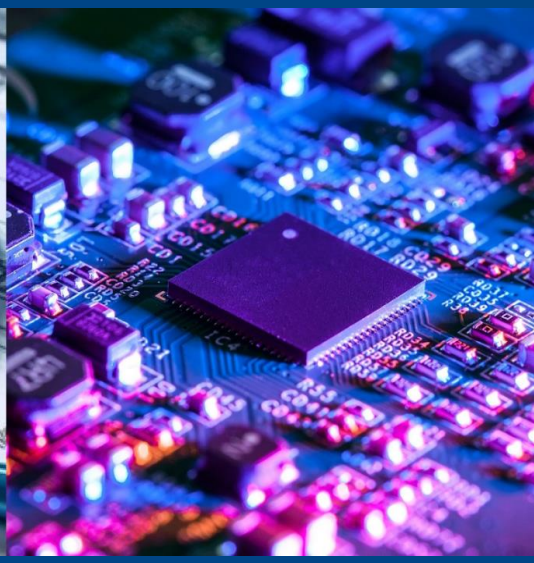
ISSN: 2582-7219





International Journal of Multidisciplinary Research in Science, Engineering and Technology

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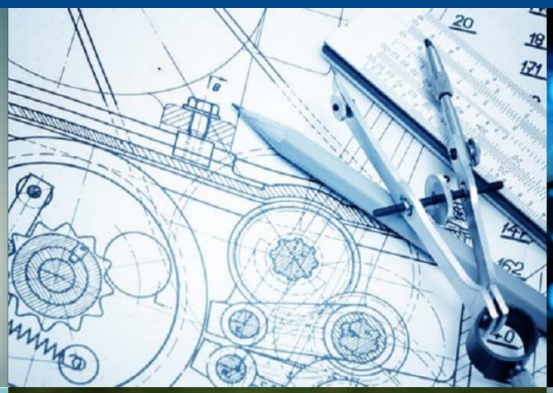

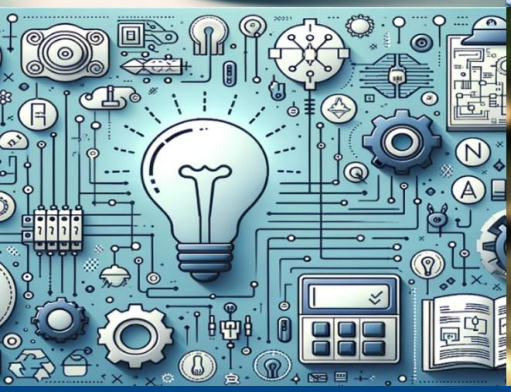

Impact Factor: 8.206 **Volume 9, Issue 3, March 2026**

© 2026 IJMRSET | Volume 9, Issue 3, March 2026| DOI:10.15680/IJMRSET.2026.0903111

ISSN: 2582-7219 | www.ijmrset.com | Impact Factor: 8.206| ESTD Year: 2018|

International Journal of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

Effect of Aerobic Training on Flexibility of School Going Children

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ABSTRACT: The purpose of this study was to examine the effect of aerobic training on flexibility among school-going children. Flexibility is an important component of health-related physical fitness and plays a significant role in movement efficiency, injury prevention, and overall physical performance. Modern sedentary lifestyles and reduced physical activity among children have contributed to decrease flexibility and limited mobility. Aerobic training, involving continuous rhythmic movements, has been identified as an effective method to improve joint mobility and muscle elasticity. A true experimental research design was adopted with school-going children aged 12–18 years. The experimental group underwent a structured aerobic training program, while the control group followed their regular routine. Flexibility was measured using the sit-and-reach test. The findings aim to provide valuable insights for physical education teachers, parents, and schools to enhance flexibility through structured aerobic exercise programs.

KEYWORDS: Aerobic training, flexibility and school going children.

I. INTRODUCTION

Background of the Study

Flexibility is a fundamental component of health-related physical fitness and refers to the ability of joints and muscles to move freely through a full range of motion without discomfort or restriction. Adequate flexibility contributes to efficient movement patterns, proper posture, improved coordination, and reduced risk of injury. It depends on factors such as muscle elasticity, joint structure, physical activity level, and age. In recent years, school-going children have shown decreased flexibility levels due to sedentary lifestyles, increased screen time, and reduced participation in outdoor physical activities. Lack of flexibility may lead to muscular stiffness, poor posture, and decreased participation in sports and physical education activities. Aerobic training involves continuous and rhythmic physical activities such as jogging, dancing, skipping, and cycling, which engage large muscle groups and promote joint mobility. These activities enhance muscle elasticity and improve range of motion through repetitive dynamic movements. Regular participation in aerobic exercise helps reduce stiffness and improves flexibility, allowing children to move efficiently and confidently. Flexibility is especially important during childhood and adolescence because it supports motor development, functional movement skills, and physical growth. Therefore, introducing structured aerobic training programs in schools may significantly enhance flexibility levels and promote overall physical fitness among children.

