

# **PHYSICAL FITNESS OF RURAL AND URBAN WOMEN**

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# **PHYSICAL FITNESS OF RURAL AND URBAN WOMEN**

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**FAMILY RESOURCE MANAGEMENT**

**By**

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**CERTIFICATE**

This is to certify that the thesis entitled “**PHYSICAL FITNESS OF RURAL AND URBAN WOMEN**” submitted by **MS. CHANNAMSETTY MAHA LAKSHMI**, for the degree of **MASTER OF HOME SCIENCE** in **FAMILY RESOURCE MANAGEMENT** to the University of Agricultural Sciences, Dharwad is a record of research work carried out by her during the period of her study in this University, under my guidance and supervision, and the thesis has not previously formed the basis of the award of any degree, diploma, associateship, fellowship or other similar titles.

**Place : DHARWAD**

**Date : JUNE, 2017**

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# *Introduction*

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## 1. INTRODUCTION

Good health provides sound and solid foundation on which physical fitness depends and at the same time fitness provides one of the most important key to leading life. It is difficult to say how physically fit we should be, since physical fitness is an open ended personal condition. People vary so much that it is impossible to say how strong or healthy they should be to qualify for the state called physical fitness.

The expert committee of the World Health Organization (1981) described physical fitness as “the ability to undertake muscular work satisfactorily.” Physical fitness is the capacity to withstand various forms of physical activities reasonably well, without being unduly tired and is a measure of individual’s health and well-being.

Every person has a different level of physical fitness which may change with time, place of work and situation. There is also correlation between the daily activities and the fitness of an individual. From the physiological point of view, physical fitness may said to be the ability of the body to adopt and recover from strenuous exercise. (Chaudhary 1998)

Physical fitness is the capacity to withstand various forms of physical activities reasonably well, without being unduly tired and is a measure of individual’s health and well-being. The relationship between physical activity and fitness was established by (Boucher and Shepherd 1994)

Physical fitness is the ability to carry out daily tasks with vigor and alertness, without undue fatigue and with ample energy to enjoy leisure time pursuits and to meet unforeseen emergencies (Shephard, 1986). It provides adequate energy to perform greater amount of work and also helps to recover from fatigue much faster. It is a major basis for good health and well-being.

The American association for health, physical education and recreation has divided physical fitness in to three aspects physique, organic efficiency and mortar efficiency. Physique is good height and weight to the age, good muscular development, good posture with appearance of easy alertness, normal bones, joints and muscles etc. Organic efficiency is Normal sensory organs – sight, hearing, smell, taste, feeling, fit heart and circulatory system, fit glands of internal secretions, fit muscular system in development, tone and fit nerves system. Morter efficiency is the least average capacity and wide variety of fundamental mortar capacities like balance, flexibility, agility, strength, power and endurance to activates.

## **Health and fitness**

The best definition of health according to World Health Organization (1981) which states that health is “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.” Health can be understood as a state of balance between the individual and his or her physical and social environment. This balance is affected on the one hand by the individual's health potential or ability to cope with environmental challenges and on the other by the type and degree of environmental stress.

Health and physical performance capacity are acquired during younger days and maintained throughout life by means of an appropriate pattern of a healthy lifestyle, including habitual physical activity. It is thought to have beneficial effects on the cardiovascular, respiratory and body functions in general. The high level of fitness goes along with optimal body functions. Fitness is physiologically characterized by having a lower heart rate and arterial blood pressure at rest as well as during performance of muscular exercise, which put less stress on the heart of the fit person compared to the unfit person.

Healthy living and physical fitness are closely connected. Being physically fit not only helps people to live healthy life. It also helps people to be happier. People who make physical activity and exercise a part of their daily lives when they are young are more likely continue as they grow older and benefit from it throughout their life. Fitness is a product of physical exercise, proper nutrition, adequate rest, relaxation, health appraisal and good health habits. These are all facets of implication because these bridge the gap between health and fitness.

## **Determinants of health and physical fitness**

There are various components which determine the health and physical fitness of an individual. Among them body mass index, body composition, body type and aerobic capacity, play a very important role in determining general health condition of a person. Physical fitness of a person is determined by various types of ergo meters and instruments like step test ergometer, bicycle ergometer, thread mill and physical fitness index.

Body mass index is an attempt to quantify the amount of tissue mass (muscle fat and bone) in an individual and categorize that person as underweight, normal weight, overweight and obese based on the value.

Body composition includes body density, fat content of the body and estimation of lean body mass. These are determined from compiling the data on skin fold thickness measured at four sites, *i.e.* bicep, tricep, subscapular and suprailiac with the help of skin fold calipers. Body type is the method of classifying the human physique based on height and weight. It differs from one person to another.

Aerobic capacity ( $\text{VO}_2$  max) or maximal oxygen uptake is attained during strenuous, but not necessarily exhaustive, muscular efforts. This is widely used as a determinant of physical fitness and has passed the test of time as a meaningful positive indicator of health status. It is considered to be the best measure of an individual's cardio-respiratory fitness or capability for doing physical work. It can serve as a reliable yardstick to judge whether an individual will be able to accomplish a given task without any signs of fatigue or discomfort.

Physical fitness index is the time spent between the beginning of physical activity by an individual and termination because of exhaustion.

### **Benefits of physical fitness**

The important benefits of fitness is that it can help to prevent and in some cases help to remediate degenerative diseases. People who engage in specific kind of exercise, particularly aerobic exercises, prevents or limits weight gain and gain in body mass index, reduce their percentage of body fat, control their blood glucose levels, and increase their insulin sensitivity.

As we exercise, a number of changes takes place on the functional side, endurance and strength will increase, allowing us to work harder and longer with less fatigue, resting pulse rate will slow down at the same time as our heart volume increases and recover more quickly from exercise. Muscles will thicken depending on how hard you work on them and excess weight will be reduced, Active people tend to suffer less from coronary problems than in active ones and they cope better if they are affected.

Walking for long time or running for daily work improves cardio respiratory fitness lifting something improves strength. Having maximum angular movements with economic use of force of different body parts through the joints improves flexibility and good stature with proper muscle mass without extra fat, Good body composition indicates good physical health.

## **Women and physical fitness**

Women have multiple roles in society, being responsible not only for food and processing but also domestic chores, income generation and care of dependants. Due to the dual responsibility at home as well as at work places outside the home, there is a greater pressure for productivity enhancement, quality work and profitability. Women physiological, characteristics and reproductive requirements make them especially vulnerable to work, related ill health. It is a well known fact that women's income in the family is of paramount importance for nutritional, economic and educational upliftment of the family. Since women constitute almost half of the population in India. It is estimated that on an average, the Indian woman spends above five hours per day more than the Indian man in work, including the visible burden of family.

Women's health is of particular concern due to widespread discrimination against women in the world, leaving them disadvantaged. Women are particularly vulnerable at the two extremes of life. Young women and adolescents are at risk from STIs, pregnancy and unsafe abortion, while older women often have few resources and are disadvantaged with respect to men, and also are at risk of dementia, abuse, and generally poor health.

### **Need for the study**

Among rural working women performing agricultural operations and working woman in urban areas denotes productivity in different fields as well as household and allied activities involved in greater physical exertion. Therefore knowledge of physical fitness and its application is of paramount importance. To ensure the better health and safety of the women from rural or urban background, it is important to have good relationship between their occupational load, physical fitness and the food which they regularly eat. Very few studies have been conducted in assessing physical fitness of women in, rural and urban women population

In the present situation there is need for the study to measure and analyse physical fitness for their own benefit and improvement of the women. Hence, the study was taken with the objective to analyse the physical fitness of the rural and urban women and to find out which of these categories is more physically fit in response to tests administered so that one can improve the standard. And level of physical fitness in rural and urban women.

**Objectives taken for the study are**

1. To assess the socio economic status of rural and urban women
2. To analyze the physical and physiological parameters of fitness among rural and urban women
3. To assess the physical fitness of the selected rural and urban women by using step test ergometer

# *Review of Literature*

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## 2. REVIEW OF LITERATURE

A comprehensive review of studies is an essential step in any research endeavour to provide base for developing a frame work, insight into the methodology and working out a basis for interpretation of the findings. Keeping in view the objectives of the study, the literature pertaining to the past research work related to the present study on “physical fitness of rural and urban women” reviewed under the following headings.

- 2.1 Demographic profile and socio-economic status of rural and urban women.
- 2.2 Life style factors of the rural and urban women.
- 2.3 Physical and physiological parameters of rural and urban.
- 2.4 Health status of rural and urban women.
- 2.5 Physical fitness of rural and urban women.
- 2.6 Relationship between physical fitness and other physical and physiological parameters rural and urban women.

### **2.1 Demographic profile and socio-economic status of the selected rural and urban women**

Viswanath and Bond (2007) conducted a study on social determinants and nutrition; reflecting on the role of communication. Findings revealed that body of evidence linking socio-economic status with health outcomes is large and invariably suggests that higher socio-economic status levels are usually positively associated with health protective behaviours and negatively associated with health-impeding behaviours.

