

APPLICATION OF INTEGRATED PROGRAMMES ON PHYSICAL REHABILITATION TO THE FEMALE STUDENTS WITH OBESITY AND RISK OF METABOLIC SYNDROME

Myronyuk I., Dub M.

Introduction

The problem of overweight and obesity prevalence among the student youth gains a special relevancy as adipositis harms their health and life quality. The reasons of growth in body weight gain of the average student youth are associated by a number of authors with their modern way of life, which differs by a high academic load, low physical activity connected with a sedentary lifestyle, stressful situations, irrational nutrition and sufficient spread of bad habits [1, 12].

The importance of the obesity problems among the youth of average age is also conditioned by a high risk of disease development of cardiovascular system, II-type diabetes, digestive system, musculo-skeletal system and psychiatric disturbance. Given that the majority of the authors emphasise on obesity to become the key problem of the modern society [3, 7, 12], the issue of search and justification of the integrated rehabilitation programmes of physical rehabilitation in the female students with obesity and risk of metabolic syndrome becomes challenging both for timely overweight correction and prevention of a series of diseases in a more maturity age.

The **research objective** is to justify an application of the most balanced measures of physical rehabilitation on the grounds of the analysis of modern scientific approaches to the body weight correction.

Research result

The means and methods of physical rehabilitation, including diet therapy, physical exercises, which find its wide application at all treatment stages of the women with obesity and body overweight, shall be a basis of correction-recovery programmes [1].

Physical trainings are the key component of the integrated programme of physical rehabilitation. The most studies dedicated to use of physical exercises in treatment and prevention of the II-type diabetes, obesity and metabolic syndrome describe the action of the dynamic aerobic exercises. It is regarded that the aerobic exercises specially improve tissue sensitivity to insulin. However, dynamic exercises are rather difficult for the persons with obesity being associated with the number of underlying diseases that are often observed in these patients, and their general severe state - in this case the application of aerobic exercise cannot always be performed [11].

The particular investigations are based in the application of anaerobic strength training, which, according to the authors, leads to system changes and, thus, to a certain extent neutralize metabolic and functional disorders connected with MS development - in particular, improving tissue sensitivity to insulin at the expense of muscle mass increase and promoting II-type diabetes development risk decrease. In addition, resistance training optimizes the process of weight loss preventing the muscle tissue loss [2, 16]. It is found that interval

aerobic exercises of average intensity with duration of more than 150 minutes per week are more efficient in comparison with the remote aerobic exercises.

Numerous investigations have proven that physical exercises are an efficient way to fight against the carbohydrate metabolism disorder. Increasing physical activity favours to use of intramuscular triglycerides (TG) and free fatty acids as energy material and insulin resistance reduction.

In a multi-factorial clinical study of DPP (Diabetes Prevention Program), it was demonstrated that the patients with insulin resistance using exercise, diet and changed their lifestyle resulted in decrease in number of new cases of II-type diabetes more effectively than the use of drug therapy [13].

Motoractivity in aquatic environment can be one of the most efficient means of functional capabilities increase in physical training of the patients with obesity. This type of fitness as Aqua aerobics should be considered as a means of hydrokinesitherapy for those who suffer from overweight. The mechanism of positive action of the exercises in water is displayed in the active training of the breathing muscles and thoracic mobility increase, strengthening of pulmonary ventilation and gas exchange. The exercises with application aqua fitness means can be recommended along with the swimming[5].

Some of the authors in the correction and body weight loss programme recommend using Nordic walking programmes for the women with overweight and obesity in order to improve the functional status of the cardiovascular system, work of inhale muscles and BMI reduction [11].

The positive effect in body overweight and obesity correction is marked by breathing exercise application. Since, the persons with obesity are observed to have increased respiratory frequency, decreased respiratory volume, respiratory muscles weakening, a need is strongly appears in ventilation when doing physical exercises the aim of which is to improve the strength and endurance of respiratory muscles. According to a number of authors, deep breathing together with other physical exercises positively influence upon the body composition and respiratory system, in combination with physical exercises results in fat oxidation increase and total energy consumption [7].

Many clinical, experimental and epidemiological studies have demonstrated the feasibility of widespread implementation of the therapeutic nutrition principles in a comprehensive program to combat obesity and metabolic syndrome. Among the dietary menus being currently used for the MS prevention and treatment, there are three most common options to be identified: a diet with limited fat intake, low-carb diets and a diet with a moderate restriction of fats and carbohydrates ("Mediterranean" diet). The goal of a diet therapy in overweight and obesity treatment is to create a negative energetic balance or calory deficiency. Depending on BMI these values will differ. In the diet of the patients with overweight having diabetes of the II type or more risk factors for cardiovascular pathology and patients with obesity I degree, the energy value of the products they consume should be reduced by 500 kcal / day. This energy deficiency allows to decrease the body weight approximately to 0.5 kg/week and loose about 10% from the initial body weight for 6 month. The patients with obesity of II-III degree should use more aggressive diet with energy deficiency of 500-1000 kcal/day, which allow to spend about 1 kg of the body weight per week and 10% from the initial body weight for 6 month [11].

Psychotherapy is an obligatory component of the integrated programmes on physical rehabilitation as stated in many investigations, the purpose of which is to form in patients an adequate attitude to their state, reduce emotional stress, train the methods of mental self-regulation, form optimistic social attitudes, increase commitment to the implementation of therapeutic and rehabilitation recommendations and participate in rehabilitation programmes and secondary prevention. Alongside with the physical rehabilitation means, the obesity therapy applies the factors of electro-magnetic, mechanic and thermal nature [6]. When using carbon dioxide-hydrogen sulfide baths, the normal ratio of inhibitory and excitatory processes in the cerebral cortex was restored, the rheological properties of blood were improved; the synthesis of low-density lipoproteins (LDL) was reduced.

Modification of the lifestyle, being recognized as a perspective trend in therapy and rehabilitation of thematic patients, is an important condition of physical rehabilitation of persons with obesity. Increase of daily physical activity is recognized as a dominating stage of lifestyle modifications, which is considered as an accessible, simple and efficient prevention method of metabolic syndrome, II-type diabetes and cardio-vascular complications [2].

Conclusion

1. The reasons of decrease/increase of student youth's body weight is connected with their modern lifestyle, namely, with high academic loads, low physical activity connected with a sedentary lifestyle, stressful situations, irrational nutrition and sufficient spread of bad habits.

2. Complex approach is obligatory in a recovery therapy of the patients with obesity and risk of metabolic syndrome development. Kinesitherapy plays an indispensable role in the rehabilitation of the patients with obesity, however, the issues of proper characteristics of physical activity for young people remain unsolved.

3. The issue of strength and aerobic exercises remains discussable and requires further research, especially among the persons of youthful stage.

In view of the above, it can be noted about the perspectives of further searches of long-term programmes application on body weight decrease in the female students with obesity and risk of metabolic syndrome development.

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Author's contact:

Dub Mariana
Senior Teacher
Uzhhorod National University
Faculty of Health and Physical Education
Uzhhorod, Transcarpathian region
marjana.dub@uzhnu.edu.ua