

THE ROLE OF PHYSICAL ACTIVITY IN THE QUALITY OF LIFE FRAMEWORKS, SOCIAL ADAPTATION AND PHYSICAL REHABILITATION OF INDIVIDUALS WITH DISORDERS IN THE ENERGY METABOLISM

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Abstract

There were described the role of motor activity in the quality of life frameworks, social adaptation and physical rehabilitation of the teens with obesity. In the paper were solved factor determining the foundation and direction of a physical rehabilitation program for the teens with primary obesity, it was a quality of life. During performed studies we're using the common questionnaire PedsQL-4.0 (Pediatric Quality of Life Questionnaire) in the Ukrainian version of the two groups of the teens (group № 1, n = 72, teens with obesity, group № 2, n = 72, teens with normal body weight), it were rated basic components of the quality of life: as the physical functioning, emotional functioning, social functioning, school functioning and mental health. Through the data analyzation, the relationships scored indicators of quality of life parameters of physical condition that characterize the severity of obesity and fat distribution features.

Key words: quality of life, nutrition, body mass index, obesity, motor activity.

Ірина Жарова. Роль фізичної активності в якості життя, соціальній адаптації та фізичній реабілітації осіб із порушенням енергетичного обміну. Охарактеризовано роль рухової активності в якості життя, соціальної адаптації й фізичної реабілітації підлітків з ожирінням. Розкрито чинник, що визначає характер і спрямованість заходів фізичної реабілітації в підлітків із первинним ожирінням – якість життя. У процесі досліджень за допомогою загального опитувальника PedsQL-4.0 (Pediatric Quality of Life Questionnaire) в російськомовній версії в підлітків двох груп (група №1, n = 72 – підлітки з ожирінням; група № 2, n = 72 – підлітки з нормальною масою тіла) оцінено основні складові частини якості життя: фізичне функціонування, емоційне функціонування, соціальне функціонування, функціонування в школі й психічне здоров'я. Отримані дані дали змогу провести аналіз взаємозв'язків показників бальної оцінки якості життя з параметрами фізичного розвитку, котрі характеризують вираженість ожиріння та особливості розподілу жирової тканини.

Ключові слова: якість життя, харчування, індекс маси тіла, ожиріння, рухова активність.

Ірина Жарова. Роль физической активности в качестве жизни, социальной адаптации и физической реабилитации лиц с нарушениями энергетического обмена. Охарактеризована роль двигательной активности в качестве жизни, социальной адаптации и физической реабилитации подростков с ожирением. Раскрыт фактор, определяющий характер и направленность мероприятий физической реабилитации у подростков с первичным ожирением – качество жизни. В процессе исследований с помощью общего опросника PedsQL-4.0 (Pediatric Quality of Life Questionnaire) в русскоязычной версии у подростков двух групп (группа № 1, n=72 – подростки с ожирением; группа № 2, n=72 – подростки с нормальной массой тела) были оценены основные составляющие качества жизни: физическое функционирование, эмоциональное функционирование, социальное функционирование, функционирование в школе и психическое здоровье. Полученные данные позволили провести анализ взаимосвязей показателей балльной оценки качества жизни с параметрами физического развития, характеризующими выраженность ожирения и особенности распределения жировой ткани.

Ключевые слова: качество жизни, питание, индекс массы тела, ожирение, двигательная активность.

Introduction. On the way from the postindustrial social development to the knowledge about the society and information era, the intensity of scientific and technological progress is a real examination of biological adaptation, social and other mechanisms for compensating from the difficult aspects of the life of the modern man [1].

It is extremely widespread and the potential of various diseases, trauma, and other psychical and emotional disorders, imbalances and dysfunctions, it largely caused by the pathogenic lifestyle of modern people, physical inactivity, disturbance regimes and quality of food, stress, chronic fatigue, the presence of bad habits, etc [4].

Changes in the diet and physical activity associated with the spread of the obesity often occur due to environmental and social changes connected with the development and the absence of appropriate measures

in sectors such as health, agriculture, transport, urban planning, environment, food processing, marketing, and education.

According to the World Health Organization (WHO) Newsletter №311 (from the March 2013), since 1980, the number of people worldwide suffering from obesity more than doubled. In 2008, more than 1,4 billion adults aged 20 years and more suffer from obesity. Particularly, the negative tension of the last years is the development of obesity at the young age. Thus, in 2010 about 40 million children under 15 had excess weight or obesity [12].

The rapid rising of the spread of obesity in recent decades, probably, there is not associated with changes in the genetic structure of humans in so short a time. It caused by the significant changes in the lifestyle of the population [7]. Interaction of genes that bringing to obesity from environmental factors and determine the degree of excess body fat [3].

