

Research article

Study on the determination of the body and mental state of adult age patients

Elena Vizitiu ^{1*}, Mihai Constantinescu¹

¹ "Stefan cel Mare" University of Suceava, Suceava, Romania

* Correspondence: Elena Vizitiu elenav@usm.ro; Tel.: 0755038200

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Abstract: Our study comes from the desire to highlight certain problems faced by adulthood, as well as the awareness of practicing physical exercise in water and on land, in order to combat them. Hypothesis of the work; it is assumed that through a thorough study in terms of body composition and mental status of patients of adult age, we will identify some problems that arise during this period of life and at the same time we will be able to develop truthful programs by applying physical means. The purpose of our work consists in highlighting the main problems of normoponderality and mental status on the patients subjected to the study by applying various tests that will highlight these aspects. Objectives of the study: Identification of body composition and mental status of adult patients; Patients' awareness of the normoponderality and mental problems arising from the applied tests; Promoting physical activities on land and in water, in adulthood. The result of questioning the subjects subjected to the study on the evaluation of the mental status revealed the fact that they have a temporal, spatial orientation, an adequate memory and attention, as well as a reading-writing and copying capacity corresponding to the age, and the determination of the body composition was achieved with the help of the "Tanita" device through which it was found an average of the group of subjects of 43.13% fat, 25,80 % muscle mass, 6,83 % bone mass, and water 42,22 %.

Keywords: study, body composition, mental status, women, physical activities

1. Introduction

Regarding the global statistical data according to WHO specifies that in the period 2015-2020 the percentage of the population over 60 years will double, exceeding the number of children under the age of 5 years and by 2050 more than 1 in 5 people will be over 60 years old. Obesity affects about 13% of the world's adult population and it is possible that this percentage will reach 20% by 2025 [1,2].

Statistical data from Romania presented by WHO specifies that 15% of the Romanian population is represented by people older than 65 years [3]. The study conducted by us comes from the desire to highlight certain problems faced by adulthood, as well as the awareness of practicing physical exercise in water and on land, in order to combat them.

In the literature, body composition is the sum of adipose tissue, water composition, muscle mass and bone mass, which can have a variable evolution depending on lifestyle. In this sense, adipose tissue is constituted by lipids containing small amounts of water and proteins, it can be white, yellow or brown, and in terms of this distribution, in the case of women there is the ginoïd type and in the case of men of the Android type. The regulation of body weight can be achieved through a controlled system having as basic components energy and metabolic [4].

Obesity in Romania and at European level, WHO defines it as "an abnormal or excess accumulation of fat in the body, with effects on the state of health", causing complications of the state of health (HTA, diabetes mellitus, heart disease, stroke, endocrinometabolic) in adults as well as in children. "Obesity can be characterized by an excess of adipose tissue, and from the authors point of view, we consider obesity to be a very complex disease, which is influenced both by physiological and psychological factors and the current environment of the Covid-19 pandemic"[5]. Obesity is a social and medical problem, which also involves medical costs representing 1-3% of the global expenditures in the health system. Statistical data show that between 20-30% of the Romanian population shows obesity [6].

Another concept about obesity is "often stigmatized and carries with it a false perception that it is caused mostly by lack of will leading to inappropriate dietary choices and physical inactivity [7]. There are studies that show the increase in the incidence of musculoskeletal disorders at the same time as the increase in body mass index. It is considered that 2 out of 3 people with obesity also associate osteoarthritis of the knee, in the context in which it is associated with mechanical stress and systemic factors associated with obesity [8-10], de that is why it is important to constantly monitor body weight [11].

In the study of Lee et al. conducted in South Korea on a number of 9512 participants over the age of 50 years, it was found the prevalence of obesity in the group of women in a higher percentage, which caused the decrease of the quality of life in this population group[12,13]. In obese people, the quality of walking and maintaining the orthostatic position are affected, due to the excess of adipose tissue and the deficit of muscle mass and strength [14].

