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Assessment Of Physical Fitness Variables Among Rural And Urban Area School Boys Of Kashmir Region

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Abstract

Physical fitness has been proposed as a metric for adolescent health. Physical fitness has a multidimensional structure and is a major predictor of health among children and adolescents. It can predict an individual's health state later in life. The purpose of the study was to compare and assess physical fitness variables (speed and agility) among school boys (11, 12 and 13 years) of Kashmir Region. To achieve the purpose, 1200 school boys of age group 11 to 13 years, were randomly selected from two areas (rural and urban) of Kashmir Region. The physical fitness variables selected for this study were speed and agility and were measured by 50 meter run and Shuttle run test. The collected data on selected criterion variables were statistically analyzed by using 2 × 3 factorial ANOVA to find out the significant difference, whenever the interaction effect was found to be significant the simple effect and then least significant difference (LSD) post hoc test was applied to find out the paired mean difference. In all the cases 0.05 level of confidence was fixed to test the hypothesis. Findings of the study disclose that significant difference in agility and speed was found between the interaction of region and age. The data will be used as a motivator to encourage schoolboys to engage in physical activity. The study ends with suggestions for acceptable evaluative measures and early intervention programmes for schoolboys.

Keywords: Physical fitness, rural, urban, school boys, speed, agility and Kashmir region

Introduction

Physical fitness is an adaptive state that can be defined as a set of characteristics that people possess or develop in relation to their capacity to engage in physical activity [8]. Physical fitness is classified into two types: health-related fitness and skill- or performance related fitness [4]. Evidence suggests that the development of health- and skill- related aspects of physical fitness early in childhood is crucial for long-term physical fitness and health outcomes [5, 14]. Regular participation in moderate to vigorous levels of physical activity improves physical fitness and lowers childhood obesity [15]. Recognizing that diseases are linked to a lack of fitness, it is critical to combat sedentary lifestyles with regular physical activity such as sports and formal exercise. This has influenced the development of minimal fitness standards in public schools in the United States [21].

Physical activity follows a fairly consistent pattern from childhood to young adulthood. Physical activity has been shown to improve the health and fitness of children and adolescents. Many physical education programmes include fitness testing for children and youth. Regular physical activity is critical for achieving the maximum possible quality of life across one's lifetime. Physical activity should be a part of every child's and adolescent's daily routine. Children should focus on health-related activity by participating in a variety of age-appropriate endurance activities. Inactivity for extended periods of time should be avoided, obvious need for communities, schools, states, and countries to support regular physical activity as a means of improving a country's health by collaborating with fitness professionals and allocating resources to encourage everyone to choose activity as part of a healthy lifestyle [9].

The quality of a person's life is determined by the physique he maintains. All of life's actions are carried out with the assistance of the body. Humans were designed by nature to be efficient at a variety of tasks. Because machines now do the majority of the work, modernity has made life easier for humans. Human efficiency has been lowered as a result of man's sedentary lifestyle. Fitness is important not only for improving our abilities, but also for our health and well-being. This would also aid in the development of a healthy environment around us, as well as community health, benefiting the entire country. We can increase our fitness, wellness, and health by planning physical fitness programmes [3].

Speed and agility are important physical fitness metrics that determine an individual's physical condition. Speed is defined as "distance per unit time" and is usually measured in terms of the time it takes to travel a set distance. Speed tests are typically not performed over distances greater than 200 meters because longer distance reflect anaerobic or aerobic capacity rather than absolute ability to propel the body at maximum speed"[2]. Agility is defined as "a quick whole- body movement in response to a stimulus that includes a change of running direction" [20]. Agility is defined as the ability to quickly change running direction without losing balance by moving the upper body segments [1]. Performance in an agility run (shuttle run) is determined by factors such as movement speed, acceleration ability, stride length, and the ability to change direction quickly and in the shortest amount of time [7].