Prasad *et al.* (2009) conducted a study on socio-economic status, health and hygiene of rural women of Godda Distt., Jharkhand the results revealed that Majority (58.00%) of the respondents were belonging to young age 20 years to 34 years, followed by middle age 35years to 50years, and only 10.7 per cent were old age that is above 50years. Half of the respondents were illiterates (56.29%) followed by 31.35 per cent were had primary and secondary schooling 16.29 per cent were had high schooling or P.U.C and none of them were graduates. majority (57.04%) of respondents were chosen agriculture as their main occupation, followed by 15.56 per cent were employed in government service, 14.82 per cent business, 10.37 per cent labour and less than 10.00 per cent were carpenters blacksmiths, gold

smiths, painters, and barbers. Majority (62.22%) of the respondents families had an annual income above Rs.11500/-

Devi and Verma (2009) conducted a study on women in agriculture a profile. the results revealed that 46.25 per cent of the total respondents were in young age group, whereas 41.12 per cent belonged to middle age group and rest of them 12.63 per cent were found to be in old age group. Majority (61.63%) were possessing low education level followed by medium education level, 30.50 per cent and only 7.87 per cent possessed education up to high level. Majority of the total respondents (84.25%) had farming as their main occupation, whereas 11.87 per cent were found to be in service followed by in business 3.25 per cent and as agricultural labours 0.63 per cent as their main occupation. about (60%) of the total respondents had monthly income Rs. 1500/- to Rs. 5500/- followed by 28.75 per cent who had monthly income between Rs. 5600/- to 9600/- whereas one tenth of the respondents 11.63 per cent had family income above Rs. 9600/- per month.

Jadhav *et al.*, (2009) conducted a study on adoption of sustainable agricultural practices by women farmers The results were clear from the total sample that majority of the women farmers from the selected districts fell in the middle age group 30 to 40 years, majority of the women farmers were illiterates 39.25 per cent and more than 90.00 per cent of them were married. The main occupation of the women was agriculture (74.08 per cent) owned land and their husband's occupation was also noticed as agriculture (66.29%).

Kumari and Laxmikant (2015) study results revealed that majority (53.33%) of the respondents belonged to middle age group followed by young age 30.00 per cent and old age 16.67 per cent, 54.44 per cent respondents were illiterate followed by 24.44 per cent were educated up to fifth class and only 16.11 per cent were having middle and above level of education. Agricultural and animal husbandry were the main occupation of 64.44 per cent respondents followed by 21.66 per cent, 8.88 per cent and 5.00 per cent agricultural, animal husbandry and service, respectively. It can be observed that maximum 78.88 per cent of the respondents had annual income of Rs. 10001 to Rs.15000 followed by 15.33 per cent of respondents annual income of Rs. 15001 - Rs. 20000 and only 2.77 per cent of respondents annual income of Rs. 20001 and above respectively.

Ranjitha and Vidya (2016) revealed that majority (51%) of the respondents were of 30 to 40 years of age, 40 percent were married at less than 18 years of age and 42 percent had

less than 2 children. Only 39 percent had permanent job, and 70 percent joined job to meet the household expenses and higher proportion of them earned Rs1000 to 5000 per month.

Seemaprakalpa (2016) found that the majority (45.00 %) of women entrepreneurs belonged to the age group of 33-45 years. followed by 38.30 per cent belonged to the age group of 20-32 and 16.70 per cent belonged to the age group of 46-58. Marital status wise figures clearly showed that 78.30 per cent of sampled women entrepreneurs were married. 13.30 per cent of sampled women entrepreneurs were unmarried 6.70 per cent sampled women entrepreneurs were widows. Only 1.70 per cent of sampled women were divorcees. The educational status of the sampled women entrepreneurs depicts that 25.00 per cent had schooling up to 12<sup>th</sup> and above 75.00 were graduates. 41.60 per cent entrepreneurs were generating income from the enterprise between Rs. 9,001-Rs. 15,000 per month. Followed by 21.70 per cent entrepreneurs were generating income from the enterprise between Rs. 15,001-Rs. 21,000.

## **2.2 Life style factors of the rural and urban women.**

Bink (1962) conducted a study on the physical working capacity in relation to working time and age. The researcher opined that caloric expenditure averaged for the whole of the working time is limited by the physical working capacity. The physical working capacity depends on two capacities, one the capacity for oxygen intake, two the capacity for food intake. Both capacities are closely related. The first is the aerobic capacity. We can measure it as the maximum level of oxygen intake per minute, and it can be measured at the highest rates of exercise. This level is reached in about the one fourth minute of exercise. We consider the maximum oxygen intake per minute or aerobic capacity as the physical working capacity for a working period of four minutes. The food intake of a man is in accordance with his body build and his activities. In many countries mean values for caloric intake in different professions are available. The researcher have made use of these two types of data *ie.*, aerobic capacity and food intake to provide an assessment for the allowable caloric expenditure during industrial work.

Hsich (1999) reported that the exercise physicists also evidenced that steady and well planned exercise can improve and prevent hyperkinetic disease.

Devid and Nieman (1999) study on physical fitness and vegetarian diets found that the available evidence supports neither a beneficial nor a detrimental effect of a vegetation diet on

physical performance capacity, especially when carbohydrate intake is controlled for. Concerns have been raised that an emphasis on plant food to enhance carbohydrate intake and optimize body glycogen stores may lead to increase in dietary fiber and phytic acid intake to concentrations that reduce the bio availability of several nutrition, including zinc, iron, and some other trace minerals. There is no convincing evidence, however, that vegetarian athletes suffer impaired nutrient status from the inactivate effect of their heavy exertion and plant-food based dietary practices to the extent that performance and health or both are impaired.

Allson *et al.* (1993) reported that according to the numerous documents, regular and proper exercising strengthens people's figures and body functions and improves people's quality of working efficiency and recreation at the same time.

Chauhan (1999) revealed that for maintaining weight and to be physically fit, proper exercise, proper nutrition and proper nutrition knowledge play an important role in one's life. Fitness is being able to handle the daily stress of life and is a symbol of good physical or mental health. Physical fitness is only achieved by correct nutrition, regular exercise and proper nutrition knowledge.

Borah and Kalita (2011) conducted a study on identifying drudgery prone home activities in rural areas of upper Brahmaputra valley zone of Assam. It was observed that majority of the respondents performed the precooking like bringing firewood and cutting vegetables daily. Cleaning of cereals and grinding and pounding were weekly, monthly and seasonally performed activities. Activities like cooking, serving food, sweeping, fetching water, washing of vessels, child care and personal care activities were performed daily by all the land holding categories. Weekly performed activities were dusting and mopping. Occasional and leisure time activities such as marketing, care of sick/elder person, pounding of rice for food preparation and weaving were performed monthly or seasonally (as revealed by 85.67, 58.82, 42.67 and 82.47 percent respondents respectively) depending on their requirement.

Priyanka and Rita Singh (2014) observed that out of total population of 629, maximum subjects *i.e.* around 44.67 per cent were observed as vegetarian, followed by 34.82 per cent were non vegetarians and, only 20.51 per cent were eggetarian.

Bhatnagar and Mahajani (2014) revealed that maximum respondents were vegetarian (69.44%) in each income class. Remaining was non-vegetarian and egtarian 26.11 per cent

and 4.45 per cent respectively. Data on frequency of doing exercise revealed that more than half of respondents (53.34 %) were not doing any physical exercise, 55.95 per cent and 41.67 per cent respondents were doing exercise daily and weekly, respectively irrespective of SES category. As far as type of exercise is concerned, 38.09 per cent and 36.90 per cent respondents were participating in yoga and sports activities, respectively. Remaining 15.47 per cent and 9.54 per cent respondents were doing physical exercise. Majority of respondents (79.76%) were doing exercise for less than 30 minutes followed by 30-60 minutes 19.05 per cent and more than 60 minutes by 1.19 per cent.

### **2.3 Physical and physiological parameters rural and urban respondents.**

Jyotsna *et al.* (2005) conducted a study on ergonomic evaluation of the rural women while performing wheat harvesting activity. The results revealed that mean age of the respondents was 32 years and mean height was 158.6 cm with mean weight of 48 kg.

Hasalkar *et al.* (2010) conducted a study on physiological indices and physical performance capacity of farm women. The results revealed that mean age of the respondents was 35 years and the mean height was 152.2cm with mean weight of 48.70 kg. The blood pressure of the respondents found to be normal *i.e.* 102.73/69.47mm/Hg. the mean skin fold measurements at biceps region was observed to be 4.56 mm at triceps region 9.04 mm, at subscapular region 11.27mm and at supriliac region 19.66 mm.

Prethi *et al.* (2010) conducted a study on blood pressure, fitness, and lipid profiles of rural women in the wellness for women project. The results revealed that the blood pressure of the women were found to be normal *i.e.* 101.92/88.17mm/Hg.

Umrikar *et al.* (2010) conducted a study on health status of farm women. The results revealed that mean age of the respondents was 34 years and the height was 150 cm with the average weight of 44.24 kgs.

Mrunalini (2013) conducted a field study on compatibility between physical fitness and work load among farm women. The results revealed that women were found to be normal, as per body temperature that is 97.53°.

Borah *et al.* (2014) observed that the mean age of the respondents was 42 years, mean height was 150.30 cms and the mean body weight was 47.70 kg. Women were found to be normal, as per body temperature that is 97.05°.