The findings of another study say that " The negative impact of obesity on health-related quality of life is greater among people with metabolic comorbidity. However, the increase in BMI is associated with a reduced quality of life related to health even in the absence of metabolic comorbidity, calling into question the notion of 'healthy obesity' [15]. Another view is " Perceiving negative representation of obesity on social media was associated with poorer mental wellbeing outcomes during the pandemic; positive representation on television was associated with both positive and negative mental wellbeing outcomes. We encourage greater media responsibility when representing people with obesity [16], but also" Childhood Side Effects experiences (ACE) are also associated with both obesity and stress, and may modify risk of stress among people with obesity" [17].

Adverse childhood experiences (ACE) are also associated with both obesity and stress and can alter the risk of stress among people with obesity." During the COVID-19 pandemic, the body mass index correlated negatively with physical activity in all age groups, but especially in overweight adults and with obesity [18]. Aquatic therapeutic exercise is recommended because of the benefits for the human body through the use of water buoyancy. It can help to decrease body fat, while maintaining a clearly superior stability compared to exercises performed on the ground [1,19].

Another opinion is that "Obesity, the female sex and the decrease in physical activity were considered factors that decreased the quality of life in these patients, and during the COVID-19 pandemic were added the states of depression, psychological stress, the reduction of inter-family and social relationships" [20]. In this regard, in women the body mass index correlates with the risk of hip fracture [20]. That is why it is essential to maintain bone health in order to reduce the risk of osteoporosis and avoid the occurrence of disability [21-23].

Among the factors involved in the modification of the bone structure, we can mention the food intake, the dietary factors, but also the presence of magnesium, calcium, potassium ions and supplements that have a role in the prevention of osteoporosis. A diet rich in

magnesium can have a role in preventing the decrease of muscle mass, muscle strength and un calcium intake has a positive effect on bone mass, with the role of reducing the risk of falls and the occurrence of fracture [24,25].

Material and method: Hypothesis of the work; it is assumed that through a thorough study in terms of body composition and mental status of patients of adult age, we will identify some problems that arise during this period of life and at the same time we will be able to develop truthful programs by applying physical means.

The purpose of our work consists in highlighting the main problems of normoponderality and mental status on the patients subjected to the study by applying various tests that will highlight these aspects. This study was divided into several stages of work; the first stage consisted in establishing the sample of adult patients, this was done in an outpatient regime; the testing period lasted 3 months from November 2022 to January 2023; studying the specialized literature as well as the research carried out for the topic proposed by us. The second stage consists of testing patients who have given their consent to the ethics and deontology of scientific research. In this regard, 40 adult patients, both female and male, have given their consent.

Establishing tests to identify body composition as well as mental status. In the last stage of the study we recorded the data obtained after testing the patients in the form of tables and diagrams, analyzing and interpreting them, also proposing the physical activities that the subjects can practice. The exclusion criteria were: sanogen status (disabilities, oncological pathology, psychiatric, neurogenic).

Objectives of the study: Identification of body composition and mental status of adult patients; Patients' awareness of the normoponderality and mental problems arising from the applied tests; Promoting physical activities on land and in water, in adulthood.

2. Results and discussions

In the approach of our study we applied a series of tests regarding the determination of the composition of the body mass as well as the mental to 20 subjects, who were monitored on an outpatient basis. As for the geriatric scale for assessing depression, the frequency of answers to the first question, 85% answered that they are crowded with their lives and 15% are not satisfied; 65% of the subjects have given up their activities due to changes in social life, but at the same time 55% have the feeling that their life is unfulfilled and 45% say it is fulfilled.

The frequency of answers to the question about the state of boredom, the percentage of 50% yes and 50% no. Analyzing the representation of the investigated subjects regarding the expectations from the future 70% replied that yes, which means a positive psycho-emotional status. On fatigue, 75% replied that they are tired, but it is understandable at this age, and 25% are more active. Regarding the appreciation of the contribution of information about the time spent in the house as well as in the open air, the frequency of the answers shows that 55% prefer to stay in the house and 45% prefer outdoor activity.

