy promują zdrowy styl życia. Analizie poddane zostały materiały z badań aktywności fizycznej studentów kierunków medycznych (fizjoterapia, zdrowie publiczne) oraz kierunków nauczycielskich (biologia, geografia). Badania zostały przeprowadzone w 2014 roku, objęto nimi 364 studentów Uniwersytetu Jana Kochanowskiego w Kielcach. W badaniach zastosowano metodę sondażu diagnostycznego. Główną techniką wykorzystaną w zbieraniu materiału badawczego był kwestionariusz ankiety skierowany do studentów. W analizie wyników starano się określić, w jakim stopniu kierunek studiów, miejsce zamieszkania/miasto, wieś oraz wskaźnik otyłości BWI mają wpływ na aktywność fizyczną badanych studentów. Materiał został opracowany statystycznie. Obok zestawień liczbowych i procentowych do oceny zależności między poszczególnymi układami zmiennych zastosowano test Ch – kwadrat. W celu ustalenia siły związku między ustalonymi układami zmiennych wykorzystano współczynnik korelacji obliczony na podstawie wartości testu Ch – kwadrat.

**Introduction.** Healthy lifestyle choices tend to be determined culturally, environmentally and individually. Physical activity appears to be one of healthy lifestyle determinants. According to A. Litwiniuk research (1995, p. 142), physical exercise can positively contribute to far-reaching body changes. Physical effort activates and develops motor organs and intensive muscles work improves physiological processes. As a result, body proportions change. Physical exercise is

also important for maintaining healthy bone density and muscle strength. What is more, it decreases adipose tissue. As J. Drabik proves (1995, p. 78), physical activity, an essential element of healthy lifestyle, has significant impact on human health. The research findings (Dziewulski 2003, p. 22) do reveal that regular physical effort reduces cardiovascular diseases mortality risk by 30–50%. Healthy lifestyle comprises a set of customary behaviour or habits which may affect health and the risk of developing various diseases. Physical activity is one of the most important elements of healthy lifestyle. The lack of or shortage of physical activity may lead to serious medical disorders. According to T. Maszczak (1995, p. 87), limiting physical activity leads to overweight and obesity.

According to J. Królicki (2002, p.133), sports are valued not only for achieving success or winning, but also for improving physical condition and a sense of well-being. As A. Dąbrowska (1995, p.118) argues, physical activities may also play the crucial role in psycho-prevention and psychotherapy. As B. Biniakiewicz (2002, p. 182) claims, national research into physical activity prove that the contribution of physical education to promotion of healthy lifestyle is insufficient. Computer and TV in all age groups are still the most popular ways of spending free time. Colleges and universities not only prepare their students for future career, but also provide them with physical education, including taking care of physical and mental health. Therefore, the colleges or universities delivering teacher training programmes as well as medical colleges may become important bodies in promoting physical education, different types of sports and leisure time activities among new generations. According to T. Bielecki (2005, p. 63), the colleges or universities offering training programmes for teachers of physical education should focus not only on the level of physical fitness in candidates, but also on their abilities to diagnose, to control and to evaluate students' progress.

The research project attempts to determine to what extent students of medical sciences and students of education are physically active and whether they promote healthy lifestyle.

**Research material and methodology.** Research material concerning physical activity of medical sciences students (physiotherapy, public health) and students of education (biology, geography) was thoroughly analysed. The research was conducted in 2014 and involved 364 students of the Jan Kochanowski University in Kielce. A method of diagnostics survey was applied to collect data by means of questionnaire directed to students. The results were statistically analysed in attempt to determine to what extent the type of studies (or the type of faculty), the place of living (urban/rural area) and body weight index (BWI) affect physical activity of the respondents. The relationships between qualitative variables were measured through a non-parametric chi-square test. In order to measure the strength of linear dependence between two variables, the Pearson correlation coefficient was calculated.

**Results analysis.** Along with the use of technological advancement, the contemporary man has been systematically limiting physical activity to the

indispensable minimum. Limited physical activity may lead to decrease in physical efficiency and consequently to overweight and obesity. The research project attempted to determine to what extent body fat indicator is determined by the field of study.

**Table 1. Respondents' obesity index / BWI in relation to the field of study**

Obesity index/BWI	The field of study								Total	
	Physiotherapy		Public Health		Geography		Biology			
	n	%	n	%	n	%	n	%	n	%
Obesity	1	1,0	2	2,3	6	6,4	5	6,0	24	6,6
Overweight	11	11,1	10	11,4	28	29,8	26	31,3	69	19,0
Normal weight	72	72,7	64	72,7	54	57,4	42	50,6	226	62,1
Underweight	15	15,2	12	13,6	8	8,6	10	12,1	45	12,3
Total	99	100,0	88	100,0	94	100,0	83	100,0	364	100,0

$$X^2 = 38,6 > X^2_{9,0,001} = 27,877$$

According to the research results, the students of educational faculties (biology, geography) have higher obesity index/BWI than students of medical faculties (physiotherapy, public health) e.g. there are more obese and overweight students among those studying education in comparison with the students of medical faculties. Based on chi-square test, correlation coefficient was found at  $r_c = 0,31$  indicating variables which have a low correlation.