Priyanka and Rita Singh (2014) conducted a study on body composition in relation to economic status among adult females. This investigation consists of assessing nutritional status and body composition of 629 young women in the age range of 18-28 years. The mean skin fold measurements at biceps region was observed to be 4.33 mm at triceps region 7.63 mm, at subscapular region 13.5 mm and at suprailiac region 17.53 mm.

Uttara and Anita (2016) conducted a study on anthropometric parameters and effect of bael (*Aegle marmelos* L.) found that mineral content of type 2 diabetics the selected subjects were divided into four groups viz., group I, II, III and IV having thirty subjects each. The Initial mean triceps skin fold thickness values recorded were  $11.9 \pm 0.13$ ,  $12.3 \pm 0.12$ ,  $12.4 \pm 0.15$  and  $12.5 \pm 0.16$  mm of the subjects in group I, II, III and IV, respectively.

#### **2.4 Health status of rural and urban women.**

Passmore and Eastwood (1979) revealed that women have larger body fat mass and lower lean body mass in comparison to men at entry to adulthood. Changes in body composition occur over time. Average body fat increases with age. Average body fat for young man is considered to be about 15 per cent and 18-23 per cent for young women. As age increases, the amount of muscle tends to drop, and fat accounts for a greater percentage.

Jyotsna *et al.* (2005) conducted a study on ergonomic evaluation of the rural women while performing wheat harvesting activity. The results observed that fat percentage of women was found to be (43.9%) and Lean body mass found to be 25.3kg.

Ranjwan and Zend (2007) conducted a study on health status of women employed in unorganized and self-employed sector. The results revealed that on an average (71.81%) subjects belonged to mesomorph category, followed by 20.00 per cent belonged to Ectomorph category and 8.81 per cent belonged to Endomorph category of body type.

Murali and Kulkarni (2009) conducted a study on physical fitness of selected women. The results revealed that the majority of the women (61%) had a good physical fitness with  $VO_2$  Max in range from 31-40 ml/min while 33 per cent of the women were having very good physical fitness with  $VO_2$  Max ranging from 41 to 45 ml/min 3 per cent were having high average and excellent physical fitness.

Hasalkar *et al.* (2010) conducted a study on body composition and physical fitness of farm women. The results on body mass index data of the sample depicted that maximum

percentage of (43.33%) of the women were in the normal body mass index range followed by low weight normal range. none of them belonged to CED grade III- severe and obese grade II range. and further the data on body composition revealed that mean body density was 1.05, the mean per cent fat 21.13 per cent, fat weigh 12.35 kg. and the lean body mass was found to be 39.73 kg. observing the body type of the respondents revealed that equal percentage of the women were having ectomorph and endomorph body type that is (43.33%) followed by 13.34 per cent having mesomorph body type. The results pertaining to VO<sub>2</sub> Max revealed that the majority of 53.33 per cent women were in good fitness range followed by 30.00 per cent falling in the high average range and 16.00 per cent in very good range.

Umrikar *et al.* (2010) revealed that majority of the subjects (34.30%) fell in the category of CED grade-I which was mild energy deficiency group. 32.00 Per cent of subjects under normal category. Observing the results on body type of the respondents travelled that the majority of the women belonged to ectomorph group that is (54.5%) and women belonged to mesomorph body type are 39.65 per cent. Only 5.85 per cent of the women belonged to endomorph type. Further results pertaining to aerobic capacity of the women observed that the maximum women (58%) have high average category. And 25 per cent of the women have good category of aerobic capacity. There was no significant co-relation found between age of the subjects and body mass index. Body mass index was not significantly correlated with physical fitness index of the subjects.

Srivastava and Chakravarty (2010) findings revealed that identification of obesity according to body mass index indicated that 16.57 per cent and 33.43 per cent of the women were categorized as underweight and normal weight, respectively. Fourteen per cent of the women were classified as overweight, 30.29 per cent and 5.71 per cent of the women were identified as obese I and obese II categories, respectively.

Borah *et al.* (2014) found that the lean body mass of women was found to be 29.60 kg and fat percentage was found to 19.61 per cent respectively. Observing the data on body type of the respondents revealed that majority of them belonged to the ectomorph group (63.00 %) followed by mesomorph and endomorph 17.00 per cent and 20.00 percent respectively.

Mrunalini (2015) revealed that Only 15 per cent were found to be in normal BMI score and the rest were found to be under weight or energy deficient.

## 2.5 Physical fitness of rural and urban women

Jyotsna *et al.* (2005) the results revealed that the physical fitness index of the maximum number of respondents (60%) falls under the category of high average category.

Ranjwan and Zend (2007) conducted a study on health status of women employed in unorganized and self-employed sector. The results found that physical fitness of the majority of subjects was low average in all occupational groups.

Borah *et al.* (2009) conducted a study on physiological workload of fetching water. The results revealed from this study that in both the age groups which indicated that higher the heart rate higher was the respondents experience of exertion. It was observed that heart rate and energy expenditure is highly co-related with perceived exertion of the respondents.

The main thrust of the study of Umrikar *et al.* (2010) was to determine the physical fitness status of selected farm women. Results showed that maximum farm women were found in high average physical fitness score. Very few per cent of women were in very good physical fitness index score category. Though all the selected parameters of physical fitness, overall health status of women was found average.

Mrunalini (2013) indicated that the subjects were having poor physical fitness and showed vulnerability of the subjects to disease and impairment due to workloads. The transplantation activity warranted above 60% of time spent at and above target zones compared to physical fitness exercise leading to conclude that work load in transplantation is more than the endurance level of physical fitness.

Khambhati and Patel (2015) conducted a study on exercise based evolution of human fitness by heart rate recovery index. The results revealed that the average resting heart rate of the rural women was found to be 87.56 beats per minute. The average exercise heart rate was found to be 134.62beats/min, and during recovery the average heart rate was found to be 94.48 beats per minute.

## 2.6 Relationship between physical fitness level and physical and physiological parameters of selected rural and urban women.

Farrell *et al.* (2002) revealed that with increasing body mass index, the proportion of fit women decreased linearly. For example, 90.5% of women with a body mass index between

18.5 and 21 kg/m<sup>2</sup> were classified as having moderate or high cardio respiratory fitness, compared with 20.5% of women with a body mass index 37.1 kg/m<sup>2</sup>.

Hasalkar *et al.* (2010) findings revealed that age and body weight showed highly significant correlation with the working heart rate during the exercise on the tread mill. It is evident from the study that the selected women were healthy having a good physical endurance capacity.

## *Material and Methods*

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### **3. MATERIAL AND METHODS**

The present investigation entitled “Physical fitness of rural and urban women” was carried out in the Department of Family Resource Management, College of Rural Home Science, University of Agricultural Sciences, Dharwad during the year of 2016-17. The materials and methods adopted for the present investigation are given under the following headings.

#### 3.1 Research design

##### 3.1.1 Type of research

##### 3.1.2 Variables under the study

##### 3.1.3 Definitions

#### 3.2 Data collection

##### 3.2.1 Locale of the study

##### 3.2.2 Selection of sample for the study

##### 3.2.3 Research tools

##### 3.2.4 Method of data collection

#### 3.3 Data analysis

##### 3.3.1 Coding

##### 3.3.2 Categorization and quantification of variables

##### 3.3.3 Statistical analysis

### **3.1 Research Design**

#### **3.1.1 Type of Research**

The research design adopted for the present investigation is both exploratory and experimental research design.

**Exploratory Research:** It is the research design for exploring, recording, analyzing and interpreting situations that exist in a selected environment. An exploratory study aims at gaining familiarity with phenomenon in order to understand it or achieve new insight into it.

**Experimental Research:** Experimental research describes what would be the outcome when certain variables are carefully controlled or manipulated. The focus is on variable relationship. Experimental research is designed to test the influence of independent variables on dependent variables.

The exploratory and experimental designs were considered as appropriate research designs because it provides information about the existing situations. It calls attention to the problems which needs solution.

The present research was aimed to explore the existing condition on socio economic status and physical parameters of the selected sample and interpret the existing situations of the population. The physical parameters like height, weight, skin fold measurements, blood pressure, grip strength and body temperature were measured by using anthropometric rod, weighing balance and skin fold callipers, digital blood pressure apparatus, and clinical thermometer respectively.

Based on the physical parameters the physiological parameters like the body mass index, aerobic capacity, body fat and body type are estimated to assess the physical fitness of the rural women and urban women.

The experiment was carried out by using step test ergometer to determine present physical fitness level of the rural and urban women with the help of heart rate monitor.

### **3.1.2 Variables under study**

Considering the objectives in view, the following dependent and independent variables have been selected for the present study. The independent variables assumed to be related with the dependent variables were identified.

#### **3.1.2.1 Independent variables**

##### **3.1.2.1.1 Socio Economic Status**

Socio economic status depicts the overall status of the family and their living condition. Agarwal scale (2005) was adopted to analyze the socio economic status of the respondents.

