



ASSESSMENT OF THE DEGREE OF OBESITY AMONG SOFIA UNIVERSITY “ST. KLIMENT OHRIDSKI” STUDENTS, LECTURERS, AND STAFF

G. Despotova*

Department of Sport, Sofia University “St. Kliment Ohridski”, Sofia, Bulgaria

ABSTRACT

Obesity is a global medical and social problem in modern society. Being overweight and obese are major risk factors for multiple diseases and may lead to serious disabilities: high blood pressure, stroke, coronary heart disease, type 2 diabetes, some types of cancer, sleep apnea, psychological disorders, and others. Obesity is a disease that is closely related to many musculoskeletal problems that lead to an increase in the risk of injury, dysfunction, and inability. **The purpose** of this study was to screen the overweight and obesity among Sofia University “St. Kliment Ohridski” students, lecturers, and staff. **Methods:** To assess overweight and obesity we used the Body Mass Index as a generally accepted indicator. Pain intensity data was collected using a visual analog scale. **The results** show a high incidence of overweight and obesity among university students, lecturers, and staff. The study has shown that increased body weight is significantly associated with back pain, and hip, knee, and feet pain. **Conclusions:** The study’s data confirm the trend for the ever-increasing number of people who are overweight or obese. The author recommends a healthy lifestyle that includes regular targeted physical activity and sports, a healthy diet, enough sleep, and low-stress levels.

Key words: body mass index, the university community, pain, physical activity, prevention

INTRODUCTION

Numerous epidemiological studies in recent decades have shown a large increase in the incidence of overweight and obesity worldwide in different age groups. In her study, G. Despotova (2018) surveyed 60 Sofia University “St. Kliment Ohridski” students and reported a high incidence of overweight and obesity in both women and men (a total of 21.66%). According to the author, the high incidence is due to the lifestyle of students – an unhealthy eating pattern and reduced physical activity (1).

In the 2020/2021 academic year, P. Hristova (2021) surveyed 269 Sofia University “St. Kliment Ohridski” students – 141 women

(52.42%) and 128 (47.58%) men. The author found that 18.6% of men are overweight and 11.63% are obese. In women, the rates are similar to those of men – 13.48% are overweight and 9.95% are obese (2).

A sedentary lifestyle and decreased physical activity are a prerequisite for the emergence of many diseases, including overweight and obesity. Obesity is a disease that is closely related to many musculoskeletal problems that lead to an increase in the risk of injury, dysfunction, and inability. Studies have shown that increased body weight is significantly associated with pain in the feet, knee, hip, and back (3, 4). This should be taken into account when developing a methodology for the treatment of obesity. The prevalence of serious musculoskeletal pain in obese patients leads to a serious negative relationship between obesity and health-related quality of life (5). Increased mechanical load plays a major role in the negative relationship between obesity and

*Correspondence to: *Gergana Despotova, Department of Sport, Sofia University “St. Kliment Ohridski”, 1504 Sofia, Bulgaria, 15, Tzar Osvoboditel Blvd., e-mail: gdespotova@uni-sofia.bg, Mobile: +359 885204382*

weight-bearing joints (spine, hip, knee, and ankle), therefore inflammatory and degenerative diseases of these joints are a fairly common problem in people of young age with obesity, especially in cases where the duration and degree of obesity increases. According to K. Kostov (2018), obesity is one of the etiological factors of osteoarthritis, due to the excessive mechanical load on the joints (6).

The prevention and treatment of overweight and the limitation of obesity-related comorbidities are of great importance for public health. In early childhood, it is necessary to perceive, build and consolidate behavioral patterns and habits for a healthy lifestyle. Family, teachers, and medical professionals play an important role.

