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Physical activity among nursing students measured with the International Physical Activity Questionnaire and their BMI

Abstract

Introduction. Excessive body weight associated with modern lifestyle may result from overeating due to stress, sleep deprivation leading to increased appetite, insufficient physical activity and changes in dietary habits.

Aim. The aim of the study was to assess the amount of physical activity among female working undergraduate and graduate nursing students and the influence of this activity on their BMI values.

Material and methods. Undergraduate extramural students consisted 58 students (group I) and graduate full-time and extramural students – 45 (group II). The research involved calculating each student's BMI value which was categorized in accordance with the World Health Organization (WHO) recommendations. The measurement of physical activity was conducted on the basis of the International Physical Activity Questionnaire (IPAQ).

Results. Group I students more frequently presented abnormal body weight, with 47% being overweight. In group II, 24.5% of the respondents were overweight and 4.5% were underweight. We revealed a significant correlation between the time spent on intensive physical activity, both at work and during recreation at home, and the BMI value decreases as the time devoted to intensive physical activity increases.

Conclusions. The education system is recommended to be redesigned in such a way as to enable students to spend more time on physical activity.

Keywords: physical activity, BMI, educational level, nurse, student.

DOI: 10.1515/pjph-2017-0026

INTRODUCTION

Excessive body weight associated with modern lifestyle may result from overeating due to stress, sleep deprivation leading to increased appetite, insufficient physical activity and changes in dietary habits [1].

The latter ones caused, among others, by the improvement of economic situation, are associated with consumption of highly processed food, low consumption of fruit and vegetables, increased animal fat content in diet, low prices of fast food and the prevalence of dispensers with high-energy food in educational institutions [1]. The consequences of excessive body weight are cardiovascular diseases, lipid disorders, hypertension, diabetes, gallstone formation, arthritis or even cancer [2,3].

An important aspect of preventing excessive body weight is physical activity. It might seem that students, being aware of the need to exercise and of the influence of excessive body weight on their health, are an exemplary group as far as physical activity and healthy lifestyle are concerned. Unfortunately, research conducted by Biernat and Tomaszewski did not confirm this assumption [2]. Research amongst a group of students by Seń et al. has revealed the study participants did not have sufficient knowledge about rational nutrition [4].

What is more, the Lublin studies have proven that students were not always convinced about the positive influence of physical activity on health [5]. Health education, which medical personnel are obliged to popularize, is also an important element of preventive healthcare. Studies conducted by Snopek et al. showed, however, that a healthy lifestyle is not an everyday practice of medical students – the future health educators. When it comes to 31.7% of the respondents in the group of medical students, they declared too little physical activity and 36.6% of the respondents were diagnosed with overweight or obesity [6].

AIM

The aim of the study was to assess the amount of physical activity among female working undergraduate and graduate nursing students and the influence of this activity on their BMI values.

MATERIAL AND METHODS

The research was conducted in the academic year 2014/2015. All the students working as nurses were included in the study. Undergraduate extramural students consisted 58 students (group I) and graduate full-time and extramural – 45 students (group II). A total of 103 students were included in the study.

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Group I students were nurses with medium educational level and the professional title of a nurse, complementing their education to obtain a Bachelor's degree in nursing pursuing undergraduate extramural 'bridging' studies co-financed by the European Union funds. Group II was constituted by nurses with a Bachelor's degree in nursing, who completed 3-year undergraduate full-time studies or enrolled in graduate extramural 'bridging' studies. Only students employed as nurses were qualified in the study.

The mean age of the respondents was 41 in group A and 27.7 in group B. When it comes to 19% of the group I students, they were living in multi-family homes on the upper floor, and 72.4% – in single-family homes. Only 2.2% of the group II respondents were living on the upper floor and as many as 33.3% on the ground floor, 64.5% of the group II respondents were living in a single-family home. The research involved conducting measurement of the body weight and height of each student and calculating the BMI value which was categorized in accordance with the WHO recommendations: underweight <18.5, norm 18.5-24.9, overweight 25.0-29.9, obesity ≥30.0.

The measurement of the physical activity was conducted on the basis of the Polish version of the International Physical Activity Questionnaire – IPAQ, approved by the IPAQ Committee [7], which was filled in by the respondents. The questionnaire covered such topics as the physical activities performed at work, activities associated with mobility, activities performed at home and physical activities taken up during time off work.

Excel v.2010 spreadsheet was used for statistical analysis, the Pearson correlation coefficient was calculated. The statistical significance level of $p < 0.05$ was used in the study. Ethical Consideration

According to the Polish legal system, this research did not require the approval of the Bioethics Review Board. All the participants gave the informed consent for taking part in the research; the participation in this study was voluntary and the anonymity of participants was preserved.