##### **3.1.2.1.2 Age**

It refers to the number of years completed after birth

##### **3.1.2.1.3 Height**

Human height or stature is the distance from the heel to crown of human body while standing erect measured in centimeters (cm)

#### **3.1.2.1.4 Weight**

The term human body weight is used colloquially refer to a person's mass or weight measured in kilograms (kg)

#### **3.1.2.1.5 Blood pressure**

Blood pressure is the pressure of circulating blood on the walls of blood vessels. Blood pressure usually expressed in terms of the systolic pressure (contraction of heart) over diastolic pressure (dilation of the heart) and it is measured in (mmHg)

#### **3.1.2.1.6 Skin fold measurement**

Skin fold measurement is used to determine the thickness of a fold of skin and underlying subcutaneous fat by using skin fold calipers. It the most commonly used technique that determines subcutaneous fat in the body was done at the triceps, biceps, sub-scapular and supra-iliac skin folds. These measurements in millimeters (mm) were taken to derive body density, per cent body fat, fat weight and lean body mass.

#### **3.1.2.1.7 Grip strength**

Grip strength is the force applied by the hand to pull on or suspend from objects and is a specific part of hand strength and it refers to the muscular power and force that they can generate within their hands measured in kilograms (kg)

#### **3.1.2.1.8 Life style factors**

Fitness is a product of physical exercise, proper nutrition, adequate rest, relaxation, health appraisal and good health habits. These are all facets of implication because these bridge the gap between health and fitness.

### **3.1.2.2 Dependent Variables**

#### **3.1.2.2.1 Body Mass Index (BMI)**

Body mass index is an attempt to quantify the amount of tissue mass (muscle, fat and bone) in an individual and categorize that person as underweight, normal weight, overweight and obese based on the value.

#### **3.1.2.2.2 Body composition**

Body composition includes body density, fat content of the body and lean body mass. These were determined from compiling the data on skin fold thickness measured at four sites, *i.e.* bicep, tricep, subscapular and Suprailiac with the help of skin fold calipers.

### **3.1.2.2.3 Body type**

It is a method of classifying the human physique. It differs from one person to another

### **3.1.2.2.4 Aerobic capacity (VO<sub>2</sub> max)**

It is considered to be the best measure of an individual's cardio-respiratory fitness or capability for doing physical work. It can serve as a reliable yardstick to judge whether an individual will be able to accomplish a given task without any signs of fatigue or discomfort.

### **3.1.2.2.5 Physical fitness index**

It is the time spent between the beginning of physical activity by an individual and termination because of exhaustion

### **3.1.2.2.6 Perceived exertion**

Perceived exertion is a way of measuring intensity level physical activity. Perceived exertion is how hard you feel like your body is working. It is based on physical sensations a person experiences during physical activity, including increased sweating, and muscular fatigue. Although this is a subjective measure, a person's exertion rating may provide a fairly good estimation of the actual heart rate during physical activity (Borg, 1998).

## **3.1.3 Definitions**

### **Body mass index**

BMI is a single number which expresses a relationship between height, body surface area, and body weight. It determines the general health status of the respondents

### **Body composition and lean body mass**

The physical characteristics of the body are incompletely described by consideration of its external dimensions alone, the body may be considered in terms of a fat free mass of metabolically active tissue (principally bone and muscles) upon which fat is deposited. Fat is the constituent which shows the greater variability from one person to another. It is stored not only in adipose tissues, but also integral parts of the cells, and a completely fat free body is incompatible with life.

### **Aerobic capacity (VO<sub>2</sub> Max)**

VO<sub>2</sub> Max is the amount of oxygen that can be extracted maximally from the atmosphere by an individual for utilization by active muscles while exerting the highest

degree of physical effort. It can serve as a reliable yardstick to judge whether an individual will be able to accomplish a given task without any signs of fatigue or discomfort.

### **Five point scale of perceived exertion**

A five point scale of perceived exertion, sequentially numbered 1 to 5, was created to simplify the complicated and time-consuming procedures using conventional methods of measuring energy expenditure, or even heart rate responses, during work of very short duration, especially in held situations. The scale denotes physiological workload: 1: very light; 2: light; 3: moderately heavy; 4: heavy; and 5: very heavy.

### **Heart rate**

The speed at which heart beats is called heart rate and it is the number of heart beats per unit of time (per minute). It is the number of contractions of the ventricles, the heart rate may be too fast (tachy cardia) or too low (brady cardia). The average heart rate is 75 beats per minute

## **3.2 Data Collection**

### **3.2.1 Locale of the Study**

The survey and experiment were conducted of four selected villages of Dharwad Taluka namely Yattinagudda, Narendra, Amminabavi, Hebbali for rural samples and in Dharwad city for urban samples, as presented in Fig. 1.

### **3.2.2 Selection of sample for the study**

Keeping in view the objectives of the study, purposive random sampling technique was adopted for the study.

#### **Stage-1**

A total sample of 120 women from the age group of 25-45 years who were normal, non pregnant, non lactating and without any major illness or cardio-respiratory complaints were selected for the study. Care was taken to select equal number from sample from working and non working category in both rural and urban areas making size 60 each from rural and urban areas.

#### **Stage-2**

A sub sample of 60 co-operative and willing women from the total sample of 120 were selected to assess the physical fitness by performing exercise on step test ergometer. Care was taken to select 30 women from each category of the total sample of rural and urban areas.



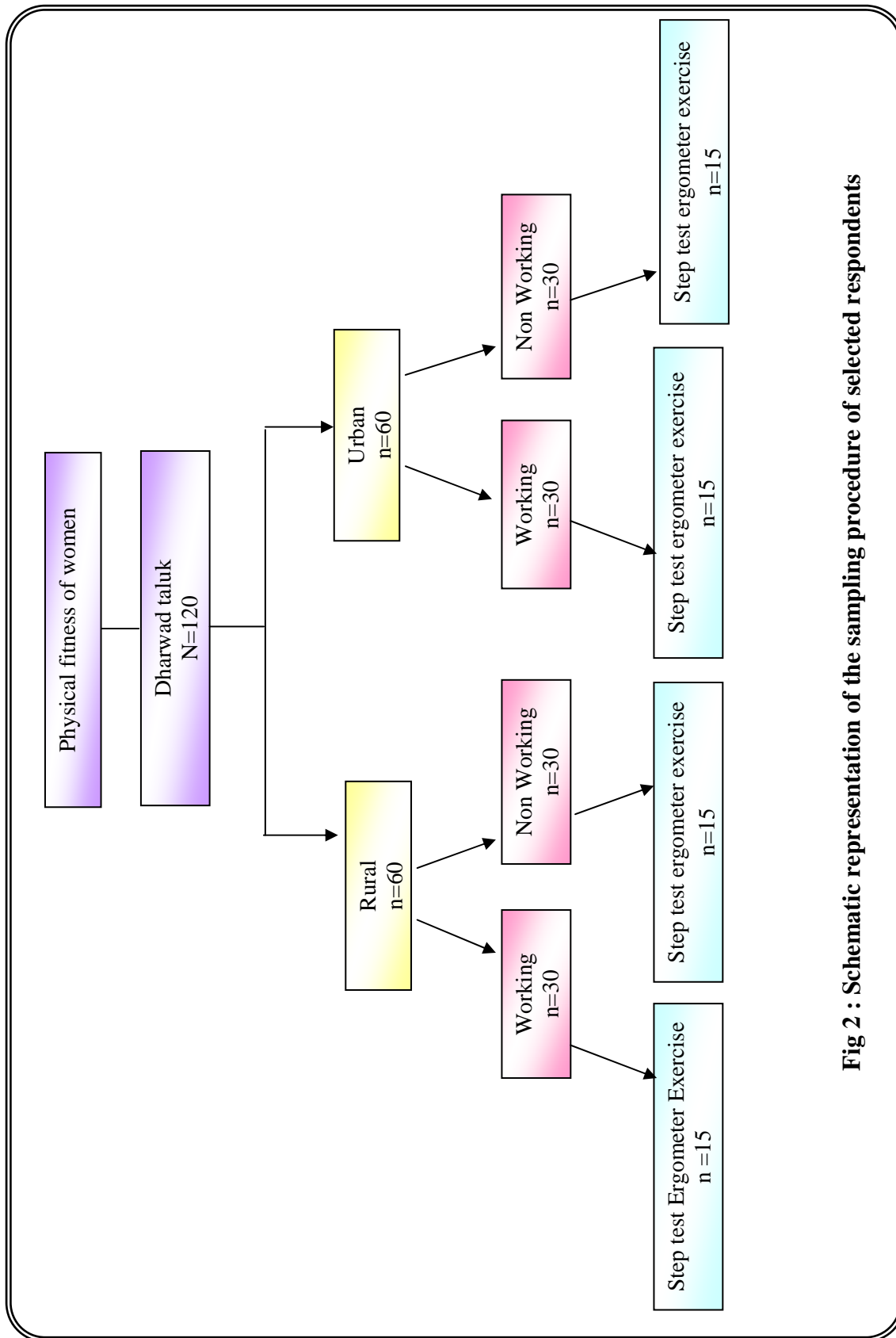


Fig 2 : Schematic representation of the sampling procedure of selected respondents

### 3.2.3 Research tools

The structured tools were used to collect the required information from the selected sample. The tools were formulated by reviewing the relevant literature. The interview schedule was formulated to elicit the information from the selected samples. Agarwal scale (2005) was used for assessment of socio economic status of the selected sample.

#### 3.2.2.1 Pilot study

The objective of the pilot study was to examine the feasibility and validity of the methods, techniques and tools to be used during the detailed study to elicit the necessary information pertinent to the topic. Accordingly 10 respondents from the village were selected for the pilot study. These respondents were not included in the main study. In light of the experience gained, during the pilot study, the interview schedule was suitably modified and the final form of the interview schedule was utilized (Appendix – I).

