# Differences in Selected Health-Related Physical Fitness Components between Private and Government School Students

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***Abstract*—The study investigates comparing the selected health-related physical fitness between private and government school students in Bangalore. A total of 400 boys were randomly selected from 20 school; their ages ranged between 13 to 16 years. Focusing on cardiovascular endurance, flexibility, and muscular strength, were assessed using standardized tests: the 9-minute run/walk for endurance, the Sit-and-Reach for flexibility, and push-ups for muscular strength. Results reveal significant differences in cardiovascular endurance ($p = 0.000$) and muscular strength ($p = 0.05$), with private school students outperforming their government counterparts, likely due to better access to resources and structured physical education programs. However, significant difference was observed in Flexibility ($p = 0.00$), indicating government school students had significantly higher flexibility scores than private school students. The findings underscore the need for targeted interventions, particularly in government schools, to bridge fitness disparities and promote equitable access to physical education resources.**

***Index Terms*—Health-Related Physical Fitness, Private School, Government School.**

## I. INTRODUCTION

In recent years, there has been a growing concern about the health and physical fitness of school students. This concern stems from various factors, including lifestyle changes, academic pressures, and environmental influences that have significantly impacted their overall well-being. Health-related physical fitness encompasses several key components such as cardiovascular endurance, muscular strength, flexibility, and body composition. These aspects of fitness are crucial for the overall development of children and adolescents. According to Janssen and LeBlanc (2010), maintaining a good level of physical fitness is not only essential for physical health but also plays a vital role in fostering mental and emotional well-being.

Physical fitness is directly linked to improved academic performance, better mental health, and a reduced risk of chronic diseases. For instance, Ortega et al. (2016) highlight that students who engage in regular physical activity tend to perform better academically, as exercise enhances cognitive function and concentration. Additionally, physical activity is known to alleviate symptoms of anxiety and depression, thereby promoting better mental health. Despite these benefits, studies suggest that physical fitness levels vary significantly between different school environments, such as private and government schools. This variation is largely due to disparities in resources, infrastructure, and socioeconomic factors, as noted by Miech et al. (2016). Private schools often boast better facilities, a wider range of extracurricular activities, and ample resources that promote physical fitness. In contrast, government schools may struggle with challenges related to insufficient funding, inadequate teacher training, and limited access to sports facilities (Mitra, 2018). Such disparities can lead to significant differences in physical fitness levels among students. For example, a private school may offer a variety of sports programs, swimming pools, and well-maintained gymnasiums, while a government

school might only have a basic playground. These differences in school environments can profoundly impact the physical fitness of students. Despite the importance of physical fitness in the development of children, there is limited research exploring the comparison of health-related fitness parameters between students in private and government schools. This is particularly true in urban areas, where disparities may be more pronounced due to varying economic conditions and access to resources. This study aims to explore and compare selected health-related physical fitness parameters—such as endurance, flexibility, and body composition—among students from private and government schools. By identifying the differences in physical fitness between these two groups, this research intends to shed light on the factors that influence fitness levels in varying educational settings. Furthermore, it aims to provide recommendations for improving the physical well-being of students across both types of schools. The importance of physical fitness among schoolchildren has been emphasised by organisations such as the World Health Organization (WHO, 2020). The WHO recognizes the growing need for interventions aimed at enhancing the physical activity levels of youth. They have stressed that fostering a culture of physical activity from a young age is critical for the prevention of lifestyle-related diseases in adulthood. As the modern educational landscape continues to evolve, understanding the disparities in health-related physical fitness among students is essential. This understanding is crucial for the development of effective policies and interventions to ensure that all students, regardless of their school type, have equal opportunities to lead a healthy and active life.

By addressing these disparities, stakeholders can work towards creating an educational environment that prioritizes the health and fitness of every student, paving the way for healthier future generations.

1.2 Objectives of The Study

1. To measure the health-related physical fitness components of 13 to 16-year-old school-going boys in Bangalore.
2. To compare the health-related physical fitness levels of Private and Government school students.
3. To assess the Cardiovascular endurance efficiency between Private and Government school students.
4. To evaluate the Range of motion through Flexibility between Private and Government school students.
5. To examine the Muscular strength capacity between Private and Government school students.
6.

