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Effect of Aerobic Training on Obesity among School-Going Children

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ABSTRACT: The present study examined the effect of structured aerobic training on obesity among school-going children. Thirty students aged 12–18 years were randomly assigned to an experimental group (n = 15) and a control group (n = 15). The experimental group participated in a six-week aerobic training programme, while the control group continued their regular routine without special training. Obesity was assessed using Body Mass Index (BMI), measured before and after the intervention. The data were analysed using the t-test at a 0.05 level of significance. The results revealed a significant reduction in BMI in the experimental group, whereas no significant change was observed in the control group. The findings indicate that structured aerobic training is an effective strategy for reducing obesity among school-going children and should be incorporated into school-based physical activity programmes. Furthermore, the results of the study suggest that regular aerobic exercise not only contributes to weight management but also promotes healthier lifestyle habits among adolescents. Structured physical activity programmes in schools can play a crucial role in preventing obesity and improving overall physical fitness, thereby supporting long-term health and well-being of children.

KEYWORDS: Aerobic training, obesity, BMI, school children, physical activity.

I. INTRODUCTION

Obesity has emerged as one of the most serious and rapidly growing public health challenges among children and adolescents across the globe. It is a complex, multifactorial condition characterized by excessive accumulation of body fat that adversely affects physical health, psychological well-being, and overall quality of life. The prevalence of childhood obesity has increased dramatically over the past few decades in both developed and developing countries, posing significant threats to individual health and national healthcare systems.

Childhood obesity is not merely a cosmetic concern but a serious medical condition associated with a wide range of health risks. Excess body fat during childhood significantly increases the likelihood of developing chronic non-communicable diseases such as cardiovascular disorders, type 2 diabetes mellitus, hypertension, respiratory problems, and musculoskeletal complications. Moreover, obese children often experience psychological and emotional difficulties, including low self-esteem, body image dissatisfaction, anxiety, depression, and social isolation. These physical and psychological consequences highlight the urgent need for effective preventive and intervention strategies to combat obesity at an early age.

In addition to immediate health consequences, childhood obesity has long-term implications for adult health. Research evidence indicates that obese children are more likely to remain obese during adolescence and adulthood, thereby increasing the risk of lifelong health problems. Early onset of obesity can disrupt normal growth and development, reduce physical efficiency, and impair functional capacity. Therefore, addressing obesity during childhood is crucial not only for improving present health outcomes but also for preventing future health complications.

Causes and Determinants of Childhood Obesity

The development of obesity among school-going children is influenced by a complex interplay of biological, behavioral, environmental, and socio-economic factors. Among these, lifestyle-related factors play a dominant role in the

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contemporary context. In recent years, rapid technological advancement and urbanization have drastically altered the daily routines of children, leading to a decline in physical activity and an increase in sedentary behaviors.

One of the major contributors to childhood obesity is a sedentary lifestyle. Modern children spend a significant amount of time engaged in screen-based activities such as watching television, using smartphones, playing video games, and browsing the internet. These activities reduce opportunities for physical movement and energy expenditure. Compared to previous generations, children today participate less frequently in outdoor games, sports, and recreational activities, which are essential for maintaining healthy body weight and physical fitness. Unhealthy dietary habits also play a critical role in the rising prevalence of obesity among children. The consumption of high-calorie, low-nutrient foods such as fast food, junk food, sugary beverages, and processed snacks has increased significantly. Irregular eating patterns, overeating, and excessive intake of refined carbohydrates and fats contribute to positive energy balance, leading to excessive fat accumulation in the body. Additionally, socio-economic factors, parental lifestyle, and cultural influences shape children's eating habits and physical activity patterns.Genetic and biological factors further influence susceptibility to obesity. Although genetic predisposition may increase the likelihood of weight gain, environmental and behavioral factors often determine the actual manifestation of obesity. Therefore, lifestyle modification through physical activity and healthy dietary practices remains the most effective approach to preventing and managing childhood obesity.

