



Physiotherapy.

ASSESSMENT OF HEALTH RELATED-PHYSICAL FITNESS COMPONENTS AMONG PRIMARY SCHOOL GOING CHILDREN IN TRIBAL, RURAL AND URBAN AREA.

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ABSTRACT **BACKGROUND:** Physical fitness level in childhood and adolescence is related to present and future health related outcomes such as risk for obesity, cardiovascular disease, skeletal and mental health. Hence childhood fitness is an emerging area of public health concern worldwide. **OBJECTIVE:** To assess and compare the health-related physical fitness components among primary school going children in tribal, rural and urban area. **METHODOLOGY:** 300 participants (100 from each area) in the age group of 5-10 years were involved. Health-related physical fitness components such as body composition, flexibility and abdominal strength assessed by Body Mass Index (BMI) percentile, V sit-reach test and partial curl ups respectively. Data analysis was done by using Student's Unpaired 't' test. **RESULTS:** The results showed statistically significant difference in health-related physical fitness components among primary school going children in tribal, rural and urban area. **CONCLUSION:** The children living in tribal area had better abdominal strength than the rural and urban area, the school going children in rural area were more flexible than the tribal and urban school going children and the urban school going children have higher Body Mass Index (BMI) percentile than tribal and rural school going children.

KEYWORDS : Health-related physical fitness, Body composition, Flexibility, Abdominal strength, Areas.

1. Introduction

Physical fitness is a set of attributes or characteristics individuals have or achieve that related to their ability to perform physical activity.[1] It is an individual matter and multidimensional state of being.[4,7] From the physiological point of view physical fitness is the ability of body to adopt and recover from strenuous exercise.[16] The characteristics of physical of fitness are divided into components such as health related physical fitness and skill related physical fitness. The health-related physical fitness components are cardio-respiratory endurance, body composition, muscular strength, muscular endurance and flexibility.[1] Each health-related fitness characteristic has a direct relationship to good health and reduced risk for hypo-kinetic disease. Possessing a moderate amount of each component of health-related fitness is important to disease prevention and health promotion.[4]

A physically fit individual has a healthy, happy and positive perspective towards life. It develops self-reliance and keeps person mentally alert.[3] As compared to inactive people, active people are less likely to suffer premature all-cause mortality; cardiovascular diseases (CVD) such as coronary heart disease (CHD), stroke and high blood pressure, colon cancer, non-insulin dependent diabetes mellitus (NIDDM) and osteoarthritis.[20] Physical fitness level in childhood and adolescence is related to present and future health related outcomes such as risk for obesity, cardiovascular disease, skeletal health and mental health.[10,12] Hence childhood fitness is an emerging area of public health concern worldwide.[21]

Health related physical fitness is important during childhood and adolescence period for proper growth and development.[15] Childhood and adolescence are extremely important period of life, since dramatic physiological and psychological changes take place during this period. Similarly, lifestyle and healthy/unhealthy behaviors are established during these years, which may influence adult behavior and health status.[16] High level of physical fitness is also associated with academic success.[2] Furthermore physical fitness has positive relation with attention, memory, response speed and it also associated with cognitive processing speed. Fitness may be related to better cognitive functioning and have implication for increasing cognitive health in children and adults.[8]

Living in different geographical areas differentiated by population size can be associated with differences in eating habits, access to sports facilities, and opportunities for physical fitness activities. However, it is not entirely clear whether such factors can affect aspects of body composition and physical fitness.[19] Majority of the Indian population belong to rural areas, mainly depending on agriculture for their survival and are more physically fit when compared to the urban

population who have sedentary life style. The tribal communities in India are in different stages of development, but they are still backward in comparison to urban communities. In tribal area people have active life with a lot of physical activities to earn their daily bread which is contributory to their physical development and also enhances physical fitness.[13]

Therefore it is important to compare health related physical fitness parameters in tribal, rural and urban school going children who may be selected at an early age and may be systematically supported for their sport potentialities through specific sport training for enhancing performance and improving overall fitness and prevent present and future health related outcomes such as risk for obesity, cardiovascular disease, skeletal health and mental health.[13]

2. Material and Methods

The study received approval from Institutional Ethical Committee. All the participants were screened according to inclusion and exclusion criteria. In this study both male and female participants between 5-10 years age group were included. Participants below 5 years, with any disability and illness and those who were reluctant to participate, or were absent on the day of testing were excluded. The participant's guardians were explained about the type of study benefits and hazards. Then informed written consent was obtained from the participant's guardian regarding the procedure prior to the study. The following sequence of testing was followed for all children.

2.1 Body composition

Height and body weight of participants dressed in light clothes, without shoes were recorded, using digital weighing machine. Height was recorded in centimeters while body mass was recorded in kilograms. CDC Body Mass Index (BMI) calculator were used to calculate BMI (Body Mass Index) percentile.

