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Original Contribution

KINESITHERAPY APPROACHES IN PRESCHOOL AND SCHOOL AGE CHILDREN WITH OBESITY

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ABSTRACT

Obesity among preschool and school-aged children is a serious public health problem worldwide, especially because of the long-term health consequences. Childhood obesity is a major public health problem, due to long-term health, social and economic consequences. Obesity is mainly caused by an imbalance between energy intake and expenditure. However, the cause is more complex and multifactorial, originating from a complex interaction between genetic, biological, environmental, socio-economic and cultural factors. There is convincing evidence for the health benefits of regular physical activity in childhood. These include a favorable course of growth and development processes, general strengthening of the body. The aim of this study is to examine the possibilities of kinesitherapy as a way to deal with obesity in preschool and school-aged children. Including the potential factors contributing to the obesity epidemic, the effect of childhood and adolescent obesity on health. Regular physical activity in childhood creates conditions for optimal development of the musculoskeletal system, good coordination and control of movements and helps maintain weight within healthy limits. Kinesitherapy is one of the main methods for combating obesity in childhood. Prevention through a kinesitherapy approach is part of limiting this significant problem on a global scale. It helps by increasing physical activity, which reduces body weight, strengthens muscle strength and endurance, improves the function of the respiratory and cardiovascular systems, as well as the coordination, balance and self-esteem of the child. Physiotherapists play a major role in improving functional motor skills and increasing physical activity in children with overweight or obesity.

Keywords: obesity; children; overweight; approaches; kinesitherapy

INTRODUCTION

In recent decades, obesity, a complex and multifactorial disease, has become one of the most common nutritional diseases in the world, reaching pandemic proportions, so much so that the World Health Organization (WHO) considers it the "disease of the 21st century" (1, 2). In 2019, the World Obesity Federation estimated that in 2025 there will be 206 million children and adolescents aged 5–19 years living with obesity, and in 2030 – 254 million (3).

Childhood obesity is a major public health problem due to long-term health, social and economic consequences (4). Recent studies have shown that in most cases, early childhood obesity can develop into adulthood, thus increasing the risk of diseases that affect the quality and duration of life, such as cardiovascular disease, type 2 diabetes, orthopaedic complications and musculoskeletal problems, psychobehavioural pathology, hypertension, respiratory problems (5).

The current epidemic of childhood obesity is largely explained by the imbalance between energy intake and expenditure, which is influenced by a wide range of environmental influences, including obesogenic school environments (6).

Obesity is primarily caused by an imbalance between energy intake and expenditure. However, the cause of obesity is more complex and multifactorial, originating from a complex

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interaction between genetic, biological, environmental, socioeconomic and cultural factors. Genetics and biology are predetermined, but other factors can be modified. These include family eating, sleeping, and exercise behaviours, access to healthy food at school and in the community, availability of safe places to be physically active, and adverse childhood experiences (7). Parents play a crucial role in shaping their children's food choices and activity levels, making the home environment a vital factor in the spread of childhood obesity. This section explores how parental attitudes, behaviours, and the overall home environment can influence children's eating habits and physical activity, highlighting the importance of parental engagement in promoting healthy lifestyles (8).

Schools play a key role in shaping children's health and well-being, particularly with regard to childhood obesity. As a central part of children's lives, educational institutions have the opportunity to positively influence students' habits and behaviours. Implementing school-based programs that promote physical activity, healthy eating, and nutrition education can make a significant contribution to combating childhood obesity and promoting lifelong healthy habits (8).

Technological innovations are essential in combating childhood obesity by providing tools and resources that encourage healthier lifestyles. Technologies, such as fitness trackers allow children and their parents to monitor their physical activity levels, encouraging more active behaviour. These devices often include features that gamify physical activity, making it more engaging and motivating for children to participate in regular exercise (9). Mobile apps have also emerged as effective resources for promoting healthy eating and physical activity among children. Apps that track food intake and offer personalized meal suggestions can help children and families make healthier dietary choices. In addition, many apps provide interactive features, such as virtual challenges and social sharing, that can improve motivation and adherence to healthy behaviours (10).

