



RESEARCH ARTICLE

ASSESSMENT OF HEALTH RELATED PHYSICAL FITNESS AMONG BOYS OF KANDI AREA

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ABSTRACT

The present study was conducted to find out the health related physical fitness differences among boys of kandi area. In the present study, the subjects for data collection were drawn from the different government schools of kandi areas of Punjab state. Random sampling technique was used to select the subjects. The sample consisted of one thousand and five hundred seventy five (N=1575) boys of Kandi areas of Punjab state. To measure maximal functional capacity and endurance of the cardio-respiratory system of the subjects, the 9-Minute run test was applied. To evaluate the level of fatness in school age boys, the skinfold fat caliper was used. To assess the abdominal muscular strength and endurance of the subjects, modified sit-ups test was applied. Sit and reach test was used to evaluate the flexibility (extensibility) of the low back and posterior thighs of the subjects. The Analysis of Variance (ANOVA) was applied to find out the significant differences among various age groups/classes of kandi area boys. Scheffe's post-hoc of test was applied to see the direction and significance of differences where 'F' ratio was found significant. The significant differences were observed among various age groups of Kandi area. The class 9th demonstrated significantly better maximal functional capacity & endurance than class 8th whereas class 10th exhibited significantly better on maximal functional capacity & endurance than class 8th and class 9th. Class 8th demonstrated better body composition than class 9th and class 10th. Similarly class 9th demonstrated better on the said variable than class 10th though not significantly. Class 9th exhibited significantly better abdominal muscular strength & endurance than class 8th. Similarly class 10th demonstrated significantly better than class 8th and class 9th on the said variable. Class 9th showed significantly better flexibility (extensibility) of the low back and posterior thighs than class 8th. Similarly class 10th demonstrated significantly better flexibility than class 8th and class 9th.

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INTRODUCTION

Physical characteristics and body composition have been known to be fundamental to excellence in athletic performance (Mathur and Salokun, 1985). Specific athletic events require different body types and weights for maximal performance (American Dietetic Association, 1987). Physical fitness to the human body is like a fine-tuning to an engine. It enables us to perform up to our potential. Fitness can be described as a condition that helps us look, feel and do our best. More specifically, it is "The ability to perform daily tasks vigorously and alertly, with energy left over for enjoying leisure-time activities and meeting emergency demands. It is the ability to endure, to bear up, to withstand stress, to carry on in circumstances where an unfit person could not continue, and is a major basis for good health and well-being" (Singh, 2001). Health-related fitness refers to the state of physical and physiological characteristics that define the risk levels for the premature development of diseases or morbid conditions presenting a relationship with a sedentary mode of life. The health-related aspect is a measure of

cardiovascular endurance, muscle strength, endurance and flexibility and body composition (Hopkins and Walker, 1988). Physical fitness is measured by functional tests that are specific and usually normative-based, rather than criterion-based, thereby leaving unanswered as to how much of a specific fitness factor (e.g. muscular endurance) is required for a good quality of life (Chia *et al.*, 2007). There are numerous factors which are responsible for the performance of sportsmen. The physique and body composition including the size, shape and form are known to play a significant role in this regard (Sodhi and Sidhu, 1984). It is widely acknowledged that a scientific approach has to be applied for selecting potential athletes and training them for better performance. As a fundamental stage for adopting a scientific approach, systematic collection of empirical data and materials are essential. Until now, many sports scientists have conducted diverse kinds of research to elucidate various characteristics of elite athletes including morphology, fitness, psychology, and physical capacity. The majority of these studies were on the scientific analyses of elite athlete's physical characteristics and fitness and/or competition and their records (Barnes, 1981; Bompa, 1985; Buckley and Kerwin, 1988; Carter, 1982; Daniels, 1974; Melnikov and Singer, 1998). Health related physical fitness, as such, is a

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Table –1 The break- up of total sample is shown in the tables below:

1575 Subjects (Kandi Area)		
525 subjects (13 – 14 years) Class 8 th	525 subjects (14 – 15 years) Class 9 th	525 subjects (15 – 16 years) Class 10 th

Table-2 Analysis of variance (anova) results with regard to health related physical fitness of kandi area boys On the variable cardio-respiratory function

Variable	Source of variance	Sum of squares	df	Mean square	F-ratio	Sig.
Cardio-respiratory function	Between group	3093791.491	2	1546895.745	23.151*	.000
	Within group	105038543.664	1572	66818.412		
	Total	108132335.155	1574			

F 0.05 (2, 1572)

