The Impact of Physical Exercises on Child Obesity

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Abstract

In recent years, there has been a noticeable increase in the number of cases of paediatric obesity, regardless of sociodemographic classification. Furthermore, the severity of obesity in children and adolescents has increased despite these rising instances. In the twenty-first century, childhood obesity and overweight have become significant public health concerns. Overweight and obesity are global issues that mostly impact low- and middle-income nations, particularly in metropolitan areas. In contrast, childhood obesity and overweight have caused more fatalities globally than childhood underweight. This review will discuss why early intervention to engage in childhood obesity issues is very important. It has been suggested that the obese children are at risk and have a have a higher likelihood of premature death. Currently proposed strategies to deal with childhood obesity include adapting a proper and healthy diet, limiting sedentary behaviour, and increasing physical activity. The effects of physical activity on body fat, insulin sensitivity and resistance, and metabolic factors in obese children, as well as the type, intensity, and duration of exercise, will be key topics of discussion. This review will shed light on how aerobic exercise, resistance training, and compound exercise differ in their effects on the risk of cardio-vascular disease in childhood obesity.

Key words: Physical activity, Paediatric obesity, Treatment for obesity

Obesity in children is characterised as having an excessive amount of body fat in a quantity that is harmful to health. It makes sense to assume that obesity develops when calorie intake greater than energy expenditure intake. The increasing prevalence of obesity around the world appears to be mostly influenced by environmental variables, cultural background, and lifestyle choices. Still, culture and individual lifestyle decisions usually play a big part in obesity (Anderson & Butcher, 2006).

Although obesity has been regarded as the most common health condition affecting people in modern society, its prevalence is currently gradually rising in both industrialised and developing countries. Citing 2022 World Obesity Federation research, it was projected that the percentage of children in India between the ages of 5 and 9 who are obese will reach 10.81percent by 2030. This research is alarming since it reports that one in ten children globally and more than half of the youngsters in the region are obese. The statistics came from a report written by the Federation, which works with the World Health Organisation (WHO). Based on the professional opinion that childhood obesity is primarily an urban issue, India is unlikely to be able to slow the growth of childhood obesity by 2025, which is why the data in this research is alarming and worrisome for the country. When a child's body mass index (BMI) is greater than 30, paediatricians define that child as obese. Complex factors are the main cause of the recent sharp increase in childhood obesity. School closures during pandemic lockdowns resulted in a drop in physical activity.

Computer games and online media consumption are the primary culprits lowering physical activities in young children. These children have a significant chance of developing childhood diabetes, heart problems, and other ailments as they grow older. Consequently, in order to put management and prevention strategies into place, parents must take childhood obesity seriously. Children should be encouraged by their parents and role models to eat a healthy, high-protein, and vitamin-rich diet, as well as participation in regular physical activity.

Obesity among School Going Children in India

The purpose of this research is to determine how various exercise regimens and intensities affect the alterations in body composition that occur in overweight and obese kids and teenagers. The study discovered that any combination of moderate- to high-intensity exercise outperformed all other exercise modalities in terms of increasing body fat percentage and BMI, decreasing fat mass, and lowering weight. When it came to building fat-free mass, resistance training worked best (Huang et al, 2023).

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There were 2033 studies in all, including 45,890,555 people from 154 different nations or regions. In kids and teenagers, the total obesity prevalence was 8.5 percent (95% CI 8.2-8.8). We discovered that the frequency varied from 0.4 percent in Vanuatu to 28.4 percent in Puerto Rico. Countries with Human Development Index values of 0.8 or higher, as well as high-income countries or areas, were have higher rates of childhood and teenage obesity. From 2012 to 2023, there was a 1.5-fold increase in the prevalence of obesity compared to the years 2000 to 2011. When obesity rates were categorised by 11 risk variables, significant disparities in prevalence were observed. Obesity increased the incidence of depression and hypertension in children and adolescents (Zhang et al, 2024).

