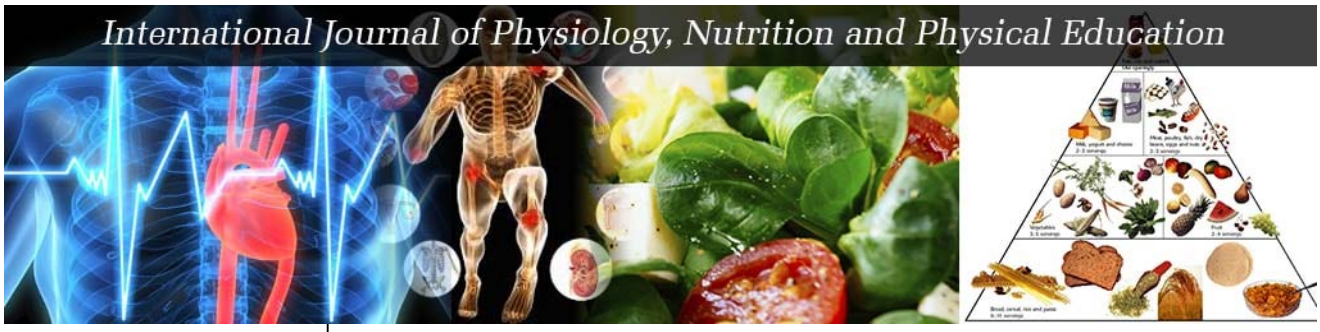

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Study of physical fitness parameters among the adolescents from Punjab

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Abstract
The primary aim of the present study was to compare the physical fitness parameters of the rural and urban children from Punjab. For the purpose of this study, 60 children (30 rural and 30 urban) of 16 years age group were selected to participate in the study. All the children were measured for various physical fitness parameters. The standing broad jump and standing vertical jump were applied to measure the explosive strength. The speed ability was measured with the help of 30 meter sprint (Flying Start). The endurance of the rural and urban children was assessed with the help of 800 meter run. Sit and reach test was used to assess the flexibility of the children. The grip strength was measured with the help of hand dynamometer. The medicine ball put was used to measure the strength of arms. The independent samples t-test revealed that the rural children were found to have significantly better performance on medicine ball put ($p<0.05$), standing broad jump ($p<0.05$), and endurance ($p<0.05$) hand than the urban children. It can be concluded that the rural children were better in some physical fitness parameters.

Keywords: Physical Fitness Parameters, Rural Area, Urban Area, Children, Speed, Medicine Ball Put, Grip Strength

Introduction
Residential areas are categorized as rural or urban areas on the basis of the density of population and human formed structures in a particular area. Urban areas are defined by their advanced public services, better facilities for education, sports, transport, business, health, social interface and overall improved standards of living. Socio-cultural information is usually based on urban residents. Whereas rural areas depends more on natural assets and events, the urban inhabitants gets the benefits of man's advancements in the fields of science and technology and for their everyday functioning, they do not need to depend upon nature. Due to globalization and growing economic growth, many countries are rapidly undergoing important demographic, epidemiological and nutrition transitions. Urbanization and increasing income have a great impact on health and well being [1-3] due in part to change in dietary and physical activity patterns [4, 5]. The transition from rural agricultural societies to urban societies, which come with major changes, have forced to a large extent the social and biological transformation of populations throughout the world [6]. The differences in growth, body dimensions, body composition and fitness levels of children due to urban and rural environmental disparities have come into center of attention during the last few years.
The environmental factors lead to changes in the physical fitness level among children. The impact of socioeconomic status, ethnicity and area of residence (urban or rural) has been reported on the level of physical fitness among children, with no consistent patterns emerging [7]. Shen and Huang [8] observed that greater physical fitness of children had a significant relationship with larger living space and residing in rural areas. Rural area is generally linked to a more strenuous, physically dynamic way of life that is advantageous to physical fitness. On the other hand, changes in lifestyle due to living in urban settings may also affect physical fitness. Environmental and social changes related to living in urban areas such as crowding, changing neighborhood, safety worries and inadequate grounds for play may possibly contribute to lower level of physical fitness among children [9]. Similar studies also reported which showing the significance of living area as a determinant of physical fitness in children [10, 11].
Differences in physical fitness levels of children from different socio-economic groups and rural and urban areas reported in developed and developing countries.

Contradictory studies have been published on physical fitness components of urban and rural children [12-15]. Matsui and Tamura [16] demonstrated that the children from rural areas had better endurance ability than the children in urban areas from Japan. Eiben *et al* [17] investigated a large number of 3 to 18 years old children in Hungary and observed that urban environment had beneficial effects on the physical fitness and children from urban areas were performed better in fitness tests. The children from rural areas in Tswana had superior endurance performance but lower grip strength than the children from urban areas [18, 19]. The rural children in Mexico were found to have superior handgrip strength whereas explosive power, muscle endurance and strength were superior in children from urban areas when adjustments for age and body size were made [9]. The children from urban areas in Greece had significantly higher performance in basketball throw and vertical jump compared to their rural counterparts, whereas the rural children had significantly greater handgrip strength compared to urban children [20]. The rural children in Turkey were found to have significantly superior flexibility and muscular endurance than their urban counterparts [21]. Investigation of the physical fitness of children living in hastily developing urban areas and in rural areas in various countries is potentially of importance [7].