Artificial intelligence (AI) is another technological innovation that has the potential to revolutionize efforts to prevent childhood obesity. AI-driven platforms can analyze user data to provide personalized diet and exercise recommendations, adapting to individual preferences and needs. This personalized approach can help maintain engagement and adherence to healthy lifestyle changes, ultimately contributing to the prevention of childhood obesity.

There is compelling evidence for the health benefits of regular physical activity in childhood. These include favorable growth and development processes, general strengthening of the body. Regular physical activity in childhood creates conditions for optimal development of the musculoskeletal system, good coordination and control of movements, and helps maintain weight within healthy limits (11).

Objective

The objective of this article is to examine the possibilities of kinesitherapy as a way to address obesity in preschool and school-age children. Including potential factors contributing to the obesity epidemic, the health effects of childhood and adolescent obesity, and recommendations that health professionals can consider when working with children, their parents, and their communities.

MATERIAL AND METHODS

We used the following databases to select information: PubMed, Google Scholar, Medline, Scopus.

DISCUSSION

Obesity in children is a serious health problem that requires timely diagnosis and a comprehensive therapeutic approach. The diagnostic approach and assessment of the condition begins with a detailed medical examination and collection of information about the child's eating habits and level of physical activity. Anthropometric measurements are performed - height, body weight, waist and hip circumference, as well as calculation of the body mass index (BMI), which serves as the main indicator of the degree of obesity.

In order to establish possible causal factors, overweight children should be referred for consultation with an endocrinologist, paediatric neurologist and gastroenterologist. In addition, additional laboratory tests are

performed - biochemical blood analysis and hormonal profile, in order to detect possible metabolic or hormonal abnormalities.
Treatment of childhood obesity often proves difficult. Data show that only 25% of affected children manage to permanently reduce their body weight, another 25% do not see any significant change, and in about half the condition continues to worsen despite therapeutic efforts.

Due to these challenges, the emphasis is increasingly placed on prevention. It should start early and be aimed at creating a healthy lifestyle. A basic principle in both the prevention and treatment of obesity is the implementation of a comprehensive approach - including limiting energy intake through healthy eating, increasing physical activity through an adapted motor regimen, and building sustainable, beneficial habits from an early age.

Interventions for obesity in children are usually based on the concept of energy balance. Energy balance is equivalent to energy intake minus energy expenditure. Based on this theory, if energy intake is greater than energy expenditure, this leads to excess obesity. Currently, two common approaches to obesity management include either a combination of the two; reducing energy intake through nutrition education and healthy eating or increasing energy expenditure through physical activity (12).

Some evidence suggests that childhood obesity can be successfully treated with improved gross motor skills, motor coordination, and physical activity. This area of research is generally based on the assumption that children with well-developed gross motor skills are more likely to engage in high levels of physical activity than those with poorly developed functional motor skills. Because obese children and adolescents have poorer coordination, balance, speed, agility, and fine and gross motor skills compared to their healthy-weight peers (13), they are often unable to meet physical activity recommendations and cannot reap the benefits that physical activity offers (14-16).

Kinesitherapy is one of the main methods for combating childhood obesity. It helps by increasing physical activity, which reduces body weight, strengthens muscle strength and endurance, improves the function of the respiratory and cardiovascular systems, as well as the coordination, balance and self-esteem of the child. The applied complex treatment also includes phytotherapy, climatotherapy and physiotherapy. Climatotherapy affects the respiratory, cardiovascular, nervous, immune systems, as well as the metabolism in the body, which is why it is used as a method for treating obesity. It is excellently combined with the above-listed methods of complex treatment, but cannot be the main one (17).