Table -3 Significant Differences Between Paired Means Of Kandi Area Boys Of Different Age Groups On The Variable Cardio-Respiratory Function

Groups				
13-14 years (class 8 th)	14-15 years (class 9 th)	15-16 years (class 10 th)	Mean difference	Sig.
1830.537	1873.581		-43.044*	.026
1830.537		1938.371	-107.834*	.000
	1873.581	1938.371	-64.790*	.000

Table -4 Analysis of variance (anova) results with regard to health related physical fitness of kandi area boys On the variable body composition

Variable	Source of variance	Sum of squares	df	Mean square	F-ratio	Sig.
Body composition	Between group	11.423	2	5.711	.469	.62
	Within group	19133.136	1272	12.171		
	Total	19144.558	1574			

F 0.05 (2, 1572)

Table-5 Analysis Of Variance (Anova) Results With Regard To Health Related Physical Fitness Of Kandi Area Boys On The Variable Abdominal Muscular Strength & Endurance

Variable	Source of variance	Sum of squares	df	Mean square	F-ratio	Sig.
Abdominal Muscular Strength & Endurance	Between group	3574.587	2	1787.293	42.615*	.000
	Within group	65930.008	1572	41.940		
	Total	69504.594	1574			

F 0.05 (2, 1572)

Table-6 Significant Differences Between Paired Means Of Kandi Area Boys Of Different Age Groups On The Variable Abdominal Muscular Strength & Endurance

Groups				
13-14 years (Class 8 th)	14-15 years (Class 9 th)	15-16 years (Class 10 th)	Mean difference	Sig.
27.404	29.983		-2.579*	.000
27.404		30.979	-3.575*	.000
	29.983	30.979	-.996*	.045

Table-7 Analysis of variance (anova) results with regard to health related physical fitness of kandi area boys on the variable flexibility

Variable	Source of variance	Sum of squares	df	Mean square	F-ratio	Sig.
Flexibility	Between group	1577.686	2	788.843	41.383*	.000
	Within group	29965.615	1572	19.062		
	Total	31543.301	1574			

F 0.05 (2, 1572)

Table-8 Significant Differences Between Paired Means Of Kandi Area Boys Of Different Age Groups On The Variable Flexibility

Groups				
13-14 years (Class 8 th)	14-15 years (Class 9 th)	15-16 years (Class 10 th)	Mean difference	Sig.
6.574	8.172		-1.598*	.000
6.574		8.982	-2.409*	.000
	8.172	8.982	-.810*	.011

much wider and more significant concept than the idea of mere physical fitness of human body. The area under investigation is lying on the North-East of the motelled road running from Chandigarh to Pathankot via SahibzadaAjit Singh Nagar, Roopnagar, Balachaur, Garshankar,

Hoshiarpur, Dasuya, Mukerian and Dharkalan block in Gurdaspur District is Sub-Mountain area (Govt. of Punjab, 1973). Therefore, the present study was designed to assess the health related physical fitness among boys of kandi area.

METHOD AND PROCEDURE

Sample

In the present study, the subjects for data collection were drawn from the different government schools of Kandi areas of Punjab state. Random sampling technique was used to select the subjects. The sample consisted of one thousand and five hundred seventy five (N=1575) boys of Kandi areas of Punjab state.

Selection of variables

To measure maximal functional capacity & endurance of the cardio-respiratory system of the subjects, the 9-Minute run test was applied. To evaluate the level of fatness in school age boys, the skinfold fat caliper was used. To assess the abdominal muscular strength & endurance of the subjects, the modified sit-ups test was applied. Sit and reach test was used to evaluate the flexibility (extensibility) of the low back and posterior thighs of the subjects. The Analysis of Variance (ANOVA) was applied to find out the significant differences among various age groups/classes of Kandi area boys. Scheffe's post-hoc of test was applied to see the direction and significance of differences where 'F' ratio was found significant.