The underlying cause of childhood obesity is generally acknowledged to be an imbalance between energy intake and expenditure, and dietary and lifestyle choices can help to achieve a positive energy balance. The rates of childhood obesity are expected to climb even higher. Consequently, it is imperative to take into account its consequences for both mental and physical well-being. Adolescent and juvenile obesity have far-reaching consequences. They comprise not only physical health outcomes like hypertension, hypercholesterolaemia, metabolic syndrome, diabetes with insulin resistance, orthopaedic issues, sleep apnoea, asthma, and hepatic steatosis, but also psychological, social, and behavioural outcomes like a higher chance of problems with self-esteem, body image, social exclusion and discrimination, depression, and a less fulfilling life (Kumari et al, 2022). The prevalence of obesity was found to be lower in garrison schools due to the encouragement and priority placed on games and physical activity, according to research on cases of obesity in school children conducted in a military camp in North-Eastern India. When Kunwar et al (2008) researched this issue, they discovered that children in high-income schools were three times more overweight (15.3%) and obese children (6.8%) as compared to those in lower-income schools.

Childhood obesity is caused by numerous factors, such as too much indoor exercise, indulgence in games, and entertainment (such as watching TV, using the internet, and playing computer games). These factors can be present alone or in combination with other factors, such as neighbourhood that are unsafe for walking and other outdoor activities, lack of playgrounds and open spaces in schools and communities, and a shifting away from sports. The practice of watching television is likely the most well-established environmental factor linked to the early onset of paediatric obesity. Studies have indicated that the relationship between media consumption and obesity is weak to non-existent. A comprehensive preventative approach should incorporate the best possible combination of clinical evaluation and environmental modifications to encourage physical activity (Kar & Kar, 2015).

The effect of exercise on children and adolescents who are overweight or obese (BMI, expressed in kg/m^2) concluded that physical activity raises children's and teenagers' BMIs who are overweight or obese (Kelley & Kelley, 2013).

Follow Up With Issues Related to Childhood Obesity

Experts constantly advise analysing the primary causes of obesity in order to provide better therapy, they also stress the need for strong teamwork to maximise treatment satisfaction and achieve favourable outcomes for obese children.

However, in children and adolescents aged 13 to 18, treatments that solely target physical exercise can lower the risk of obesity (BMI). It is not clear from the data in this age ranges whether diet-only interventions are beneficial, but there is some indication that diet-plus programmes involving physical activity may be. The new review is noteworthy since it indicates that there are no apparent negative consequences or health disparities from interventions aimed at preventing childhood obesity (Brown et al, 2019).

Along with team work, another way to enhance treatment compliance includes adjusting nutrition and providing psychological support along with physical activity (Table 1). Further more, cooperation with families, social circles, and teachers is also very significant in establishing permanent and positive behavioural changes in children (Epstein et al, 2008).

Table 1: Treatment approach in long term follow-up of child obesity

1	Extra calorie intake reduction
2	Increasing exercise
3	Motivation for behavioural modification
4	Drug therapy
5	Surgery

Physical Activities to Combating Child Obesity

Physical Activity

It has been hypothesised that a relentless decrease in physical activities among all age children groups intensely contributes to rising rates of obesity and overweight all around the world. Lower support rates in sports and PAs, especially among youthful young ladies, are moreover related with extensive obesity and overweight predominance.

The study found that aerobic exercise, in particular, effectively interferes with the course of non-alcoholic fatty liver disease by affecting visceral and subcutaneous adipose tissue as well as the composition of hepatic lipids. Systematic registration of reviews, exercise that is intense promotes a negative energy balance because it modifies energy intake and expenditure without altering feelings of hunger, indicating that teenagers are not susceptible to food frustration (Ramirez-Velez et al, 2018).

According to reports, the university population is in a stage of life where certain behavioural and metabolic changes take place. Therefore the study's findings have significance for both public health and therapeutic practice. This has increased the percentage of overweight and obese Colombians, particularly among university students. These developments have also resulted in the adoption of Western foods and lifestyles (Gonsalez-Ruiz et al, 2017).

Exercise Types and Examples for Children (Takken et al, 2012)

1. Aerobic exercises: These work the big muscles of the body and boost respiratory power while also raising heart rate. Examples include skate-boarding, kayaking, dancing, basket-ball, swimming, gymnastics, volley ball, tennis, rope jumping, house cleaning, running, and cycling.
2. Building muscles through exercises like pushups, weight-lifting, and rope climb a rope, tree, or rock.
3. Bone strengthening: Exercises such as running, climbing mountains, walking, playing basket ball and volley ball, and jumping rope should be done at least three times a week.
4. Extension 'Strain': Increases muscle elasticity and lowers the risk of injury, as shown in gymnastics, yoga, and dancing.

