



**A STUDY ON CARDIORESPIRATORY FITNESS OF COLLEGE
FEMALE OF WEST BENGAL**

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ABSTRACT

Objective: The objective of this study was to compare cardio-respiratory fitness in terms of VO_{2max} between rural and urban college female of West Bengal. **Subjects:** Sixty (N=60) female college students were randomly chosen from a large population of which thirty ($GR_U=30$) were chosen from urban area and rest thirty ($GR_R=30$) students were chosen from rural areas of West Bengal. The subjects belonging from rural area were chosen from the Govt. Institute of Education for Women, Hastings House, Alipore, Kolkata-27. On the other hand the subjects belonging from rural areas were chosen from two colleges of Hoogly district of West Bengal. The age ranged between 18-25 years. **Variable Studied:** In this project only one variables was studied i.e. cardiovascular fitness (CVF) in terms of VO_{2max} and it was measured by Queen's College Step Test (QCST) **Statistical analysis:** To find out significant difference in CVF between GR_U and GR_R statistical t-test was used. The significance of means were tested at $p<0.05$ level of confidence. For statistical calculations Excel Spread Sheet of windows version 7 will be used. **Results:** The results suggest that the rural female were significantly superior in VO_{2max} than the urban female.

Key words: Cardiovascular fitness, VO_{2max} .

1. INTRODUCTION

Cardio respiratory fitness and body composition are associated with the risk of emergence of cardiovascular diseases. Accordingly, these factors as related to health have been the focus of researchers in the field of Health and Physical Education. The incidence of cardiovascular disease is statistically and physiologically related to obesity. For example, the obese individual has a mortality rate from cardiovascular disease is 2½ times greater than the individual with an average or below average body weight [Fox and Browers, (1989)].

Over the past four decades, there has been an increase in the prevalence of overweight and physical fitness deterioration in adult across all genders, age and racial/ethnic groups. It can cause many risk factors to health including coronary heart disease, forms of cancer, diabetes, hypertension, stroke, osteoarthritis respiratory problems etc. Low levels of physical activity and cardio respiratory fitness are both associated with higher risk of all causes and disease specific mortality [Thune et. al.(1998)].

Aerobic fitness is a very good indicator of cardio respiratory fitness/cardiovascular and exercise tolerance for everyday activities which are largely aerobic for the general population [Zuluaga, (1995)]. It is considered that VO₂ max or maximal aerobic capacity is only a single measure of the functional capacity of the oxygen system or cardio-respiratory system or the oxygen transport system [Koley, (2007)]. Research has indicated the importance of exercise in reducing the risk of cardiovascular diseases, through reduction of blood lipids, body fat, and blood pressure, improvement in myocardial function and as an independent risk factor [(Fletcher et al., 1990 and National Heart Foundation, 1991)]. Thus, the concept of fitness being defined as good condition or good health, tells us that, while we do not expect the general population to compete with athletes, an above average Vo₂ max score indicates a healthy level of cardio respiratory fitness and that an individual is fit to cope with the general demands of living [(Zuluaga, 1995)]. Civilization and industrialization make our life pleasant, jubilant and luxuriant. Indeed, automation and other technologies have contributed greatly to lessening physical activities at work place and home. The assessment of cardio respiratory fitness in children and adolescent has been growing in importance because several data link the VO₂ max with CVD risk factors [(Sallis, 1988 and Anderson, 1992)]. So, the purpose of the present study was to fulfill the lacuna of knowledge in these aspects in young adults especially in Indian context. Therefore, the aim of the present study was to compare the cardiorespiratory fitness in terms of VO₂max between the rural and urban female of West Bengal.

2. MATERIALS AND METHODS

2.1. Sample

Sixty (N=60) female college students were randomly chosen from a large population of which thirty (30) was chosen from urban area and rest thirty students were chosen from rural areas of West Bengal. The subjects belonging from rural area were chosen from the Govt. Institute of Education for Women, Hastings House, Alipore, Kolkata-27. On the other hand the subjects belonging from rural areas were chosen from a rural college of Arambag subdivision of Hoogly district of West Bengal. The subjects were selected on the basis that they should have the history of living in their areas (Rural or Metropolitan) continuously

for last 18 years without interruption for more than three month at a time. Students having experience of participation in competitive sports, regular exercise program and the students of Physical education were excluded from the sample. That means only sedentary women were chosen as subjects for the present project. Students having history of cardiac disease and lung disease will also be excluded from sample. The study was approved by Institutional Ethical Committee.

2.2 Selection of Variables

In this project only one variables was studied i.e. cardiorespiratory fitness (CF) in terms of VO_2 max and it was measured by Queen’s College Step Test (QCST)

2.3 Procedure

Height and Weight were measured by Anthropometric rod and Digital Weighing machine (Tanita™, Model: BC-554). To measure CF in terms VO_2 max Queen’s College Step Test (QCST) was administered on all the selected subjects.

Cardiorespiratory fitness in terms of VO_2 max was measured by Queen’s College Step Test (QCST). *Prediction of VO_2 max:* In brief the step test was performed using a stool of 16.25 inches (or 41.30 cm) height. Stepping was done for a total duration of 3 minutes at the rate of 24 cycles per minute which was set by a metronome. After completion of the exercise, the subjects were asked to remain standing comfortably and the carotid pulse rate was measured from the fifth to the twentieth second of the recovery period. This 15 second pulse rate was converted into beats per minute (15 sec pulse rate x 4) and the value thus obtained was put in the following equation to predict VO_2 max in ml/kg/min, as proposed by McArdle et al., 1986.

$$VO_2 \text{ max (ml/kg/min)} = 65.81 - (0.1847 \times \text{pulse rate in beats per min})$$

2.4 Statistical analysis

In the present study for the sake of analysis of data mean and standard deviation of the variables were calculated. To find out significant difference of mean in CVF between the rural & urban college women statistical t-test was used. The significance of means were tested at $p < 0.05$ level of confidence. For statistical calculations Excel Spread Sheet of windows version 7 will be used.

