Cardio-respiratory Function among Rural School Girls of Rajasthan

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Abstract

Background: The purpose of the present study was to find out the cardio-respiratory function among different age groups of rural school girls of Rajasthan.

Methods: 9 minute run/walk test was conducted on 1050 female ranging between 14 to 16 years school students. Random sampling technique was used to select the subjects. To find out the significance differences among the different three age groups of school girls, Analysis of Variance (ANOVA) was applied. Further Scheffe’s post-hoc test was used to see the direction and significance of differences where ‘F’ ratio was found significant. The level of significance chosen was .05.

Results: There were significant differences obtained on Cardiorespiratory function (9-minute run-walk test), among different three age groups of rural school girls. The finding reveals that 16 year age group of rural school girls demonstrated significantly better than their counterparts.

Keywords: Cardio-respiratory Function, Rural, School Girls, Rajasthan.

INTRODUCTION

Cardio-respiratory function, or aerobic fitness, is probably what most people identify as physical fitness. Aerobic fitness refers to the integrated functional capacity of the heart, lungs, vascular system, and skeletal muscles to expend energy. The basic activity that underlies this type of fitness is aerobic metabolism in the muscle cell, a process in which oxygen is combined with a fuel source (fats or carbohydrates) to release energy and produce carbon dioxide and water. The energy is used by the muscle to contract, thereby exerting force that can be used for movement. For the aerobic reaction to take place, the cardio-respiratory system (i.e., the circulatory and pulmonary systems) must constantly supply oxygen and fuel to the muscle cell and remove carbon dioxide from it. The maximal rate at which aerobic metabolism can occur is thus determined by the functional capacity of the cardio-respiratory system and is measured in the laboratory as maximal oxygen intake. As will be discussed in detail below, aerobic fitness is inversely related to the incidence of coronary heart disease and hypertension. Physical fitness should be the result of the balance of activities that are provided in the physical education programs at school and continued by the family and in other community activities outside of school. The four performance objectives can be practiced at home with a minimum of adult supervision. Practicing at home initiates the opportunity for parents and students to exercise and be physically active together, making fitness a family activity.

Exercise, Training of the body to improve health and fitness, different types have different purposes, including aerobics for heart and respiratory function and weight loss, weight-bearing exercise for bone strength, weight training for muscle strength, and stretching for flexibility. Specific exercises are used in physical medicine and rehabilitation. Benefits
include lower blood pressure, higher HDL cholesterol, improved disease resistance, and better general well-being.

Camethon et al. (2003) studied cardio-respiratory fitness in young adulthood and the development of cardio-vascular disease risk factors and found that participants with low fitness were 3 to 6 fold more likely to develop diabetes, hypertension and the metabolic syndrome than participants with high fitness. The association between low fitness and hypercholesterolemia was modest 95% confidence interval and attenuated to marginal significant after body mass index adjustment improved fitness over 7 years was associated with a reduced risk of developing and the significance of these associations was reduced after accounting for changes in weight. Jonatan (2009) investigated whether physical fitness in childhood and adolescence is a predictor for cardiovascular disease risk factors, events and syndromes, quality of life and low back pain later in life. Physical fitness-related components were: cardio respiratory fitness, musculoskeletal fitness, motor fitness and body composition. Adiposity was considered as both exposure and outcome. They found strong evidence indicating that: higher levels of cardio respiratory fitness at childhood and adolescence are associated with healthier cardiovascular profile later in life. Muscular strength improvements from childhood to adolescence are negatively associated with changes in overall adiposity. A healthier body composition at childhood and adolescence is associated with a healthier cardiovascular profile later in life, and with a lower risk of death.

METHODS AND PROCEDURES

In this study, a sample of 1050 rural school girls ranging between 14 to 16 years studying in different schools from rural area of Rajasthan was taken as subjects. Random sampling technique was used to select the subjects. The 9 minute run/walk test was used to measure cardiorespiratory function. To determine the significance differences among the different three age groups of school girls, Analysis of Variance (ANOVA) was applied. Scheffe's post-hoc test was applied to see the direction and significance of differences where 'F' ratio was found significant. The level of significance chosen was .05.

Fig-1: Illustration of 9-Minute run/walk test
RESULTS

Descriptive analysis of cardiorespiratory function among different three age groups is presented in Table-1.

