

Body mass index and quality of life among students aged nineteen to twenty two years

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Abstract

Aim: The purpose of this research is to identify and analyze the association of the Body Mass Index (BMI) and quality of life (QoL) components in students aged 19 to 22 that attended physical education classes once a week during a whole semester. The students come from different faculties of the West University of Timișoara. *Methods:* The research was conducted during the physical education classes to which they participated during one semester. The research has begun in October 2018 and ended in January 2019. A total of 400 students were asked to participate in this study, 200 female and 200 male students. As research methods, we used the RAND 36 Item Short Form Health Survey SF-36 questionnaire to assess the quality of life, as well as the statistical-mathematical method. *Results:* Our results showed that 66% of the students had a normal BMI, 12% are underweight, 17% are overweight and 12% are obese. It has been found that the quality of life score does not depend on the body mass index. No correlation has been found between the QOL total score and BMI in neither male students $r=0.035$, $R^2=0.0012$, $p=0.62$, nor female students $r=-0.01$, $R^2<0.001$, $p=0.88$.

Key words: *body mass index, quality of life, students*

Rezumat

Scop: Scopul acestei cercetări este de a identifica și analiza asocierea dintre indicii de masă corporală (IMC) și calitatea vieții studenților cu vârsta cuprinsă între 19 și 22 de ani, care au frecventat orele de educație fizică, desfășurate o dată pe săptămână pe durata unui semestru. Studenții provin din diferite facultăți a Universității de Vest din Timișoara. *Metode:* Cercetarea a fost efectuată în cadrul cursurilor de educație fizică la care au participat pe parcursul unui semestru. Cercetarea a început în octombrie 2018 și s-a încheiat în ianuarie 2019. În studiu, au fost incluși 400 de studenți, 200 de subiecți de sex feminin și 200 de sex masculin. Ca metode de cercetare, am folosit chestionarul RAND 36 Item Short Form Health Survey SF-36 pentru evaluarea calității vieții, precum și metoda statistico-matematică și metoda reprezentării grafice. *Rezultate:* Conform rezultatelor 66% din studenți au o greutate normală, 12% sunt subponderali, 17% supraponderali și 12% se încadrează în grupa celor cu obezitate de gradul I. Nu s-au găsit corelații între scorul total al CV și IMC nici în cazul subiecților de gen masculin $r=0.035$, $R^2=0.0012$, $p=0.62$ și nici în cel al celor de gen feminin $r=-0.01$, $R^2<0.001$, $p=0.88$.

Cuvinte cheie: *indice de masă corporală, calitatea vieții, studenți*

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Introduction

There are many known benefits of an active lifestyle and, yet, there is a low interest of students in being more active. Worldwide, the physical activity phenomenon in youth and adults is in a continuous decline. A strong motivation could be a boost in becoming a dynamic individual. Being physically active has much to contribute to the quality of life (QoL) for most individuals. Quality of life is an important issue for all individuals regardless of their age and is a multi-dimensional construct [1]. Quality of life is a broad construct based on the complex way individuals appraise the following components of their lives: physical health, psychological well-being, level of independence, social relationships, personal beliefs/spirituality, and relationships with the environment [2]. There is a general agreement that various domains of functioning and well-being can each contribute independently to a global quality of life, thus making a multidimensional measurement of the quality of life necessary [3]. Studies have expanded the focus to include the physical and psychological outcomes associated with obesity in adolescence. These studies consistently identify negative associations between weight status and subjective measures of functioning and wellbeing [4].

The body mass index BMI now appears to be a widely accepted index for classifying adiposity in adults. Furthermore, a consensus conference proposed the use of a BMI above the 85th percentile as a screening index for overweight, and a BMI above the 95th percentile as an index of excess adiposity in young adults [5].

The body mass index (BMI) is the metric currently in use for defining anthropometric height/weight characteristics in adults and for classifying (categorizing) them into groups. The BMI has been useful in population-based studies by its wide acceptance in defining specific categories of body mass as a health issue [6]. The body mass index (BMI) is used as an indicator of obesity, as well as undernutrition, and warrants profound attention in terms of its relationship with a health-promoting lifestyle. The BMI is a statistical measure of the weight of a person scaled according to height.

BMI: a statistical measure of the weight of a person scaled according to height. The BMI is calculated by dividing a person's weight by the height squared (kg/m^2). Four categories of BMI have been adopted: underweight ($<18.5 \text{ kg}/\text{m}^2$); normal weight ($18.5\text{--}24.9 \text{ kg}/\text{m}^2$); overweight ($25\text{--}29.9 \text{ kg}/\text{m}^2$); and obesity ($\geq 30 \text{ kg}/\text{m}^2$) [7].