RESULTS

It is evident from Table-2 that results of Analysis of Variance (ANOVA) among three different age groups of kandi area boys on the variable cardio-respiratory function were found statistically significant ($P < .05$). Since the obtained F-ratio was found significant, therefore, Scheffe's Post-hoc test was applied to find out the direction and significance of difference between paired means among different three age groups of kandi area on the variable maximal functional capacity and endurance of the cardio-respiratory system. The results of Post-hoc test have been presented in Table-3. It can be observed from the above table that significant difference exists between 13-14 years (class 8th) and 14-15 years (class 9th) ($P < .05$). While comparing the mean scores of both the groups, it is found that 14-15 years (class 9th) group has performed significantly better on the variable maximal functional capacity and endurance of the cardio-respiratory system. The difference between 13-14 years (class 8th) and 15-16 years (Class 10th) was found statistically significant ($P < .05$). When comparing the mean values of the groups in question, it is found that group 15-16 years (class 10th) has performed significantly better on the variable maximal functional capacity and endurance of the cardio-respiratory system. The difference between 14-15 years (class 9th) and 15-16 years (Class 10th) was also found statistically significant ($P < .05$) When comparing mean values of the groups in question, it is observed that group 15-16 years (class 10th) has performed significantly better on the variable maximal functional capacity and endurance of the cardio-respiratory system. The comparison of mean scores of all the three groups of kandi area with regard to the variable cardio-respiratory function has been presented graphically in figure-1. It has been observed from table-4 that results of Analysis of Variance (ANOVA) among three different age groups with regard to health relate physical fitness of kandi

area boys on the variable body composition were found statistically insignificant ($P < .05$).

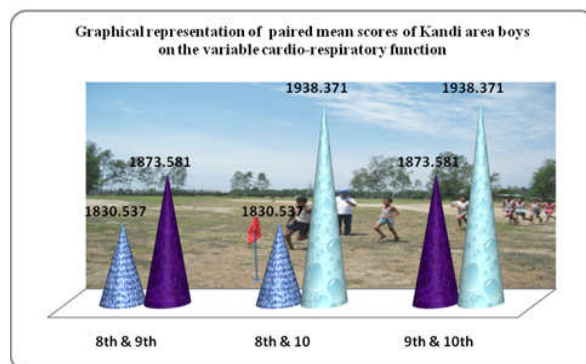


Figure - 1

Table-5 showed significant differences among three different age groups of kandi area boys on the variable abdominal muscular strength & endurance ($P < .05$). Since the obtained F-ratio was found significant, therefore, Scheffe's Post-hoc test was applied to find out the direction and significance of difference between paired means among different three age groups of kandi area on the variable abdominal muscular strength & endurance. The results of Post-hoc test have been presented in Table-6. Table-6 reveals significant differences between paired mean scores of different three age groups on the variable abdominal muscular strength and endurance. It can be observed from the above table that significant difference exists between 13-14 years (class 8th) and 14-15 years (class 9th) ($P < .05$). While comparing the mean scores of both the groups, it is found that 14-15 years (class 9th) has performed significantly better on the variable abdominal muscular strength & endurance. The difference between 13-14 years (class 8th) and 15-16 years (Class 10th) was found statistically significant ($P < .05$). When comparing the mean scores of both the groups, it is found that group 15-16 years (class 10th) has performed significantly better on the variable abdominal muscular strength & endurance. The difference between 14-15 years (class 9th) and 15-16 years (Class 10th) was also found statistically significant ($P < .05$). When comparing the mean values of the groups in question, it is observed that group 15-16 years (class 10th) has performed significantly better on the abdominal muscular strength & endurance. The comparison of mean values of all the three groups of kandi area with regard to the variable abdominal muscular strength and endurance has been presented graphically in figure-2.