2.2 Flexibility

It is measured using V-sit reach test. Placed a measuring tape on the floor with right angle line which is made with tape at the 15 inch mark. The participant sited with the measuring tape between the legs, with the legs extended at right angle to the taped line on the floor. The heels of the feet should touch the edge of the right angle taped line and heels should be about 10 to 12 inches apart. With the legs held flat by therapist, the participant should slowly reach forward with both hand as far as possible, holding the position approx. 2 sec. If participant was able to touch the right angle to the taped line, the distance was marked as "0". If participant was unable to touch the right angle to the taped line then the distance between that point and tip of the middle finger was measured in centimeters and represented as negative and if participant was reached beyond the right angle to the taped line then

distance was represented in positive. The score is the most distant point which is taken in cm. The participant should breathe normally and should not hold the breathe during the test.

2.3 Abdominal strength

It is measured using partial curl ups in one minute. The participant lay supine with knees flexed and feet about 12 inches from buttocks. Arms are extended forward with fingers resting on the legs and pointed towards knees and then participant should slowly slide the fingers up the legs until the fingertips touch the knees, then back down until the head touches ground. The participant was asked to perform partial curl-ups in one minute as many times possible.

3. Data analysis and Results

Table 1- Comparison health-related physical fitness parameters in Tribal, Rural and Urban area.

Parameters	Tribal	Rural	Urban
	Mean ± SD	Mean ± SD	Mean ± SD
BMI percentile	21.43±17.664	15.79±22.201	62.98±30.069
Flexibility	0.01±3.406	2.45±3.693	0.793±4.445
Abdominal strength	23.71±6.022	16.94±4.838	14.18±3.785

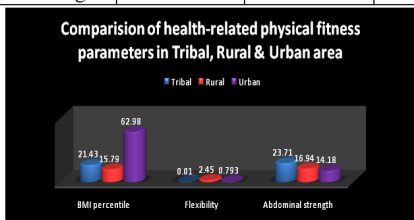


Fig 1: Comparison health-related physical fitness parameters in Tribal, Rural and Urban area.

Results: Table 1 shows that the Body Mass Index (BMI) percentile is higher in urban school going children as compared to others, tribal school going children have better abdominal strength than rural and urban school going children and flexibility is more in rural school going children than tribal and urban students.

Table 2 : Represents comparison of health-related physical fitness parameters in tribal and rural area.

Parameters	Tribal	Rural	Student's Unpaired 't' test value	'p' value	Results
	Mean ± SD	Mean ± SD			
BMI percentile	21.43±17.664	15.79±22.201	2.02	p <0.01	Significant
Flexibility	0.01±3.406	2.45±3.693	1.99	p <0.01	Significant
Abdominal strength	23.71±6.022	16.94±4.838	3.01	p <0.01	Significant

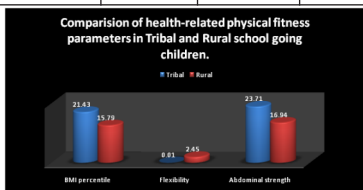


Fig 2: comparison of health-related physical fitness parameters in tribal and rural area.

Results: Table 2 shows that the t value for mean of BMI percentile in tribal and rural school going children is 2.02 and p value is <0.01 which is statistically significant. For flexibility the t value is 1.99 and p value is <0.01 which is statistically significant in tribal and rural school going children. In comparison of mean of abdominal strength in tribal and rural school going children, the t value is 3.01 and p value <0.01 which is statistically significant.

Table 3: Represents comparison of health-related physical fitness parameters in tribal and urban area.

Parameters	Tribal	Urban	Student's Unpaired 't' test value	'p' value	Results
	Mean ± SD	Mean ± SD			
BMI percentile	21.43±17.664	62.98±30.069	22.14	p <0.01	Significant
Flexibility	0.01±3.406	0.793±4.445	2.62	p <0.01	Significant
Abdominal strength	23.71±6.022	14.18±3.785	3.11	p <0.01	Significant

BMI percentile	21.43±17.664	62.98±30.069	22.14	p <0.01	Significant
Flexibility	0.01±3.406	0.793±4.445	2.62	p <0.01	Significant
Abdominal strength	23.71±6.022	14.18±3.785	3.11	p <0.01	Significant

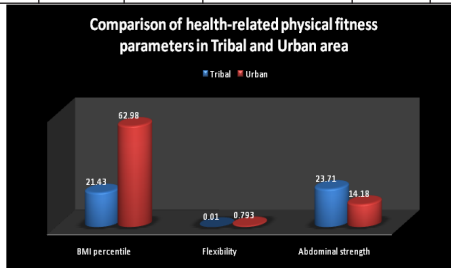


Fig. 3: comparison of health-related physical fitness parameters in tribal and urban area.

Results: Table 3 shows that the t value for mean of BMI percentile in tribal and urban school going children is 22.14 and p value is <0.01 which is statistically significant. For flexibility t value is 2.62 and p value is <0.01 which is statistically significant in tribal and urban school going children. In comparison of mean of abdominal strength in tribal and urban school going children, t value is 3.11 and p value is <0.01 which is statistically significant.