Educating kids to adopt a lifestyle that integrates nutrition treatment and behaviour modification to promote physical activity can be difficult in today's technologically savvy world. A substantial difference was found between the dietary variety scores of scheduled tribal families in India and the high prevalence of overweight among young Asian children in the study on children under five years old. Alternatively, Muslim homes seem to offer a safeguard against childhood obesity or overweight. Parents should concentrate on propaganda campaigns aimed at reducing obesity and overweight while bolstering preventive measures when it comes to prevention techniques (Saha et al, 2022).

The current consensus is that BMI is a valid and feasible indirect measure of body fatness, useful in clinical and epidemiologic studies, but it suffers from a number of limitations. Health professionals should be aware and consider these limitations. More efforts are needed to develop other valid and feasible measures of body composition. Further research on the applications of waist circumference, bio-impedance, or other forms of weight-for-height index remains valuable. It has been argued that population-specific standards should be used due to biological differences between populations. To assist international comparisons, in epidemiologic studies, the IOTF reference is superior. The most significant finding of this review of the literature on paediatric obesity is that there is a lack of evidence-based research on effective interventions. The existing research has found that most methods of weight loss are unsuccessful over time. Prevention is clearly the best way to deal with paediatric obesity.

Discussion

In today's environment, it can be quite challenging to help youngsters adopt a lifestyle that includes a behavioural model that promotes physical activity in addition to diet therapy. According to study by Jay Shah et al (2022) on South Asian children under five, there is a high rate of overweight among young children. Additionally, there is a substantial disparity in dietary variety scores and scheduled tribal families in India. Conversely, it seems that Muslim families offer a safeguard against childhood

Table 2: Physical workout programmes can be suggested in children and teenagers by using FITT principles

FITT	Cardiovascular (aerobic) programme	Interval programme	Muscle resistance programme
Frequency	≥3/week	≥3/week	≥3/week
Intensity	Moderate to intense exercises	3-5 minutes Mild-moderate	High (50-70% MVC)
Time	20-60 minutes	Total 20-60 minutes	2-3 minutes per muscle group (8-20 repetitions)
Type of work outs	Running, jumping, biking, soccer	Running, jumping, swimming, biking	Push-ups, climbing paddle
Programme duration	8-12 weeks	6-12 weeks	6-12 weeks

FITT: Frequency, Intensity, Time, & Type; MVC: Maximum Voluntary Contraction. Taskin & Sachin Ozdemir, 2018

obesity or overweight. Parents should prioritise propaganda campaigns to increase preventative measures and decrease overweight and obesity when it comes to prevention tactics.

Presently, most experts agree that BMI is a reliable and practical indirect indicator of body fatness, helpful in epidemiological and clinical research, although it has certain drawbacks. Healthcare providers must to be conscious of and take into account these restrictions. Additional work is required to create more reliable and practical body composition measurements. It is still useful to conduct additional study on the uses of waist circumference, bio-impedance, or other weight-for-height index methods. Some have claimed that because populations differ biologically, population-specific norms ought to be used. The IOTF reference is better for epidemiologic research in order to facilitate international comparisons. The absence of evidence-based research on successful therapies is the most important result of this assessment of the literature on childhood obesity. The existing research has found that most methods of weight loss are unsuccessful over time. Prevention is clearly the best way to deal with paediatric obesity.

Recommendations

To help children who are overweight lower their weight, it is recommended to:

- Create more supportive circumstances for physical exercise and a healthy diet in the social and physical settings where children live, learn, and play;
- Recognise and address the early warning signs of childhood obesity and overweight; and
- Investigate strategies to make it easier for kids to access and obtain nutrient-dense foods while making it harder for them to access and obtain meals and beverages that are rich in fat, sugar, or sodium.

Conclusion

Obesity and overweight in children raises the chance of developing various physical and mental illnesses. Encouraging overweight kids to increase high energy activity, reduce low energy activity (viewing TV, computers, or mobile screens), and establish healthy eating habits is need of the day.

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