The purpose of this research is to examine the association between the body mass index and

quality of life components in students aged 19 to 22 years.

Research hypothesis

High BMI associated with increased weight relates to low QOL parameters.

Material and Methods

Design

The study was a non-experimental, cross-sectional and descriptive survey examining the relationship between the BMI and QOL among undergraduate students aged 19 to 22 years from the West University of Timișoara.

Place, subjects and time of research

The survey was conducted during the physical education classes attended by students between October and December 2018. A total of 400 undergraduate students participated in the research, 200 female and 200 males with age between 19 and 22 years old. This study has been done with the consent of all subjects.

Research methods

In this study we used the questionnaire survey method. The students had to fill in one questionnaire as well as some data related to weight, height and age.

For assessing QOL, the RAND 36 Item Short Form Health Survey SF-36 questionnaire was completed by adolescents [8]. The short form 36 (SF-36) health survey instrument is a self-administered general health questionnaire, which generates a profile of scores across eight dimensions of health [9]. It is comprised of 36 items that assess eight health concepts: physical functioning, role limitations caused by physical health problems, role limitations caused by emotional problems, social functioning, emotional well-being, energy/fatigue, pain, and general health perceptions. Physical and mental health summary scores are also derived from the eight RAND-36 scales [10].

The results obtained after applying the questionnaire were recorded using Microsoft Excel® and analysed with GraphPad Prism® 6.0.

Results

After the interpretation of the BMI we have found that out of the 400 students 5% were obese, 17% overweight, 12% underweight and 66% had normal BMI. Female students were classified 22% underweight, 63% normal, 11% overweight, and 4% obese, whereas males were 2% underweight, 69% normal, 24% overweight, and 2% obese. The percentages of normal BMI in both males and

females are about the same (Figures 1, 2). The main difference observed was in the case of underweight females 22% compared to 2% underweight males, and overweight males 24% compared to 11% overweight females.

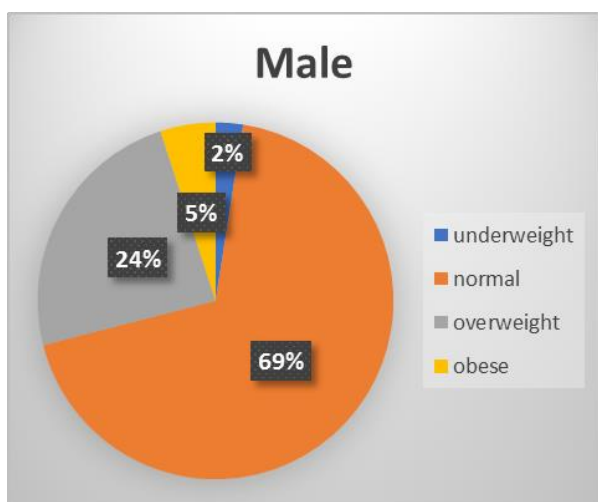


Figure 1. The BMI distribution of male students in the study group

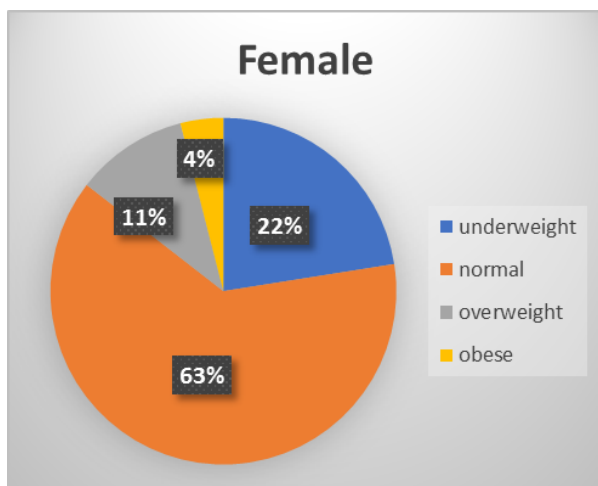


Figure 2. The BMI distribution of female students in the study group

Male students scored better than females at every component of the quality of life except emotional wellbeing where we see an equal percentage Figure 3. No significant difference has been found between male and female QoL scores.