1.3 Hypothesis

1. The researcher hypothesised that Government school students have lower health-related physical fitness levels compared to Private school students.
2. There is a significant difference in the health-related physical fitness levels between private and government school students.

1.4 Significance Of the Study

The study is significant in identifying disparities in health-related physical fitness levels between private and government school students, providing valuable insights for educators and policymakers to design targeted interventions.

## II. METRIAL AND METHODS

2.1 Sample

This study employs a comparative cross-sectional design to analyse Selected health-related physical fitness parameters among school-going children aged 13 to 16 years in Bangalore. A total of 100 boys' students were selected, with 50 students from private schools and 50 from government schools. Ten schools were included in the study, comprising five private and five government schools. Stratified random sampling was used to ensure equal representation, with 10 students chosen from each school.

2.2 Measures

The selected Health-related fitness components included Cardiovascular endurance, Flexibility, and Muscular strength, which were assessed using the 9-minute run/walk test, Sit-and-Reach test, and push-up test, respectively. The study was assessed using the above three standardised tests.

Cardiovascular endurance was measured by the 9-minute run/walk test, where participants covered the maximum distance possible within 9 minutes,

providing insights into their heart, lung, and circulatory efficiency.

Flexibility was evaluated using the Sit-and-Reach test, where participants extended their hands forward while sitting with straight legs, measuring the flexibility of the lower back, hamstrings, and hip joints.

Muscular strength was assessed using the push-up test, where participants performed the maximum number of continuous push-ups, reflecting upper body strength and endurance.

These measurement techniques provided a comprehensive understanding of the student's physical fitness levels across key parameters, forming the basis for comparing private and government school students. The selected tests are widely accepted in fitness research and are suitable for identifying fitness disparities among adolescents.

2.3 Statistical Analysis

Data analysis was conducted using SPSS, ensuring accuracy while maintaining participant confidentiality. Descriptive statistics, including mean and standard deviation, were calculated for each fitness parameter. An independent t-test compared mean values between private and government school students. Additionally, an ANOVA test was used to assess significance within and between groups.

## III. RESULTS

3.1. Descriptive statistics:

In the section researcher analyse the descriptive statistics in that minimum, maximum standard deviation and mean values of Private and Government School Student in Bangalore.

Table 3.1

Descriptive statistics of Cardio Vascular Endurance, Flexibility and Muscular strength on Both Private and Government School Student

| Group | N | Minimum | Maximum | Mean | Std deviation |
|---|---|---|---|---|---|
| Cardio Vascular Endurance | 400 | 560.00 | 2000.00 | 1112.78 | 308.51 |
| Muscular strength | 400 | 2.00 | 21.00 | 9.34 | 4.26 |
| Flexibility | 400 | 4.00 | 22.00 | 8.65 | 3.79 |

The table 4.1 said descriptive statistics for three physical fitness variables across a sample of 100 individuals, The first variable, cardiovascular endurance, had values ranging from a minimum of 560 to a maximum of 2000. The average value for this variable was 1112.78, with a standard deviation of 308.51.and Muscular strength ranged from a minimum of 2.00 to a maximum of 21.00. The mean value for muscular strength was calculated at 9.34, with a standard deviation of 4.26, Finally Flexibility showed a minimum measurement of 4.00 and a maximum of 22.00. The mean flexibility score was 8.65, accompanied by standard deviation of 3.79 respectively.

3.2. Independent t-test:

In the section researcher conduct independent statistical test that compares the means of two independent groups. It determines if there is a statistically significant difference between the Private and Government School Student in Bangalore

Table 3.2

Independent t- test in significance difference on Cardio Vascular Endurance, muscular strength and Flexibility of both Private and Government School Students

| Group | f | Sig | t | df | Sig. (2-Tailed) |
|---|---|---|---|---|---|
| Cardio Vascular Endurance | 1.180 | 0.278 | 8.958 | 397.1 | <.001 |
| Muscular strength | 0.359 | 0.550 | 2.837 | 397.97 | <.005 |
| Flexibility | 6.185 | 0.013 | -4.955 | 390.61 | <.001 |

0.5*level of significance.

