

An Analysis of Cardio-Respiratory Fitness among Chandigarh, Haryana and Himachal Pradesh School Girls

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Abstract

The purpose of the study was to compare cardio-respiratory fitness among school girls of Chandigarh, Haryana and Himachal Pradesh. To attain the objective of the study, a total sample of three thousand (N=3000) school girls (one thousand school girls each from Chandigarh, Haryana and Himachal Pradesh) were selected as subject of the study by using stratified random sampling technique. Cooper's 9 min run/walk test was used to test the cardio-respiratory fitness among school girls. The age of the subjects ranged between 15-18 years. To find out the significance differences among school girls on cardio-respiratory fitness, analysis of variance (ANOVA) was computed with the help of SPSS software. Further scheffe's post-hoc test was used to see the direction and significances of differences where 'F' ratio was found significant. The level of significance chosen was .05. Statistical calculation on the gathered data showed that significant difference was found on cardio-respiratory fitness among Chandigarh, Haryana and Himachal Pradesh school girls. The finding reveals that Himachal Pradesh school girls demonstrated significantly better than their counterparts.

KEYWORDS: Cardio-respiratory Fitness, Cooper's 9min Run/Walk Test, Chandigarh, Haryana, Himachal Pradesh, School Girls.

Introduction

Low cardio-respiratory fitness in adolescents and young adults has emerged as an important factor for developing cardiovascular co-morbidities later in middle age. Increased body fatness is an additional factor for developing cardiovascular diseases. Cardio-respiratory endurance is the ability of the body to perform prolonged, large-muscle; dynamic exercise at moderate-to-high levels of intensity is a key health-related component of fitness. A healthy cardio-respiratory system is essential to high levels of fitness and wellness (*Fahey et al. 2005*). Each day, virtually all people participate in some type of physical activity. For some, this may mean making their bed or preparing meals. For others, this might entail high-intensity exertion, such as running a 1500 m race. Common to all activities is the involvement of the cardiovascular system (*Foss & Keteyien, 1998*).

Regular physical activity would be important for life's quality even if it had no relationship to disease or longevity. Physical activity is significant in gradient in the quality of life because it increases energy and promotes physical, mental and sociological and psychological well being in addition to conferring health benefits. Regular exercise as well as diet, abstention from smoking, proper amount of sleep and relaxation will help

to maintain health related fitness; children need exposure to wide variety of sport and fitness activities. Children and youth will hopefully develop interest in the type of physical activities that will promote and maintain physical fitness throughout the life. Physically fit children generally have better memory, concentration and energy levels. Endurance is the ability which enables to do a sport activity without getting tired and to recover quickly from fatigue during after activity. Aerobic exercise develops cardio respiratory endurance and reduced risk of CHD.

Objective of the Study

The objective of the study is to compare the cardio-respiratory fitness among Chandigarh, Haryana and Himachal Pradesh school girls.

Methodology

A total of three thousand (N=3000) school girls (*one thousand school girls each from Chandigarh, Haryana and Himachal Pradesh*) were selected as subject of the study by using stratified random sampling technique.

For the purpose of the study, Cooper's 9 min run/walk test was used to test the cardio-respiratory fitness among school girls. The age of the subjects ranged between 15-18 years. To find out the significance differences among school girls on cardio-respiratory fitness, analysis of variance (ANOVA) was applied. Further scheffe's post-hoc test was used to see the direction and significances of differences where 'F' ratio was found significant. For testing hypothesis, the level of significance chosen was 0.05.

Findings

Descriptive analysis of cardiorespiratory function among school girls of Chandigarh, Haryana and Himachal Pradesh is presented in table-1.

Table-1
Descriptive statistic of Chandigarh, Haryana and Himachal Pradesh
School Girls on Cardio-respiratory Fitness

CARDIO-RESPIRATORY FITNESS	N	Mean	SD
Chandigarh	1000	1237.61	191.62
Haryana	1000	1407.61	199.22
Himachal Pradesh	1000	1567.67	220.87
Total	3000	1404.30	244.68

It is evident from the above table-1 that the school girls of Himachal Pradesh have higher mean value (220.87) when compared with school girls of Haryana (199.22) and Chandigarh (191.62) schools on cardio-respiratory fitness.

The analysis of variance (ANOVA) among Chandigarh, Haryana and Himachal Pradesh school girls on cardiorespiratory function is presented in Table -2.