I. Peltekova and B. Peltekov (2022) studied VI-grade students (all were born in 2009) from the 68th “Academician Nikola Obreshkov” Secondary School in Sofia. Based on the results obtained, the authors conclude that the studied 12-13-year-old students rarely play sports in their spare time. A significant percentage of them are not physically active and believe that motor activity is only sometimes useful for their health. Also, at this age, students still don’t have enough knowledge and they are not convinced of the importance of healthy eating and physical activity for their good physical and mental health (7).

In 2015, P. Hristova (2016) found out that of a total of 175 female university students, only 2.12% of them play sports every day; 27.67% play sports 2-3 times a week; almost half of the surveyed students (45.47%) exercise 1-2 times a month; 24.47% – do not play sports (8). The general conclusion that can be drawn is that a large percentage of young people do not play sports.

In the 2018/2019 academic year, N. Bocheva (2021) conducted an experiment with 150 Sofia University “St. Kliment Ohridski” students, aged 18-23 years. The author concluded that the state of the physical capabilities of the participants in the experiment in most tests was unsatisfactory (9).

According to many studies, the quality of life is deteriorating in overweight and obese people. With the increase in body mass index, quality of life data deteriorates (10, 11). Different aspects of quality of life can be influenced by obesity in different ways, depending also on the degree of obesity. Weight loss has a beneficial effect on quality of life. It leads to improved health, increases working capacity and activity, leads to a change in appearance, and is evidence of a person’s desire, motivation, and ability for personal change.

METHODS

The purpose of this study is to establish the incidence of overweight and obesity among Sofia University “St. Kliment Ohridski” students, lecturers, and staff and the intensity of pain in the studied subjects.

The study was conducted from October 2022 to January 2023, at the Center for Physiotherapy. The study involved 104 Sofia University “St. Kliment Ohridski” students, lecturers, and staff, with an average age of 27.81 ± 13.92 years. A total of 73.08% of the persons surveyed were women (76 students, teachers, and staff) and 26.92% (28 persons) were men. The survey involved 82 students (78.85%), 9 lecturers (8.65%), and 13 staff (12.5%) of Sofia University “St. Kliment Ohridski”.

For achieving the study’s objectives, we used the following methods:

- Anthropometry – anthropometric indicators weight and height were studied;
- Body mass index (BMI) is an indicator used to classify overweight and obesity. WHO recommends for assessing obesity of people, aged 18 and over, to be used the BMI values set out in Table 1 (12).
- Visual-analog scale to measure the intensity of the pain (VAS). The examined person notes the subjective sensation of pain on a 10 cm line (**Figure 1**) (13);

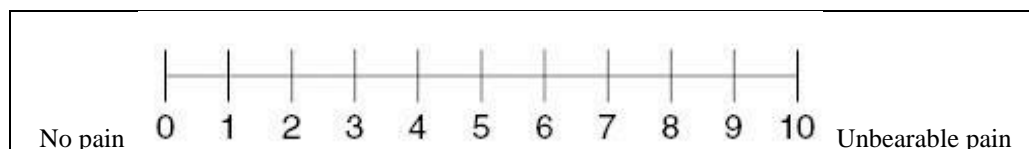


Figure 1. Visual-analog scale for quantitative assessment of pain

- Alternative analysis;
- Variance analysis.

RESULTS

Table 1 shows that 19.23% of the students, lecturers, and staff surveyed were overweight and

they belong to the category of people at increased risk of comorbidities. Obese class I and class II were a total of 11.54% of the study's participants, with a high and very high risk of comorbidities. As BMI increases, so does the risk of comorbidities.

