

An assessment study on health related physical fitness of school children with the components of muscular strength and endurance.

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Abstract: *With 14.4 million obese children, India stands as the second largest country in the world and it is next to China as the home for obese children. Through various study and research, it is emerged as an established fact that obesity is linked to heart disease, high blood pressure, diabetes, respiratory problem and slow mental growth etc. In the study, schools were selected by using purposive sampling in consideration of feasibility aspect. The sample size of the study was 1000 school children comprising of government school and private school with age range of 6 to 10 years. It is concluded in the study by its findings that government school children carry higher significance on muscular strength and endurance than that of private school counterparts.*

Key Words: Muscular strength, Muscular endurance, Obesity etc.

Introduction

Childhood obesity is a growing epidemic in the world. Alarmingly it is affecting more than 18% of children in some western countries. Childhood obesity is emerging as a global health issue. As per the report of World Health Organization (WHO), obesity in children nearly has been tripled since 1975 in the world. Further the report suggests that the prevalence of overweight and obesity among children and adolescents aged 5-19 increased alarmingly from just 4% in 1975 to just 18% in 2016 (WHO, 2016). The National Family Health Survey of India (NFHS-5) conducted in 2019-21 published a report of the survey that 3.4% children under five years are now overweight compared to 2.1% in 2015-16. WHO report had also suggested that 39 million under the age of 5 were overweight or obese in 2000 globally. Over 340 million children and adolescents with age range from 5-19 were overweight or obese in 2016.

As a developing country, in recent time, India is witnessing the double burden of diseases including childhood and adolescent obesity in one front and on other front the menace of non communicable diseases, malnutrition and overweight (Rajanitt et.al. 2016). The majority of overweight and obese children live in developing countries having an increased rate of more than 30% which is higher than that of developed countries (WHO Report, 2018). Obesity in children and adolescents is slowly emerging as a major public health challenge in many developing countries including India (Pepkin BM et. al. 1998).

Obesity is defined as abnormal or excessive fat accumulation that may impair health. It further clarifies the primary cause of obesity and overweight as an outcome of energy imbalance of calorie consumption and calorie burnt. Another contributing factor of obesity is an increase in physical inactivity due to the increasingly sedentary nature of the various types of work, changing mode of transportation and rapid urbanization (Global Health Observatory 2021).

The prevalence overweight and obesity in children is 15%. In private schools catering to upper income families, the incidence has shot upto 35-40% showing a worrying upward trend in growth. The childhood obesity carries a serious bearing on their health. Obese children are prone and very susceptible to the risk of hypertension, osteoarthritis, high cholesterol and triglycerides, Type-2 diabetes, stroke, gallbladder disease, respiratory problems, emotional disturbances and some cancers (Narayana Health, 2019).

As per the guidelines of WHO, the obesity is physical state or condition where a Body Mass Index (BMI) greater than or equal to 30. Body Mass Index (BMI) is a calculation that uses height and weight to estimate the body fat. Body Mass Index (BMI) is

calculated by Weight in Kg /Height in m^2m^2 .

The childhood obesity is a result of the interaction of natural selection favoring those with more economical energy metabolism and the present consumerist society with availability of energy rich foods and less energy demand in daily life (Han JC, et al 210). The factors contributing to the childhood obesity are over usage of technology, frequent consumption of snacks and portion size of meals and the reduction in physical activity of children. A study revealed that use of electronic devises 3 or more hours a day carried 17-44% increased risk of being overweight or a 10-16 increased risk of obese (Cespedes ML, et al 2011).

In India, medically it is found that Indians are genetically predisposed to obesity. However through various studies, it is commonly found that rapid increase in childhood obesity is largely due to environmental influences.

The Centre for Health Promotion & Wellness at MIT Medical terms physical fitness is to human body what fine tuning is to an engine. It enables an individual to perform to one's potential. Fitness can be described as a condition that helps an individual to look, feel and do at one's best. Physical fitness also comprises the performance of heart and lungs and also the muscles of the body.