Table-2
ANOVA for Cardio-Respiratory Fitness among Chandigarh, Haryana and Himachal Pradesh School Girls

Variable	Source of Variance	Sum of Squares	Df	Mean Square	F
Cardiorespiratory Fitness	Between Group	54483628.61	2	27241814.30	652.78*
	Within Group	125070224.18	2997	41731.80	
	Total	179553852.79	2999		

*Significant at .05 level
 $F_{.05}(2, 2997) = 3.00$

Table-2 clearly indicates that there was significant difference among Chandigarh, Haryana and Himachal Pradesh school girls on cardio-respiratory fitness since the obtained 'F' value at 0.05 level was 652.78 whereas, value needed to be significant was 3.00. Since the ANOVA was found significant, the Scheffe's post-hoc test was applied to find out which of the difference of the means amongst the group were statistically significant. The data related to this are presented in table-3.

Table: 3
Significant Differences Among Paired Means on Cardio-Respiratory Fitness among Chandigarh, Haryana and Himachal Pradesh School Girls

GROUPS			MEAN DIFFERENCE	Sig.
Chandigarh	Haryana	Himachal Pradesh		
1237.61	1407.62		169.99*	.000
1237.61		1567.67	330.05*	.000
	1407.62	1567.67	160.05*	.000

Table 3 clearly indicates that the significant differences existed between Chandigarh and Haryana school girls, Chandigarh and Himachal Pradesh school girls, Haryana and Himachal Pradesh school girls on cardio-respiratory fitness since the value obtained were 169.99, 330.05, and 160.05 respectively.

Mean scores of Chandigarh, Haryana and Himachal Pradesh school girls on cardio-respiratory fitness is graphically depicted in figure-1.

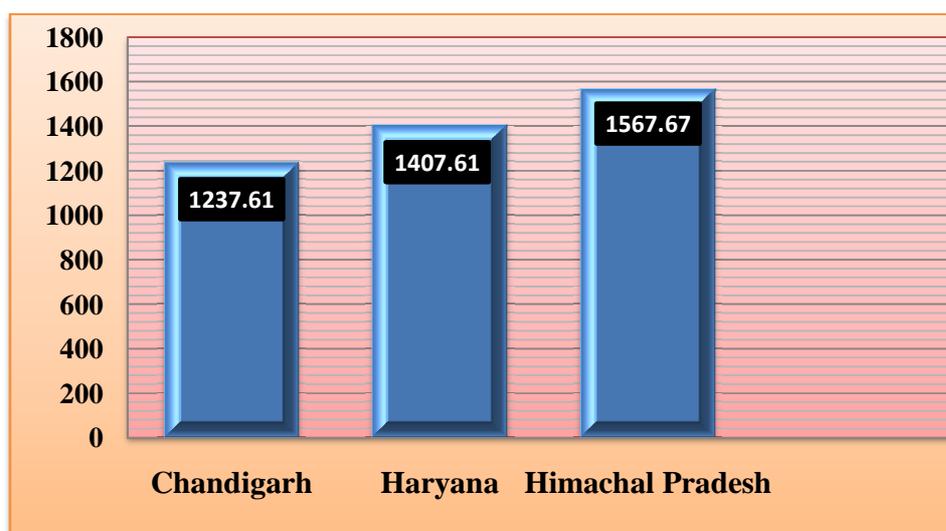


Fig. 1. Graphical Representation for Cardio-Respiratory Fitness among Chandigarh, Haryana and Himachal Pradesh School Girls

Discussion of Findings

The finding of the study showed that there was a significant difference among Chandigarh, Haryana and Himachal Pradesh school girls on cardio-respiratory fitness. Himachal Pradesh school girls performed significantly better in cardiorespiratory function than Chandigarh and Haryana. Altitude exposure is associated with major changes in cardiovascular function. Health of people residing at high altitude is shaped not only by the low oxygen environment, but also by population ancestry socio-cultural determinants as well as nutritional factors, it may be due to their adoptive physiological changes for residing in such high altitude. Such physiological differences may be due to their life style in hilly areas which require extra energy expenditure for daily activities resulting in such adaptive changes. Cardio-respiratory fitness at altitude determined by many factors like barometric pressure, cardiac output of the subject and hemoglobin saturation with oxygen. Results of the several study showed that overweight subjects performed more poorly on cardio-respiratory fitness tests than their thinner counterparts, with low to moderately-high inverse correlations found between cardio-respiratory fitness and adiposity (*Laxmi et al. 2014, Burns et al. 2013, Lee & Arslanian, 2007*). Hence, the three different states of school girls were differed significantly.

Conclusion

In the light of the findings and limitations of the present study the following conclusions were drawn:

1. Significant difference was found among Chandigarh, Haryana and Himachal Pradesh school girls on cardio-respiratory fitness.
2. Himachal Pradesh school girls performed significantly better in cardiorespiratory function than their counterparts.

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