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Original article

DETERMINING THE GROWTH AND PHYSICAL DEVELOPMENT PROFILE OF SECOND YEAR STUDENTS

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Abstract

The body mass index gives us standardized information about each person's weight group. At the same time, the values of this index provide information on identifying the weight category corresponding to the relationship between the square of height and the weight of the individual. The purpose of the paper is to establish the profile of growth and physical development of second-year students in the Faculty of Physical Therapy. The methods used to conduct the research are represented by: bibliographic study, anthropometric measurements for determining body weight and height, mathematical method and graphical method. The research included 116 students, all of whom were enrolled in the second year at the Faculty of Physical Therapy within the National University of Physical Education and Sports in Bucharest, aged between 20-23 years, excluding subjects over this age category. . In conclusion, the body mass index allows us to place individuals in a certain category according to nutritional status, but it should be correlated with other measurements, to take into account the level of physical activity and the level of adipose tissue specific to each age. Also, the body mass index is not differentiated by sex; Depending on the individual's genetic characteristics, research in the field has shown that men have more muscle and bone mass than women.

Keywords: weight, height, body mass index.

Introduction

Today, for most of the population, body composition is a topical psychosocial problem, through which the ratio of structural components of the body must be maintained in constant proportions, but also functionally integrated.

According to Cordun (2009, p. 102), the composition of the body can influence the health of the human body, because "from the age of 30, muscle mass decreases progressively and the lost tissue is replaced with fibrous connective tissue and adipose tissue. Even subjects with a constant normal weight lose muscle tissue and deposit adipose tissue as a result of a high-fat diet and a sedentary lifestyle.

The World Health Organization (WHO) considers that the coproral mass index (BMI) indicates the nutritional status of the adult. In children there are changes in BMI values, because they accumulate different adipose tissue, muscle mass, etc., depending on the stages of growth and development.

In the past, the BMI was called the Quetelet index and is defined as "a person's weight in kilograms divided by the square of a person's height in meters (kg / m2)."

The determination of BMI allows us to classify the subjects into the corresponding categories: underweight, normal, overweight, obesity (grade 1, 2 or 3). The risk of illness can also be detected.

In order for the measurements to be conclusive, in addition to BMI, other anthropometric measurements (perimeters, diameters, etc.) are needed, because BMI does not provide us with information about the amount of adipose tissue in the body. Thus, "the body mass index can be increased without the subject showing excess fat, or it can be normal, even subnormal for age, sex, height, but with excess fat" (Cordun, 2009, p. 91) .

We believe that the technology increasingly present in the life of every individual can help increase the risk of disease. One of the main causes

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of health problems is its association with an unhealthy lifestyle, in which the principles of a balanced diet are not observed and no physical activity is performed, either in an organized setting or individually.

Technological evolution actively contributes to the decline of physical activity among the population, implicitly their inclusion in different categories with values above normal (overweight / obesity). Author Nigg (2003, p. 53) cites Goran and Treuth (2001), who consider that some of the eloquent examples of the occurrence of sedentary population, are: "increased use of auto-mobiles, automated household appliances (dishwashers and washing machines), elevators andescalators rather than stairs, television and computers for entertainment and leisure activities and e-mail use for communications ".

We cannot fail to mention the positive effect that technological development has on the life of every person. Today, there are many smart applications and devices for monitoring physical activity that contribute to its promotion among the adult population.
The authors King, Ahn, et al (2008, p. 138) consider that "efforts to effect population-wide physical activity increases can be enhanced through the applications of state-of-the-art communication technologies". O'Reilly and Spruijt-Metz (2013, p. 501) state that "recent studies show conclusively that most young people and adults in the U.S. do not meet the recommended PA (physical activity) guidelines ", and traditional interventions have not been widely applied and have not contributed to improving the level of physical activity. Thus, there have been applications for smartphones that "offer novel approaches to measurement and intervention methodologies." At the moment, most people have a phone. If every owner of a smart device would install an application to warn him that he has to perform a certain exercise / day, then there is a possibility that the level of sedentary lifestyle will decrease and implicitly will decrease a number of conditions, such as: obesity, diabetes, cancer, etc. In another paper, "Using Smartphone Technology to Monitor Physical Activity in the 10,000 Steps Program: A Matched Case – Control Trial" (2012), the topic of using a mobile phone that can help monitor physical activity is discussed. The authors Kirwan et al consider that "using a smartphone application as an additional delivery method to a website-delivered physical activity intervention may assist in maintaining participant engagement and behavior change".

People need to be aware of the need to change their lifestyle and include any form of physical activity in their daily routine.

We believe that information campaigns should be conducted on the benefits of exercise and the involvement of competent authorities in designing a strategy. The media must also be involved in the dissemination of an advertisement or a public awareness campaign to encourage the participation of each individual in various and regular physical activities.

In the paper "Health benefits of physical activity: a systematic review of current systematic reviews", the authors Warburton and Bredin (2017, p. 541) highlight the idea that every adult should perform "150 min / week of moderate-to- vigorous intensity physical activity ".