**Table 2. Frequency of respondents' physical activity in relation to obesity index/BWI**

Obesity index/BWI	Frequency								Total	
	Every day		3 times a week		Once a week		Occasionally			
	n	%	n	%	n	%	n	%	n	%
Obesity	-	-	-	-	14	3,9	10	2,7	24	6,6
Overweight	6	1,6	18	4,9	28	7,7	17	4,7	69	19,0
Normal weight	12	3,3	45	12,4	98	26,9	71	19,5	226	62,1
Underweight	10	2,8	13	3,6	18	4,9	4	1,1	45	12,3
Total	28	7,7	76	20,9	158	43,4	102	28,0	364	100,0

$$X^2 = 47,4 > X^2_{9,0,001} = 27,877$$

In academic environment mass physical education and sports are not very common. 43,4% of students take up physical activity once a week, in majority, those whose obesity index is found normal. Obese and overweight students occasionally perform physical activity. Correlation coefficient was found at  $r_c = 0,34$  indicating variables which have a low correlation.

**Table 3. Weekly time devoted to physical activity in relation to obesity index/BWI**

Obesity index/BWI	Weekly time devoted to physical activity								Total	
	Over 2 hours		1–2 hours		30–60 minutes		Less than 30 minutes			
	n	%	n	%	n	%	n	%	n	%
Obesity	-	-	-	-	2	0,5	22	6,1	24	6,6
Overweight	3	0,8	16	4,4	32	8,9	18	4,9	69	19,0
Normal weight	38	10,4	112	30,8	64	17,6	12	3,3	226	62,1
Underweight	12	3,3	19	5,2	10	2,7	4	1,1	45	12,3
Total	53	14,5	147	40,4	108	29,7	56	15,4	364	100,0

$$X^2 = 132,7 > X^2_{9, 0,001} = 27,877$$

The research prove correlation between the time which university students devote to physical activity and their weight. Obese students devote little time to physical activity, whereas students with normal weight appear to be the most physically active. Based on chi-square test, correlation coefficient was found at  $r_c = 0,52$  indicating a moderate relationship between variables.

**Table 4. Forms of respondents' physical activity in relation to obesity index/BWI**

Forms of physical activity	Obesity index/BWI								Total	
	Obesity		Overweight		Normal weight		Underweight			
	n	%	n	%	n	%	n	%	n	%
Cycling	6	1,0	18	2,9	42	6,9	19	3,1	85	13,9
Swimming	-	-	4	0,7	38	6,2	11	1,8	53	8,7
Aerobics	-	-	8	1,3	32	5,3	18	2,9	58	9,5
Winter sports	-	-	6	1,0	34	5,6	25	4,0	65	10,6
Jogging	2	0,3	8	1,3	58	9,5	38	6,2	106	17,3
Tourism	6	1,0	18	2,9	47	7,7	32	5,2	103	16,8
Team games	-	-	17	2,8	39	6,4	22	3,6	78	12,8
Gymnastics	-	-	4	0,7	32	5,2	28	4,5	64	10,4
Total	14	2,3	83	13,6	322	52,8	193	31,4	612	100,0

$$X^2 = 53,1 . X^2_{21,0,001} = 46,797$$

Jogging (17,3%), tourism (16,8%) and cycling (13,9%) are the most common forms of physical activity. Comparative analysis of the respondents' weight in relation to the forms of their physical activity proves that obese students perform only three types of physical activity, whereas the respondents with normal weight turn out to be the most physically active. Correlation coefficient was found at  $r_c = 0,28$  indicating variables which have a low correlation.

**Table 5. Frequency of respondents' physical activity in relation to their field of study**

Frequency of physical activity	Field of study								Total	
	Physiotherapy		Public health		Geography		Biology			
	n	%	n	%	n	%	n	%	n	%
Everyday	12	12,1	10	11,4	4	4,3	2	1,2	28	7,7
3 times a week	21	21,2	34	38,6	12	12,7	9	10,8	76	20,9
Once a week	55	55,6	40	45,5	34	36,2	29	34,9	158	43,4
Occasionally	11	11,1	4	4,5	44	46,8	43	51,8	102	28,0
Total	99	100,0	88	100,0	94	100,0	83	100,0	364	100,0

$$X^2 = 111,3 > X^2_{0,001;9} = 27,877$$

A significant majority of the respondents carry out physical activity only once a week (43,4%) and even less frequently (28,0%). As the results show, students of medical faculties tend to be more physically active than students of educational faculties. However, students of education, that is future teachers, are expected to set good examples for their pupils, especially in terms of habits and behaviour patterns that can add up to a healthy lifestyle. The relationship between these variables is proved by correlation coefficient measured at  $r_c = 0,48$  indicating moderate correlation.