RESULTS

The analysis allowed us to affirm that group I students more frequently presented abnormal body weight, with 47% of the respondents being overweight. In group II, 24.5% of the respondents were overweight and 4.5% were underweight. Group I body weight line showed an upward trend (Figure 1).

The analysis of the intensity of physical effort at work revealed that 15.5% of group I students and only 7% of group II students performed sedentary work. The remaining students, depending on the course of the duty, performed work involving intensive physical effort (62% of group I students and 91% of group II students) or moderate physical effort (76% of group I students and 89% of group II students) (Figure 2). Both group I and group II students commuted to work by car. Within the same group, 93.1-98% of the respondents also travelled to work on foot. Only 31-38% of the students cycled to work. Group II students were more likely to travel to work on foot or by bicycle (Figure 3).

All of the respondents, both on working days and non-working days, rested by sitting. Over 57% of group II students spent their time off work performing intensive physical activity, 87% of the group walked for recreation – almost 10% more in comparison to group I students who were considerably less

active during time off work: 43.1% performed intensive physical activity, and 41.4% performed physical activity of moderate intensity (Figure 4).

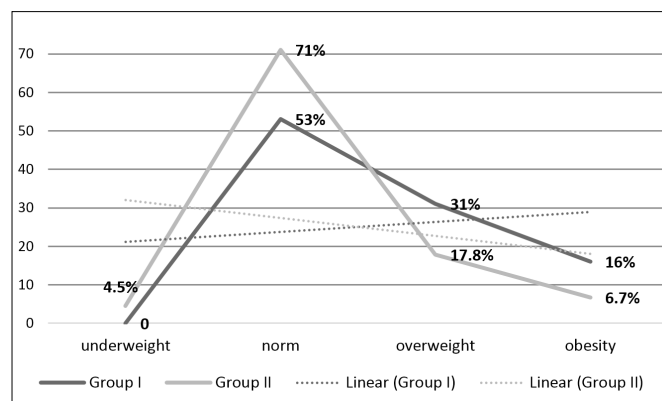


FIGURE 1. Percentage of body weight and trend line in the analyzed groups of students.

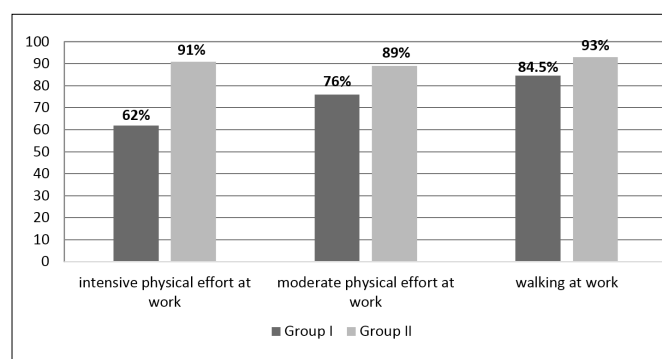


FIGURE 2. Percentage of group I and group II students performing work requiring intensive, moderate and small effort (walking).

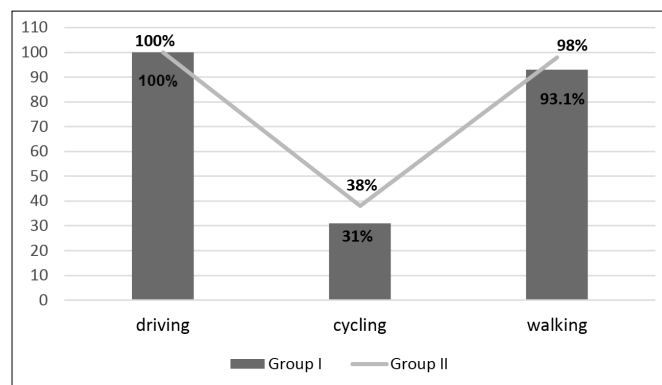


FIGURE 3. Percentage related to the way of commuting by analyzed groups.

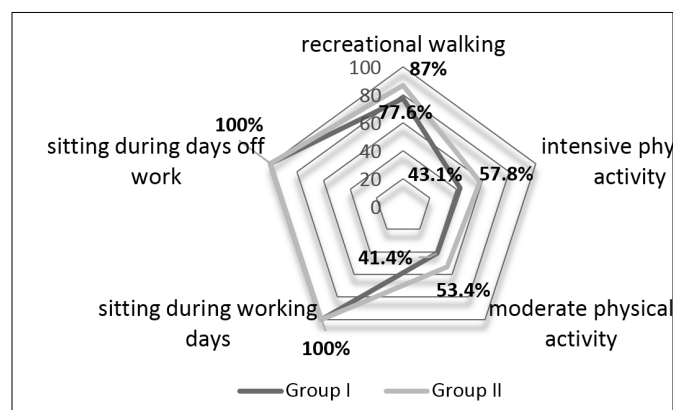


FIGURE 4. Presentation of the way the students spend time off work by the analyzed groups.