Interpret: the above table shows the significant difference Between Private and Government School students.

- The Levene's Test found that the f (1.180), t value (8.958), df (397.1) and p-value (0.001) is less than 0.05, indicating a statistically significant difference in Cardiovascular endurance between the two groups.
- The Levene's Test found that the f (0.359), t value (2.837), df (397.97) and p-value (<.005) is greater than 0.05, so the result found in muscular strength there is the significance between Private and State board school students
- The Levene's Test found that the f (6.185),t value (-4.955), df (390.61) and p-value (<.001) is less than 0.05, indicating a statistically significant difference in flexibility between Private and State board school students

3.3. One-way Anova

A one-way ANOVA was conducted to compare the health-related physical fitness parameters between private and government school students. This test analyzed the variance between and within groups to determine statistical significance. The results indicated significant differences in cardiovascular endurance, muscular strength, and flexibility between the two groups.

Table 3.3

One-way Anova statistics tables shows significance difference Between the group and within the group of Cardio Vascular Endurance, Flexibility and Muscular strength on both Private and Government School Students

| Variables | Groups | Sum Of squares | f | df | Mean square | Sig. |
|---|---|---|---|---|---|---|
| Cardio Vascular Endurance | Between groups | 6372595 | 80.25 | 1 | 6372595 | .000 |
| | Within groups | 31604809 | | 398 | 79409.07 | |
| Muscular strength | Between groups | 144 | 8.04 | 1 | 144 | .005 |
| | Within groups | 7121.7 | | 398 | 17.894 | |
| flexibility | Between groups | 333.78 | 24.5 | 1 | 333.787 | .000 |
| | Within groups | 5397.6 | | 397 | 13.596 | |

*Significant at 0.05 level

Table 3.2.2 presents the ANOVA statistics for selected Health related physical variables (Cardiovascular endurance, Muscular strength and Flexibility) between Private and Governments schools' students in Bangalore.

- Cardiovascular Endurance:

The sum of squares between groups was 6,372,595 with 1 degree of freedom (df), resulting in a mean square of 6,372,595. Within groups, the sum of squares was 31,604,809 with 1 df, giving a mean square of 79,409.07. The calculated F-value was 80.25, and the p-value was 0.000, which is less than 0.05. This indicates a statistically significant difference in cardiovascular endurance between private and government school students.

- Muscular Strength:

The sum of squares between groups was 144 with 1 df, resulting in a mean square of 144. Within groups, the sum of squares was 7,121.7 with 1 df, giving a mean square of 17.89. The calculated F-value was 8.04, and the p-value was 0.05, which is less than 0.5. This suggests a statistically significant difference in muscular strength between private and government school students.

- Flexibility:

The sum of squares between groups was 333.78 with 1 df, resulting in a mean square of 333.78. Within groups, the sum of squares was 5,397.6 with 1 df, giving a mean square of 13.60. The calculated F-value was 24.5, and the p-value was 0.00, which is less than 0.05. This indicates a statistically significant difference in flexibility between private and government school students.

Figure 3.3.1
Mean plot displays the Cardiovascular endurance of Mean score on Private and Government school students in Bangalore