WHO (2018) has developed a "Global action plan on physical activity 2018–2030: more active people for a healthier world" which aims to reduce sedentary lifestyle among adolescents and the adult population by 15% compared to the values recorded by 2030 in 2016. The efforts of all countries must focus on the 4 proposed strategic objectives: "Create active societies; Create active environments; Create active people; Create active systems ".

The purpose of the paper is to establish the profile of growth and physical development of second-year students in the Faculty of Physical Therapy.

Methods As research methods were used: - the bibliographic study of the specialized literature aimed at consulting the various existing documents both at international and national level; - anthropometric measurements for weight and development are performed as follows: - body height involves measuring with the thaliometer the "distance between the vertex and the plant plane (basis)" (Cordun, 2009, p. 71). Conditions of realization: - "the subject in the sitting position must touch the thaliometer with the heels, buttocks, shoulder blades and the opistocranium (external occipital protuberance). The head is held with the chin in the chest, the gaze horizontal, so that the imaginary line (Frankfurt line) joining the upper edge of the orbit is perpendicular to the graduated rod of the thaliometer. The thaliometer slider stops at the vertex, which is the highest point of the body. The height of the subject reads on the graduated rod "(Cordun, 2009, p. 74); - for the correctness of the measurement, it is recommended to perform in the morning, because the physiological variations caused by the compression forces at the level of the intervertebral discs will be eliminated. -

body weight involves determining with the help of the digital / mechanical scale the "sum of the weights of the structures that make up the body" (Cordun, 2009, p.83).

Conditions of performance: the subject is asked to climb on the digital / mechanical scale in an orthostatic position with the lower limbs slightly apart, observing the following rules: the measurement is recommended to be performed in the morning, before the first meal, after evacuation of the digestive tract and bladder, and the subject will be dressed briefly (shorts and T-shirt / swimsuit) at the time of its development. - the body mass index was calculated based on the data collected from the two measurements (height and body weight) by applying the formula: body weight (kg) / square of body height (m2). - mathematical method - contributes to the calculation of body mass index. - graphic method - highlights with the help of figures / diagrams the classification of subjects in a certain category (underweight, normal, overweight, obesity). The hypothesis of the paper is represented by the fact that the development of physical exercises in adolescence, but also their continuation in adulthood, can lead to the body mass index in normal values (18.5 - 24.9 kg / m2). For the research, the 116 subjects were selected from the students enrolled in the second year at the Faculty of Kinesiotherapy, within the National University of Physical Education and Sports, in Bucharest, based on the inclusion and exclusion criteria.

Inclusion criteria: - the age of the subjects between 20-45 years; - attending courses / practical works; - schooling in the second year within the Faculty of Physical Therapy; - agreement to participate in the research. Exclusion criteria: - age of subjects under 20 years; - age of subjects over 45 years; - absence from the development of courses / practical works; - lack of agreement on participation in research; - participation in a similar research.

Results Following the analysis of the data collected in the anthropometric measurements, we present the values obtained with the help of table 1.

Weight measurement		Height measurement		Body Mass Index	
Maximum value (kg)	Minimum value (kg)	Maximum value (m)	Minimum value (m)	Maximum value (kg/m^2)	Minimum value (kg/m^2)
148	41	1.98	1.51	37.75	16.49

Table 1 – Dates of the subjects

Table 2 presents the statistical data of the measurements performed on the subjects included in the research.

Dates	Average	Median	Standard deviation	Coefficient of variability
Weight measurement	68.38	70	13.68	20.10%
Height measurement	1.73	1.72	0.10	6.13%
Body Mass Index	22.58	22.31	3.25	14.46%

Tabel 2 – Statistic dates

Discussions

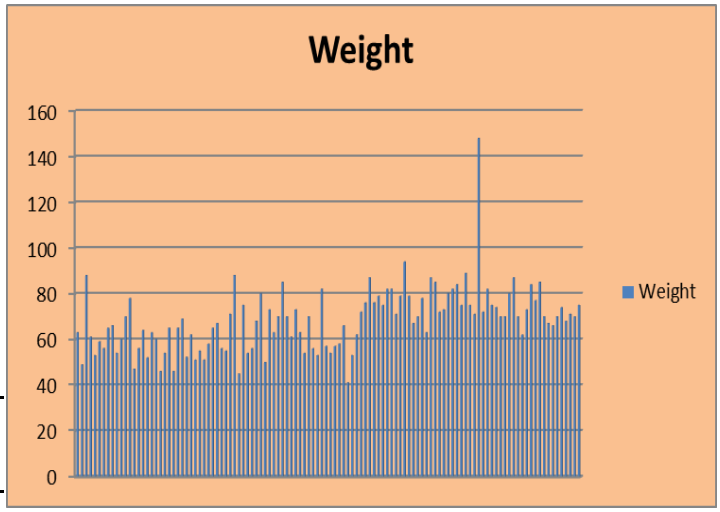

Figure 1 – Weight measurement

Figure 1 highlights the values recorded by the subjects included in the research on weight measurement. They range from a minimum of 41 kg.

at the maximum value of 148 kg. The coefficient of variability of 20.10% demonstrates that the sample data are relatively homogeneous.

