



Short Communication

Cardiorespiratory Fitness among Adolescent Girls

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Available online at: www.isca.in, www.isca.me

Received 1st April 2015, revised 12th September 2016, accepted 20th September 2016

Abstract

Cardio respiratory fitness is an integrated function of circulatory and respiration system to supply fuel and oxygen to working muscles and organs for prolong activity. Purpose of the study was to examine the cardio respiratory fitness (CRE) of different age groups such as 14, 15 and 16 years of school girls. Cardio respiratory fitness is considered as key variables to assess the endurance ability of girls. To assess the cardio respiratory fitness ability the subjects have been selected from Jaffna Zone in Sri Lanka. 1000 subjects have been recruited from a age group totally 3000 subjects was assigned from three age group for this study. 9 minutes Run/ Walk test was conducted to assess the ability of cardio respiratory fitness. During 9 minutes covered distance was recorded in meter for data interpretation. Analysis of variance (ANOVA) was administered to find out significant different. The result revealed that significant differences were observed among three group. The 16 years girls was higher in cardio respiratory fitness compared to 15 and 14 years, 15 years also was better than 14 years this study concluded that when age increase the cardio respiratory fitness also increase during adolescence.

Keywords: Cardiorespiratory, Adolescence.

Introduction

Cardio respiratory fitness is followed by general population to maintain the physical fitness and to do routine life without tiredness. In Sri Lanka, all the schools are following keep fit programme in morning session to improve the cardio respiratory which may improves the heart, lungs, vessels, blood circulation function which may potential positive effect on health factors. Over last two decades that lower and middle income countries has been ramification for health development. It is changing global socio economic of countries¹.

Several previous studies have highlighted that cardio reparatory fitness is a good indicator of health factors. Lower cardio respiratory fitness is associated with many heart diseases such as coronary heart diseases, high blood pressure, diabetic and cholesterol which can be overcome through regular endurance exercise. However previous study had concluded that 40% of cardio respiratory fitness is dependent on genetic factors². Cardio respiratory fitness is responsible for body adaptation through exercise. It is immediate positive impact on cardiac output, blood flow, heart rate and stroke volume³. Which improvements may prevent from many chronic non communicable diseases.

Cardio respiratory fitness is high among adolescence than other group because majority of adolescence will not be as obese in urban city particularly in Jaffna zonal due to lifestyle factor and food habits, however family genetic factors are exemption. Maintaining the correct BMI may increase the lungs capacity,

tidal volume and vital capacity it will increase cardio respiratory capacity. Correct BMI(normal) is associated with lean body mass tissue and fat free mass which may improve the VO_{2max} . which is internationally accepted device to measure cardio respiratory fitness.

Currently statement of world health organization (WHO) has found that adolescences obesity proportion is increasing among developed countries than developing countries⁴ causes are food habits and physical inactivity which will affect the cardio respiratory fitness. Most of research has been indicating that an infant was not born with obese but they get obese after 18 years there arises problem in health related factors. Increasing obesity may lead to poor cardio respiratory fitness.

Current Study: This study was investigated to measure the cardio respiratory fitness among the 14, 15 and 16 years girls of Jaffna Zone in Sri Lanka.

Methodology

Selection of Subjects: Untrained school women under 14,15 and 16 have been recruited for this study from Jaffna zones by school advertisement. All participants answered a questionnaire, which possesses information about personal data, sports participation and medical history. Recruited subjects completed orientation programme was scheduled for recruited subjects. Finally 3000 women participated in this study from 50 schools in various age groups.

Test Protocol: Participant had 2 to 3 minutes light warm up and involved related stretching exercise prior to participate the test. Standard track was used to administrate the test. Subjects have started to run upto 9 minutes then successfully completed labs was counted when the 9 minutes reach umpire has blew whistle subject has stopped the running and counted covered distances in meters.

Data Collection and Statically Analysis: Successfully covered distance was measured in meters. One way analysis of variance was applied to find out whether there was any significant difference on cardio respiratory fitness among the different age group girls. Minitab 16.version was administered to analysis the static. The level of significance was fixed at 0.05 level.