3. RESULTS

In Table-1 the mean and standard deviation of Age, Height and Weight of Rural and Urban college female students have been presented.

TABLE 1
DESCRIPTIVE STATISTICS OF DIFFERENT GROUPS OF SUBJECTS IN AGE, HEIGHT AND WEIGHT

S.NO.	Groups	N	Age M±SD	Height M±SD	Weight M±SD
1	Rural Female	30	20.08±1.21	1.54±4.48	46.95±6.94
2	Urban Female	30	23..32±5.73	1.57±6.07	54.37±10.44
3	Total	60			

Thus **Table-1** shows that the number of subjects for **Rural Group** (GR_R) was 30 and the mean age of the subjects was 20.08 years with a standard deviation ± 1.21 . The mean height was 1.54 m. with a standard deviation of ± 4.48 . The mean weight for the same age

group was 46.95 kg with a standard deviation and range of ± 6.94 . For **Urban Group** (GR_U) the number of subjects was 30 and the mean age of the subjects was 23.32 years with a standard deviation of ± 5.73 . The mean height was 1.57 m with a standard deviation of ± 6.07 . The mean weight for the same age group was 54.37 kg with a standard deviation of ± 10.44

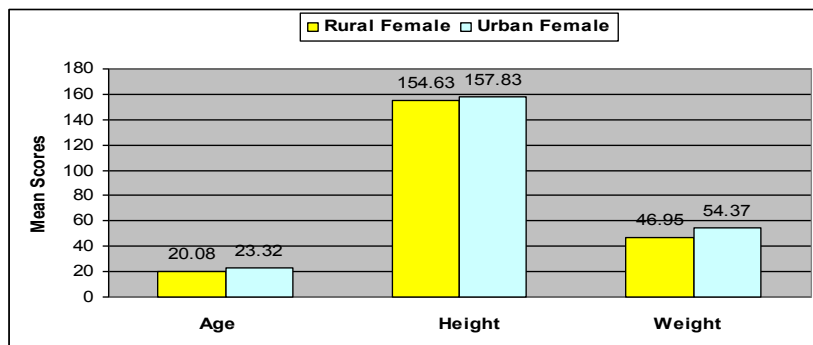


TABLE 2
MEAN, SD, MEAN DIFFERENCE, SE, T-VALUE OF VO₂ MAX OF RURAL AND URBAN COLLEGE STUDENTS.

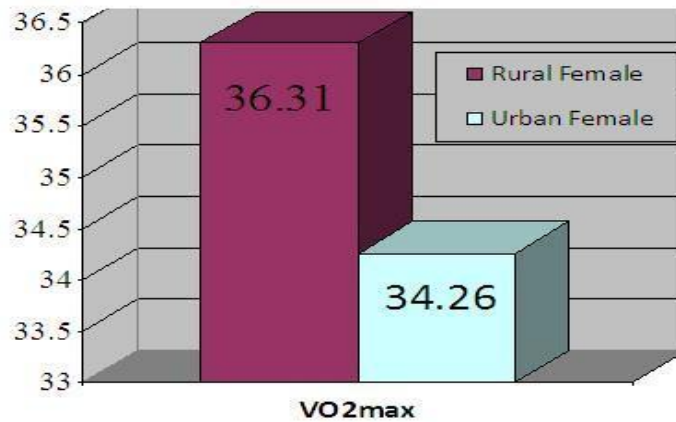
Students	Mean	SD	MD	σ DM	t-ratio
Rural	36.31	2.84	2.05	0.66	3.10
Metropolitan	34.36	4.60			

From the Table -2 it was found that the mean \pm standard deviation of VO₂max for Rural and Urban female was 36.31 ± 2.84 and 34.26 ± 4.64 respectively. From the Table -2 it was also found that the mean difference, standard error and t-value were 2.05, 0.66 and 3.10 respectively. It was also found that the difference in VO₂max between rural and urban female was statistically significant. In Fig-2 the mean value of vo₂ max for rural and urban female was presented.

4. DISCUSSION

The possible explanations for these results may be due to the fact that the food habits of the urban girls and rural girls are different. Urban girls usually take cold drinks, fast and junk foods regularly whereas rural girls take to their usual foods. That is why urban girls gains fat and becomes heavier than Rural girls. Again Rural girls in our country engaged in family works but urban girls were not too much engaged themselves in such works rather watch television programme, read magazine, work on computer which do not permit any physical activity. That was probably the cause behind getting such result. In respect of Cardio-respiratory endurance it was found that the urban girls were significantly inferior to the rural counter parts. That was because The Rural girls engage themselves in different family works, place and recreational activities whereas the metropolitan girls mostly reluctant to resort to physical activities rather they like to engage themselves in other activities. The effects of pollution may also be a factor of such type of results.

Fig -2
Mean VO₂ max of Rural and Urban Female



5. CONCLUSION

From The result of the present study it can be concluded that that there are significant difference in cardio-respiratory fitness between rural and urban female.

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