Speed and its importance

Speed, like strength and stamina, is a conditional skill. It has a dynamic nature, since sitting relies on the central nervous system to a large degree. Because of this fact, it is hard to discover and understand the exact nature of speed capabilities. In addition, since the functioning of the central nervous system can only be impaired to a very small degree, as result, speed performance cannot be significantly improved, as is the case with strength and endurance. In addition, due to the high role of the coordinating process in speed performance, speed improvement has to be achieved by means of specific means and methods [17].

Agility and its importance

Agility is an important motor skill in most sporting activities, especially in badminton, tennis, trampoline, football, basketball, high jumping, etc. Simply put, agility means a kind of skill that how quickly an individual can change his or her direction precisely and how quickly the body's movements change. The proper use of agility in physical education and sport is defined as the control of rapid

changes and the accuracy of the body's movements. In other words, agility has been taken as a separate identity, defined as the individual's ability to change position and direction quickly and precisely, and that agility is highly correlated with other general motor skills, like coordination, balance, muscular strength, power and endurance [10].

Surprisingly, there has been little research on physical fitness among rural and urban school boys in the Kashmir region. The findings of this study will serve as a foundation for future research into assessing and monitoring school boys in Kashmir. It could also serve as a foundation for comparing and contrasting juvenile fitness testing procedures in both rural and urban settings in order to offer new insight on how can be used to promote a healthy lifestyle among schoolboys. The goal of this study is to evaluate physical fitness factors (speed and agility) in rural and urban school boys in Kashmir region.

Materials and Methods

Subjects

For this study, 1200 school boys between the ages of 11 and 13 were chosen as participants. The sample frame consisted of school boys aged 11 to 13 years old who were enrolled in various Government schools in various areas of Kashmir during the academic year 2019-2020. The study's objectives were met using a stratified sampling technique. After being told about the study's objectives and protocol, all the subjects granted their consent and volunteered to participate.

Study Design

The study was conducted in a cross-sectional format. The outdoor tests were administered twice to the study participants in order to assess the selected physical fitness components (speed & agility). All testing was done under the direct observation of the different schools' principals and physical education teachers. Prior to data sessions, subjects completed a supervised warm-up and were given the opportunity to rehearse the tests that the researcher will deliver. Subjects' performance in various physical fitness factors was assessed using common tests such as the 50 meter run (for speed) and the shuttle run (for agility). Each test in this fitness test battery has been proven to be valid and reliable in prior studies and is available in fitness assessment guides. To estimate the fitness level of school boys, each of these motor fitness characteristics was assessed.

Variables and tests

Speed (50 meter run) two lines are drawn 50 meters apart on the floor. One line serves as the start line, while the other serves as the finish line. When the signal 'Ready Go' is given, the subjects sprint to the finish line as quickly as possible. The starter's arm is swept downward to give the visual signal to the timer/timers who stands/stand at the finish line when signal "go" is given. The test score is the time elapsed between the start signal and the moment the subject crosses the finish line. The time is accurate to the tenth of a second.

Agility (shuttle run) the subjects' agility and changing direction was assessed using a 4 × 10 meter shuttle run. The subjects are positioned behind the starting line, which is parallel to another line drawn on the ground at a distance of 10 meters. On one of the sides, there were two wooden blocks. On the "ready" signal, the subject places his front foot behind the line. On the "go" signal, the subject dashes

to the other line, picks up a wooden block and returns to place it on or behind the starting line. As soon as the block was placed on the ground, the timekeeper stopped the watch and recorded the time. Two trails were followed by an interval in which another pair of subjects was tested. The maximum time taken by the subjects to position both blocks behind the starting line will be given as the test's final score.

Statistical Analysis

The collected data on selected criterion variables (speed and agility) of school boys were statistically analyzed by using 2 × 3 factorial ANOVA to find out the significant difference, whenever the interaction effect was found to be significant; the simple effect and then least significant difference (LSD) post hoc test was applied to find out the paired mean difference. In all the cases 0.05 level of confidence was fixed to test the hypothesis.