Prospective epidemiological studies of the feeding behavior of people in the US have shown that in 15 years fixed a significant reduction of motor activity in children and adolescents [13]. The study of schoolchildren motor settings [8] showed that almost 80 % of students had overweight, a limited exercise in a class at school and only 20–25 % further engaged in various sports clubs. However, these studies were not constant and often interrupted by the illness. In addition, according to a special surveying [6], 70 % of children with overweight played music, visited various sections, studied foreign languages. The students with overweight have no morning exercises and/or procedures harden. Games and exercises outdoors they had not so often. In families of adolescents enrolled in the college and high school did none morning exercises by themselves or with the family members. Unfortunately, sports and recreational physical activity in these families are not practiced.

Thus, from all forms of physical training of students with overweight is only physical education classes in school, therefore the daily range of motion is clearly low. The expectation of the compensation of the lack of movement activity by the spontaneous motor activity is not so necessary because these children have become a regular sedentary lifestyle, quiet games with peers. Even in healthy children develop properly, only spontaneous motor activity and physical culture lessons in schools can not provide the required range of motion.

According to research [7] in the teens during the puberty drastically changes psyche and behavior. Obese teens begin to lag from the teens with normal body weight in the performance of those movements, teens with normal body weight still had the advantage. During this period, even on smooth physical training lessons children either boys or girls, on any occasion trying to evade many exercises or exercises make fewer times, abandon attempts to exercise the result.

The analysis of progress under the «Physical culture» education program [8] showed that students from 12–13 years initially stages of obesity are beginning to dramatically lag behind in the development of endurance, speed, and strength. Particularly, they make out with exercises on the equipment, climbing ropes, acrobatic exercises. They fail high jumping and fast running.

Evaluation of the motor activity [9] spent on physical education classes for children with overweight (using a pedometer) showed that by fourth grade these students had average movements per lesson (low level only in rare cases) compared with children with normal weight. From the fifth to the eighth-grade performance motor activity both in boys and in girls with overweight was only small.

Free time in the most cases students spending by the watching television or playing computer games or reading fiction. Thus, students in fourth grade wasting 44–58 % of their free time by the watching television nearby the two hours per day, and ninth grade students – more than three hours per day. The watching television and video programs, playing the video games occupy more and more of the free time [7].

Talking about the food, it was fixed an increasing part of the diet of sandwiches meals, «fast food» and high-calorie foods advertised on television. There is a direct correlation between watching television and the magnitude of overweight, especially in the teens [6].

The correlation between television watching and obesity due to three factors: a decrease of the motor activity, increased caloric intake while watching basal metabolism and decrease in a sitting position. It was found that children suffering from obesity, physically less active than children of normal weight [3].

The Connection with Scientific Planes and Themes. This research performed according to the Plan of the scientific and research working of the Physical Rehabilitation dept., NUUPES and «Consolidated Plan of research in the area of physical culture and sports in 2016–2020 yy.» by the theme 4,6 «The improvement of the theoretical and strategical foundations of the programming of physical rehabilitation process during the initial exogenous and constitutional forms obesity», state registration № 0116U001665.

The aim of the research was to define the role of physical activity in the quality of life frameworks, social adaptation and physical rehabilitation of the teens with disorders in the energy metabolism.

Research Objectives there are follows: to evaluate the quality of life and nutrition of the teens 11–15 years old with primary form of the obesity and teens 11–15 years of normal levels of body mass index (BMI); to compare and evaluate the indicators studied in the two groups of teens; to analyze the relationships scoring indicators of quality of life parameters of physical development that characterize the severity of obesity and fat distribution features.

Materials and Methods. Methods, used in the research were the generally scientific methods (as the analysis, synthesis, generalization, comparison); sociological methods (as the interviewing, questioning) and the methods of mathematical statistics.

The quality of life in our studied group was evaluated in 72 children 12–15 years (group №1) with the obesity using common questionnaire PedsQL – 4,0 (Pediatric Quality of Life Questionnaire) in the Ukrainian version. The questionnaire measures the overall health of 100 point scale, as the components of health that are not specific to all age groups, specific disease or treatment program: as the physical functioning, emotional functioning, social functioning and operation of the school. The questionnaire filled both teenagers and their parents independently.

Given the current lack of regulatory quality of life of children, we performed parallel surveying conducted 72 healthy children without obesity, matched by sex and age (average age was 13,5 years) and their parents after their acquaintance with the procedure and consent (group № 2). Research performed at the Center for Radiation Medicine of The Academy of Medical Sciences of Ukraine.