Statistical analysis revealed the existence of both positive and negative correlations in the analyzed groups of variables. The highest value of the correlation coefficient (0.308) was observed in the case of commuting by car – positive correlation value indicates rising variable values in both analyzed groups. The lowest Pearson correlation value (-0.202) was observed in the case of intensive physical effort performed by the students at work. This is negative correlation which indicates that the values of variables showing the intensity of the physical activity performed by group II students at work increased, as the values of variables showing the intensity of physical activity performed by group I students decreased, regardless of the fact that Metabolic equivalent (MET) time value devoted to the physical activity was the same (Table 1).

TABLE 1. Types of physical activity expressed in MET-min/week and the value of the Pearson correlation coefficient in the tested groups of female students.

Analyzed variable	MET-min/week		Correlation coefficient value
	Group I	Group II	
Intensive physical effort at work	1320	1320	-0.202
Moderate physical effort at work	892	780	0.197
Walking at work	798	815	0.281
Commuting by car	353	341	0.308
Cycling	816	870	0.113
Travelling on foot	1089	1142	-0.166
Walking for recreation	564	594	0.068
Intensive physical effort connected with recreation	880	944	0.06

The analysis allowed us to affirm the existence of significant correlation between the time spent on intensive physical activity, both at work and during recreation at home, and the BMI value. Among group I students, the values were -0.675 and -0.672, and among group II students – 0.724 and 0.554, respectively. The negative correlation value shows that BMI value decreases as the time devoted to intensive physical activity increases (Table 2). The correlation between the duration of physical effort and the BMI value with the trend line is shown in Figure 5.

TABLE 2. Value of the Pearson correlation coefficient showing the correlation between physical effort and the BMI value in the tested groups of female students with p below 0.05.

The value of the correlation coefficient in the groups of students	Intensive physical effort at work and the BMI value	Recreational physical effort and the BMI value
Group I	-0.675	-0.672
Group II	-0.724	-0.554

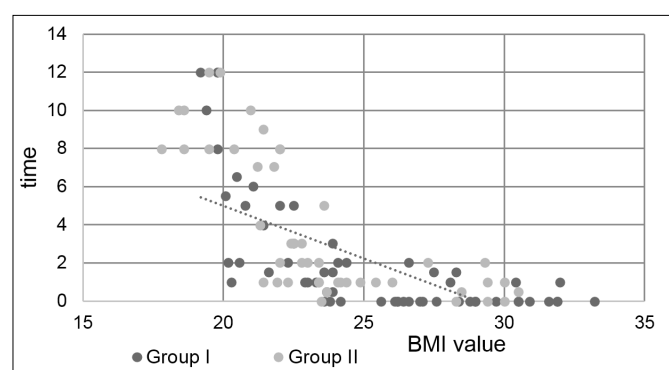


FIGURE 5. Presentation of the correlation between the duration of the physical effort and the BMI values as well as the trend line in the tested group of students.

DISCUSSION

Lack of physical activity constitutes an important public health issue. Physical activity improves well-being, prevents depression, is an element that responds to the need for success and, at the same time, has a beneficial effect on self-esteem. By minimizing the incidence of cardiovascular disease, it also significantly reduces premature mortality [2,6,8]. Physical effort improves overall physical condition, normalizes blood pressure and has a positive effect on lipid metabolism. Physical exercise significantly helps to maintain appropriate body weight [9]. Previous studies have demonstrated that the problem of excessive body weight affects all the social groups, including students [10].

The research by Gaździnska et al. revealed that the frequency of excessive body weight occurrence raises with each year of study, and in the group of fourth-year and fifth-year students it may even exceed by 50% [9].

On the basis of the authors' own materials, excessive body weight was identified in 47% of the first-year students belonging to group I and in 24.5% of students belonging to group II. At the same time, the comparison of the tested group of students to the group of professional nurses in one of the Warsaw hospitals, where 38% of nurses were excessively overweight [11], may lead us to conclusion that the value of 47% in the tested group is relatively high.

Research on academic youth shows that students constitute a social group with irrational and irregular dietary habits, who often feel stressed and demonstrate a low level of participation in sports or recreational activities [12,13]. It is, therefore, necessary to draw attention to spontaneous daily physical activity, particularly in the group of students [9]. According to the international guidelines for physical activity, minimum 30 minutes of physical activity performed 5 times a week is recommended to an adult. Such recommendations are implemented in England, Ireland, Wales and Scotland. In the United States, 150 minutes of exercise per week are recommended [14].

According to the British recommendations, a moderate physical activity in the group of adults should amount to 60 minutes a day, and to be beneficial to health, physical activity should be performed at least 3 days a week, provided more exercises apart from stretching are included. Previous studies show that 61% of the society do not meet the recommended standards [13].