Results and Discussion

Table-1 display F value was 12919.03 at 0.05 level of confidence, since the P value is less than 0.05 level this clearly revealed that significant differences were observed among the three age group of school girls on cardio respiratory fitness.

The mean difference of cardio respiratory fitness among the age group of 14, 15 and 16 years have shown significant difference among each group. It revealed that 16 years girls is better than other two group like 14 and 15 years comparing this two age group, 15 years group is better than 14 years according to mean value which is clearly shown in Table-2.

Discussion: Cardio respiratory fitness improves the heart rate, healthy lungs and clean vessels. It can be improved by endurance activity like continues running, jogging, swimming, walking and playing games. Developing fitness variables control the weight among adolescence and prevent from non communicable disease. Commonly it comes early in the age due to physical inactivity. Recent research found that 250000 death held in USA causes are physical inactivity. Regular physical activity is remedy for this disease⁵. Regular exercise will improve the low density lipoprotein (LDL). LDL is bad cholesterol and increasing the bad cholesterol may lead harmful effect on artery and fat deposit on blood vessels. Regular exercise also improves the high density lipoprotein (HDL). It is good cholesterol and prevent from chronic heart disease. Who keep peak level of cardiovascular fitness they may have high level of HDL. Almost middle age people suffer by heart disease it is big challenge among people thus early regular exercise can save from such non communicable disease⁶.

Regular cardiovascular exercise improves cellular metabolism and capillaries in muscles. It can supply adequate level of oxygen, nutrients and remove waste products. Increasing number of capillaries helps to heel from injury and reduce muscles aches. Cardio respiratory fitness increases the size and number of mitochondria in the muscles cells thus it increase endurance capacity. Heart disease patient can participate physical activity which has improved many physiology and psychological factors like increase blood circulation, anxiety, lower stress, self confident.

Table-1
Result of Analysis of Variance on Cardio Respiratory Fitness among the three difference Age Groups

Age Groups	Mean Value	Standard Deviation	F Value	P Value
14	1155.0	75.7	12919.03	0.000
15	1571.9	127.2		
16	1943.4	119.2		

Significant at 0.05 level

Table-2
Significant Difference among Means of Different Age Groups on Cardio Respiratory Fitness

Level	N	Mean	St. Dev	Individual 95% CIs For Mean Based on Pooled StDev			
1(14)	1000	1155.0	75.7	*			
2(15)	1000	1571.9	127.2	*			
3(16)	1000	1943.4	119.2	(*)			
				1250	1500	1750	2000

Pooled St. Dev = 109.7

Investigator has gone through several review literature which has highly highlighted that most of the heart disease patient are belong developed country compare to developing countries, key causes are lifestyle factors, food habits and sedentary life style which may lead lower cardio respiratory fitness. Lower respiratory fitness is associated with many heart diseases so all reviewers recommend to keep up your cardio vascular fitness at peak and recommend to involve physical activity at least 30 minutes. In this connection Sri Lanka government has scheduled physical activity programme among school students to keep up cardiovascular fitness at peak further the student study health and physical education theory subjects which have marked important of physical activity in modern life, disease so huge number of school adolescences have been participating the some sort of physical activity which may have reduced number of heart disease due to adequate level of cardiovascular fitness among girls. Adolescences cardio respiratory level also indicates that student has involved some sort of physical activity.

Conclusion

According to this study the researcher concluded that adolescence period is important period to promote the physical and physiological system in human body. During adolescence who involve the strenuous physical activity or exercise that may lead to prevent from non communicable disease. Most of the develop country child and children are under non communicable disease causes are physical inactivity so improving the physical activity will have good impact on cardiovascular fitness so this study make alarm that cardio respiratory fitness prevent from

many non communicable disease and ensure healthy lifestyle among adolescence.

Implication: i. Improving the cardio respiratory fitness develop the academic performance and healthier society so curriculum designer should give importance for physical education programme in schools, college and universities. ii. General and health related physical fitness may be included in current and future public health promotion.

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