Results. The development of overweight and obesity and related noncommunicable diseases can be largely prevented. Favorable environmental conditions and society are crucial to the formation of choice people, determining the most appropriate (available, accessible and affordable cost) choose healthier foods and regular motor activity and thus preventing the development of obesity.

At the individual level, one might [1]

- restrict calorie intake from general fats;
- increase consumption of fruits and vegetables as well as legumes, whole grains, and nuts;
- regularly engage in physical activity (60 minutes a day for children and 150 minutes per week for adults).

According to WHO experts [11] responsible attitude to their own health can fully give positive results only when people have the opportunity to keep a healthy lifestyle. Therefore, the level of public importance there follows:

- support the people in following recommendations by the constant manifestation of political commitment and participation by many public and private stakeholders;
- to take measures for the regular physical activity and healthy eating, there is affordable and easily attainable to all, especially the poorest.

Adopted by the World Health Assembly in 2004, Global Strategy of the Diet, Physical Activity, and Health [12] were formed a description of the necessary actions to support healthy eating and regular physical activity. The strategy has four main objectives:

1. To reduce the risk factors for chronic diseases that are caused by unhealthy diet and physical inactivity, through the health actions.
2. To increase awareness and understanding about the impact of nutrition and health of motor activity and the positive impact of preventive measures.
3. To develop, enhance and implement policies and action plans at a global, regional and national level for improving the nutrition and increase physical activity to be sustainable, comprehensive and actively to involve all sectors.
4. To follow the scientific achievements and to promote research in nutrition and physical activity.

Thus, a large and versatile range of critical issues related to the violation of energy metabolism, has long ceased to be purely medical and acquired global, universal character because of the stability and complexity dysfunction, accompanied by long and often persistent disability, reduced the quality of life these patients [].

Over the past decade, research activity in the field of quality of life (QL) has been significantly increased worldwide as one of the most important indicators of health care effectiveness [8]. The concept of QL research is logically based on the main components of the WHO definition of health and offers an effective model for an integral assessment of the child's condition, a comprehensive and deep understanding of the impact on various areas of its functioning.

The QL is understood as an integral characteristic of a person's physical, psychological and social functioning, based on his subjective perception. The value of the indicator lies in the fact that subjective

evaluation is based on strict principles of evidence-based medicine, which makes the quality of life an informative and reliable criterion [7].

Measurement of the QL in pediatrics is carried out both in medical, social and in clinical studies, covering almost all nosological forms.

Subjective experiences of the child, his attitude to health, illness, treatment, as well as to the family, school, life as a whole can have a significant impact on the formation of the clinical picture of the disease. An important factor that led to the development of QL research methodology in pediatrics was the understanding of the effective monitoring of the child's health and successful treatment that's impossible only on the basis of clinical and laboratory data without determining the condition of the «optimal functioning» of the child and his parents.

From the point of view of society, obesity is associated, first of all, with laziness, selfishness, from reduced of the mental abilities, low activity in society and low academic performance, as well as with ill health, inadequate nutrition, and low motor activity. According to a study performed in the United States, children share a negative evaluation of people with obesity in the society, regardless of the body weight [4]. Children, starting from the age of five, are worried about their own weight, affecting appearance, physical performance, self-respect and self-esteem [8], but parental approval and lack of concern about obesity in the child can play a protective role in reducing self-esteem [9]. Among teens with severe forms of obesity, 48 % have mild or severe depressive symptoms, 35 % have a high level of anxiety. Psychopathological distress is detected in 26 % of obese individuals and worsens the QL more than the obesity-related somatic diseases [1].

Thus, knowledge about the characteristics of disorders of the QL of the teens with obesity can help in the development of rehabilitation programs and assess their effectiveness.

According to our survey results, the total score for assessing the QL in a group of the teens with normal BMI values (group № 2) was 80 (at average) for children and 74 for parents. Parents assess the QL of children lower than the children themselves, with the exception of emotional functioning. The greatest difference in the assessment of the QL level is indicated by the scales of social functioning and functioning in school. The lowest indices the teens with normal BMI values are revealed by the scales of emotional functioning and functioning in school. At the highest level, there were physical and social functioning (fig. 1).