The interview schedule was developed to elicit the detailed information from different categories as mentioned bellow.

Research Tools	Content	Sections	Purpose
Interview schedule	General information	Part-I	Socio economic status of the family
	Specific information	Part-II	Life style factors and daily activity schedule of the respondents
		Part-III	Physical, physiological parameters and number of pregnancies, of the respondents
		Part-IV	Step test exercise

#### Tools used for recording measurement and observations

Sl. No.	Experimental tools	Purpose
1	Anthropometry rod	To record standing height of the respondents in cms
2	Weighing balance	To record the body weight of the respondents in kg
3	Digital skin fold calipers	To measure of skin fold thickness of the respondents in mm
4	Grip dynamometer	To measure grip strength of both hands of the respondents in kg
5	Digital clinical thermometer	To measure body temperature of the respondents in °c
6	Omron automatic blood pressure monitor	To measure the blood pressure of the respondents SBP, DBP in mmHg
7	Polar heart rate monitor	To measure heart rate of the respondents in beets/ min
8	Step test ergometer	To perform the stepping exercise



**Plate 1 : Anthropometric Rods**



**Plate 2 : Weighing Balance**



**Plate 3 : Automatic Blood Pressure Monitor**



**Plate 4 : Grip Dynamometer**



**Plate 5 : Digital Skinfold Caliper**



**Plate 6 : Digital Clinical Thermometer**



**Plate 7 : Polar Heart Rate Monitor**



**Plate 8 : Polar Heart Rate Monitor**

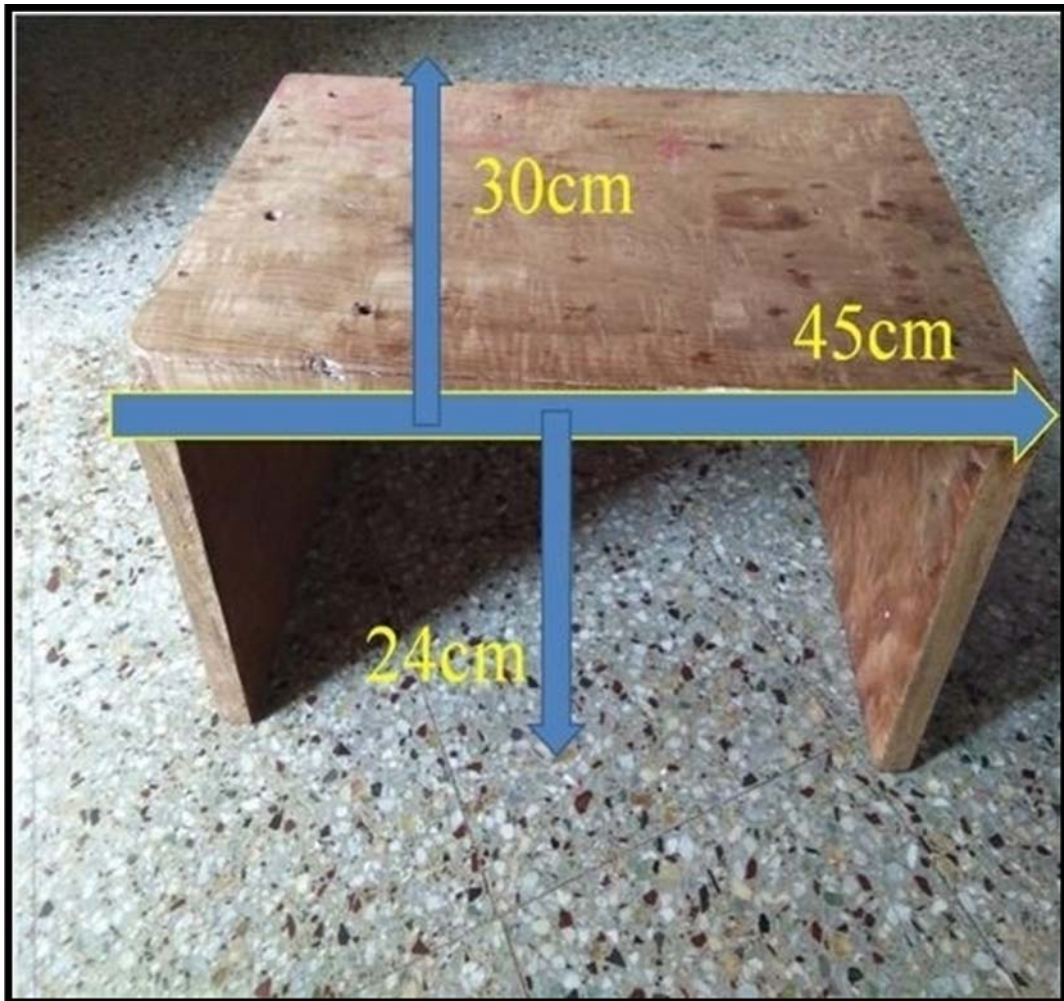


Plate 9 : Step test ergometer

The different tools and instruments used for collecting the data on various parameters for research are explained below.

### **3.2.2.2 Description of the equipment**

#### **1. Anthropometric rod**

Anthropometric rod is used to measure the height of person. It consists of four detachable segments. These segments are joined together to make rigid rod of 200 cm. There is a fixed sleeve on the top of the rod with an adjustable graduated cross bar and a movable sleeve with an adjustable graduated cross bars, which registers the height measurements in centimeters

#### **2. Digital weighing balance**

Weighing balance is a measuring instrument for determining the weight or mass of an object. Here the weight of the respondent is recorded in kilograms.

#### **3. Digital skin fold calipers**

It is used to measure of skin fold thickness of the respondents. It is the most commonly used technique that determines subcutaneous fat in the body. It was taken at the triceps, biceps, subscapular and supriliac skin folds regions. The measurements were taken in two replications at both right and left side of body and the results were averaged. At all sites, a lengthwise skin fold was firmly grasped and slightly lifted up between fingers and thumb of the left hand. Care was taken not to include underlying muscles. The calipers were applied about 1 cm below the operator's fingers at a depth about equal to the skin fold.

#### **4. Grip dynamometer**

It is an instrument for measuring the maximum isometric force with which an individual can squeeze two handles together between palms and fingers. It is also known as hand grip dynamometer which measures the force in kilograms.

#### **5. Digital clinical thermometer**

Clinical thermometer is used for measuring human body temperature. The tip of the thermometer is inserted into the mouth under the tongue (oral or sublingual temperature, under the armpit (axillary temperature), or into rectum (rectal temperature). In present experimentation axillary temperature was recorded in centigrade.

## **6. Omron automatic blood pressure monitor**

It is a compact, fully automatic blood pressure monitor operating on the oscillometric principle. It measures systolic and diastolic blood pressure (above 135/85 mmHg) and pulse rate simply and quickly. For comfortable inflation without the need of pressure pre sitting or re-inflation. The device uses its advanced “IntelliSense” technology.

## **7. Polar heart rate monitor**

Heart rate monitor is another instrument to measure the heart rate stresses during activity. It is very light instrument, which can be taken to any place for measuring the heart rate. It has got transmitter with the inbuilt electrodes and the receiver. The transmitter having in built electrodes is mounted over the respondent’s chest. The transmitter after receiving the heart beat signals transmits the same to a receiver mounted over the subject’s wrist. The receiver has an in built data lodging system, which stores the data which can be uploaded to computer for further analysis.

## **Step test ergometer**

It is a wooden stool having length 45 cms, Breadth 30 cms, and Height 24 cms. It is used to perform the stepping exercise at the rate of 30 steps per minute.

### **3.2.4 Method of Data Collection**

The researcher visited the selected villages during the leisure hours and recorded the detailed information of the selected rural and urban respondents by using the developed interview schedule. The general information pertaining to socio economic status of the family was recorded.

The details of respondents such as daily activity schedule, number of pregnancies and life style factors which influencing the physical fitness are recorded from rural and urban respondents. Then the details of physical and physiological parameters of rural and urban women were recorded.

The physical fitness test was conducted by using step test ergometer of length 45 cms, Breadth 30 cms, and Height 24 cms by the selected sub sample. five minutes rest was given to the respondents and Stepping was done for a total duration of 5 minutes at the rate of 30 steps up per minute, which was set by a metronome. After completion of exercise, the heart rate was measured from the fifth minute after exercise to the tenth minute of recovery period.



**Plate 10 : Performing step test**



**Plate 11 : Taking skinfold measurements**



**Plate 12 : Performing step test**



**Plate 13 : Taking blood pressure measurements**

### 3.3 Data analysis

#### 3.3.1 Coding

A coding plan was developed and code numbers were given to the collected data. These were subjected to computer analysis by using both MS Excel and SPSS 16 software.

#### 3.3.2 Categorization and quantification of variables

The data on selected independent and dependent variables were analyzed and categorized as follows:

##### 3.3.2.1 Socio economic status

Socio economic status depicts the overall status of the family and their living condition. O.P Agarwal scale is adopted to analyze the socio economic status of the respondents and classified in to following categories.