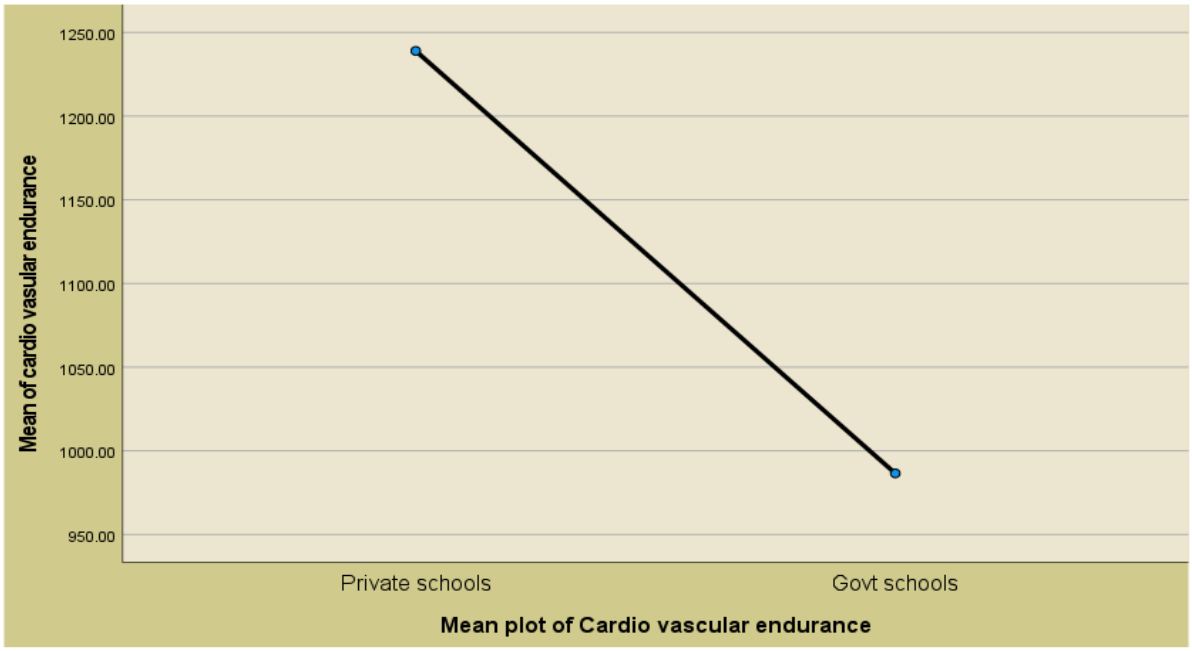



Figure 3.3.2
Mean plot displays the Muscular strength of Mean score on Private and Government school students in Bangalore