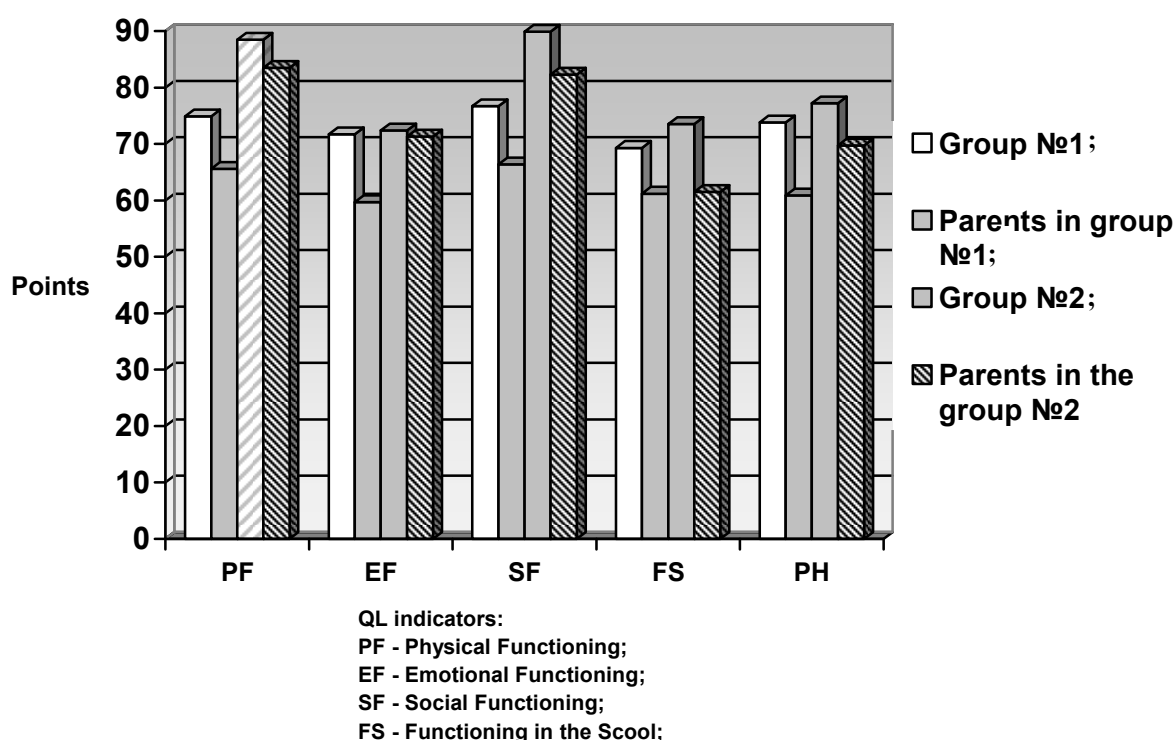


Fig. 1. The Indicators of the QL of the Teens:

PF – physical functioning;
 EF – emotional functioning;
 SF – social functioning;
 FS – functioning in the school;
 PH – psychic health.

In adolescents with obesity (group №1), compared to the control, the overall QL indicator was significantly lower, both according to the assessment of the children themselves, there was 73 points, and their parents, there was 63 points. Obese children are less likely to assess their physical and social functioning than their peers without obesity – 74,9 and 76,7, compared to 88,5 and 89,9, respectively. Parents also gave a low assessment of physical (65,6 points), social (66,4 points) and emotional (59,7 points) aspects of the QL of their children. The parents' score for all indicators was lower than that of the children (fig. 1).

According to the survey, we noted that obesity in the children can limit certain types of motor activity. So, when they answering the questions of the questionnaire, the children noted difficulties in such kinds of activity: running, physical exercises performance, muscular pain during physical exertion. Limiting the participation of children with obesity in sports games and competitions brings to adverse social consequences, disrupting the adaptation in society. The questioned children had problems in the communicating with their peers. The stereotype of attitudes towards obese people in the society is spreading among children, the answers to questions of the scale of social functioning have shown that children with obesity suffer from ridicule, they find it difficult to find friends.

The environment plays a more significant role in childhood than in adults, especially with considerable teenage dependence on peer opinion. Children with obesity are painfully experiencing shortcomings in their appearance, which, of course, should be reflected in a decrease in the evaluation of emotional functioning. The lack of reliable differences in the evaluation of this aspect by obese children compared with the control is probably due to an overestimation of the assessment because of the reluctance to demonstrate their experiences, which can be considered as a variant of psychological protection. In part, this assumption can be confirmed by an estimate given by the parents of children with obesity – 59,7 points, it was significantly lower than the parents' score in the control group – 71,3 points.

The QL of children is affected by family, friends, teachers, with the last two factors becoming more significant at school age. Children, both with the presence of obesity and with a normal body weight, as well as their parents very low evaluated life in school. Thus, the school can be considered as a stress factor, significantly affecting the quality of life of children.