Table 1. Distribution as per estimated BMI

Classification	Participants n (%)	Risk of comorbidities
Underweight BMI < 18.5 kg/m ²	Students 13 (12.5%) Lecturers 1 (0.96%) Staff 1 (0.96%) Total 15 (14.42%)	Increased
Normal weight BMI 18.5 – 24.9 kg/m ²	Students 51 (49.04%) Lecturers 4 (3.85%) Staff 2 (1.92%) Total 57 (54.81%)	Low
Overweight BMI 25.0 – 29.9 kg/m ²	Students 14 (13.46%) Lecturers 2 (1.92%) Staff 4 (3.85%) Total 20 (19.23%)	Increased
Obesity class I BMI 30.0 – 34.9 kg/m ²	Students 4 (3.85%) Lecturers 1 (0.96%) Staff 3 (2.88%) Total 8 (7.69%)	High
Obesity class II BMI 35.0 – 39.9 kg/m ²	Students 0 Lecturers 1 (0.96%) Staff 3 (2.88%) Total 4 (3.85%)	Very high
Obesity class III BMI ≥ 40 kg/m ²	Students 0 Lecturers 0 Staff 0 Total 0	Ultrahigh

The percentage of lecturers and staff with overweight and obesity is greater compared to the percentage of overweight and obese university students (**Figure 2**). In young people, especially in women, overweight and obesity are more of an aesthetic problem than a healthy one. This problem can lead to a lack of self-esteem, impaired adaptation to the social environment, and social isolation. In our opinion, this is one of the reasons why young overweight women do not allow the additional increase in body mass and their transition to the degree of obesity. During

menopause metabolism slows down, and the amount of adipocytes increases. Simlin-Silverman L. and Wing R., (2000) point out that the positive energy balance during menopause is not the result of excess intake, but is due to reduced energy expenditure (14). After menopause, in addition to weight gain, changes in the distribution of body fat are also observed. Therefore, the postmenopausal period is critical for the development of obesity. After the age of 20, metabolism is reduced by about 2% every 10 years (15).

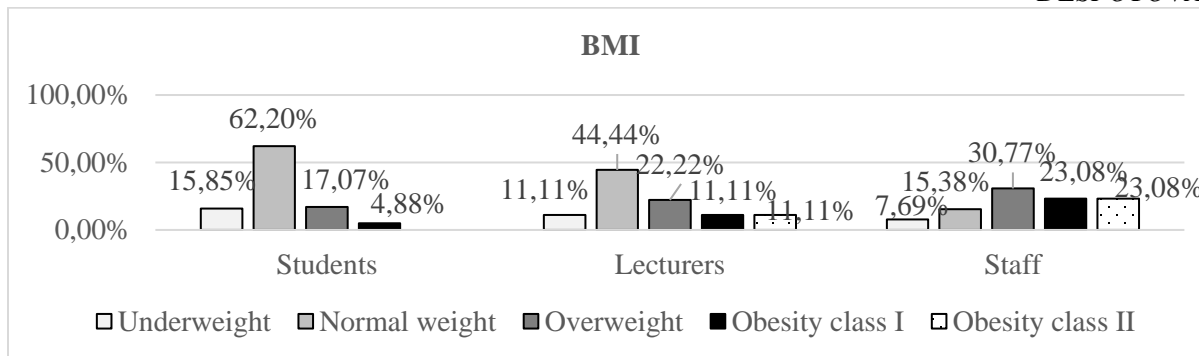


Figure 2. Distribution of the students, lecturers, and staff surveyed according to BMI

Table 2 presents the distribution of overweight and obese participants by gender. Overweight are 17.86% of men and obese are 7.14% of them. In

overweight women, the percentage is similar to that of men – 19.74% and 13.16% are obese.

Table 2. Distribution of overweight and obese participants by gender

Classification	Men n(%)	Women n(%)
Underweight	4 (14.29%)	11 (14.47%)
Normal weight	17 (60.71%)	40 (52.63%)
Overweight	5 (17.86%)	15 (19.74%)
Obesity	2 (7.14%)	10 (13.16%)

Pain is a subjective feeling and its assessment is important for successful treatment. In this study, the visual analog scale to measure the intensity of pain is used.

have pain and 43 people (75.44%) have no pain. Also **Figure 3** shows that out of 32 students, lecturers, and staff who are overweight or obese, 22 people (68.75%) have pain and 10 people (31.25%) have no pain.