Results

Speed

The descriptive statistics on speed among school boys of rural and urban area are presented in table 1.

Table: 1 Descriptive Statistics on Speed among School Boys of Rural and Urban Area of Kashmir region

Age Group		Rural Area	Urban Area
11 years	Mean	10.52	10.59
	S.D.	0.45	0.49
12 years	Mean	10.72	10.62
	S.D.	0.51	0.48
13 years	Mean	10.57	10.68
		0.47	0.52

	S.D.		

Table 1, reflects the descriptive values of school boys of age group 11, 12 and 13 years on speed, which indicates that the mean and standard deviations of school boys of rural and urban area of Kashmir region.

The statistical analysis among school boys from rural and urban area on speed are presented in the table 2.

Table 2: Summary of ANOVA (2 × 3) Factorial Design on Speed

Tests of Between –Subjects Effects					
Dependent Variable: Speed					
Source of Variation	**Sum of Square (SS)**	**df**	**MS**	**F**	**Sig**
Factor A (Area)	0.187	1	0.187	0.777	0.378
Factor B (Age)	2.400	2	1.200	4.983	0.007
Interaction (Area × Age)	2.446	2	1.223	5.079	0.006
Error	287.535	1194	0.241		

*Significant at 0.05 level

(Table value, df of 1 to 1194 & 2 to 1194 are 3.84 & 3.00 respectively)

It is clear from the above table that speed measured between rural and urban area reveals an insignificant difference, irrespective of age as the obtained F ratio of 0.777 is lesser than the required table value of 3.84 at $\alpha = 0.05$ for the df of 1 and 1194. Further, the findings disclose that there is significant difference on speed between ages irrespective of areas, since the obtained F of 4.983 is greater than the required table value of 3.00 at $\alpha = 0.05$ for the df of 2 and 1194.

Moreover, the findings disclose that significant difference in speed was found between the interaction of area and age as the obtained F ratio of 5.079 is greater than the required table value of 3.00 at $\alpha = 0.05$ for the df of 2 and 1194. Since, the interaction between area and age is significant, simple effect and post hoc test was applied and presented in the table 3.

Table: 3 Simple Effect on Area and Age Wise on Speed

Source of Variance		SS	df	MS	F	Sig.
Difference between Rural and Urban area school boys of age group 11 years.		0.512	1	0.512	2.126	0.145
Difference between Rural and Urban area school boys of age group 12 years.		1.026	1	1.026	4.261	0.039
Difference between Rural and Urban area school boys of age group 13 years.		1.095	1	1.095	4.548	0.033
Difference on rural area with respect to the age groups	11 years	4.105	2	2.052	8.523	0.000
	12 years					
	13 years					
Difference on urban area with respect to the age groups	11 years	0.741	2	0.371	1.539	0.215
	12 years					
	13 years					
Error		287.535	1194	0.241		

From the above table , it is clear that there is insignificant difference between rural and urban area school boys of age group 11 years in speed since the obtained F ratio 2.126 is lesser than the table value of 3.84 at $\alpha = 0.05$ for the df of 1 and 1194. But, significant difference exists between rural and urban area school boys of age group 12 years in speed, since the obtained F ratio 4.261 is greater than the table value of 3.84 at $\alpha = 0.05$ for the df of 1 and 1194. Also significant difference exists between rural and urban area school boys of age group 13 years in speed, since the obtained F ratio 4.548 is greater than the table value of 3.84 at $\alpha = 0.05$ for the df of 1 and 1194.

Table 3, clearly shows that there is significant difference in speed between different age groups i.e. 11, 12 and 13 years in rural area school boys, since the obtained F ratio 8.523 is greater than the table value of 3.00 at $\alpha = 0.05$ for the df of 2 and 1194. Further, from the results it is clear that there is insignificant difference in speed between different age groups i.e. 11, 12 and 13 years in urban area school boys, since the obtained F ratio 1.539 is lesser than the table value of 3.00 at $\alpha = 0.05$ for the df of 2 and 1194.