Table 4: Represents comparison of health-related physical fitness parameters in rural and urban area.

Parameters	Rural	Urban	Student's Unpaired 't' test value	'p' value	Results
	Mean ± SD	Mean ± SD			
BMI percentile	15.79±22.201	62.98±30.069	29.17	p <0.01	Significant
Flexibility	2.45±3.693	0.793±4.445	2.74	p <0.01	Significant
Abdominal strength	16.94±4.838	14.18±3.785	1.92	p <0.01	Significant

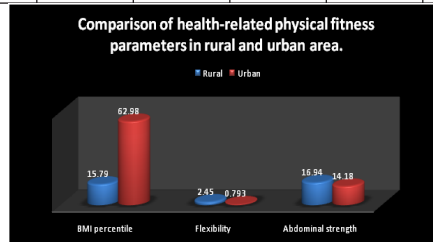


Fig 4: Comparison of health-related physical fitness parameters in rural and urban area.

Results: Table 4 shows that the t value for mean of BMI percentile in rural and urban school going children is 29.17 and p value is <0.01 which is statistically significant. For flexibility the t value is 2.62 and p value is <0.01 which is statistically significant in rural and urban school going children. In comparison of mean of abdominal strength in rural and urban school going children, t value is 1.92 and p value <0.01 which is statistically significant.

4. DISCUSSION

The strength of the present study is the ability to assess the children who resides in tribal, rural and urban area because all the geographical areas and ethnic distribution of the samples. According to our knowledge, this may be a first study which examined selected health-related physical fitness components in tribal, rural and urban primary school going children. The present study showed that there was significant difference in health-related physical fitness components among primary school going children in tribal, rural and urban area.

The results of study showed that the urban school going children had a higher Body Mass Index (BMI) percentile than tribal and rural school going children. In urban school going children, there is increased calorie intake due to consumption of junk food (consuming high level

of dietary fats, carbohydrates and sugary drinks), less energy expenditure and sedentary life style (e.g. watching television, computer games and usage of mobile phone for prolonged period of time) which may lead to obesity.[5] Some other reasons which contributed to increase in obesity and decrease in fitness level are improved economic status and better lifestyle choices, increased academic demands and competitiveness which decrease the time effectively spent in physical activity and concerns of child safety, which parents voice as reasons for disallowing physical activity.[11] Hence decrease in physical activity lead to decrease in fitness levels which increase the risk of incidences of several chronic-degenerative dysfunctions in early ages.[13]

The reference data from this study is in agreement with evidence from a study done by Saha, G.C. &Haldar, S. shows similar results that Body Fat Percentage is more in urban children as compared to rural children.[13]In another study conducted in North Cyprus by Tinazci, Cevdet and Emiroglu, Osman, it has been found that body fat (BMI and Skinfold thickness) was higher in urban children when compared to those who residing in rural areas.[17]While another study conducted by Sampa Sarkar and Dr. Ashish Paul in tribal and non-tribal school going boys showed that non- tribal students had higher body fat % than tribal students.[15]

When flexibility was compared, the results revealed that the rural school going had more flexibility than tribal and urban school going children. It is commonly observed that the lifestyle of rural population is based on hard physical works which makes them more hardy, speedy and flexible due to these reasons they have high functional ability in their daily activities which makes them more fit physically and mentally.[13]

The literature shows contradictory results in relation to flexibility living in urban and rural settings, yet some evidences agrees with our results. The study done by Saha, G.C. &Haldar, S. shows similar results that rural school going children are more flexible than urban student.[13] Another study done by Sampa Sarkar and Dr. Ashish Paul shows that the non-tribal students were more flexible than tribal students.[15]In Kurukshetra, another study was done by Gahlawat, Parveen shows similar results as our results that is flexibility is higher in rural students than urban students.[6] Another study done by Tinazci,Cevdet and Emiroğlu Osman suggest that children living in the urban area have lower flexibility than those who live in rural region.[18]

Our results also suggest that tribal school going children had more abdominal strength than rural and urban school going children. Due to hilly geographical area, tribal students are generally engaged in hard working and laborious activities and may be genetically strong.[13] Also the students belong to hilly tribal area performs various extra activities in addition to regular physical activities in school like climbing hill during their walk to school, market, nearby villages. Due to these reasons their abdominal strength is higher than others.

A study done by Bikram Singh Laishram on topographical conditions and physical fitness shows that the tribal school going active female students belonging to hilly area is superior in abdominal strength as compared to tribal school going active female students belonging to plain area.[9]

5. CONCLUSION

The study concluded that there was significant difference in health-related physical fitness components among primary school going children in tribal, rural and urban area. The tribal school going children had better abdominal strength than the rural and urban school going children. The rural school going children were more flexible than tribal and urban school going children and the urban school going children had higher Body Mass Index (BMI) percentile than tribal and rural school going children.

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