Statement of the Problem

The present study aims to investigate the effect of aerobic training on flexibility among school-going children. Flexibility is an essential component of health-related physical fitness that plays a significant role in enhancing movement efficiency, maintaining proper posture, preventing injuries, and improving overall physical performance. In recent years, increasing academic pressure, sedentary lifestyles, and excessive screen time have reduced the level of physical activity among children, which has resulted in decreased flexibility and increased muscular stiffness. Reduced flexibility can negatively influence participation in physical education, sports performance, and daily functional movements.

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Aerobic training, characterized by continuous rhythmic activities involving large muscle groups, has been recognized as an effective method for improving physical fitness components, including flexibility. The dynamic and repetitive movements involved in aerobic exercises may enhance joint mobility, increase muscle elasticity, and improve range of motion. However, despite the recognized benefits of aerobic exercise, there is a need for systematic research focusing specifically on its impact on flexibility among school-going children.

Therefore, the problem of this study is to scientifically examine whether a structured aerobic training program can significantly improve flexibility levels in school-going children. The findings of this research may provide valuable insights for physical education teachers, coaches, and policymakers to develop effective exercise programs that promote flexibility and overall physical fitness among children.

Objectives of the Study

The objectives of the present study are to assess the level of flexibility among school-going children and to examine the effect of aerobic training on improving their flexibility. Flexibility is an important component of health-related physical fitness that supports efficient movement, injury prevention, and overall physical performance. By evaluating the existing flexibility levels of school-going children, the study aims to understand their current physical fitness status. Furthermore, the study seeks to determine whether a structured aerobic training program can significantly enhance flexibility through improved muscle elasticity, joint mobility, and range of motion. These objectives will help identify the role of aerobic exercise in promoting flexibility and contribute to the development of effective physical education programs for school children.

II. METHODOLOGY

Research Design

The study adopted a true experimental research design using a randomized control trial (RCT) method. Participants were randomly assigned into two groups: an experimental group, which underwent a structured aerobic training program, and a control group, which continued with their regular routine without any specific intervention. To assess the effectiveness of the aerobic training, pre-test measurements were conducted before the intervention and post-test measurements were taken after the completion of the training program, allowing for comparison of changes between the two groups.

Selection of Subjects

The study comprised a total of 30 school-going children within the age range of 12 to 18 years. The sample included both boys and girls, ensuring representation of both genders in the research.

Variables

Dependent Variable: Flexibility.

Criterion Measure

Variable	Test	Unit
Flexibility	Sit and Reach Test	Centimeters

Table no.1

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Aerobic training schedule for 6 weeks

Week	Warm-up(minute)	Main Aerobic activity	Reps / Time	Cool down
Week-1	5	Marching, Side steps, easy dance moves.	2 sets × 8 min each (2 min. rest)	5 minutes
Week-2	6	Step Aerobics, Jumping jacks, Grapevine step	3 sets × 7 min each (2 min. rest)	5 minutes
Week-3	6	Skipping, jogging in place, Arm & leg coordination moves.	3 sets× 8 min each (2 min. rest)	6 minutes
Week-4	7	Combination dance + Jogging + high knees	3 sets× 9 min each (2 min. rest)	6 minutes
Week-5	7	Circuit style- Step aerobics + skipping + dance	4 sets× 8 min each (2 min. rest)	6 minutes
Week-6	7	High-energy aerobic dance (Zumba style) + running drills	4 sets× 9 min each (2 min. rest)	6 minutes

Test Administration

The Sit and Reach Test was used to measure the flexibility of the lower back and hamstring muscles. In this test, the participant sits on the floor with legs fully extended and feet placed firmly against the testing box. Keeping the knees straight, the participant slowly bends forward and reaches as far as possible along the measuring scale. The highest distance reached is recorded in centimetres, and a higher score indicates better flexibility.