Table: 4 Pair Wise Comparison (Post Hoc Test) on Area and Age Wise on Speed

Source of Variance			Post hoc test		95% of C.I	
			M.D	Sig.	L.B.	U.B.
Difference between Rural and Urban area school boys of age group 11 years.			0.072	0.145	0.168	0.025
Difference between Rural and Urban area school boys of age group 12 years.			0.101	0.039	0.005	0.198
Difference between Rural and Urban area school boys of age group 13 years.			0.105	0.033	0.201	0.008
Difference on rural area with respect to the age groups	11	12	0.195	0.000	0.291	0.099
	12	13	0.145	0.003	0.049	0.241
	13	11	0.050	0.308	0.046	0.146
Difference on urban area with respect to the age groups	11	12	0.022	0.651	0.118	0.074
	12	13	0.061	0.214	0.157	0.035
	13	11	0.083	0.090	0.013	0.179

Table 4, exhibits that statistically insignificant paired mean difference exists among school boys of rural and urban area in the age group 11 years on speed as the obtained paired mean difference of 0.072 ($p< 0.05$) were respectively obtained. But significant paired mean difference exists among school boys of rural and urban area in the age group 12 years on speed as the obtained paired mean difference of 0.101 ($p< 0.05$) were respectively obtained. Also, significant paired mean difference exists among school boys of rural and urban area in the age group 13 years on speed as the obtained paired mean difference of 0.105 ($p< 0.05$) were respectively obtained.

Table 4, exhibits that statistically significant paired mean difference exists among age group 11 and 12 years on speed as the obtained paired mean difference of 0.195 ($p< 0.05$) were respectively

obtained. Similarly, significant paired mean difference exists among age group 12 and 13 years on speed as the obtained paired mean difference of 0.145 ($p< 0.05$) were respectively obtained. But, insignificant paired mean difference exists among age group 13 and 11 years on speed as the obtained paired mean difference of 0.050 ($p< 0.05$) were respectively obtained.

Table 4, exhibits that statistically insignificant paired mean difference exists among age group 11 and 12; 12 and 13 and 13 and 11 years on speed as the obtained paired mean difference of 0.022($p< 0.05$), 0.061 ($p< 0.05$) and 0.083 ($p< 0.05$) were respectively.

Agility

The descriptive statistics on agility among school boys of rural and urban area are presented in table 5.

Table: 5 Descriptive Statistics on Agility among School Boys of Rural and Urban Area of Kashmir region

Age Group		Rural Area	Urban Area
11 years	**Mean**	13.94	13.66
	S.D.	0.30	0.45
12 years	**Mean**	13.81	14.06
	S.D.	0.32	0.30
13 years	**Mean**	13.87	14.11
	S.D.	0.29	0.29

Table 5, reflects the descriptive values of school boys of age group 11, 12 and 13 years on agility, which indicates that the mean and standard deviations of school boys of rural and urban area of Kashmir region.

The statistical analysis among school boys from rural and urban area on agility are presented in the table 6.

Table 6: Summary of ANOVA (2 × 3) Factorial Design on Agility

Tests of Between –Subjects Effects
Dependent Variable: Agility

Source of Variation	Sum of Square (SS)	df	MS	F	Sig
Factor A (Area)	1.460	1	1.460	13.175	0.000
Factor B (Age)	7.894	2	3.947	35.613	0.000
Interaction (Area × Age)	18.406	2	9.203	83.034	0.000
Error	132.336	1194	0.111		

*Significant at 0.05 level

(Table value, df of 1 to 1194 & 2 to 1194 are 3.84 & 3.00 respectively)

It is clear from the above table that agility measured between rural and urban area reveals a significant difference, irrespective of age as the obtained F ratio of 13.175 is greater than the required table value of 3.84 at $\alpha = 0.05$ for the df of 1 and 1194. Further, the findings disclose that there is significant difference on agility between ages irrespective of areas, since the obtained F of 35.613 is greater than the required table value of 3.00 at $\alpha = 0.05$ for the df of 2 and 1194.