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>14 YEARS (N=350)</th>
<th>15 YEARS (N=350)</th>
<th>16 YEARS (N=350)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
</tr>
<tr>
<td>Cardiorespiratory Function</td>
<td>1672.94</td>
<td>300.36</td>
<td>1807.97</td>
</tr>
<tr>
<td>(9-Minute run-walk test)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Descriptive Analysis of Cardiorespiratory Function of Rajasthan Rural School Girls

The Analysis of Variance (ANOVA) among different three age groups of rural school girls on cardiorespiratory function is presented in Table 2.

Table-2: Analysis of Variance of Rural School Girls on Cardiorespiratory Function

<table>
<thead>
<tr>
<th>Variable</th>
<th>Source of Variance</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiorespiratory Function (9-Minute run-walk test)</td>
<td>Between Group</td>
<td>1034607.57</td>
<td>2</td>
<td>517303.78</td>
<td>8.14*</td>
</tr>
<tr>
<td></td>
<td>Within Group</td>
<td>66461346.92</td>
<td>1047</td>
<td>63477.88</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>67495954.50</td>
<td>1049</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant at .05 level

\[ F_{0.05}(2, 1047) = 2.99 \]

The result presented in Table 2 reveals that there was a significant difference between 14 to 16 year age groups of rural school girls. The obtained F-value in 9-Minute run-walk test variable was 8.14. F value was greater than the table value of 2.99, which is required to be significant at .05 level.

Table-3: Significant Differences between the Paired Means of Cardiorespiratory Function among Different Three Age Groups

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>GROUPS</th>
<th>MEAN DIFFERENCE</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiorespiratory Function (9-Minute run-walk test)</td>
<td>14 Year</td>
<td>15 Year</td>
<td>16 Year</td>
</tr>
<tr>
<td></td>
<td>1354.27</td>
<td>1359.22</td>
<td>1423.20</td>
</tr>
<tr>
<td></td>
<td>4.95</td>
<td>68.92*</td>
<td>.001</td>
</tr>
</tbody>
</table>

Table 3 clearly indicates that the significant differences existed between 14 years and 16 years & 15 years and 16 years on cardiorespiratory function since the value obtained were 68.92, and 63.97 respectively. No significant difference was obtained between 14 years and 15 years since the value obtained was 4.95.

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Discussion

There was significant difference obtained on cardiorespiratory function among different three age groups of rural school girls. When the paired mean difference of cardiorespiratory function was found that a significant difference existed between 14 years & 16 years, and 15 years & 16 years of rural school girls of Rajasthan. Above mentioned findings in the case of rural school girls all the three age groups differs significantly. It may be attributed to the facts that the subjects of this study were during growth period and their cardiorespiratory function differed because of their age differences though they were living under the same tropical as well as environmental conditions. Hence, the three different age groups of rural school girls of Rajasthan were differed significantly.

CONCLUSION

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

- There were significant differences obtained on cardiorespiratory function among different three age groups of Rajasthan rural school girls.
- 16 year group rural school girls performed significantly better in cardiorespiratory function than their counterparts.

References:


To,

The Deputy Director (Education)
Churu Zone (RAJESTHAN)

Subject: - For the permission of data collection in schools

Respected sir,

With due respect and honor, I am research scholar Chandigarh. The research topic is “health related physical urban schools students of Rajasthan”. Sir, I want to collect school students in various districts of Rajasthan, the age group...

So please permit me for the data collection and all respective schools in your Zone.

I’ll highly thankful to you sir.

Your sincerely,
Rajeshwari (Research scholar)
Panjab University Chandigarh

Deputy Director Churu
The D.E.O.
Bundi (Rajasthan)

for the permission of data collection in schools.

Sir,

With due to respect and honour I am a research scholar at Punjab University, Chandigarh. The research topic is "HEALTH PROMOTED PHYSICAL FITNESS AMONG RURAL AND URBAN STUDENTS OF RAJASTHAN." Sir, I need to collect data of rural and urban students in all districts in Rajasthan. The age group of students is 14 to 16 years. I beg you to permit me to do the data collection in your district.

I am highly thankful to you sir.

Yours sincerely,

Rajesh
Research Scholar
Panjab University, Chandigarh.