Health related physical fitness is defined as a multi dimensional construct containing the components cardio respiratory endurance, muscular strength, muscular endurance, flexibility and body composition (Britton U et.al 2019).

Health related physical fitness (most commonly, aerobic fitness, body composition, muscular strength, muscular endurance, and lower back and hamstring muscular flexibility) that are associated with some aspects of overall good health or disease prevention (Medical Dictionary for the Health Professions and Nursing 2012). For improving of health related physical fitness including cardiovascular endurance, muscular strength and endurance, flexibility and body composition is conducive and precondition for improving health. Through the findings of the study, it is reported that muscular strength and endurance are linked to established and emerging cardio vascular disease risk factors. In addition to that improvement in muscular strength, muscular endurance and flexibility give positive effect on skeletal health (Ortega FB et. al 2008). Muscular strength is one of the most pertinent components of physical fitness with enormous positive influence on health status (Galancho-Reina I. et al 2019).

Health related physical fitness is a physiological state of well being that reduces the risk of hypokinetic disease, a basis for participation in sports, and vigor for the tasks of daily living (F W Booth, 2014).

The components of Health related physical fitness are Cardio vascular endurance, Muscular strength, Muscular endurance, Flexibility and Body Composition. There is unanimous consensus in the fitness community that these are five components of Health related physical fitness.

Muscular strength is generally defined as the maximum amount of force that a muscle can exert against some form of resistance in a single effort.

Muscular endurance is the ability to resist fatigue while holding or repeating a muscular contraction.

The objective of the study

1. To carry out an assessment study on muscular strength and endurance of Primary school children.
2. To find out the health related physical fitness level of Primary school children of Lower Assam Districts through two components muscular strength and endurance.

Statement of the Problem

The purpose of the study was to assess the Muscular endurance Muscular strength of Primary school children of Lower Assam.

Hypothesis of the study

In this study, the following hypothesis was put forth:

1. It was predicted that there would be a significant difference in Muscular Endurance and Muscular strength between the Private school children and Government school children.

Delimitation 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 Bongaigaon, Chirang, Baksa and Kokrajhar.
2. The study was delimited to Muscular endurance and Muscular strength out of the five components of the Health related physical fitness.

Limitation 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 that were not controlled or identified throughout the investigation and testing period.

Materials and Method of Data Collection

Total 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 who volunteered to participate in the study. Before commencement of the study, the participants were informed of the test protocols and procedures and to ascertain equal efforts in the test, participants were encouraged throughout the test. 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 start of the study. The study was conducted in the primary schools of Bongaigaon, Chirang, Kokrajhar and Baksa districts of Lower Assam. As an important and cardinal 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 assess the Muscular strength and endurance the Bent Knee - Push-up and Bent Knee Sit-up were applied in the study. Those two test batteries were selected considering the age of the subjects and easy applications.

Statistical Analysis and Interpretation of the results

In the study, for the purpose of data analysis the IBM SPSS STATISTIC 2022 version used. Independent t Test was employed to find out the significant differences.

Table1: Independent t –test for Muscular Endurance of children of Government school and Private school

	Group	Number of subject (N)	Mean	Standard Deviation (SD)	Standard Error (SE)	t	Sig.
Muscular endurance	Private school children	500	13.74	4.05	0.18	<.001	15.94
	Government School children	500	18.64	5.54	0.25		

$p < 0.05$

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 Muscular Endurance of Private school children was found 13.74 whereas it was 18.64 for Government school children. Standard Deviation of Private school children and Government school children was 4.05 and 5.54 respectively. There was significant difference in Muscular endurance between Private school children and Government school children.