Another important item is the appreciation of the contribution of information in terms of, ability to memorize, 25% of subjects responded that they have problems with memory much more than others. The appreciation of the item from which the start of a new plan in life emerges, in 55% of the subjects it is not difficult to start new plans, positively correlated with the appreciation to the contribution of information on decision-making in a percentage of 65%. With regard to the subjects' lucid mind/thinking, 65% answered in the affirmative. According to the authors " the main properties of the CNS typology are characterized by CNS energy, the equal or unequal distribution of the force between the two

basic fundamental processes – excitation and inhibition and by the speed with which energy is consumed" [26]

Table 1. Cognitive evaluation of the subjects

| | What year are we in? Season? Date? During the day? Moon? | Where are we? Country? County? City? Hospital? Floor? | The name of three objects that the examiner is called? | The subject has to get numbers from 100 descending from 7 to 7? | To repeat the named objects two stages behind | The subject is shown two objects that he must be called | Must repeat the phrase, without if and or but | Take a piece of paper a right hand bend it in half and put it on the floor | Read and do what you write here close the eye | Formulates a sentence to contain at least one noun and one verb |
|----------|--|---|--|---|---|---|---|--|---|---|
| x | 3.60 | 5.00 | 3.00 | 4.90 | 2.85 | 2.00 | 1.00 | 3.00 | 0.95 | 1.00 |
| α | 0.89 | 0.00 | 0.00 | 0.43 | 0.64 | 0.00 | 0.00 | 0.00 | 0.21 | 0.00 |
| Cv% | 24.85 | 0.00 | 0.00 | 8.68 | 22.39 | 0.00 | 0.00 | 0.00 | 22.39 | 0.00 |

In order to obtain information on the cognitive evaluation of the subjects, we applied the questionnaire "Mini mental state examination" and the results of the analysis of the questionnaire aimed at identifying relevant aspects such as recognition, date, calendar year, season, country, city, etc. Another aspect was the identification by subjects of three objects, counting from 100 descending from 7 to 7 and repeating objects named two stages ago. The subjects were also asked to repeat a sentence, formulate a sentence, and copy a drawing. The results of the statistical indicators can be found in Table 1 [27].

Table 2 Body composition

| | Age, years | Height, cm | Weight, kg | % Fat | % Muscles | % Bone | % Water | Calories consumed by subjects/day | Calories needed by the subjects/day | The difference between the calories consumed and the necessary / day |
|----------|------------|------------|------------|-------|-----------|--------|---------|-----------------------------------|-------------------------------------|--|
| X | 64.40 | 165.68 | 79.55 | 43.13 | 25.80 | 6.83 | 42.22 | 1695.45 | 1345.45 | 350.00 |
| α | 5.00 | 8.41 | 16.52 | 7.84 | 3.17 | 1.32 | 5.68 | 195.64 | 189.37 | 6.27 |
| CV % | 7.76 | 5.08 | 20.77 | 18.18 | 12.30 | 19.36 | 13.46 | 11.54 | 14.07 | 2.54 |

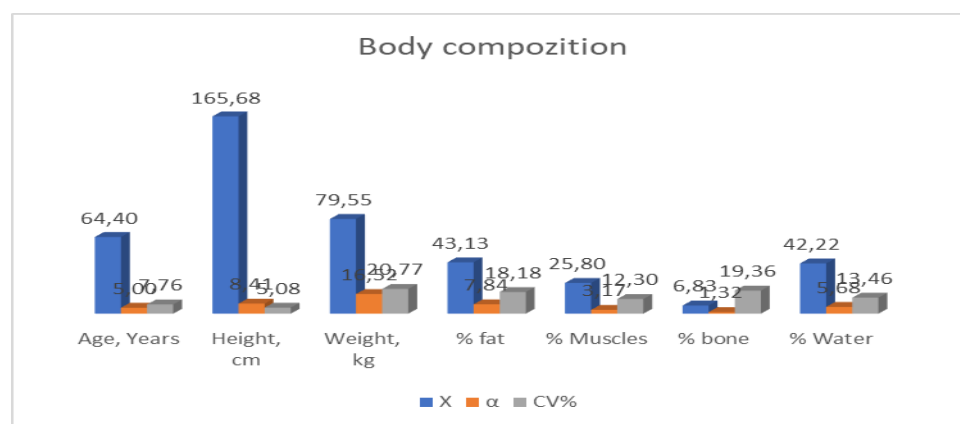


Figure 1 Body composition

The determination of the body composition was made with the help of the "Tanita" apparatus, which found an average of the group of subjects of 43,13 % fat, 25,80 % muscle mass, 6,83 % bone mass, and the percentage of water 42,22 %. As for the number of calories needed by subjects, we calculated using the Harris - Benedict equation.