II. METHODOLOGY

Research Design: A true experimental pre-test and post-test control group design was employed in the study to scientifically examine the effect of aerobic training on obesity among school-going children. In this design, the participants were randomly assigned into two groups: an experimental group and a control group, ensuring that both groups were initially comparable. Pre-test measurements were taken from both groups before the intervention to assess their baseline status. The experimental group then underwent a structured aerobic training programme, while the control group continued their regular routine without any special treatment. After the intervention period, post-test measurements were conducted for both groups. This design enabled the researcher to compare changes within and between groups, thereby establishing a cause-and-effect relationship between aerobic training and obesity reduction with greater accuracy and validity.

Participants

Thirty school-going children (boys and girls) aged 12–18 years were selected through convenient sampling and randomly assigned to two groups:

- Experimental Group (n = 15)
- Control Group (n = 15)

Variable of the Study

- Independent Variable: Aerobic training
- Dependent Variable: Obesity

Training Programme

The experimental group underwent a six-week aerobic training programme consisting of activities such as jogging, skipping, and aerobic movements. Training was conducted five days per week, 40 minutes per session. The control group did not participate in any special training programme.

Table no.1
Aerobic training schedule

Week	Warm-up (Minutes)	Main Aerobic Activities	Repetitions / Duration	Cool-down (Minutes)
Week 1	5	Marching, side steps, easy dance movements	2 sets × 8 minutes each (2 minutes rest)	5
Week 2	6	Step aerobics, jumping jacks, grapevine step	3 sets × 7 minutes each (2 minutes rest)	5
Week 3	6	Skipping, jogging in place, arm and leg coordination movements	3 sets × 8 minutes each (2 minutes rest)	6

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Week	Warm-up (Minutes)	Main Aerobic Activities	Repetitions / Duration	Cool-down (Minutes)
Week 4	7	Combination of dance, jogging, and high knees	3 sets × 9 minutes each (2 minutes rest)	6
Week 5	7	Circuit style: step aerobics, skipping, and dance	4 sets × 8 minutes each (2 minutes rest)	6
Week 6	7	High-energy aerobic dance (Zumba style) and running drills	4 sets × 9 minutes each (2 minutes rest)	6

Statistical Technique

The t-test was employed as an inferential statistical technique to analyse the differences between the pre-test and post-test scores of the experimental and control groups. This test was used to determine whether the observed changes in Body Mass Index (BMI) after the intervention were statistically significant or occurred merely by chance. The paired t-test was applied to compare the pre-test and post-test scores within each group, while the independent t-test was used to compare the mean differences between the experimental and control groups. The level of significance was set at 0.05.

Table no. 2
Comparison of Pre-test and Post-test BMI Scores of Experimental and Control Groups

	Experimental Group		Control Group	
	Pre- test	**Post-test**	**Pretest**	**Post-test**
Sample Size	15	15	15	15
Mean	**26.5933**	**26.5067**	**27.7267**	**28.2200**
S.D.	0.4194	**0.4271**	2.5785	2.6580

Significant at 0.05 level.

Table no. 2: The table shows the mean and standard deviation of BMI scores for the experimental and control groups. In the experimental group, the mean BMI decreased from **26.5933 ± 0.4194** (pre-test) to **26.5067 ± 0.4271** (post-test), indicating a reduction in obesity after the aerobic training programme. In contrast, the control group showed an increase in mean BMI from **27.7267 ± 2.5785** (pre-test) to **28.2200 ± 2.6580** (post-test), indicating no improvement in obesity levels. The results suggest that aerobic training had a positive effect on reducing BMI among school-going children.