Table 2: Independent t-test for Muscular Strength of children of Government school and Private school

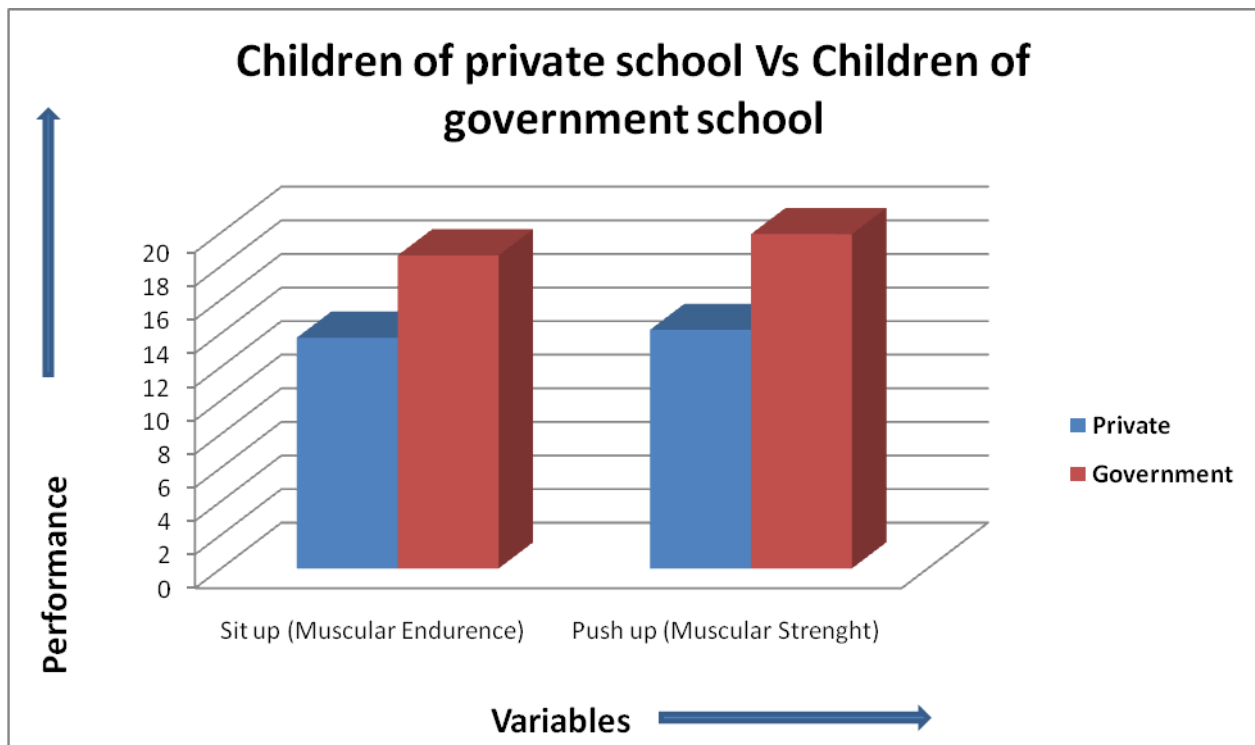
	Group	Number of subject (N)	Mean	Standard Deviation (SD)	Standard Error (SE)	t	Sig.
Muscular Strength	Private school children	500	14.21	4.10	0.18	<.001	18.79
	Government School children	500	19.91	5.40	0.24		

$p < 0.05$

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

In the table 2, it was observed that the Mean of Muscular Strength of Private school children and Government school children was 14.21 and 19.91 respectively. Standard Deviation of Private school children was 4.10 whereas it was 5.40 for Government school children. There was significant difference in Muscular strength between Private school children and Government school children.

Figure 1 is the graphical representation of the findings of the Independent t Test on Muscular Endurance and Muscular Strength between the Private school children and Government school children.



Conclusion

Within the limitations and delimitations of the study, the following conclusion was drawn:

1. The children of Government school were found higher Muscular endurance and significantly greater values than the children of Private school.
2. Again, it is concluded with the findings of the study that the children of Government school were found significantly higher Muscular strength and greater values than the Private school.

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