



A study on assessment of cardiovascular endurance of primary school children

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Abstract:

Cardiovascular endurance is associated to proper functioning of pulmonary and respiratory systems. High levels of cardiovascular endurance show a person's heart system is healthy. The aim of the study was to examine the cardiovascular endurance of primary school children. In the study, total 1000 primary school children mainly 500 from the Government schools and 500 from the Private schools were randomly selected as subjects with age group of 6 to 10 years old. The data required for conducting study were collected from the primary sources by conducting the Cooper 12 minutes run/walk test as a marker of cardiovascular fitness. The data collected were given statistical treatment by using Independent t-Test and to compare the mean value at 0.05 level of confidence. As an important part of ethical research, the subjects were asked to participate in the test voluntarily. The necessary consent from the parents and school authorities was accorded before conducting the test. In pursuant to the result of the study, it was concluded with a significant difference which was observed between the primary school children of Government schools and Private schools. Further, counting on the result of study, the children of Government schools had better cardiovascular endurance than that of Private schools.

Keywords: Cardiovascular endurance, Physical fitness, Health related physical fitness.

Introduction

Physical fitness is termed as overall human organism fitness that is well functioned and efficient, Corbin and Lindsay (1998). Howley and Franks define physical fitness as a state of well being with low risk of untimely health problems and energy to take part in a wide range of physical activity. Physical fitness is a set of attributes either Health related or Skill related. Physical fitness is the ability to perform daily works with vigor and all attentiveness without excess fatigue and still left with adequate and ample energy to enjoy leisure pursuits and to meet unforeseen emergencies, Carspersen CJ, et al (1985). Cardiovascular endurance is related to the cardio respiratory function, as blood carries the oxygen, William P Kelley, (2022). The cardiovascular activity and endurance help in keeping one's heart, lungs and circulatory system healthy and also ameliorates the overall physical fitness. Improvement in cardiovascular endurance can make it easier for an individual to carry out one's daily tasks. Cardiovascular endurance is the ability of the heart, lungs and blood vessels to work together to provide oxygen to the muscles during the sustained physical activity. Cardiovascular endurance has

been regarded as one of key components of physical fitness throughout the history of fitness, R Pate (2012). Cardiovascular endurance denotes the body's ability to continue and support physical activity and it shows the cardio respiratory function of the human body during certain exercise intensity. It is considered as one of the most important indicators in the healthy physical fitness evaluation index system, Berton G et al (2016). Cardiovascular endurance is measured in how much oxygen is being supplied in the blood and pumped by the heart to the whole working muscles, Buccheit, M, Al Haddad, et al (2009). The increased in cardiovascular fitness shows the ability of heart to supply oxygen to all needy muscles which are on work, Bangsbo J (1994).

Cardiovascular endurance is necessary for children especially who are students. As students sit a lot for prolonged period when they are learning in school and home and in the process they require to pay attention. In the learning process, good cardiovascular endurance helps not only in augmenting academic performance and outcome but also in maintaining physical fitness. Poor cardiovascular induces child to feel drowsy and lose concentration easily while studying, Insanistyo B and Pujianto D (2018). High cardiovascular endurance is required for generating speed and strength during the high energy demanding games and sports activities, Kartal R (2016). Cardio respiratory fitness in relation to maximum oxygen uptake (VO_2) reveals physical fitness of a person. The 12 minute run/walk fitness test was developed by Dr Kenneth Cooper in 1968 as an easy way to quantify aerobic fitness and provides value that determines the efficiency with which someone can use oxygen while exercising, Quinn E (2019).

Cardiovascular endurance normally refers to aerobic endurance. In aerobic exercise oxygen is required for supplying energy needed for exercise. Hence, it can be counted that the objective of endurance training is to develop and improve the body systems that produce and supply the energy required to satiate the demands of sustained activity, Seiler S, et al (2009).

Cardiovascular endurance can be measured by simple fitness test to assess how well body functions to bring oxygen to muscle during exercise. A cardiovascular endurance test can be used to assess overall health, Mihalache A (2012). Cardiovascular endurance refers to the efficiency of the cardio respiratory system when continuously performing full-body exercises at moderate to high intensities, Pate R et al (2012).

A healthy level of cardiovascular endurance is positively associated to a healthier cardiovascular condition in children. Children with a healthy cardiovascular endurance level of overall adiposity and low metabolic risks, Ortega FB et al (2008).

Cardiovascular endurance is a direct marker of physiological status the level and it is related to many health related outcomes, Ruiz JR et al (2007). Cardiovascular endurance seems to thwart premature mortality and it has been linked to body fat with marks of metabolic syndrome and arterial compliance in young population which also subscribes the concept that the cardiovascular endurance may give a protective effect on the cardiovascular system from an early age, Brage S et al (2004).

The objective of the study

1. The objective is to conduct an assessment study on cardiovascular endurance of primary school children of Government and Private Schools.