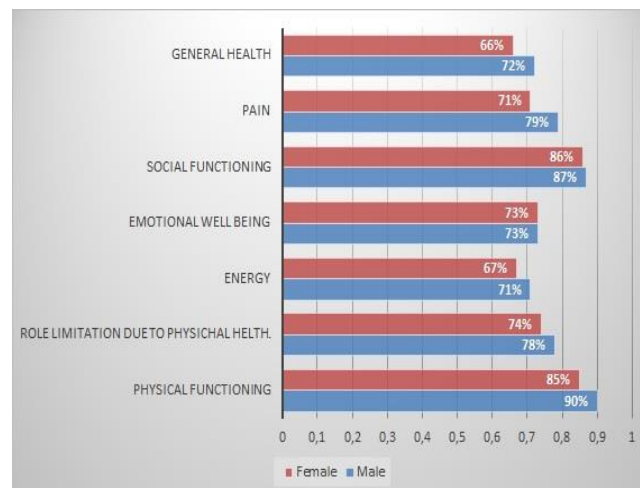


Figure 3. Male and female QoL component scores

It has been found that the quality of life score does not depend on the body mass index. We have no correlation between the QoL total score and BMI in neither male students $r=0.035$, $R^2=0.0012$, $p=0.62$, nor female students $r=-0.01$, $R^2<0.001$, $p=0.88$. In addition, there was no correlation observed between any of the individual components of the QoL and BMI.

Significant statistical correlations have been found between the different components of QoL as follows. In male students the energy-fatigue component correlated with emotional well-being $r=0.69$, $R^2=0.47$, $p<0.0001$, and with general health $r=0.56$, $R^2=0.31$, $p<0.0001$. Emotional well-being is also associated with general health scores $r=0.51$, $R^2=0.26$, $p<0.0001$. In male students, role limitation due to physical functioning is the component mostly related with the total QoL score $r=0.76$, $R^2=0.58$, $p<0.0001$. Not so many associations have been found in the case of female students. A noticeable result is that in female students, emotional well-being influences the total QoL score the most $r=0.71$, $R^2=0.50$, $p<0.0001$.

Discussions

Identifying the association between the body mass index (BMI) and quality of life (QoL) components was the purpose of this study. The research hypothesis that "High BMI associated with increased weight relates to low QoL parameters" was not supported by the results. Similar findings were achieved by Harward, Millar, Petersen, Swinbur, Lewis in their study which included

N=3040 adolescents, that adolescents who were outside the normal weight range and misperceived their objectively measured weight status enjoyed a higher QoL than adolescents whose weight perception was concordant with their actual weight status. These findings suggest that practitioners may need to exercise caution when educating adolescents about their weight status, as such 'reality checks' may negatively impact on adolescent QoL [11].

Renzaho, Wooden & Houg have noticed that low and high BMIs were associated with decreasing levels of both physical and emotional well-being, but the deterioration in health status was more consistent in the physical than in other dimensions [12].

Wee, Wu, Thumboo, Lee, Tai investigated the association between BMI and physical and mental health-related QoL in a multiethnic Asian population in Singapore (n=5027). The results showed that obesity was associated with lower physical component summary and the effect was modified by gender but not ethnicity, such that the association was greater in women than in men. Obesity was not associated with the mental component summary. Underweight was associated with reduced mental component summary but not with physical component summary [13].

In the article "The association between body mass index and health-related quality of life", Hopman, Berger, Joseph et al. concluded that mean BMI for every age and gender group exceeded healthy weight guidelines. For women, being underweight, overweight or obese was associated with poorer health related QoL in most outcomes while for men, this was associated with poorer health related QoL, in some domains, and with higher health related QoL in others [14].

Another possible explanation for the lack of BMI association with the QoL can be the fact that there is a discrepancy between the actual weight and the body weight perception of the individual. One's perception does not always reflect reality [15]. Body weight perception is influenced by several factors including age, gender, family, peers, media, and ethnicity [16,17]. Also, the BMI does not indicate a number of aspects that could influence the quality of life, namely those related to body composition or

somatoscopic aspects (posture, proportionality of segments, etc.).

Conclusions

Analyzing the results, the following statements have been concluded:

- A considerable percentage of the female students are underweight while male students tend to be overweight.
- The body mass index does not influence the quality of life in neither male nor female students.
- Individual quality of life components are also not influenced by the BMI.
- There is no significant difference between the perceived QoL of male and female students.
- The component that has the greatest influence on male QoL is "role limitation due to physical functioning" while in the case of female students, emotional well being is the decisive one.

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