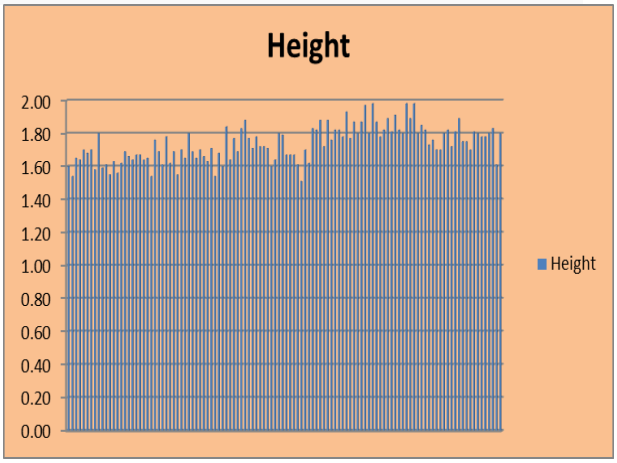

Figure 2 - Height measurement

Figure 2 shows the data obtained after measuring the height of the 116 subjects. The waist values vary from the minimum value of 1.51 m to the maximum value of 1.98 m. The statistical processing highlights that the standard deviation is 0.10.

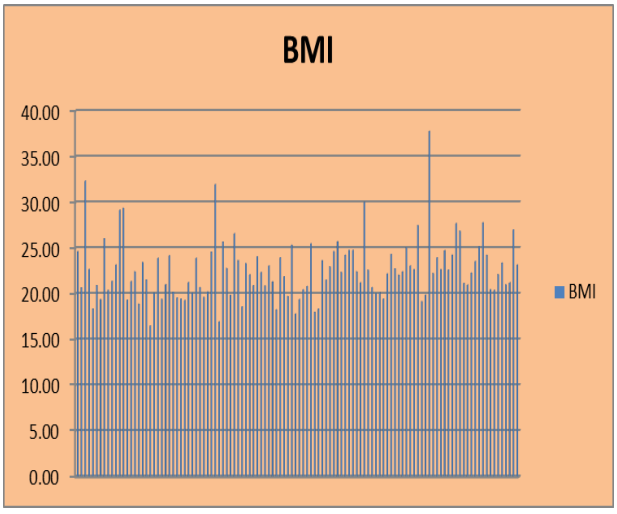

Figure 3 – Body mass index

Figure 3 shows the values of the body mass index of the subjects. These vary from the minimum value of 16.49 (kg / m2) to the maximum of 37.75 (kg / m2), and the coefficient of variability of 14.46% highlights the homogeneity of the sample.

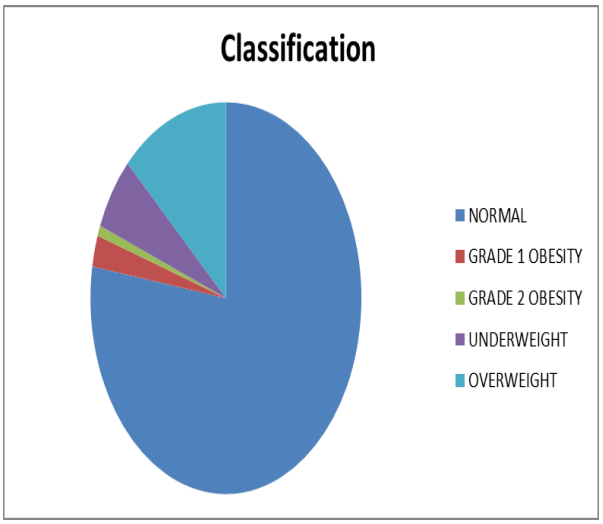

Figure 4 - Classification of the subjects depending on body mass index

Figure 4 shows that 90 subjects out of a total of 116 fall within the normal values of the body mass index (18.5 - 24.9 kg / m2), which indicates a low probability of health problems. It can also be seen that no student has grade 3 obesity (≥ 40 kg / m2), which would suggest an extremely high risk of disease. Of the subjects included in the research, 7 students are underweight (<18.5 kg / m2) and 15 are overweight (25 - 29.9 kg / m2), which indicates that there is an increased risk of losing the normal ability to functioning of the body. Regarding the obesity of the persons included in the research, there are 3 subjects with grade 1 obesity (30 - 34.9 kg / m2) and a subject with grade 2 obesity (35 - 39.9 kg / m2).

Conclusions The highlighted data demonstrate the fact that the hypothesis of the paper is confirmed according to which "the development of physical exercises in adolescence, but also their continuation in adulthood, can lead to the body mass index in normal values (18.5 - 24.9 kg / m2) ", Because 90 subjects out of a total of 116 have a low degree of occurrence of health disorders. We consider that physical activity performed constantly and regularly contributes to the fit between the normal values of the body mass index. However, physical activity must also be associated with a healthy lifestyle, which respects the principles of healthy eating, hydration, rest hours, etc. The evolution of technology can lead to the reduction of sedentary lifestyle, if each individual were aware of the importance of

performing physical exercises. We believe that information campaigns should be carried out on the benefits of exercise and the involvement of the competent authorities in designing a national strategy.

The authors contributed equally to create the article.

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