Social economic status	Score
Upper high	>76
High	61-75
Upper middle	46-60
Lower middle	31-45
Poor	16-30
Very poor or below poverty line	<15

##### 3.2.2.2 Socio personal characteristics of the respondents

Data on personal and socio characteristics of the selected women such as age, education, occupation and socio economic status were collected and categorized as follows. O.P Agarwal scale is adopted to analyze socio personal characteristics of the respondents

##### Age

The respondents were grouped into three age categories based on the mean and standard deviation of age of the total sample by using formula,  $X \pm 0.425*SD$ .

Category	Age (years)
Young	$\leq 34$
Middle	35 - 37
Old	$\geq 38$

### **Marital status**

The marital status of the respondents was recorded and classified into 6 categories according to Agarwal scale (2005).

- 1) Married
- 2) Un-married
- 3) Single
- 4) Widow
- 5) Divorce

### **Education**

The education of the respondents was recorded and classified into 7 categories according to Agarwal scale (2005).

- 1) Illiterate
- 2) Primary school
- 3) High school
- 4) P.U.C
- 5) Graduation
- 6) Post graduation

### **Occupation**

The occupation of the respondents family was recorded and classified in to 5 categories according to Agarwal scale (2005).

- 1) Laborer, house wife
- 2) Self employed
- 3) Service at shops, home, transport, agriculture.
- 4) Service in Private sector
- 5) Service in central/State/Public

#### **3.2.2.6 Income**

Monthly income of the respondents family was recorded and classified into 7 categories as follows according to Agarwal scale (2005).

- 1) Less than 1000
- 2) 1000-2499
- 3) 2500-4999
- 4) 5000-9999
- 5) 10000-19999
- 6) 20000-49999
- 7) Greater than 50000

### 3.2.2.3 Health status of selected women

#### a. Body Mass Index

The body mass index (BMI) of the subjects was calculated by using the data on anthropometric measurements *viz.*, stature and body weight. By using the following formula

$$\text{BMI (kg/m}^2\text{)} = \frac{\text{Weight (kg)}}{\text{Height (m}^2\text{)}}$$

The samples were classified based on the body mass index as per the classification given by Garrow *et al* (1981) as follows

Body mass index	Presumptive diagnosis
<16	CED Grade III severe
16.0 - 17.0	CED Grade II mild
17.1 - 18.5	CED Grade I mild
18.5 - 20.0	Low weight normal
20.0 - 25.0	Normal
25.0 - 30	Obese Grade-I
>30	Obese Grade-II

#### b. Body composition

Durnin and Rahman (1967) has derived regression equation for the production of body density from the logarithm of the sum of four skin fold thickness measurements at biceps, triceps, sub scapular and supra- iliac sites. The following formulae were used to calculate body density, per cent fat, fat weight and lean body mass of the selected subjects.

$$\text{Body density (D)} = 1.1599 - (0.0717 \times \log \text{ of sum of 4 skin folds})$$

$$\text{Per cent fat} = (4.95 / D - 4.5) \times 100$$

$$\text{Fat weight} = \text{Body weight} \times \text{Per cent fat} / 100$$

$$\text{Lean body mass (kg)} = \text{Body weight} - \text{Fat weight}$$

#### c. Body Somatotype

By using the data on anthropometric measurements *viz.*, stature and body weight, the ponderal index data was calculated as the ratio of cube root of weight in kilograms to height in meters multiplied by thousand.

$$\text{PI} = 1000 \times \frac{\sqrt[3]{\text{weight (kg)}}}{\text{height (cms)}}$$

Body somatotype of selected respondents was classified based on their ponderal index score (PI).

Scores (PI)	Body type
<20	Ectomorph
20-25	Mesomorph
>25	Endomorph

#### d. Aerobic capacity (VO<sub>2</sub>max)

The consumption of maximum volume of oxygen (VO<sub>2</sub> max) was estimated based on the body weight and age of the subjects by using the following formula:

$$\text{VO}_2 \text{ max (l/min)} = 0.023 \times \text{Body weight (kg)} - 0.034 \times \text{Age (yrs)} + 1.652$$

$$\text{VO}_2 \text{ max (ml/kg.min)} = \text{VO}_2 \text{ max (l/min)} / \text{Body weight} \times 1000$$

The subjects are classified into various physical fitness categories according to the classification given by Saha *et al* (1996).

VO <sub>2</sub> - ml/kg ×min	Category
Poor	Up to 15.0
Low average	16.0- 25.0
High average	26.0- 30.0
Good	31.0- 40.0
Very good	41.0- 45.0
Excellent	Beyond 150

#### e. Determination of physical fitness index by using step test ergometer test

This is a simple method of measuring the ability of one's circulatory capacity to recover from the exercise of an endurance nature. The heart rate monitor was fitted to the selected respondents and five minutes relaxation time was given to adjust to the heart monitor. Then the monitor was switched on to record the heart rate data. Then the subjects were made to sit in a relaxed position for five minutes to get the resting heart rate data. From sixth minute onwards they were asked to perform the step test exercise on the step stool.

The subjects were asked to stand up and face the step stool. Particular attention should be paid here to indicate the method and rhythm used in stepping. Subjects should breathe fully throughout and straighten the knees completely on top of the bench. With help of Metronome the cadence can be kept to thirty steps per minute.

Continue this until they get exhausted or up to five minutes, at the rate of 30 steps per minute. Immediately after termination of the exercise the subjects were given rest in sitting

position for five minutes for recovery. The heart rate was recorded continuously for the rest, exercise and recovery periods. Then the physical fitness index score was determined by using the following formula. Later the subjects were classified as per the classification score given by Varghese *et al.* (1994).

$$\text{Physical Fitness Index} = \frac{\text{Duration of stepping (sec.)}}{\text{Sum of I, II \& III min recovery heart rate}} \times 100$$

Physical Fitness Index	
Category	Scores
Poor	Up to 80
Low average	81-100
High average	101-115
Good	116-135
Very good	136-150
excellent	Beyind150

#### f. Rate of Perceived exertion

The exertion perceived by the women after performing the step test ergometer exercise was recorded by using the five point scale given by (Varghese et al., 1994)

From Very light –1, Light-2, moderate-3, heavy-4, to Very heavy-5

### 3.3.3 Statistical Analysis

The data collected was tabulated by keeping in view the objectives of the study. The data was analyzed employing suitable descriptive as well as relational statistics as follows

#### 3.3.3.1 Frequency and percentage

The frequency and percentage were calculated for making simple comparison and tabular analysis was carried out to interpret the respondents and detailed information on socio-economic status, type of food consumed, number of pregnancies, details of exercise performed, time expenditure pattern, body type.

#### 3.3.3.2 Mean and standard deviation

Mean and standard deviation were used to categorize the variables selected for the study *viz.*, age, height, weight, blood pressure, pulse rate, grip strength, body temperature, skin fold measurements, percent fat, fat weight, lean body mass, body density, and time expenditure pattern for daily activities.

### 3.3.3.3 Correlation

Correlation is measure of extent or degree of mutual dependence between two variables. In the study Correlation was used to analyze Physical fitness index scores and life style factors, Relationship between physical and physiological parameters and physical fitness index scores, Correlation matrix between physical and physiological characteristics

$$r = \frac{n \sum xy - \sum x \sum y}{\sqrt{\{n \sum x^2 - (\sum x)^2\} \{n \sum y^2 - (\sum y)^2\}}}$$

Where,

r = simple correlation coefficient

x = Independent variable

y = Dependent variable

$\sum x$  = Sum of 'x' values

$\sum y$  = Sum of 'y' values

$\sum x^2$  = Sum of squares of 'x' values

$\sum y^2$  = Sum of squares of 'y' values

$\sum xy$  = Sum of product of 'xy' values

n = Number of pairs of observations

### 3.3.3.4. Student t- test

Was used to know the difference between rural and urban entrepreneurs and the income generation with the help of following formula.

$$t' = \frac{|X1 - X2|}{\sqrt{Sp^2 (1/n1 + 1/n2)}}$$

Where,

$$Sp^2 = \frac{\{(n1-1) S1^2 + (n2 - 1) S2^2\}}{(n1 + n2 - 2)}$$

Where,

X1 = Mean of the first group

X2 = Mean of the second group

n1 = No. of observations in the first group

n2 = No. of observations in the second group

S1<sup>2</sup> = Variance of first group

S2<sup>2</sup> = Variance of second group

Sp<sup>2</sup> = Pooled variance of two groups

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## *Experimental Results*

## 4. EXPERIMENTAL RESULTS

In consistence with the objectives of the study the necessary data collected from the selected respondents were analyzed and interpreted. The results obtained are presented in this chapter under the following headings.

- 4.1 Demographic profile and socio-economic status of the selected rural and urban women
- 4.2 Life style factors of the rural and urban women
- 4.3 Physical and physiological parameters of selected rural and urban respondents
- 4.4 Health status of rural and urban women
- 4.5 Physical fitness of rural and urban women
- 4.6 Relationship between physical fitness with other parameters of selected rural and urban women

### 4.1.1 Demographic profile of selected rural and urban respondents

The data on Demographic profile of selected rural and urban respondents is presented in table 1.