Figure 3 shows that out of 57 students, lecturers, and staff with normal weight, 14 people (24.56%)

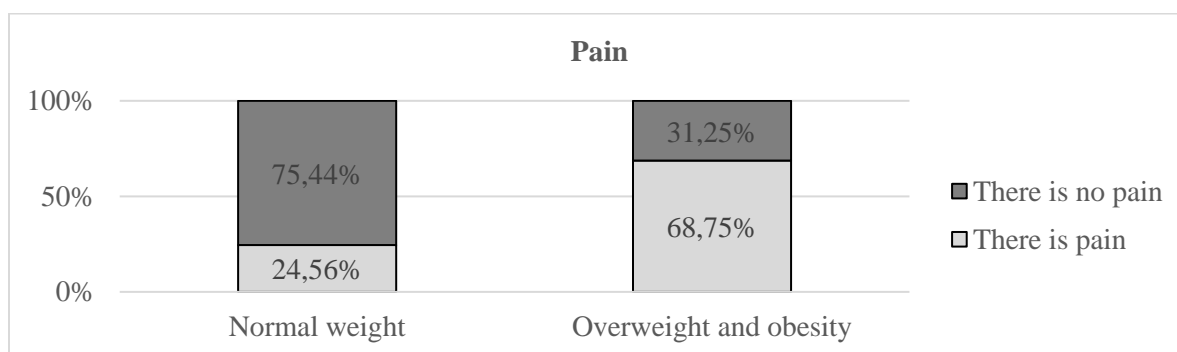


Figure 3. Distribution according to the presence of pain in normal weight participants and overweight and obese participants

Figure 4 presents the results for the presence of pain in overweight and obese students, lecturers, and staff separately. With increasing BMI, the

percentage of people with pain in both students and lecturers and staff increases (**Figure 4**).

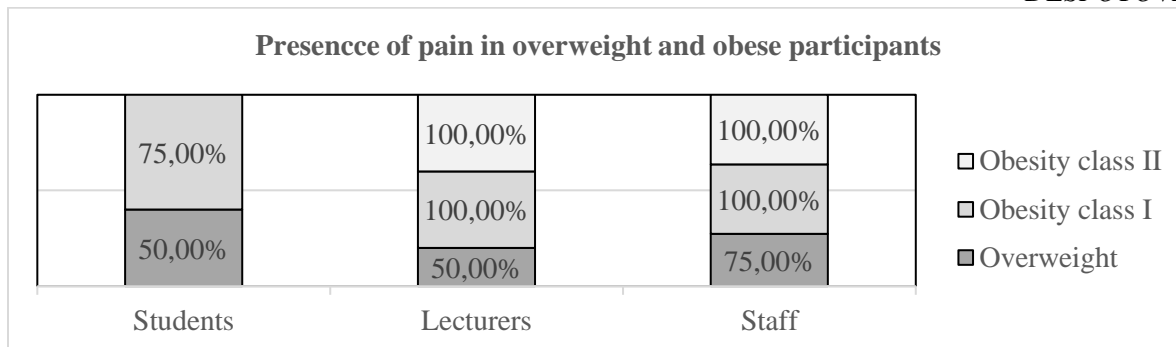


Figure 4. Presence of pain in overweight and obese students, lecturers, and staff

In the majority of examined people who have pain, it is permanent (Figure 5).