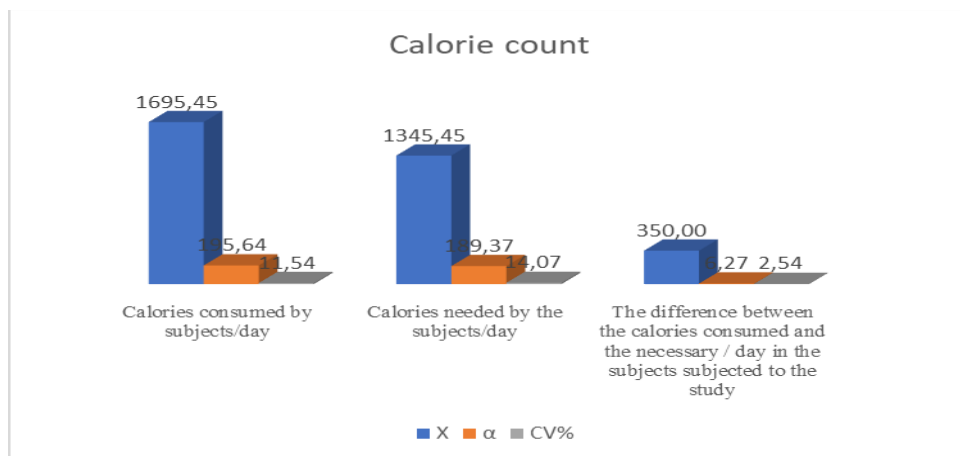


Figure 2 Calorie count

On the calorie requirement in adulthood, it is of major importance for the optimal functioning of the body, and any deviation from the correct dietary plan over a long period of time can create somato-functional imbalances and the installation of various pathologies. In this regard it can be seen in Fig. no.2 the difference in the average between the calories consumed by the patients and the calorie requirement per day of 350 kal/day. In order to carry out a program for adjusting the food diary, we will have to take into account the factors related to "lifestyle, habits, behavior including exposure to different levels of stress, favoring the appearance of diseases" [3].

Table 3 Average of the groups per BMI grade

| | X-IMC | X-The difference between the weight of the patients compared to the ideal weight |
|--------------------------------|-------|--|
| 6 people with normal weight | 21.91 | 6.45 |
| 6 overweight people | 28.18 | 10.02 |
| 4 people with obesity grade I | 32.32 | 20.85 |
| 4 people with obesity grade II | 38.6 | 37.9 |

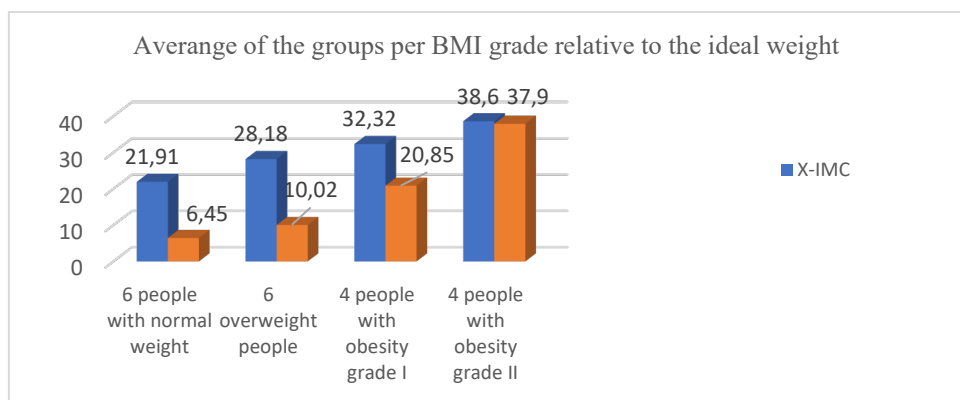


Figure 3 Average of the groups per BMI grade

After determining the composition of body mass per degree of BMI relative to the ideal weight, we have 6 people with normal weight, the average of the group being 21.91 uc, 6 overweight people with an average of the group of 28.18 uc, 4 people with obesity grade

1 with an average of 32.32 uc and 4 people with obesity of grade 2 with an average of 38.6 uc. According to these data, it can be noted that 16 subjects exceeded the degree of normality BMI, which implies exercise programs and a corresponding food diary.