#### 4.1.1.1 Age

The data on age of the rural women depicted that majority of them belonged to the group of 38 years and above 43.33 per cent and equal percentage (28.33 %) belonged to the age group of 35-37 years and less than 34 years age group. Age of the rural working and non working respondents revealed that a maximum of 46.67 per cent and 40 per cent respectively belonged to the age group of more than 38 years. In rural working group respondents about 30 per cent belonged to the age group of 35-37 years followed by 23.33 per cent belonged to less than 34 years age group. Where as among non working rural women 33.33 per cent were in less than 34 years age group and 26.67 per cent in 35-37 age group.

Where as among urban women majority of them (48.33%) belonged to the age group of 38 years and above, followed by 35 per cent belonged to the age group of 35-37 years and 16.67 per cent belonged to less than 34 years age group. In urban working and non working women 46.67 per cent and 50 per cent belonged to the age group of 38 years and above respectively followed by 36.67per cent and 33.33per cent belonged to the age group of 35-37 years. Only 16.67 per cent in both groups belonged to the age group of less than 34 years.

Table 1: Demographic profile of the selected rural and urban respondents

N=120

Particulars	Rural Women			Urban Women		
	Working n=30	Non Working n=30	Total n=60	Working n=30	Non Working n=30	Total n=60
<b>Age</b>						
≤34	7 (23.33)	10 (33.33)	17 (28.33)	5 (16.67)	5 (16.67)	10 (16.67)
35-37	9 (30.00)	8 (26.67)	17 (28.33)	11 (36.67)	10 (33.33)	12 (35.00)
≥ 38	14 (46.67)	12 (40.00)	26 (43.33)	14 (46.67)	15 (50.00)	29 (48.33)
<b>Marital status</b>						
Married	24 (80.00)	25 (83.33)	49 (81.67)	19 (63.33)	20 (66.67)	39 (65.00)
Un married	2 (6.67)	2 (6.67)	4 (6.67)	4 (13.33)	4 (13.33)	8 (13.33)
Single	3 (10.00)	2 (6.67)	5 (8.33)	3 (10.00)	4 (13.33)	7 (11.67)
Widow	1 (3.33)	1 (3.33)	2 (3.33)	2 (6.67)	2 (6.67)	4 (6.67)
Divorce	0 (0.00)	0 (0.00)	0 (0.00)	2 (6.67)	0 (0.00)	2 (3.33)
<b>Education</b>						
Illiterate	1 (3.33)	2 (6.67)	3 (5.00)	1 (3.33)	0 (0.00)	1 (1.67)
Primary school	2 (6.67)	4 (13.33)	6 (10.00)	2 (6.67)	3 (10.00)	5 (8.33)
High school	6 (20.00)	8 (26.67)	14 (23.33)	3 (10.00)	6 (20.00)	9 (15.00)
P.U.C	8 (26.67)	10 (33.33)	18 (30.00)	10 (33.33)	7 (23.33)	17 (28.33)
Graduation	10 (33.33)	6 (20.00)	16 (26.67)	12 (40.00)	10 (33.33)	22 (36.67)
Post graduation	3 (10.00)	0 (0.00)	3 (5.00)	2 (6.67)	4 (13.33)	6 (10.00)
<b>Occupation</b>						
Income less than 5000 (labourer, house wife)	7 (23.33)	30 (100)	37 (61.67)	1 (3.33)	30 (100)	31 (51.67)
Self employed	2 (6.67)	-	2 (3.33)	2 (6.67)	-	2 (3.33)
Service at shops, home, transport, agriculture	15 (50.00)	-	15 (25.00)	7 (23.33)	-	7 (11.67)
Service in Private sector	2 (6.67)	-	2 (3.33)	10 (33.33)	-	10 (16.67)
Service in central/State/Public	4 (13.33)	-	4 (6.67)	10 (33.33)	-	10 (16.67)
<b>Income ( Rs - per month )</b>						
Less than 1000	0 (0.00)	-	0 (0.00)	0 (0.00)	-	0 (0.00)
1000-2499	2 (6.67)	-	2 (3.33)	4 (13.33)	-	4 (6.67)
2500-4999	10 (33.33)	-	10 (16.67)	4 (13.33)	-	4 (6.67)
5000-9999	10 (33.33)	-	10 (16.67)	7 (23.33)	-	7 (11.67)
10000-19999	4 (13.33)	-	4 (6.67)	5 (16.67)	-	5 (8.33)
20000-49999	4 (13.33)	-	4 (6.67)	10 (33.33)	-	10 (16.67)
More than 50000	0 (0.00)	-	0 (0.00)	0 (0.00)	-	0 (0.00)

Note: Figures in parenthesis indicate percentages

#### **4.1.1.2 Marital status**

Among total rural women more than 80 per cent of the respondents were married in both working and non working category followed by 8.33 per cent single, 6.67 per cent unmarried, and 3.33 per cent widows. In working and non working category of rural women more than 80 per cent of the respondents were married, followed by 10 per cent and 6.67 per cent single, 6.67 per cent unmarried in both categories respectively.

Whereas in total urban sample more than 60 per cent of the respondents were married in both working and non working categories, followed by 13.33 per cent each were unmarried. More than 10 per cent were single, and 6.67 per cent were widows and only 3.33 per cent divorced in both categories.

#### **4.1.1.3 Education.**

Data on education of selected respondents in rural areas showed that 30.00 per cent were educated up to P.U.C while 26.67 per cent were graduates followed by 23.33 per cent were educated up to high school and 10.00 per cent were educated up to primary school. Only 5.00 per cent were illiterates and post graduates. Among rural working category 33.33 per cent were graduates, followed by 26.67 per cent were educated up to P.U.C, 20.00 per cent were completed up to high school, 10.00 per cent were post graduation, 6.67 per cent were educated up to primary school and only 3.33 per cent were illiterates. Among rural non working category 33.33 per cent were P.U.C completed, 26.67 per cent were high school followed by 20.00 per cent were graduation, 13.33 per cent were primary school, only 6.67 per cent were Illiterates and none of them were post graduates.

Further, the data on education of selected urban respondents showed that 36.67 per cent were graduates followed by 28.33 per cent studied up to P.U.C, 15.00 per cent had completed high school education, 10.00 per cent were post graduates, and 8.33 per cent studied up to primary school. Only 1.67 per cent were illiterates. Among urban working women 40.00 per cent were graduates, followed by 33.33 per cent were studied up to P.U.C, 10.33 per cent had secondary schooling, and 6.66 per cent post graduates. Only 3.33 per cent were illiterates. Among urban non working group 33.33 per cent were graduates, followed by 23.22 per cent studied up to P.U.C, 20.00 per cent up to high school education, 10.00 per cent completed primary school and none of them were Illiterates.

#### 4.1.1.4 Occupation

Majority of the rural respondents (61.67 %) were house wives or labour. This was followed by 25.00 per cent serving at shops, home, transport, agriculture, 6.67 per cent serving in central or state or public sectors, and equal per cent (3.33 %) of them were self employed and serving in private sector. Half of the rural working respondents were serving at shops, home, transport, agriculture, followed by 23.33 per cent labours, 13.33 per cent serving in central or state or public sectors. An equal per cent of 6.66 were serving in private sector and self employed. All the respondents in rural non working category were house wives.

Majority of the urban respondents (51.67%) were house wives or labourers, followed by an equal per cent of 16.67 were serving in private sector and in central or state or public sectors. Almost 11.67 per cent were serving at shops, home, transport, agriculture. Only 3.33 per cent were self employed. An equal per cent of 33.33 per cent urban working women were serving in private sector and in central or state or public sectors, followed by 23.23 per cent serving at shops, home, transport, agriculture, 6.67 per cent self employed and only 3.33 per cent were labourers. Among all the urban non working respondents were house wives.

#### 4.1.1.5 Income

Among rural respondents it can be observed an equal percent of rural women (16.67%) were having income level ranging from Rs 2500 to Rs 4999 per month and Rs 5000 to Rs 9999 followed by again an equal percent of 6.67 were having income level ranging from Rs 10000 to Rs 19999 and Rs 20000 to Rs 49999 only 3.33 per cent were having income level ranging from Rs. 1000 to Rs. 2499. Among rural working category equal per cent 33.33 were having monthly income level ranging between Rs. 5000 to Rs. 9999 and Rs 5000 to Rs. 9999 followed by again equal per cent of 13.33 per cent were having monthly income ranging from Rs 10000 to Rs. 19999 and Rs20000 to 49999 and only 6.67 per cent were having income ranging from Rs. 1000 to Rs.2499. Among rural non working category all the respondents were house wife's so they were having income less than Rs 5000 per month.

Among urban respondents it can be observed that majority of the women (16.67%) per cent were having monthly income level ranging between Rs. 20000 to Rs. 49999 per month, followed by 11.67 per cent were having monthly income level ranging between 5000 to Rs. 9999 per month, 8.33 per cent were having monthly income level ranging between Rs. 10000

to Rs. 19999 per month and an equal per cent of 6.67 were having monthly income level ranging between 1000 to Rs. 2499 and Rs. 5000 to Rs. 9999 per month. Among urban working category 33.33 per cent were having monthly income level ranging between Rs. 20000 to Rs. 49999 per month followed by 23.33 per cent were having monthly income level ranging between Rs. 5000 to Rs. 9999 per month, 16.67 per cent were having income ranging between Rs. 10000 to Rs. 19999 per month, and an equal percent of 13.33 67 per cent were having income ranging between Rs. 1000 to Rs. 2499 and Rs. 2500 to Rs. 4999 per month. Among urban non working category all the respondents were house wife's so they were having income less than Rs 5000 per month.