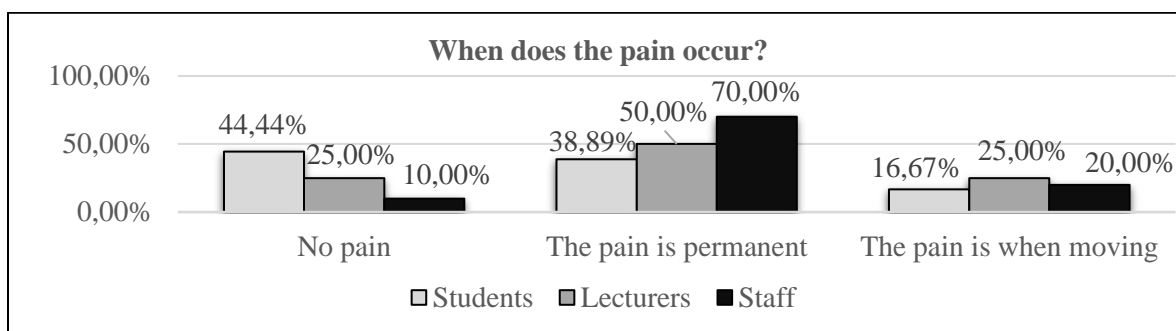


Figure 5. Occurrence of pain

Figure 6 shows the localization of pain in students, lecturers, and staff. From the processing of the data on the percentage distribution of pain localization, it was seen that the subjects studied most often reported back pain, followed by knee

pain and hip pain. It is assumed that the high percentage of localization of pain in the above mentioned zones is due to the increased mechanical load on the weight-bearing joints.

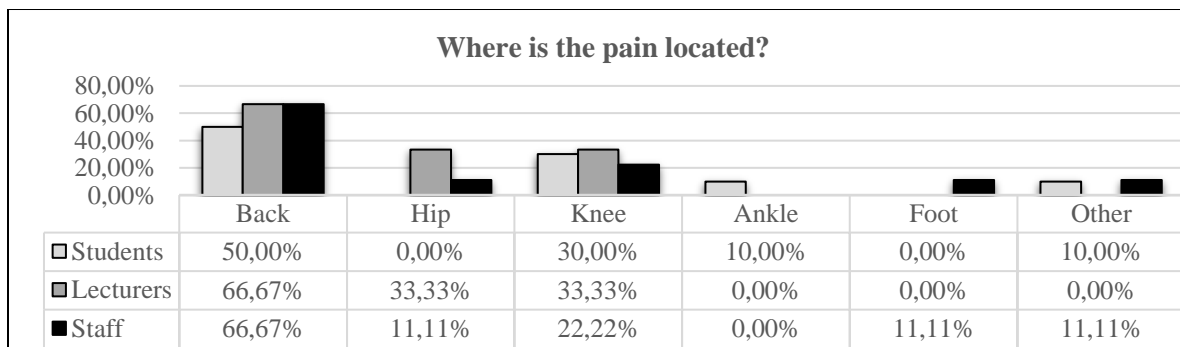


Figure 6. Distribution according to pain localization

In terms of the indicator for quantitative assessment of pain, the average value for overweight and obese people is 2.34 ± 1.94 and the

average value for normal weight participants is 0.63 ± 1.20 (Table 3). We can conclude that the

intensity of pain in overweight and obese people is greater than normal weight people.

Table 3. Variance analysis of the results from the visual analog scale for quantitative assessment of pain

Participant	n	X min	X max	R	\bar{X}	S	V	As	Ex
Overweight and obese	32	0	6	6	2.34	1.94	82.97	0.182	-1.024
Normal weight	57	0	4	4	0.63	1.20	190.73	1.648*	1.242

CONCLUSION

This study, reported a high incidence of overweight and obese Sofia University “St. Kliment Ohridski” students, lecturers, and staff, in both women and men (a total of 30.77%). Increased body weight was significantly associated with back, knee, and hip pain.

The analysis of the study’s results allows recommending the inclusion and/or increase in the number of the subject “Physical Education and Sport” classes per week in the programs’ curricula for university students, as well as stimulation of lecturers and staff for regular physical activity. This is important for the prevention and treatment of overweight and obesity, which is closely related to many musculoskeletal problems, which lead to an increase in the risk of damage, dysfunction, and inability.

Prevention of obesity should begin in early childhood. An important role here is played by the family, medical professionals, and teachers of physical education and sport in building and strengthening habits for a healthy lifestyle – healthy eating and regular, purposeful physical activity and sports.

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