The authors' own research demonstrated that an average intensive physical activity in leisure time was 880-944 MET-min/week, depending on the tested group.

Marchewka and Jungiewicz stated proportional correlation between physical activity before the age of 35 and the assessment of the health conditions and physical fitness after the age of 55 [15].

Physical activity is understood not only as the activity in leisure time, but also as physical activity at work and during housework. The boundary when a decrease in professional activity among women can be observed is the age of 60 [8]. While studying physical activity among, inter alia, university and postsecondary school students, Litwic-Kaminska et al. stated that the level of physical activity decreased with age [16]. Previous studies have demonstrated that physical activity in leisure time has a beneficial effect on the human body. The influence of physical activity at work on the human body has not been entirely known. It is believed that physical effort

at work has an adverse effect on the cardiovascular system as it is mainly a static effort [13].

Lifting and handling loads by nurses can be classified as this type of physical effort [11]. Static effort increases the risk of cardiovascular diseases [17], whereas walking or other dynamic effort at work may have a beneficial effect on the human body [16].

Makowiec-Dąbrowska et al. demonstrated that increased physical activity of employees is beneficial for their health. However, other factors (e.g. stress levels), which may influence health, were not taken into account by researchers with regard to all the tested groups [18].

This study allows the authors to conclude that group I students in comparison with group II students, were less active and had more problems with excessive body weight. At the same time, the study confirmed that adults have more difficulties with changing their habits, which also refers to habits associated with physical activity. However, according to British data, even minor physical activity is more beneficial than complete lack of activity [14].

According to research an objective assessment of the intensity of one's own physical activity by means of International Physical Activity Questionnaire is encumbered with a certain level of error [19]. This is confirmed by the work of J. Palacz. The part of the studies determining the level of physical activity was conducted with reference to the name of the occupation and not to the actual physical effort [20].

Contemporary lifestyle – computerization, a wider offer of TV programs and cars do not encourage physical activity. The low level of physical activity may also be caused by improper organization of the day and often by the lack of awareness of beneficial health effects of such activities [5].

Professional work and physical activity related to work constitute a rather significant aspect of the overall physical activity. Students form a group whose daily routine depends on both their class timetable and paid employment. The authors' own research revealed that full-time work and additional activities of students (participation in university classes) in the analyzed group led to decrease in leisure time and, thus, to a decrease in time devoted to physical exercises. Average time spent on physical activity at work in both tested groups was comparable, however, the difference in the intensity of the physical effort was statistically significant. Group II students spent their leisure time more actively compared to group I students. At the same time, both groups reported using the car as mean of transport equally frequently (100%).

The way of commuting is an important element which affects health. Women who permanently commute to work by car are at a higher risk of cardiovascular diseases than women commuting to work by bus or on foot [16].

Smoking cigarettes is a significant factor affecting the incidence of cardiovascular diseases. In addition, noise at work and stress can also adversely affect health.

According to the authors' own research, none of the respondents smoked cigarettes, however, due to numerous course tests and examinations, the tested group was constantly subjected to stress. In addition, the noise in hospital wards where the respondents worked, had an adverse effect on their bodies.

Carrying out research on physical activity in Poland may be challenging due to the lack of long-term studies conducted with the division of respondents according to sex, age and professional groups. Even very detailed questionnaires run

the risk of subjective assessment of the level and duration of physical activity. It is also uncertain whether professional activity of nurses can be identified as beneficial if its duration is the only factor taken into consideration.

The authors' own research led to the conclusions that group I students, whose average age was 41, devoted less time to active recreation compared to group II students, whose average age was 27.7. It was demonstrated that cycling amounted to 816-870 MET-min/week and walking to 1089 or 1142 MET-min/week, depending on the tested group.

The research conducted by Bergier et al. on the group of nurses, demonstrated that the level of average activity at work was 2099.6 MET-min/week and the level of their time driving a car was 470 MET-min/week [21].

The authors' own research revealed that overall physical effort at work of the undergraduate students (group I) amounted to 2212 MET-min/week, whereas in the case of graduate students (group II) – to 2100 MET-min/week.

Health status is formed throughout the whole life. Physical activity improves oxygen efficiency and helps maintaining mobility.

The program of nursing studies does not include physical education classes; such classes are offered during undergraduate course but participation is not obligatory. Despite free access to sport facilities provided to students by the university, no students participate in the activities. It is worth remembering that the students of nursing are future promoters of health, whose "physical activity" may undermine the credibility of knowledge they will transfer.

CONCLUSIONS

1. Undergraduate extramural students were less physically active in comparison with full-time and extramural graduate students.
2. There is significant correlation between the duration of physical activity and the BMI value in both tested groups of students.
3. The education system is recommended to be redesigned in such a way as to enable students spending more time on physical activity.

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