Rehabilitation therapists play a major role in improving functional motor skills and increasing physical activity in children with overweight or obesity (18). They have an understanding of physical function and movement and how to deal with any impairments in physical function that may limit movement and participation in activity (19). Physical education teachers, in collaboration with rehabilitation professionals, can develop high-quality physical education programs in schools to facilitate maximum improvements in the health and well-being of children who are overweight or obese (18). Participation in sports and more active learning in school are major factors in increasing physical activity, energy expenditure and are recommended interventions (20).

When preparing a physical activity regimen for obese children, it is important to take into account their individual physical and mental abilities, age, gender, as well as the degree and type of obesity. The most appropriate forms of kinesitherapy in these cases include:
1. Morning hygienic gymnastics, performed immediately after waking up;
2. Therapeutic exercise - in the form of organized or individual classes;
3. Dosed walking or walks;
4. Participation in sports and outdoor games such as basketball, volleyball, football, handball and tennis;
5. Tourist activities - outings, field trips and hikes;
6. Hardening procedures.

These activities should be selected and implemented carefully, with a view to their safety and effectiveness in relation to the specific needs of the child.

- Examples of kinesitherapy exercises in preschool age (3–6 years):

1. Game “Catch the balloon”

Goal: Development of coordination and aerobic endurance
Children run in a circle, trying not to drop a flying balloon in the air.
2. Climbing along a "tunnel" (using hoops and pillows)
Goal: Activation of the muscles of the arms, legs and abdomen
Improves spatial perception and basic motor skills.
3. Jumping from a place into hoops on a path
Goal: Development of explosive strength and body control
Possibility of increasing intensity through time or repetitions.
4. Breathing game "Inflate the balloon"
Goal: Strengthening the respiratory muscles and improving lung capacity
Performed while sitting – deep inhalation and long exhalation with visualization.

- Examples of kinesitherapy exercises in primary school age (7–12 years):

1. Aerobic warm-up with music (10 min.)
Jump-step, arm swings, shoulder circles, squats with jumping
Goal: Increase heart rate and body temperature
2. A series of bodyweight exercises:
Squat with arm raises – 3 sets of 10–15 repetitions
Plank – hold 20–30 sec
Lifting the pelvis from a lying position (gluteus bridge) – 2 sets of 12 repetitions
Goal: Activation of the muscles of the legs, back and abdomen, improvement of metabolism
3. Game "Obstacle course"
Cones, ropes, mattresses are used
Children go through a route by running, climbing, jumping
Goal: Intensive load and engagement of the whole body
4. Flexibility exercises and Relaxation:
Cat back – 5 reps
Sitting forward bends – hold 10 sec
Slight torso rotation in a sitting position – 5 reps per side
Breathing: 3 deep breaths with exhalation through the mouth.

Recommendations:
Activities should be fun, age-appropriate and include positive encouragement.
The use of music, games and competitive elements increases motivation.
The presence of a physiotherapist is desirable to adjust the load and monitor the correct technique.
Therapeutic gymnastics procedures can be carried out after school hours. Three times a week for 60 minutes of sports games - football and basketball, as well as fast walking and running for short distances. A good effect is obtained if combined with breathing exercises (21).

CONCLUSION

The epidemic of obesity and overweight in children has been on the rise in recent decades. In conclusion, this study demonstrates that a structured physiotherapy program has a significant place in both the prevention and treatment of overweight and obese children. Prevention through a physiotherapy approach is part of limiting this significant global problem. Rehabilitation professionals must be prepared to deal with the problem of obesity. They should offer specific strategies and plan different interventions for preschool and school-age children who are overweight. They should be able to deal with the mechanical and physiological impairments that accompany the disease and encourage children to maintain a physically active lifestyle in the long term. The benefits of kinesitherapy are very great in this regard. Associated with increasing metabolism, hardening through appropriate methods, physical exercises and intensive physical activity in the open air. These activities should start from an early age, be a priority throughout the entire period of growth and life.

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