Statement of the problem

The purpose of the study is to assess the cardiovascular endurance of primary school children of Government and Private schools of four districts namely Bongaigaon, Chirang, Kokrajhar and Baksa of Lower Assam.

Hypothesis of the study

In this study, the following hypothesis was put forth:

1. It was hypothesised that there would be a significant difference in cardiovascular endurance between the Private school children and Government school children.
- 2.

Delimitations of the study

1. The study was conducted by randomly selecting 1000 school children as subjects of the study of Lower Assam districts comprising of Bongaingaon, Chirang, Baksa and Kokrajhar.
2. The study was confined only to assess the cardiovascular endurance out of the five components of the Health related physical fitness.
3. The subjects were selected from the age group of 6 to 10 years.

Limitations of the study

1. Limitation of the study comprised of those aspects of the subjects living style, economic condition, eating habits, genetic and environmental factors which might influence the psychological variables were not taken into account in the study.
2. To attain maximum performance during the research and testing period, specific motivational practices and tactics were not used in the study.

Materials and Methods of data collection

The purpose of the study was to carry out an assessment study on cardiovascular endurance of primary school children of Lower Assam. To achieve the purpose of the study, 1000 students studying in primary level from Class I to Class V of government and private schools with age group of 6 to 10 years were randomly selected. It was made purely voluntary for the subjects to participate in the test. Before commencement of the test, the participants were categorically informed of the test protocols and procedures. Participants were made acquainted with the test prior to the study. The voluntary written consent was obtained from each participant and parents prior to the commencement of the test. The study was conducted in the primary schools of Bongaingaon, Chirang, Kokrajhar and Baksa districts of Lower Assam. As a necessary part of ethical research work, the nature and scope of study were explained to the subjects and their respective parents. Further, the necessary permission was obtained from the school authorities and Office of the District Elementary Education. Officer (DEEO) of the above mentioned four districts for conducting the study.

Out of the five components of the Health related physical fitness, to estimate the cardiovascular endurance, Cooper 12 Minutes Run/Walk test were applied in the study. The test battery was selected considering the age of the subjects, easy applications, reliability and feasibility aspects.

Statistical Analysis and Interpretation of the results

In the study, for the purpose of data analysis the IBM SPSS STATISTIC was used. Independent t Test was employed to find out the significant differences.

Table 1: Independent t –test for Cardiovascular endurance of children of Government school and Private school

| Cardio vascular endurance | Group | N | Mean | Standard Deviation | Standard Error Mean | Significance | t |
|---------------------------|----------------------------|-----|---------|--------------------|---------------------|--------------|-------|
| | Private school children | 500 | 912.02 | 181.55 | 8.12 | <0.001 | 13.74 |
| | Government School children | 500 | 1081.28 | 187.27 | 8.37 | | |

$p < 0.05$

N=Number of students, SD (σ) =Standard Deviation, SE=Standard Error, t=Student' t distribution

In the table 1, it is found that the Mean of Cardiovascular endurance of Private school children was found 912.02 whereas it was 1081.28 for Government school children. Standard Deviation of Private school children and Government school children was 181.55 and 187.27 respectively. There was significant difference in Cardiovascular endurance between Private school children and Government school children.

Table 1 denotes the mean, standard deviation of the Cardiovascular Endurance of children from Government and Private School. The Cardiovascular Endurance was found better in Government school children than that of Private school children.

Figure 1: Age group wise, the mean value of Cardiovascular Endurance is presented in Bar diagram.