Regarding the weight of the subjects compared to the ideal weight, by group it is as follows: the group of subjects with the normal IBM value has an average difference of 6.45 kg; the group of subjects with the IBM overponderality value has a difference of 10.02 kg; the group of subjects that has an IBM grade 1 obesity value, has an average difference of 20.85 kg and the last group with grade 2 obesity has a difference of 37.9 kg.

Following the determination of the body and mental composition of the subjects of adult age, the objectives of the physical activities programs will be established, as well as the follow-up of the food program given by the nutritionist, depending on the lifestyle of the subjects. For the group of subjects with normal BMI we propose: practicing swimming, fitness, aerobic dance, etc. For the group with subjects with overweight BMI we propose the practice of swimming, aquagym, gymnastics programs, cycling.

For groups with obesity of grade 1 and 2, we propose the following activities: therapeutic swimming, hydrokinotherapy, aquagym, medical gymnastics. To maintain and optimize the psycho-emotional status we propose outdoor walks, salinotherapy, meditation, etc. Another study confirms the importance of physical activities performed in water "Variants of physical activity in water (Aqua gym and Aqua Jogging) have beneficial effects on multiple levels (stimulation of blood circulation, thermoregulation, improving balance and coordination, rehabilitation of structures affected by injuries, etc.) [28].

A 2021 study of a group of 62 men revealed that a program of exercise in water but without dietary intervention on body weight, has resulted in significant but modest results on body weight and body mass index [29]. The 2014 clinical study also revealed that an intensive aquatic therapy program for 2 months, with a frequency of 2-3 times/week, reduces pain, disability, improves quality of life and physical condition in sedentary adults with low back pain and influences body composition (weight, body mass index, % body fat and skeletal muscle mass) [30]. More studies are needed to investigate not only the impact that physiotherapy has on the symptoms of this disease (Covid 19), but also its effects on exercise capacity, muscle strength and pulmonary capacity [31].

3. Conclusions

From recent studies, from the point of view of the composition of the body and mental mass of man, it can be found that the vast majority of researchers and authors emphasize the importance of monitoring people in order to prevent the onset of deviations from the status of normoponderality. The level of somato-functional and psycho-emotional parameters in adulthood demonstrates a differentiated dynamic of the female organism which requires special attention from both the subject and the family doctor, and "The influence of constant activity on adults leads to beneficial morpho functional changes in the body, making it more adaptable to stress and more resistant to pathogenic factors"[32].

The result of the questioning of the subjects subjected to the study on the evaluation of the mental status revealed the fact that they have a temporal, spatial orientation, an appropriate memory and attention, as well as a writing and copying capacity corresponding to the age. The causes of obesity are in continuous research but no single or simple solutions have been found, it requires an approach from several decision makers (schools, parents, state and local organizations, doctors) all of them have the duty to promote a healthy lifestyle.

Author Contributions: For research articles with several authors, a short paragraph specifying their individual contributions must be provided. The following statements should

be used “Conceptualization, Vizitiu Elena and Constantinescu Mihai.; methodology, Vizitiu Elena.; software, Vizitiu Elena; validation, Vizitiu Elena and Constantinescu Mihai.; formal analysis, Vizitiu Elena and Constantinescu Mihai ; investigation, . Vizitiu Elena and Constantinescu Mihai; resources, Vizitiu Elena and Constantinescu Mihai ; writing—original draft preparation —Constantinescu Mihai; writing—review and editing, Vizitiu Elena.; visualization, Vizitiu Elena and Constantinescu Mihai.

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