To become physically fit is not only important for sports and games but it is also very essential factor for living a healthy and happier life [22, 23]. Physical fitness helps to develop the positive attitude towards body, enables the child to be motivated to maintain or improve his individual fitness. In the present study, an attempt has been made to find out whether the differences exist in the physical fitness parameters among boys living in different background i.e. rural and urban.

Methodology

The subjects of the present study were purposively selected from the various camps conducted under "Catch Them Young Programme" organized by Department of Physical Education (AT), Guru Nanak Dev University, Amritsar under the aegis of Centre of excellence in sports sciences. A total sixty children of age 16 years from the rural and urban areas were selected as subjects. Out of sixty children, 30 children were belonged to rural areas and 30 children were from the urban areas. In different studies and countries the meaning and definition of rural and urban residence may differ according to their country norms. For the present study, an area with a minimum population of 15,000, with 75 percent of the male population is engaged in non-agricultural works is considered as urban area.

Physical Fitness Parameters

All the subjects were assessed for various physical fitness parameters. The various parameters of physical fitness were measured using the following tests

Table 1: Tools and measurement units of physiological variables

Sr. No	Component	Tests	Unit of Measurement
1	Speed	30m sprint (flying start)	Seconds
2	Endurance	800m run/walk test	Minutes
3	Shoulder Strength	Medicine ball put	Meters
4	Explosive Strength	Standing vertical jump,Standing broad jump	Centimeters
5	Flexibility	Sit and reach test	Centimeters
6	Grip Strength	Hand dynamometer	Kilograms

Statistical Analysis

Statistical analysis was performed using SPSS version 16.0 for windows (SPSS Inc, Chicago, IL, USA). All descriptive data pertaining to physical fitness variables was reported as mean and standard deviation. An independent sample t-test was used to compare the mean values of physical fitness parameters between the 16 years old rural and urban children. Significance levels were set at $p<0.05$.

Results

Table 2: Comparison of physical fitness components of the rural and urban boys

Variables	Rural (N=30)		Urban (N=30)		t- Value
	Mean	SD	Mean	SD	
Speed (sec)	4.65	0.51	4.64	0.47	0.05
Medicine Ball Put (m)	3.83	0.89	3.35	0.80	2.17*
Flexibility (cm)	12.33	8.02	10.85	5.82	0.81
Endurance (min)	3.21	0.38	3.51	0.41	2.93**
Standing Vertical Jump (cm)	33.70	5.15	34.00	7.19	0.18
Standing Broad Jump (cm)	190.73	22.40	171.83	30.47	2.73**
Grip Strength Left (kg)	35.00	6.95	31.73	5.64	1.99
Grip Strength Right (kg)	35.80	6.74	32.93	6.77	1.64

* Indicates $p<0.05$

The Physical fitness parameters of the rural and urban boys are shown in table 2. There was no significant difference in relation to speed between the 16 years old rural and urban boys. Rural boys were found to have significantly better performance in medicine ball put ($t = 2.17$, $p < 0.05$) when compared to urban boys. Similarly, the rural boys were found to have significantly better endurance ($t = 2.93$, $p < 0.01$) as compared to urban boys. However, there were no significant differences on the variables flexibility, standing vertical jump and grip strength of both right and left hands between the rural and urban boys. Whereas, the boys residing in rural areas were reported to have significantly better standing broad jump ($t = 2.73$, $p < 0.01$) as compared to boys residing in urban areas.

Discussion

The presents study evaluated and compared the 16 years old rural and urban boys on the physical fitness parameters. The

findings of the study showed that the rural boys had performed significantly better in medicine ball put, endurance and standing broad jump as compared to urban boys. The present data agreed with the published reports advocating that the place of residence has an impact on children's fitness. Contradictory studies have been published on physical fitness components of urban and rural children. [12-15, 24] In some cases, there were no significant differences in physical fitness between urban and rural children [25]. While some studies reported that the urban children have superior physical fitness compared to children from rural areas, other studies reported contradictory findings. Reports suggested that the physical fitness of children across rural and urban environments should be studied in different climatic, economic and cultural perspectives [7]. Matsui and Tamura [16] demonstrated that the children from rural areas had better endurance ability than the children in urban areas from Japan, while Henneberg and Louw [26] reported that the children from rural areas in South Africa were found to have significantly lower grip strength than urban children, but no significant differences were reported among rural and urban children in neuromuscular reaction time and pulse rate. Many studies from Poland, Turkey and Bengal proposed that rural children were fitter than their urban counterparts [13, 21, 27, 28]. However, Tsimeas *et al* [20] reported mixed results on Greek children regarding physical fitness as urban children were better in vertical jump and basketball throw and rural children were better in hand grip strength. The boys in the present study have lower flexibility and grip strength compared to adolescents from Oman [29] whereas have higher flexibility than the Swedish boys [30]. On the other hand, no significant differences were reported in performance of speed, standing vertical jump, flexibility and grip strength between the two groups. Such research reports may be due to the fact that the difference between rural and urban areas are diminishing because of facilities which were available in urban areas are now being provided in rural areas also in terms of gymnasium, transport, connectivity with other towns and cities and better health facilities and other opportunities. But as the results of the present study showed that rural children were better in some physical fitness parameters than the urban children, it might be due to more activity oriented routine in rural areas, engagement in agriculture related work, more open spaces and play fields compared to cities, clean air etc in the rural areas of Punjab.

Conclusions

The living conditions and life style factors lead to changes in the physical fitness level among children. The area of living also has effects on physical fitness parameters of the children. The rural children reported significantly better performance on physical fitness parameters (medicine ball put, standing broad jump and endurance) than the urban children.

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