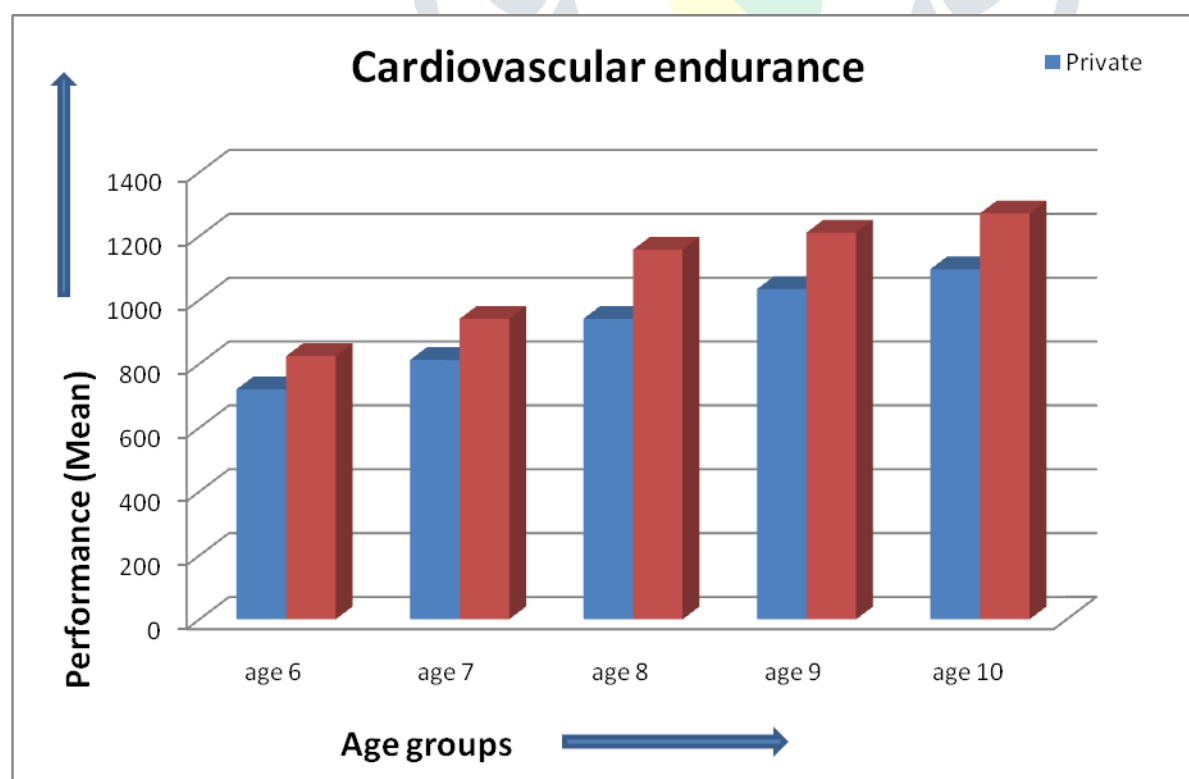
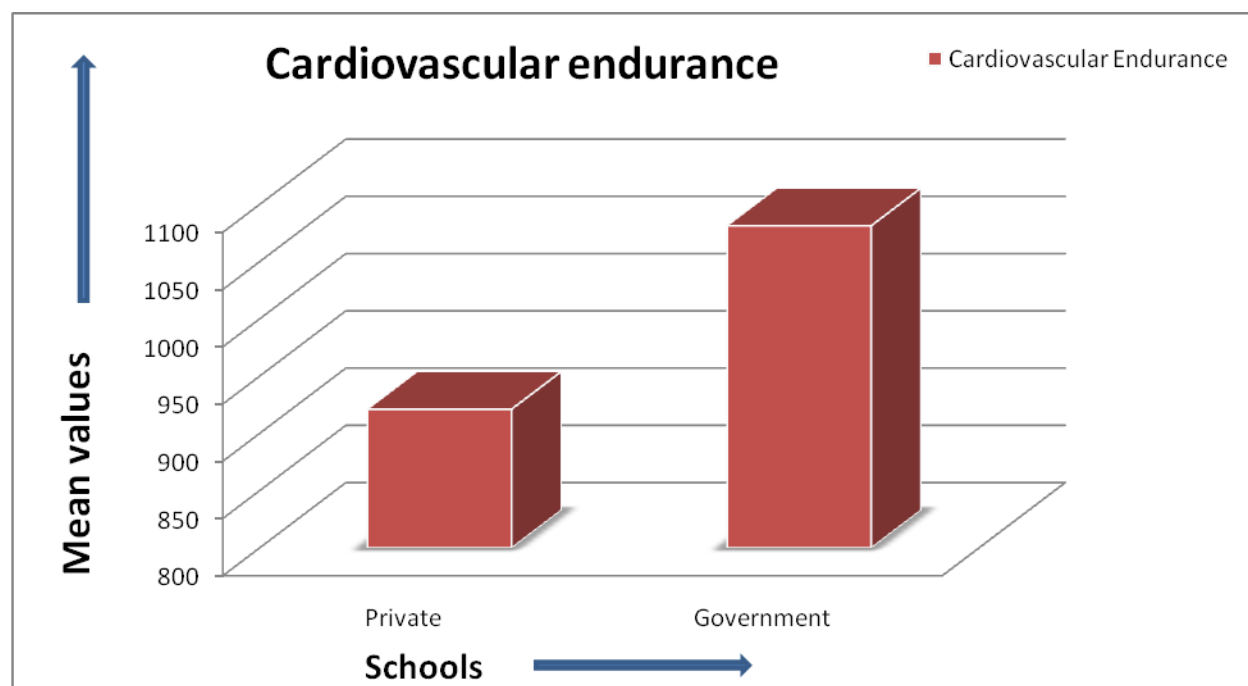


Figure 2: The mean value of Cardiovascular endurance of children of Private schools and Government schools is presented in Bar diagram.



Research conclusion

Considering on the findings of the study, it was concluded as under

1. The children of Government schools were found higher in Cardiovascular endurance and significantly greater values than the Private schools counterparts.

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