Moreover, the findings disclose that significant difference in agility was found between the interaction of area and age as the obtained F ratio of 83.034 is greater than the required table value of 3.00 at $\alpha = 0.05$ for the df of 2 and 1194. Since, the interaction between area and age is significant, simple effect and post hoc test was applied and presented in the table 7.

Table: 7 Simple Effect on Area and Age Wise on Agility

Source of Variance	SS	df	MS	F	Sig.
Difference between Rural and	7.868	1	7.868	70.989	0.000

Urban area school boys of age group 11 years.						
Difference between Rural and Urban area school boys of age group 12 years.		6.190	1	6.190	55.850	0.000
Difference between Rural and Urban area school boys of age group 13 years.		5.808	1	5.808	52.403	0.000
Difference on rural area with respect to the age groups	11 years	1.529	2	0.764	6.898	0.001
	12 years					
	13 years					
Difference on urban area with respect to the age groups	11 years	24.771	2	12.386	111.749	0.000
	12 years					
	13 years					
Error		132.336	1194	0.111		

From the above table , it is clear that there is significant difference between rural and urban area school boys of age group 11 years in agility since the obtained F ratio 70.989 is greater than the table value of 3.84 at $\alpha = 0.05$ for the df of 1 and 1194. Similarly, significant difference exists between rural and urban area school boys of age group 12 years in agility, since the obtained F ratio 55.850 is greater than the table value of 3.84 at $\alpha = 0.05$ for the df of 1 and 1194. Also significant difference exists between rural and urban area school boys of age group 13 years in agility, since the obtained F ratio 52.403 is greater than the table value of 3.84 at $\alpha = 0.05$ for the df of 1 and 1194.

Table 7, clearly shows that there is significant difference in agility between different age groups i.e. 11, 12 and 13 years in rural area school boys, since the obtained F ratio 6.898 is greater than the table value of 3.00 at $\alpha = 0.05$ for the df of 2 and 1194. Further, from the results it is clear that there is significant difference in agility between different age groups i.e. 11, 12 and 13 years in urban area school boys, since the obtained F ratio 111.749 is greater than the table value of 3.00 at $\alpha = 0.05$ for the df of 2 and 1194.

Table: 8 Pair Wise Comparison (Post Hoc Test) on Area and Age Wise on Agility

Source of Variance	**Post hoc test**	**95% of C.I**

			M.D	Sig.	L.B.	U.B.
Difference between Rural and Urban area school boys of age group 11 years.			0.281	0.000	0.215	0.346
Difference between Rural and Urban area school boys of age group 12 years.			0.249	0.000	0.314	0.183
Difference between Rural and Urban area school boys of age group 13 years.			0.241	0.000	0.306	0.176
Difference on rural area with respect to the age groups	11	12	0.123	0.000	0.058	0.189
	12	13	0.054	0.104	0.120	0.011
	13	11	0.069	0.038	0.134	0.004
Difference on urban area with respect to the age groups	11	12	0.406	0.000	0.471	0.341
	12	13	0.046	0.164	0.112	0.019
	13	11	0.452	0.000	0.387	0.518

Table 8, exhibits that statistically significant paired mean difference exists among school boys of rural and urban area in the age group 11 years on agility as the obtained paired mean difference of 0.281 ($p< 0.05$) were respectively obtained. Similarly significant paired mean difference exists among school boys of rural and urban area in the age group 12 years on agility as the obtained paired mean difference of 0.249 ($p< 0.05$) were respectively obtained. Also, significant paired mean difference exists among school boys of rural and urban area in the age group 13 years on agility as the obtained paired mean difference of 0.241 ($p< 0.05$) were respectively obtained.

