



ASSESSING CARDIORESPIRATORY FITNESS AND FLEXIBILITY IN 12 TO 17 YEARS OF SCHOOL GOING CHILDREN: A SURVEY BASED STUDY

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ABSTRACT

This is a survey based study for assessing the Cardiorespiratory Fitness and Flexibility in 12 to 17 years by using Sit and Reach Test and Cooper Run Test. The objective are to assess the Cardiorespiratory fitness by Cooper Run Test & Flexibility by Sit and Reach Test among the 12 to 17 years of school going childrens. Total 382 assents and consents form were recorded from parents, participants respectively.

KEYWORDS : School Going Childrens, Cardiorespiratory Fitness, Flexibility, Cooper Run Test, Sit and Reach test

INTRODUCTION

Children is defined as the transition phase between childhood and adulthood, is a natural time of learning and adjustment, particularly in the setting of long-term goals and personal aspirations¹.

Physical activity and physical fitness are key components in the development and well-being of children and childrens². While Physical activity is defined as any bodily movement as a result of muscular activity, physical fitness refers to the ability to perform activities of daily living without undue fatigue³. It is an important health marker, because high levels of fitness during childhood and adolescence have a positive impact on adult health^{4, 5}.

Academic achievement testing mandated by the state has unintentionally led to a decrease in opportunities for children to engage in physical activity both during the school day and outside of it. This is primarily due to a shift in school time allocation from physical education to academic subjects. Furthermore, some children are excluded from physical education classes or recess to participate in additional academic programs aimed at improving their academic performance⁶.

An increased sedentary lifestyle in children and childrens^{7, 8, 9}, which also affects physical fitness¹⁰. By mid-adolescence, students sit for up to 70% of the school day¹¹, and spend significantly more time sitting¹². Students spend 8 hours per day on sedentary activities¹³ and Increased academic demands, which decrease the time effectively spent in physical activity also known and proven that decrease level of physical activity, decreases physical fitness levels¹⁴.

The 12-minute run fitness test was developed by Kenneth Cooper, MD, in 1968 as a valid way to measure Cardiorespiratory fitness and provide an estimate of VO₂max for The Cooper test, as it's also known, is still used today as a field test for determining Cardiorespiratory fitness¹⁵.

Flexibility is defined as the ability of the muscle to lengthen to the end of the ROM. It is influenced by muscles, tendons, ligaments, bones, and bony structures¹⁶ and it commonly accepted as an important component in reducing the prevention for injury¹⁶. According to Giles R et al, aging leads to decrease in flexibility. Increase in flexibility is seen from birth to adolescence¹⁷.

To assess flexibility sit-and-reach test (SRT) has been commonly used. The SRT is proven to be better in measuring flexibility¹⁸.

Need Of Study

School going Children are engaging in prolonged period of sitting for 8 hours per day¹³, inactive behavior due to increasing academic demands¹⁴ and decrease in opportunities to engage in physical activity⁶.

The most recent global data by WHO reveal the majority (81%) children are far less active¹⁹.

Hence, we cannot neglect the adverse effect of physical inactivity on the Cardiorespiratory fitness and Flexibility.

Methodology

Study Design : A Survey Based Study

Sample Size : 382

Sampling Method : Cluster sampling

Study Population : School going Children

Study Setting : School in and around pune

Study Duration : 6 Months.

Criteria

Inclusion Criteria :

Age 12 to 17 years old.

Exclusion Criteria:

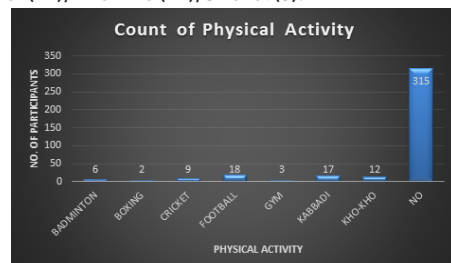
Recent or chronic musculoskeletal injuries, Cardiovascular condition, Unstable medical condition reported by parents and school authority.

RESULTS

This study was done in 382 school going children from Pune. Total 382 assents and consents form were recorded from parents, participants respectively.