Graph No.1

Graph No.1: Graphical representation of obesity of school going children

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III. ANALYSIS OF DATA

The results of the study revealed a statistically significant reduction in Body Mass Index (BMI) scores of the experimental group following the aerobic training programme. The calculated t-value (3.72) exceeded the critical (tabulated) t-value at the 0.05 level of significance, thereby leading to the rejection of the null hypothesis and acceptance of the research hypothesis. This finding clearly indicates that the structured aerobic training programme had a significant positive effect on reducing obesity among school-going children. The reduction in BMI reflects improved body composition, increased energy expenditure, and enhanced metabolic efficiency resulting from regular participation in aerobic exercises.

In contrast, the control group did not exhibit any statistically significant change in BMI scores between the pre-test and post-test measurements. The calculated t-value for the control group was lower than the critical value, indicating that the observed differences were not statistically meaningful. This suggests that routine school activities and daily lifestyle practices, without any structured physical training intervention, were insufficient to bring about measurable improvements in obesity levels. The absence of significant change in the control group further strengthens the evidence that aerobic training played a decisive role in reducing BMI in the experimental group.

Moreover, the comparative analysis between the experimental and control groups highlights the effectiveness of systematic and planned aerobic exercise in obesity management. The findings underscore the importance of incorporating structured aerobic training programmes into school curricula as a preventive and therapeutic strategy for childhood obesity. Overall, the results demonstrate that aerobic training is a scientifically effective and practical approach for reducing obesity and promoting healthier body composition among school-going children.

IV. DISCUSSION

The findings of the present study support the hypothesis that aerobic training significantly reduces obesity among school-going children. Aerobic exercise increases energy expenditure and enhances fat metabolism, leading to a reduction in body weight and Body Mass Index (BMI). Regular aerobic activity stimulates physiological adaptations such as improved cardiovascular efficiency, increased fat oxidation, and enhanced metabolic rate, which collectively contribute to effective weight management in children and adolescents.

The results of the present study are consistent with earlier research findings. Ramesh and Subramaniam (2011) reported that aerobic training significantly reduced BMI and body fat percentage among obese adolescents. Similarly, Padmanathan (2011) found that a twelve-week aerobic exercise programme led to a significant improvement in body mass index and health-related physical fitness variables among male adolescents. Febin (2016) also observed significant reductions in anthropometric variables, including body weight and BMI, among school obese students following aerobic exercise intervention. Furthermore, Sigal et al. (2014) demonstrated that aerobic training significantly reduced total body fat and waist circumference in overweight and obese adolescents, highlighting the effectiveness of aerobic exercise in obesity management.In addition, Frappier et al. (2015) emphasized that aerobic training is one of the most effective exercise modalities for reducing body fat and improving cardiorespiratory fitness in obese adolescents. These findings collectively reinforce the role of aerobic exercise as a scientifically validated strategy for combating childhood obesity by improving metabolic function and body composition. Furthermore, regular participation in aerobic exercise encourages children to adopt physically active lifestyles, which may have long-term benefits in preventing obesity-related health problems. Early engagement in structured physical activity not only helps in reducing obesity but also promotes lifelong healthy habits, thereby reducing the risk of chronic diseases in adulthood. Therefore, the present study, in alignment with previous research, strongly supports the inclusion of structured aerobic training programmes in school curricula as an effective preventive and therapeutic approach to childhood obesity.

V. RESULTS

The major findings of the study are as follows:

- Aerobic training significantly reduced BMI among school-going children in the experimental group.
- No significant change in BMI was observed in the control group.
- Aerobic training was found to be an effective intervention for reducing obesity among school-going children.

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VI. CONCLUSION

The present study concludes that aerobic training has a significant positive effect on reducing obesity among school-going children. Regular participation in aerobic exercise leads to a reduction in BMI and promotes healthy body composition. Therefore, aerobic training should be incorporated into school physical education programmes to prevent and manage childhood obesity.

The findings of the study highlight the importance of physical activity in promoting health and preventing obesity among children. Schools, parents, and policymakers should encourage regular aerobic exercise as a sustainable strategy for improving the health and well-being of school-going children.

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