Table no.2

Descriptive statistics

Mean and Standard Deviation of Sit and Reach of Treatment group and Control Group

	Treatment Group		Control group	
	Pre-test	**Post-test**	**Pre-test**	**Post-test**
Sample size	15	15	15	15
Mean	**28.20**	29.80	24.40	23.53
S.D	7.16	6.95	**4.52**	4.60

From the above table : It was found that the mean and standard deviation of experimental group in respect of pre-test 28.20 and S. D were 7.16 whereas the mean value and S.D of control group are 24.40 and .4.52 respectively. On the other side mean and standard deviation of experimental group 29.80 and 6.95 whereas control group were 23.53 and 4.60.

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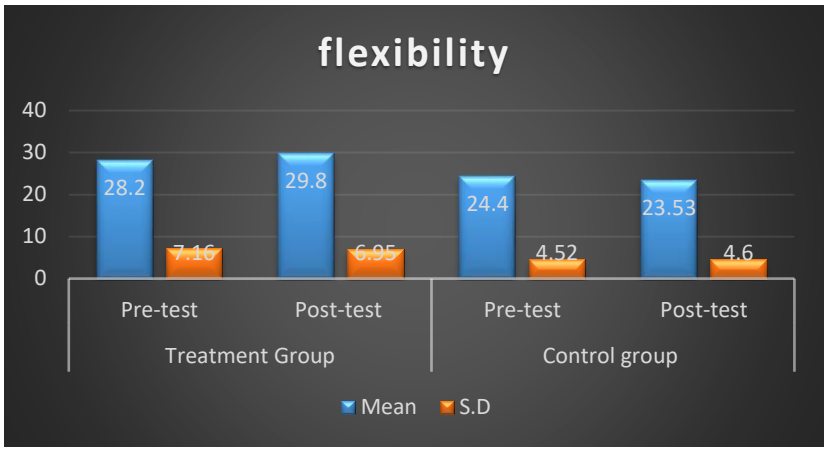
Graph no. 1



Graph No. 1: A graphical depiction of the mean value for the pre- and post-test periods of Sit and Reach between the experimental and control group.

Table No.3

t-test of Sit and Reach

Test	N	Mean	DF	Cal 't'.	Tab 't'.
Experimental group post-test	15	29.80	28	2.9126	2.048
Control group post test	15	**23.53**			

Level of significance – 0.05
Calculated 't' – 2.9126.
Tabulated 't' – 2.048
Degree of freedom – 28
Number of subjects (N) – 30

From table No.3 : Mean and Standard Deviation of Visual Memory Treatment and Control Groups Since the computed "t" value of 2.9126 is higher than the tabulated "t" value of 2.048 (28 degrees of freedom at 0.05 level of confidence), the test result indicates a significant difference between the mean of the experimental group post-test and the control group post- test.

Statistical Analysis

- Pre-test and post-test comparison.
- t-test used at 0.05 level of significance.

III. DISCUSSION

The present study examined the effect of aerobic training on the flexibility of school-going children. The findings revealed a significant improvement in flexibility among participants who underwent the aerobic training program. This improvement may be attributed to the dynamic and repetitive nature of aerobic exercises, which involve continuous movement of major muscle groups, thereby enhancing joint range of motion and muscular elasticity.

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Aerobic training activities such as jogging, skipping, rhythmic exercises, and dance-based movements promote increased blood circulation and muscle temperature. Elevated muscle temperature improves the extensibility of muscles and connective tissues, which contributes to enhanced flexibility. Additionally, regular aerobic activity reduces muscle stiffness and improves neuromuscular coordination, both of which are essential for optimal flexibility in growing children. The results of the present study are consistent with the findings of **Daryl L. Alter et al. (2004)**, who reported that regular aerobic exercise improves vascular function and muscle elasticity, indirectly supporting improvements in flexibility. Similarly, research conducted by **William D. McArdle, Frank I. Katch, and Victor L. Katch (2015)** in their exercise physiology studies indicated that continuous aerobic activity enhances muscle temperature and connective tissue extensibility, which positively affects flexibility performance. Further support is found in the work of **Jack H. Wilmore and David L. Costill (2004)**, who stated that systematic aerobic conditioning improves overall physical fitness components, including flexibility, particularly in children and adolescents. Their findings emphasized that structured physical activity during developmental years contributes significantly to musculoskeletal adaptability. Moreover, studies on school children have shown that regular participation in aerobic-based physical education programs leads to measurable improvements in flexibility scores assessed through sit-and-reach tests. This aligns with the present findings, where participants demonstrated increased range of motion following the training intervention. The physiological explanation for these improvements may also be linked to growth and maturation factors. During adolescence, connective tissues are highly adaptable. When aerobic exercise is introduced systematically, it enhances collagen elasticity and reduces passive resistance of muscles, resulting in better flexibility outcomes. In conclusion, the findings of this study support the hypothesis that aerobic training has a positive and significant effect on the flexibility of school-going children. The results reinforce the importance of incorporating structured aerobic activities into school physical education curricula to promote overall physical fitness and musculoskeletal health. Future research may explore long-term interventions and comparisons between aerobic, anaerobic, and combined training methods to determine the most effective approach for improving flexibility in children.