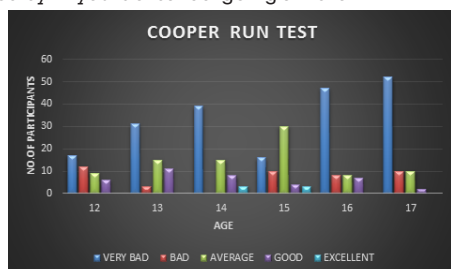
Gender distribution of participants shows 193(50.52%) of boys and 189(49.48%) of girls.

There are 315 (82.46%) participants reported to less physically active, 18 Participants are engaged with Football, followed by Kabbadi (17), Kho-Kho (12), Cricket (9).



Cooper 12 minute run test performed in children, There were 142(73.58%) boys and 62(32.8%) Girls are categorized as 'Very Bad' it indicates the higher prevalence of very poor Cardiorespiratory endurance is in a peaks in age 17,16

followed by 14 years of school going children



Sit and reach test used to assess the flexibility in school going children, There are 64 Boys (33.16%) and 100 Girls (52.91%) indicating higher prevalence of poor flexibility with the highest proportion observed in 13 years of school going children.



DISCUSSION:

The Study was carried out to assess cardiorespiratory fitness and flexibility in 12 to 17 years school going children in and around Pune (Maharashtra). Out of 400 students, 382 students fitted in the inclusion criteria were assessed for Cardiorespiratory fitness and flexibility

The study showed that Children aged 12-17 years had less physically activity and decreased cardiorespiratory fitness & Flexibility. There Study indicates the higher prevalence of very poor Cardiorespiratory endurance is in a peaks in age 17,16 followed by 14 years.

The reasons are excessive uses of smartphones for playing games, entertainment, excessive screen time²⁰. A Study conducted in children reveals positive relation between physical activity and cardiorespiratory fitness²¹.

According to data from the Swedish version of the European Youth Heart Study, children who completed more than 40 minutes a day of intense physical exercise had improved cardiorespiratory fitness²². Physical activity levels are the primary factor influencing CRF in individuals²³ increasing evidence indicates that low physical activity in children is associated with increased cardiovascular risk.^{24,25}

According to WHO physical activity guideline 2022, A global target to reduce physical inactivity by 15% by 2023, Globally, 81% of aged 11-17 years children were insufficiently physically active. Children should do at least 60 minutes of moderate to vigorous intensity of physical activity per day²⁶ can prevent and control noncommunicable diseases, such as heart disease, stroke, diabetes and even malignancies²⁷.

There were 315 subjects are less physical activity this is the 82.46% of study population, Physically less active are at a higher risk of developing cardiovascular disease²⁸. The most recent global data by WHO reveal the majority (81%) children are far less active¹⁹. This study showed higher prevalence of poor flexibility with the highest proportion observed in 13 years of school going children, Less than 2 hours of screen entertainment per day is referred as a part of sedentary lifestyle in children²⁹.

Reduced flexibility is due to spend a lot of time in the sitting position during school time less activity from a sedentary lifestyle and lack of flexibility²⁶. 25% of adults worldwide do not engage in the recommended amounts of physical activity. over 80% of children worldwide have insufficient physical activity³⁰. Physical inactivity is directly linked to the risk of obesity and other health problems in children³¹.

FIT INDIA movement is to bring to promote fitness by various physical activity & spread awareness in every school, college, university, etc³⁰. Students will engage in sports-integrated learning activities in the classroom to assist them develop a fitness-as-a-lifelong attitude and to reach the fitness levels and related life skills that the Fit India Campaign expects. it is widely acknowledged that sports education is necessary to support holistic development³².

Requirement for academic success has resulted in less opportunities for children to be physically active during and after school hours⁶.

The sedentary lifestyle and increased academic demands within school going children are decreased opportunities for physical activity. Findings show the importance of promoting flexibility especially in Girls participants who have poor flexibility.

CONCLUSION

From this study we conclude that due to physical inactivity there is high prevalence of (73.58%) boys and (32.8%) Girls have poor Cardiorespiratory fitness is in a peaks in age 17,16 followed by 14 years, (33.16%) Boys and Girls (52.91%) showed poor flexibility in the highest proportion observed in 13 years of school going children.

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