Table 8, exhibits that statistically significant paired mean difference exists among age group 11 and 12 years on agility as the obtained paired mean difference of 0.123 ($p< 0.05$) were respectively obtained. But, insignificant paired mean difference exists among age group 12 and 13 years on agility as the obtained paired mean difference of 0.054 ($p< 0.05$) were respectively obtained. Also, significant paired mean difference exists among age group 13 and 11 years on agility as the obtained paired mean difference of 0.069 ($p< 0.05$) were respectively obtained.

Table 8, exhibits that statistically significant paired mean difference exists among age group 11 and 12 years on agility as the obtained paired mean difference of 0.406 ($p< 0.05$) were respectively obtained. But, insignificant paired mean difference exists among age group 12 and 13 years on agility as the obtained paired mean difference of 0.046 ($p< 0.05$) were respectively obtained. Also, significant paired mean difference exists among age group 13 and 11 years on agility as the obtained paired mean difference of 0.452 ($p< 0.05$) were respectively obtained.

Discussion

The primary goal of this study was to use direct physical testing to assess and compare physical fitness factors (speed and agility) among school boys. The findings of this study on schoolboys' physical fitness characteristics revealed substantial variations. The results show that the speed of rural and urban areas was found to be significant, as was the interaction between area and age at the level of 0.05. Furthermore, the results revealed that the agility of rural and urban areas was also found significant, as was the interaction between the two sources, i.e., area and age, at the 0.05 level. These findings identify several aspects of physical fitness parameters among school boys that may need to be improved in order to improve both their personal health and performance. When compared to the criterion standards, the findings of this study show that overall selected physical fitness parameters among school boys are average. According to the findings, this specific population of students maintains an adequate level of physical activity, and sedentary behavior is common among them. Nowadays, making an attempt to increase child physical fitness levels must be a top priority. Several studies have found that the level of physical fitness in today's children has decreased, while others have found no differences [11, 18]. Furthermore, as compared to urban boys, the results of the current study revealed that rural boys scored much higher in practically all physical fitness metrics. The current findings corroborated previous research suggesting that a child's home had an impact on their fitness. It was revealed that rural children in Poland, Turkey, and Bengal were physically fitter than their urban counterparts [6, 12, 16]. Other researchers found that of the five physical fitness variables of speed, agility, strength, and flexibility, urban high school boys have higher strength and flexibility, but rural high school boys have higher speed, endurance, and agility [13]. Researchers have revealed that engaging in adequate physical and psychological activity on a daily basis improves an individual's physical and psychological health [20]. The study provided early information to assist students in understanding their performance level or physical fitness. It will encourage them to participate in sports. Teachers play an important role in implementing interventions or carrying out activities because they should be encouraging to children as well as patient and flexible in terms of providing rich stimuli and changing activities when needed. It is also critical that the teacher supports interventions that use appropriate means to meet the various needs of their students [19]. The most important thing is that the programmes are meaningful for children, who should not see them as tests, but rather as opportunities to participate in fun activities. According to the study's findings, speed and agility are important physical fitness parameters for performing various physical activities.

Conclusion

Based on the study's major findings, it was concluded that rural area school boys between the age group of 11 and 13 years outperformed urban area school boys in terms of speed, however, in the age group of 11 years, urban area school boys outpaced in terms of speed. The urban 11- year- old age group

outperformed the rural 11-year- old age group in agility. Schoolboys aged 12 and 13 years in rural areas performed better than schoolboys in urban areas. Physical fitness variables play a significant role in schoolboy fitness performance. The findings of this study will allow for the development of a fitness management information system that will cover the physical fitness variables of schoolboys. Furthermore, it would facilitate the selection of youth for sports competitions as well as long-term planning for talent development.

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