**Table 6. Weekly time devoted to respondents' physical activity in relation to their field of study**

Frequency of physical activity	Field of study								Total	
	Physiotherapy		Public health		Geography		Biology			
	n	%	n	%	n	%	n	%	n	%
Over 2 hours	19	19,2	20	22,7	10	10,6	4	4,8	53	14,6
1–2 hours	42	42,4	49	55,7	36	38,3	20	24,1	147	40,4
30–60 minutes	35	35,4	17	19,3	29	30,9	27	32,5	108	29,7
Less than 30 minutes	4	3,9	2	2,3	19	20,2	32	38,6	56	15,3
Total	99	100,0	88	100,0	94	100,0	83	100,0	364	100,0

$$X^2 = 80,3 > X^2_{0,001;9} = 27,877$$

Majority of the respondents devote 1–2 hours a week to physical activity. The students of medical faculties devote the biggest amount of time to physical activity, whereas the students of educational faculties, particularly biology, devote little time to physical activity; 38,6% of biology students devote less than 30 minutes a week to physical activity. It seems to be important especially for their pupils' future education since they have to be equipped not only with skills and knowledge, but also with appropriate patterns of healthy lifestyle. The relationship between these variables is proved by correlation coefficient measured at  $r_c = 0,43$  indicating moderate correlation.

**Table 7. Forms of respondents' physical activity in relation to their field of study**

Forms of physical activity	Field of study								Total	
	Physiotherapy		Public health		Geography		Biology			
	n	%	n	%	n	%	n	%	n	%
Cycling	34	5,6	29	4,7	12	2,0	10	1,6	85	13,9
Swimming	18	2,9	24	3,9	9	1,5	2	0,4	53	8,7
Aerobics	16	2,6	25	4,1	9	1,5	8	1,3	58	9,5
Winter sports	19	3,1	26	4,2	11	1,8	9	1,5	65	10,6
Jogging	31	5,1	38	6,2	26	4,2	11	1,8	106	17,3
Tourism	24	3,9	29	4,7	38	6,2	12	2,0	103	16,8
Team games	26	4,2	22	3,7	18	2,9	12	2,0	78	12,8
Gymnastics	24	3,9	20	3,3	14	2,3	6	0,9	64	10,4
Total	192	31,3	213	34,8	137	22,4	70	11,5	612	100,0

$$X^2 = 31,4 < x^2_{0,05;21} = 32,671$$

Jogging (17,3%), tourism (16,8%) and cycling (13,9%) are the most popular forms of physical activity. It is believed that these types of activities are accessible and relatively cheap as they do not require financial assets. Having analysed forms of physical activity among the students of educational and medical faculties, it turned out that 61,1% of medical faculties students and only 33,9% of educational faculties students carried out different types of physical activity. Correlation coefficient was found at  $r_c = 0,22$  indicating variables which have a low correlation.

**Table 8. Frequency of physical activity in relation to the place of living (urban/rural area)**

Frequency	Place of living				Total	
	Urban area		Rural area			
	n	%	n	%	n	%
Everyday	24	12,9	4	2,2	28	7,7
3 times a week	58	31,2	18	10,1	76	20,9
Once a week	89	47,8	69	38,8	158	43,4
Occasionally	15	8,1	87	48,9	102	28,0
Total	186	100,0	178	100,0	364	100,0

$$X^2 = 88,1 > X^2_{0,001;3} = 16,268$$

Physical activity is significantly determined by organisational factors and facilities. Limited number and range of sports facilities in rural areas result in the fact that young people living in the country rarely take up physical activity (48,9%), whereas students living in urban areas most frequently carry out physical activities once (47,8%) and 3 times (31,2%) a week. Based on chi-square test, the relationship between these variables is proved by correlation coefficient measured at  $r_c = 0,44$  indicating moderate correlation.