IV. CONCLUSION

The study concludes that structured aerobic training programs can effectively improve flexibility among school-going children. The significant improvement observed in flexibility suggests that regular participation in rhythmic and continuous aerobic activities enhances muscle elasticity, joint range of motion, and neuromuscular coordination. Aerobic exercises such as jogging, skipping, cycling, and rhythmic movements increase blood circulation and muscle temperature, which reduce muscular stiffness and improve the extensibility of muscles and connective tissues. As children are in a dynamic stage of growth and development, their musculoskeletal system responds positively to systematic physical activity, making aerobic training particularly effective during this age period. Incorporating aerobic exercise into school physical education programs may not only enhance flexibility but also improve movement efficiency and overall health-related fitness. Improved flexibility contributes to better posture, smoother coordination, and reduced risk of musculoskeletal injuries during sports and daily activities. Furthermore, aerobic training supports the development of other fitness components such as cardiovascular endurance, muscular endurance, and body composition, thereby promoting holistic physical development. From an educational perspective, integrating structured aerobic sessions into the regular school timetable can create lifelong exercise habits among children. Schools serve as an ideal setting to implement planned physical activity programs under professional supervision. When aerobic activities are systematically designed with appropriate intensity, duration, and frequency, they can significantly contribute to the physical well-being and functional capacity of students.

Therefore, it is recommended that physical education curricula include well-structured aerobic training modules to foster flexibility, enhance motor performance, and support overall health-related fitness among school-going children. Future research may further explore long-term adaptations and compare different types of aerobic interventions to identify the most effective strategies for improving flexibility in youth populations.

REFERENCES

1. American College of Sports Medicine. (2018). ACSM's guidelines for exercise testing and prescription (10th ed.). Wolters Kluwer.
2. Faigenbaum, A. D., & Myer, G. D. (2010). Resistance training among young athletes: Safety, efficacy and injury prevention effects. British Journal of Sports Medicine, 44(1), 56–63. https://doi.org/10.1136/bjsm.2009.068098

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3. Malina, R. M., Bouchard, C., & Bar-Or, O. (2004). Growth, maturation, and physical activity (2nd ed.). Human Kinetics.
4. McArdle, W. D., Katch, F. I., & Katch, V. L. (2015). Exercise physiology: Nutrition, energy, and human performance (8th ed.). Wolters Kluwer.
5. Ortega, F. B., Ruiz, J. R., Castillo, M. J., & Sjöström, M. (2008). Physical fitness in childhood and adolescence: A powerful marker of health. International Journal of Obesity, 32(1), 1–11. https://doi.org/10.1038/sj.ijo.0803774
6. Strong, W. B., Malina, R. M., Blimkie, C. J. R., Daniels, S. R., Dishman, R. K., Gutin, B., ... Trudeau, F. (2005). Evidence based physical activity for school-age youth. The Journal of Pediatrics, 146(6), 732–737. https://doi.org/10.1016/j.jpeds.2005.01.055
7. Thomas, J. R., Nelson, J. K., & Silverman, S. J. (2015). Research methods in physical activity (7th ed.). Human Kinetics.
8. Wilmore, J. H., Costill, D. L., & Kenney, W. L. (2008). Physiology of sport and exercise (4th ed.). Human Kinetics.
9. World Health Organization. (2020). WHO guidelines on physical activity and sedentary behaviour. World Health Organization.
10. Zeng, N., Ayyub, M., Sun, H., Wen, X., Xiang, P., & Gao, Z. (2017). Effects of physical activity on motor skills and cognitive development in early childhood: A systematic review. BioMed Research International, 2017, Article 2760716. https://doi.org/10.1155/2017/2760716

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