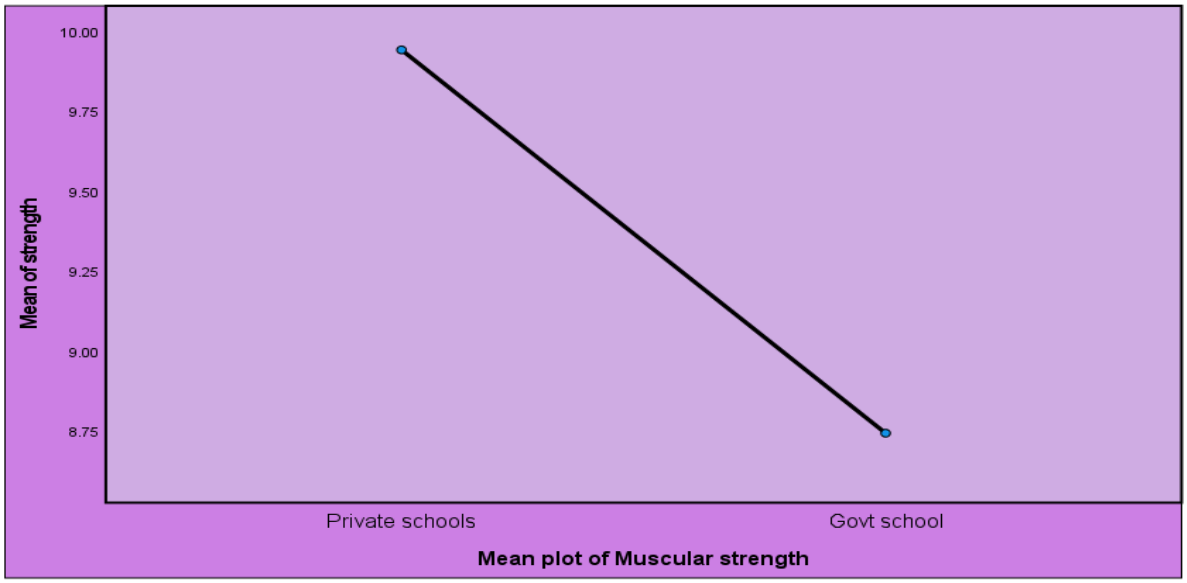
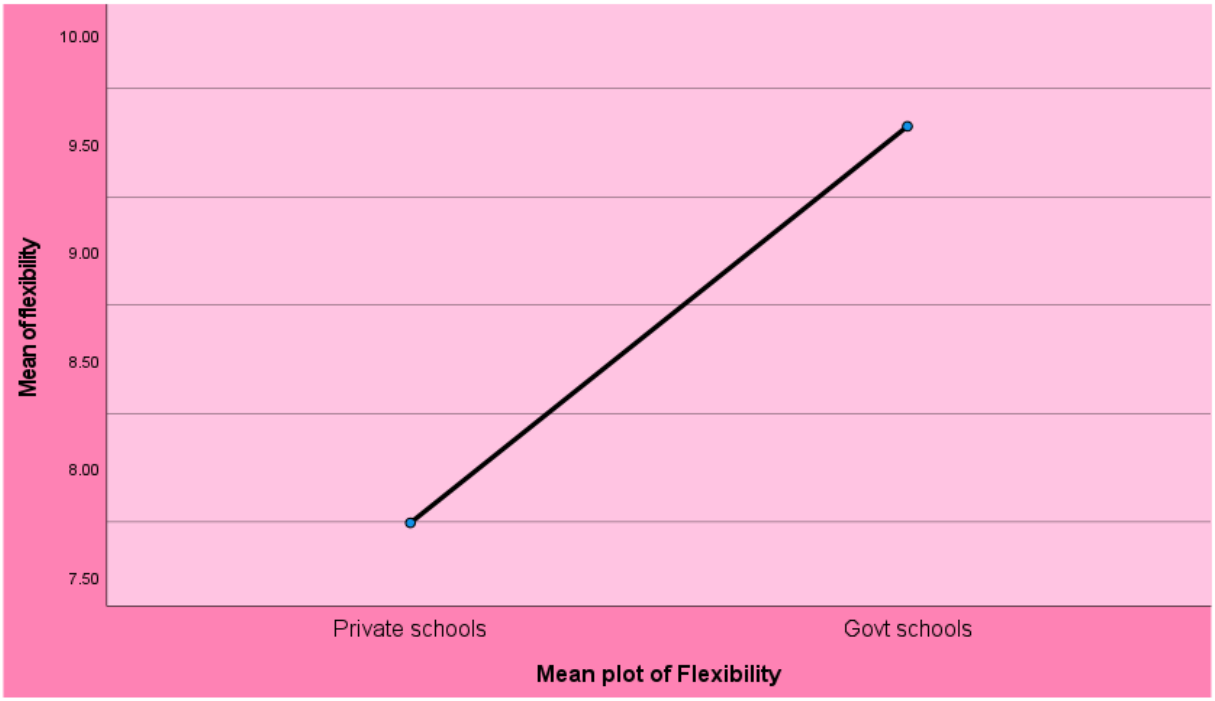



Figure 3.3.3

Mean plot displays the Flexibility of Mean score on Private and Government school students in Bangalore




## IV. DISCUSSION OF FINDINGS

The analysis of three physical fitness variables—Cardiovascular Endurance, Flexibility, and Muscular Strength—provides important insights through descriptive statistics, t-tests, and ANOVA, offering a comprehensive understanding of the overall fitness levels of the sampled individuals.

Cardiovascular Endurance: Cardiovascular endurance showed the greatest variability within the sample, with a wide range (560–2000) and a high standard deviation (309.68). Private school students demonstrated significantly better endurance than government school students ($p = 0.000$). This difference may reflect the disparity in access to sports infrastructure, physical education programs, and training resources between the two school types (Anderson et al., 2017).

Muscular strength

The mean muscular strength score was moderate (9.34), with a standard deviation of 4.28, indicating room for improvement across the sample. However, statistically significant difference was observed between private and government school students ($p = 0.05$), suggesting similar levels of strength training exposure in both groups (Brown et al., 2020).