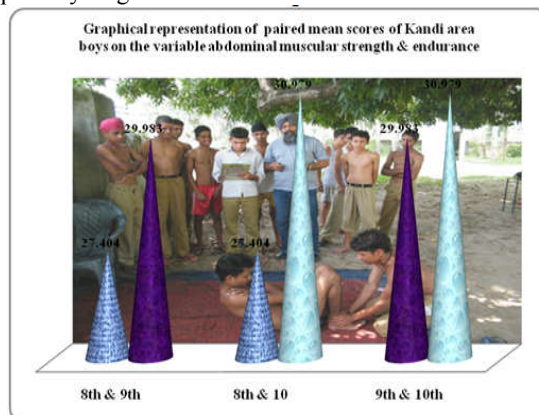


Figure-2

It has been observed from table-7 that results of Analysis of Variance (ANOVA) among three different age groups of Kandi area boys on the variable flexibility were found statistically significant ($P < .05$). Since the obtained F-ratio was found statistically significant, thus Scheffe's Post-hoc test was applied to find out the direction and significance of difference between paired means among various age groups of Kandi area on the variable flexibility. The results of Post-hoc test have been presented in Table-8. Table-8 clearly indicates that there have been significant differences found between paired mean scores of different three age groups on the variable flexibility. It can be observed from the above table that significant difference exists between 13-14 years (class 8th) and 14-15 years (class 9th) ($P < .05$). While comparing the mean scores of both the groups, it is found that group 14-15 years (class 9th) has exhibited significantly better on the variable flexibility (extensibility) of the low back and posterior thighs. The difference between 13-14 years (class 8th) and 15-16 years (Class 10th) was found statistically significant ($P < .05$). When comparing the mean values of groups in question, it is found that group 15-16 years (class 10th) has demonstrated significantly better on the variable flexibility (extensibility) of the low back and posterior thighs. The difference between 14-15 years (class 9th) and 15-16 years (Class 10th) was also found statistically significant ($P < .05$). When comparing mean values of the groups in question, it is observed that group 15-16 years (class 10th) has performed significantly better on the variable flexibility (extensibility) of the low back and posterior thighs. The comparison of mean values of all the three groups of Kandi area with regard to the variable flexibility has been presented graphically in figure-3.

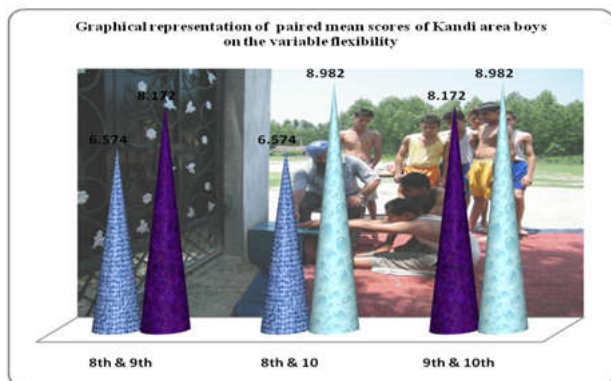


Figure-3

DISCUSSION

It is evident from Analysis of variance (ANOVA) tables-2,5,7 with regards to various age groups (13-14 Years Class 8th, 14-15 years class 9th & 15-16 years class 10th) of Kandi area boys revealed significant differences among various age groups on the variables; cardio-respiratory function, abdominal muscular strength & endurance and flexibility. However, no significant differences have been observed among various age groups of Kandi area boys on the variable body composition. It has been observed from the above (ANOVA) tables that group 15-16 (class 10th) has performed significantly better on the variables; cardio-respiratory function, abdominal muscular strength & endurance and flexibility than the groups 13-14 Years (Class 8th) and 14-15

years (class 9th). However, group 13-14 Years Class 8th exhibited better results on Body composition than groups 14-15 years (class 9th) & 15-16 years (class 10th). Similarly the group 14-15 years (class 9th) demonstrated better results than group 15-16 years (class 10th) though not significantly. The outcome of above results might be due to the better general fitness of Kandi area boys as it has been observed that most of the boys of this area have to either walk down few kilometers or have to ride cycles to reach their schools due to lack of transportation facilities hence facilitated the Kandi area boys to do well on the task at hand. It is generally believed that the people living in hilly areas have to face more manual work, walking, cycling and carrying loads are essential components of their ordinary day to day life as compared to people staying in plains. Similar results have been reported by Kumar (2006). The findings of the present study also revealed significant improvement in performance of the subjects with the advancement of their age as group 15-16 years (class 10th) has demonstrated better results as compared to group 14-15 years (class 9th). Similarly group 14-15 years (class 9th) has performed better than group 13-14 Years (class 8th). Similar findings have also been reported by Singh (1986) and Sandhu (2006). Glaner (2003) revealed that higher and moderate levels of aerobic endurance, flexibility, muscular strength/endurance, and desirable body fat levels, are very important for promoting health at all ages, and to avoid early development of chronic diseases. Kei (2010) while examining weight status, health related physical fitness and quality of life in Hong Kong adolescents revealed that both overweight and underweight adolescents had poorer health related physical fitness than those of normal weight.

Conclusion

It is concluded from the above findings that significant differences were observed among various age groups of Kandi area. The class 9th demonstrated significantly better maximal functional capacity & endurance than class 8th whereas class 10th exhibited significantly better on maximal functional capacity & endurance than class 8th and class 9th. Class 8th demonstrated better body composition than class 9th and class 10th. Similarly class 9th demonstrated better on the said variable than class 10th though not significantly. Class 9th exhibited significantly better abdominal muscular strength & endurance than class 8th. Similarly class 10th demonstrated significantly better than class 8th and class 9th on the said variable. Class 9th showed significantly better flexibility (extensibility) of the low back and posterior thighs than class 8th. Similarly class 10th demonstrated significantly better flexibility than class 8th and class 9th.

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