Girls with obesity, in comparison with boys with obesity, lower estimated almost all parameters of QL: physical functioning – the indicator was 70,5 and 79,3 points, emotional functioning – 65,4 and 78,0 points, mental health – 69,7 And 77,9 points, social functioning – 71,6 and 81,8 points. The indicator of school functioning in girls was higher and amounted to 71,8 points, compared with boys, whose score was 66,8 points. Parents of girls rated lower the same QL indicators as their children, but the parents' score for all indicators was even lower than that of children.

The scores of the OL indices were compared with the parameters of physical development that characterize the severity of obesity and the distribution of fat tissue. As a result of the analysis of interrelations, moderate negative correlations of the indices of practically all aspects of the quality of life with the BMI index were revealed (table 1). In the group of children without obesity, there were no reliable correlations of the quality of life indicators with similar parameters of physical development.

Table 1

The Correlation Coefficients of Various Aspects of the QL with the BMI Index in Adolescents with Obesity

Indicator	Children	Parents
Physical functioning	-0,34	- 0,39
Emotional functioning	-0,40	- 0,33
Social functioning	-0,43	- 0,35
School functioning	-0,33	н/д
Psychic health	-0,43	- 0,33
QL total indicator	-0,41	- 0,36

Based on the study about the relationships, it can be concluded that the QL in obese children is more affected by the deterioration of social and emotional functioning. Apparently, this can be explained by a more negative perception of the shortcomings of a figure with a significant distribution of adipose tissue both by the children themselves and by their environment.

Thus we see that contempt for the physical aspects of rehabilitation of patients brings to smooth rather adverse effects.

Rehabilitation of persons with obesity should be a long-term state policy aimed at optimum and the full restoration of their life.

According to some authors [7] physical rehabilitation of persons with disorders of the energy metabolism includes cases about the problem of the using of physical factors in the rehabilitation of patients. These include exercise, environmental factors, hygiene factors, spa treatments and more.

If obesity treatment were offered a wide range of therapeutic measures - from diet to use modern medicines to reduce overweight. At the same time, domestic and foreign experts note that the pathogenic agents that contribute to a cure obesity, there is. Additionally, some complex of the medical interventions, prescribe untimely and unjustified, excluding major pathogenetic factors, stage of disease severity and clinical syndromes.

It is important to consider that physical rehabilitation used in patients with obesity can give a positive effect when they detect drilling performance and enhance adaptive capacity, provided that physiotherapist knows and takes into account a number of interventional rules and principles of physical exercise.

A. P. Averianov [1] indicates that in the first dosed exercise causes a sharp decrease in insulin resistance in obese patients; leptin level decreases after the seventh physical exercise and remains low for four weeks of treatment. Additional aerobic exercise combined with a low-calorie diet can reduce the size of adipocytes of subcutaneous adipose tissue. In most cases, weight loss, the following aerobic activity, like walking, cycling, aerobics and various options for aerobic trainers.

According to I. M. Hryhus [6] therapeutic effect of exercise is based on a significant increase in energy consumption, which is possible due to the normalization of metabolism. With loads of aerobic orientation is enhanced lipolytic processes, improving adaptation to load all organs and systems.

Promoting consumption of large quantities of carbohydrates, exercise focus ring mechanism catalyzed removal from stores of the neutral fat subsequent transformation of phosphatides that are easily oxidized to carbon dioxide and water.

Thus, despite the fact that physical activity in children with obesity can greatly vary, one only reduce time spent in sedentary position leads to a shift of the energy balance towards reducing energy entry, excluding the impact of diet and physical activity programs. In controlled studies, some authors [3,9,15] has been proven that children with obesity are encouraged to reduce time spent passively (watching TV, on the computer), noted a marked reduction in body weight compared to those who were encouraged to increase motor activity (all patients followed low-carbo diet). In addition to reducing passive pastime, effective turns any extension of motor activity in daily life: climbing stairs instead of using elevators, reducing the use of transport etc.

Conclusions in the teens with obesity in comparison with the control, the overall QL is statistically significantly lower, both according to the assessment of the children themselves – 73 points, and their parents – 63 points. Based on the study of the relationship of all aspects of the questionnaire, it is noted that QL in children with obesity is more affected by the deterioration of social, physical and emotional functioning. The assessment of parents for all indicators is lower than that of children. Obesity limits the normal existence of the child, and these limitations reduce the QoL of children to a greater extent than the disease itself.

Prospects for further research are related to the development of the concept of physical rehabilitation for primary adiposity in adolescents, taking into account the factors characterizing the quality of life and nutrition in this category.

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