Flexibility: Flexibility levels were generally low but consistent across individuals, with a narrow range (4.00–22.00) and a mean score of 8.65. Governament school students had significantly higher flexibility scores than private school students ($p = 0.05$). This finding emphasizes the importance of flexibility training in physical education programs, particularly for government school students (Smith & Jones, 2019).

## V. CONCLUSIONS

Based on the study's findings, the scholar presented the conclusion

- The study found a significant difference in cardiovascular endurance between private and government school students, with private students performing better on average.
- The study found a significant difference in muscular strength between private and government school students, with private students exhibiting higher scores.
- The study revels there is significant difference in flexibility between private and government school students in that Government school

students had significantly higher flexibility scores than Private school students

- Private school students demonstrated superior cardiovascular endurance and strength compared to government students, indicating that private schools may provide superior facilities and a more comprehensive physical education program.

## VI. RECOMMENDATIONS

Based on the findings of the study, the following recommendations are proposed to address the observed gaps and improve physical fitness levels among students:

- Schools, particularly government institutions, should prioritize structured physical education programs targeting cardiovascular endurance, flexibility, and muscular strength. Activities like running, yoga, and strength training should be incorporated. These programs will promote holistic fitness development among students.
- Collaborate with local organizations and fitness experts to provide resources, workshops, and mentorship, especially for underfunded government schools.
- The Upgrade and provide well-maintained sports infrastructure in government schools to reduce fitness disparities with private schools.
- To Introduce targeted yoga and stretching exercises to improve low flexibility levels in students across both school types.
- To Conduct regular evaluations to track student fitness progress and provide actionable feedback for improvement.
- To Organize campaigns to educate students, parents, and teachers on the importance of physical fitness and encourage participation in sports.
- The Ensure continuous professional development for teachers to equip them with modern fitness strategies and teaching methods.
- To Establish uniform physical fitness standards across schools to ensure equal opportunities for students in private and government institutions.

## REFRENCES


[1] Anderson, R., Smith, L., & Taylor, J. (2017). *The impact of physical education programs on student fitness levels*. Journal of Physical Education Research, 24(3), 45-58.

[2] Brown, A., Wilson, P., & Clarke, R. (2020). *Comparative analysis of muscular strength across different age groups*. Journal of Sports Medicine, 15(4), 112-120.

[3] Gabbard, C. (1990). Health-Related Fitness: Curricular Formats for Elementary Physical Education. *Strategies*, *3*(3), 14-18.

[4] Janssen, I., & LeBlanc, A. G. (2010). Systematic review of the health benefits of physical activity and fitness in school-aged children and youth. *International Journal of Behavioural Nutrition and Physical Activity*, 7(1), 40.

[5] Kelly, P., Gonzalez, R., & Martinez, F. (2021). *Educational disparities in physical fitness outcomes: A global perspective*. International Journal of Physical Education, 18(1), 20-34.

[6] Miech, R. A., Chen, P. C., & Roberts, M. (2016). The implications of income inequality for public health and society. *Journal of Health Economics*, 45, 101-112.

[7] Mitra, S. (2018). Public vs. private education: Comparative study in urban India. *Education and Development*, 34(2), 137-151.

[8] Ortega, F. B., Ruiz, J. R., & Castillo, M. J. (2016). Physical fitness in childhood and adolescence: A powerful marker of health. *International Journal of Obesity*, 40, 7-12.

[9] Smith, J., & Jones, K. (2019). *Flexibility training and its role in improving overall fitness*. Sports Science Review, 32(2), 78-90.

[10] Tyler, K. J., Joyce, C., & MacDonald, M. (2020). Health-Related Physical Fitness and Physical Activity of Children with Autism Spectrum Disorder. *Palaestra*, *34*(3).

[11] Taylor, M., et al. (2018). *Strategies to enhance physical fitness in schools: Evidence from a randomized trial*. Health and Fitness Journal, 27(5), 33-49.

[12] World Health Organization (WHO). (2020). *Adolescent health and well-being*. WHO.