**Table 9. Weekly time devoted to physical activity in relation to place of living**

Time devoted to physical activity	Place of living				Total	
	Urban area		Rural area			
	n	%	n	%	n	%
Over 2 hours	39	21,0	14	7,9	53	14,6
1–2 hours	88	47,3	59	33,1	147	40,4
30–60 minutes	48	25,8	60	33,7	108	29,7
Less than 30 minutes	11	5,9	45	25,3	56	15,3
Total	186	100,0	178	100,0	364	100,0

$$X^2 = 39,4 > X^2_{0,001; 3} = 16,268$$

Based on the results analysis, it has been proved that the respondents living in rural areas, regardless of the field of study, tend to devote less time to physical activity than the respondents living in urban areas. 25,3% of students living in rural areas devote less than 30 minutes a week to physical activity. Correlation coefficient was found at  $r_c = 0,31$  indicating variables which have a low correlation.

**Table 10. Forms of physical activity carried out by respondents in relation to their place of living**

Forms of physical activity	Place of living				Total	
	Urban area		Rural area			
	n	%	n	%	n	%
Cycling	38	6,2	47	7,7	85	13,9
Swimming	47	7,7	6	1,0	53	8,7
Aerobics	46	7,5	12	2,0	58	9,5
Winter sports	38	6,2	27	4,4	65	10,6
Jogging	64	10,5	42	6,8	106	17,3
Tourism	54	8,8	49	8,0	103	16,8
Team games	43	7,0	35	5,8	78	12,8
Gymnastics	48	7,8	16	2,6	64	10,4
Total	378	61,7	234	38,3	612	100,0

$$X^2 = 44,5 > X^2_{0,001; 7} = 24,322$$

The research findings reveal that jogging, tourism and cycling are the most popular activities among students regardless of their place of living. Correlation coefficient was measured at  $r_c = 0,26$  indicating variables which have a low correlation.

**Table 11. Obesity index/BWI of the respondents in relation to their place of living**

Obesity index/BWI	Place of living				Total	
	Urban area		Rural area			
	n	%	n	%	n	%
Obesity	8	4,3	16	9,0	24	6,6
Overweight	26	14,0	43	24,2	69	19,0
Normal weight	118	63,4	108	60,7	226	62,1
Underweight	34	18,3	11	6,1	45	12,3
Total	186	100,0	178	100,0	364	100,0

$$X^2 = 39,0 > X^2_{0,001; 3} = 16,268$$

Students living in rural areas are characterised by higher obesity index/BWI than students living in urban areas. There are more obese (9%) and overweight students (24,2%) among those living in rural areas. The respondents living in the country occasionally carry out physical activity. Among those inactive, university students of educational faculties outnumber the students of other faculties. Correlation coefficient was measured at  $r_c = 0,31$  indicating variables which have a low correlation.

## Conclusions

- The differences between urban and rural environment generate unequal chances in terms of physical activity taken up by young people. Poor physical education facilities as well as limited number and a narrow range of sports clubs or associations in rural areas result in the fact that young people living in the country tend to be less physically active than students living in urban areas. The differences refer to both frequency and the amount of time devoted to physical activity. 48,9% of students living in rural areas occasionally take up physical activity, as compared with 8,1% of those living in urban areas. As R. Przewęda claims [1993, p. 115], motivation for physical activity is determined by the place of living.
- Respondents' physical activity appears to be significantly determined by the field of study. Students of physiotherapy and public health tend to be more physically active than students of educational faculties such as biology and geography. The students – future teachers should promote healthy habits and attitudes among their pupils. However, 46,8% of geography students and 51,8% of biology students occasionally perform physical activity.



- Obesity and overweight appear to be a serious medical issue in academic students e.g. 6,6% of students suffer from obesity and 19% of students are overweight. It is alarming that these students perform little physical activity. Majority of the obese and overweight respondents seem to be students of biology and geography living in rural areas.
- Jogging (17,3%), tourism (16,8%) and cycling (13,9%) were found the most popular physical activities among the respondents. Although majority of the respondents claim that they do not practise sports or leisure time activities due to the lack of free time, they spend a lot of time watching TV and in front of a computer or TV screen.

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### **dr Robert DUTKIEWICZ**

Uniwersytet Jana Kochanowskiego w Kielcach  
robert.dutkiewicz@ujk.edu.pl

### **dr hab. Monika SZPRINGER, prof. UJK**

Uniwersytet Jana Kochanowskiego w Kielcach

### **mgr Filip SZOŁOWSKI**

Uniwersytet Jana Kochanowskiego w Kielcach

### **dr n. o zdr. Jarosław CHMIELEWSKI**

Instytut Ochrony Środowiska – Państwowy Instytut Badawczy, Warszawa

### **dr hab. Mariola WOJCIECHOWSKA, prof. UJK**

Uniwersytet Jana Kochanowskiego w Kielcach

### **dr hab. Stanisław LACHOWSKI**

Instytut Medycyny Wsi, Lublin; Uniwersytet Marii Curie-Skłodowskiej, Lublin