DEO
Bundi

जिला शिक्षा अधिकारी
(नागरिक) बुंडी
The D.E.O.

chitorgarh. (Rajasthan)

ubi- for the permission of data collection in school

sir,

with due to respect and honour, I am research scholar

with the respect for the permission of data collection in school

students in "HEALTH AND PHYSICAL FITNESS AMONG AND URBAN SCHOOL STUDENTS IN RAJASTHAN." Sir, I want to collect data of rural and urban

students in all districts in Rajasthan. The age group of

14 to 16 years.

sir, please permit me for the data collection in

we district.

I'll highly thankful to you sir

Yours sincerely

(Research scholar)

- Rajsamad

Vyas University, chitor larkh.

17/11/13

this is the permission to collect data from rural and urban

students in the age group of 14 to 16 years.

17/11/13
The D.E.O.
Jodhpur (Rajasthan)

Sir,: For the permission of data collection in schools.

with due respect and honour, I am research scholar
Punjab university, Chandigarh. The research topic is "HEALTH
RELATED PHYSICAL FITNESS AMONG RURAL AND URBAN SCHOOL
DENTS OF RAJASTHAN". Sir I want to collect data of
and urban students in all districts in Rajasthan.

age group of students 10 to 16 years.

Sir, please permit me for the data collection in your

I'll highly thankful to you sir.

Yours Sincerely

[Signature]

D.E.O.
Jodhpur.

[Signature]

(Research Scholar)
Punjab university, Chandigarh.

[Signature]

[Signature]

[Signature]
Respected sir,

With due respect and honour, I am a research scholar at Punjab University Chandigarh. The research topic is "HEALTH RELATED PHYSICAL FITNESS AMONG RURAL AND URBAN SCHOOL STUDENTS OF RAJASTHAN". Sir, I want to collect data of rural and urban school students in various districts in Rajasthan. The age group of students is 14 to 16 years.

So please permit me for the data collection and also circulate this application for respective schools in your district.

I'll highly thankful to you sir.

Yours sincerely,
Rajeshwari
Research scholar
Panjab University Chandigarh
This is to certify that Mrs. Reshmiwar, Research Scholar, Punjabi Univ, Chandigarh, has collected data from our school regarding a health related physical fitness among school students of Jyothir, our physical education teacher supervised the whole process.

[Signature]

Pradhanacharya
Raj. B.A. B.V. Vidyalaya
Vikas Nagar, Jodhpur (Raj.)
This is to certify that Mrs Rajeshwari, Research Scholar, Punjab University, Chandigarh, had collected data from our school regarding "Health Related Physical Fitness among School Students of Rajasthan," our staff teachers supervised the whole process.

[Signature]

[Name]

[Designation]

[Institution]
This is to certify that Mrs. Rojeshwari, Research Scholar, Panjab University, Chandigarh, has collected data from our school regarding Health Related Physical Fitness among School students of Rajasthan. Our physical education teachers ensured the whole process.

[Signature]

Rajkunwar
Professor
Rajkunwar Uchch Madhyamik Vidyalaya
Gujranwala, Punjab, Rajasthan
This is to certify that Mrs Rajeshwari, Research Scholar, Punjab University, Chandigarh, has collected data from our school regarding "Health Related Physical Fitness among School Students of Rajasthan". Our Physical Education Teacher supervised the whole process.

29/10/2012
This is to certify that Mrs. Rajeshwari, Research Scholar, Panjab University, Chandigarh, has collected data from our school regarding a "Health Related Physical Fitness Among Rural and Urban School Students of Rajasthan", our physical education teacher supervised the whole process.

[Signature]

[Date: 18.10.13]

[Name]
This is to certify that Mrs. Rajeshwari, Research scholar, Punjabi University, Chandigarh, has collected data from our school regarding "Health Related Physical Fitness among School Students of Rajasthani". Our physical teacher supervised the whole process.

[Signature]

[Stamp]

693319
To,
The Deputy Director (Education)
Churu Zone (RAJESTHAN)

Subject: - For the permission of data collection in schools

Respected sir,

With due to respect and honor, I am research scholar at panjab university Chandigarh. The research topic is “health related physical fitness among rural and urban schools students of Rajasthan”. Sir I want to collect data of rural and urban school students in various districts in Rajasthan, the age group of students 14 to 16 years.

So please permit me for the data collection and also circulate this application for respective schools in your Zone.

I’ll highly thankful to you sir.

Your sincerely,
Rajeshwari (Research scholar)
Panjab University Chandigarh

Deputy Director Churu

Research scholar