#### **4.1.2 Socio-economic status of selected rural and urban respondents**

Table 2 presents the socio-economic status of the selected rural and urban respondents.

In rural respondents equal percentage of (66.67%) respondents belonged to lower middle socio economic status followed by 30 per cent were belonged to upper middle socio-economic status. Very less respondents belong to poor (3.33 %) socio economic status. None of the respondents were in upper high, poor and very poor socio economic status. In rural working and non working category it can be observed that majority of the respondents (56.67% and 76.67%) belonged to lower middle socio economic status category respectively, followed by 40 per cent and 20 per cent belonged to upper middle socio economic status category. Only 3.33 per cent in both working and non working category belonged to poor socio economic status category.

Among urban respondents majority of the respondents (63.33%) belonged to upper middle socio economic status, followed by 25.00 per cent of the respondents belonged to lower middle class socio economic status. Only 6.66 per cent respondents belonged to high socio economic category and 5.00 per cent in poor category. None of the respondents were in upper high and very poor category of socio economic status. In urban working and non working category it can be observed more than 66 per cent of the respondents belonged to upper middle socio economic status, followed by 26.67 per cent and 23.33 per cent belonged to lower middle socio economic status, 6.66 per cent belonged to high socio economic status. Only 10 per cent and 5 per cent belonged to poor socio economic status as presented in table 2.

Table 2: Socio-economic status of selected rural and urban respondents

N=120

Classification of SES	Rural Women			Urban Women		
	Working n=30	Non Working n=30	Total n=60	Working n=30	Non Working n=30	Total n=60
High (61-75)	-	-	-	2 (6.67)	2 (6.67)	4 (6.67)
Upper middle (46-60)	12 (40.00)	6 (20.00)	18 (30.00)	20 (66.67)	18 (60.00)	38 (63.33)
Lower middle (31-45)	17 (56.67)	23 (76.67)	40 (66.67)	8 (26.67)	7 (23.33)	15 (25.00)
Poor (16-30)	1 (3.33)	1 (3.33)	2 (3.33)	-	3 (10.00)	3 (5.00)

Note: None of the respondents were in upper high class and very poor category of socio economic status  
 Figures in parenthesis indicate percentage

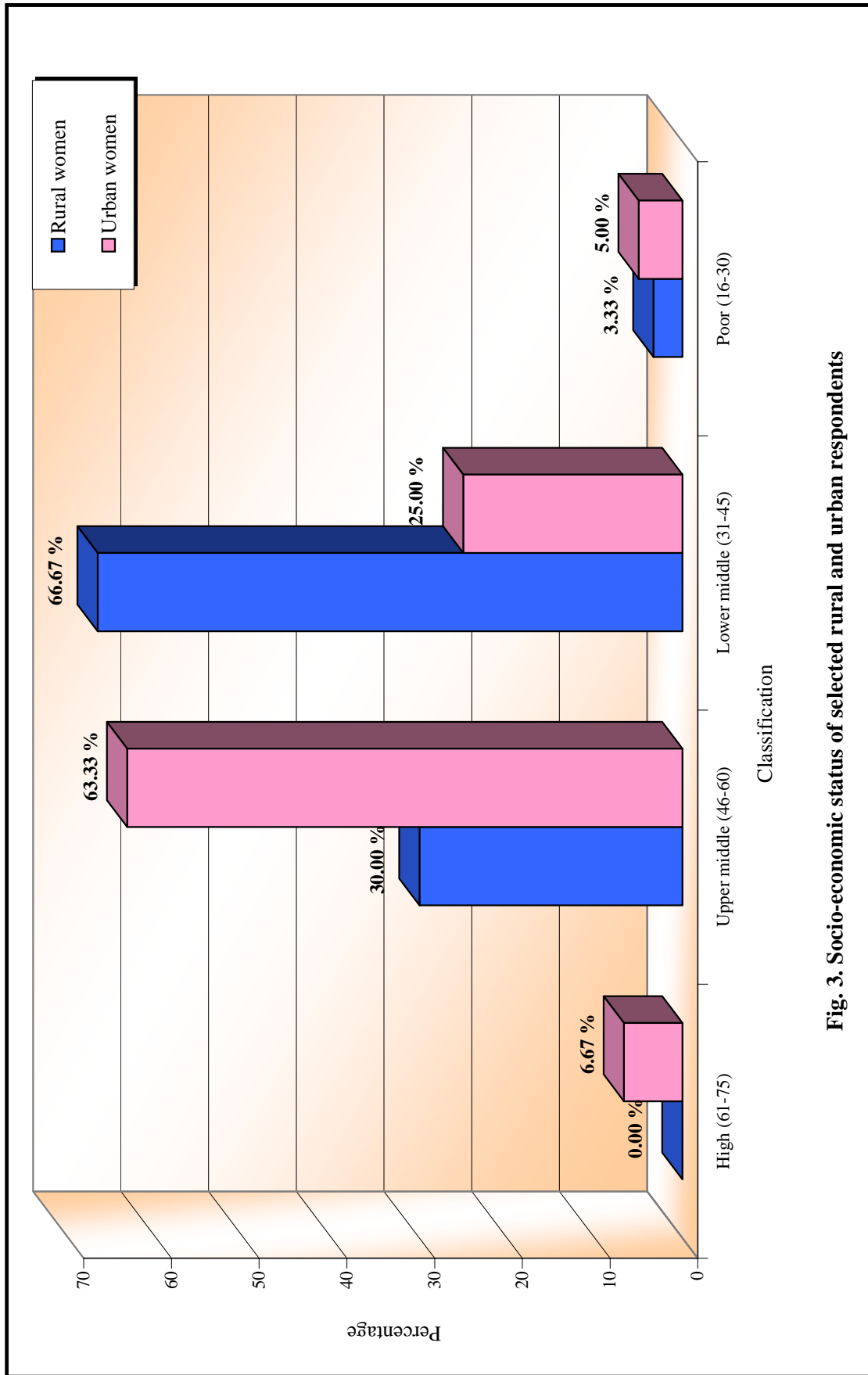


Fig. 3. Socio-economic status of selected rural and urban respondents

## **4.2 Life style factors of the rural and urban women.**

### **4.2.1 Type of food consumed**

It can be observed from the table 3 that irrespective of working status majority of the women (45%) in rural area were vegetarians followed by 43.33 per cent belonged to non vegetarians group. Very less per cent (11.67 %) women were in eggatarian category. In rural working category it can be observed that equal per cent (43.33 %) women were vegetarians and non vegetarians followed by 13.33 per cent eggatarians. Where as in non working category majority of 46.67 per cent the women were vegetarians, followed by 43.33 per cent of the women were non vegetarians and 10 per cent belonged to eggatarian category.

In urban area majority of (58.33%) the women were vegetarians followed by non vegetarians group (28.33%). Very less percent (13.33%) of the women were eggatarians. A glance in to the urban working and non-working respondents revealed that more than half of the women (60.00% and 56.67%) were vegetarians, followed by 26.67 per cent and 28.33 per cent non vegetarians. Only 16.67 per cent and 13.33 per cent were eggatarians in working and non working women as shown in table 3.

### **4.2.2 Time expenditure pattern**

Time spent for daily activities by the selected rural and urban respondents is shown in table 4.

Daily on an average rural women spent 7 hours 29 minutes for sleeping, 6 hours 38 minutes for paid work, 4 hours 14 minutes for other house hold activities, 3 hour 19 minutes for rest and recreation, 3 hours 8 minutes for cooking, and 2 hour 26 minutes for personal activities. On an average a rural working women spent 7 hours 31 minutes for sleeping, 6 hours 38 minutes for paid work, 4 hours 10 minutes for other household activities, 2 hours 30 minutes for cooking, 1 hour 46 minutes for rest and recreation and 1 hour 20 minutes for personal activities. On an average rural non working women spent 7 hours 21 minutes for sleeping, 5 hour 17 minutes for rest and recreation, 4 hours 15 minutes for cooking, 4 hours for other house hold activities, and 3 hour 7 minutes for personal activities

Similarly urban women spent 7 hours 29 minutes for sleeping, 7 hours 22 minutes for paid work, 4 hours 13 minutes for other house hold activities, 3 hours 23 minutes for cooking, 3 hour 19 minutes for rest and recreation and 2 hour 20 minutes for personal activities. The

**Table 3: Type of food consumed by the selected rural and urban respondents****N=120**

<b>Type of food in take</b>	<b>Rural Women</b>			<b>Urban Women</b>		
	<b>Working n=30</b>	<b>Non Working n=30</b>	<b>Total n=60</b>	<b>Working n=30</b>	<b>Non Working n=30</b>	<b>Total n=60</b>
Vegetarian	13 (43.33)	14 (46.67)	27 (45.00)	18 (60.00)	17 (56.67)	35 (58.33)
Non vegetarian	13 (43.33)	13 (43.33)	26 (43.33)	9 (30.00)	8 (26.67)	17 (28.33)
Eggetarian	4 (13.33)	3 (10.00)	7 (11.67)	3 (10.00)	5 (16.67)	8 (13.33)

Note: Figures in parenthesis indicate percentage

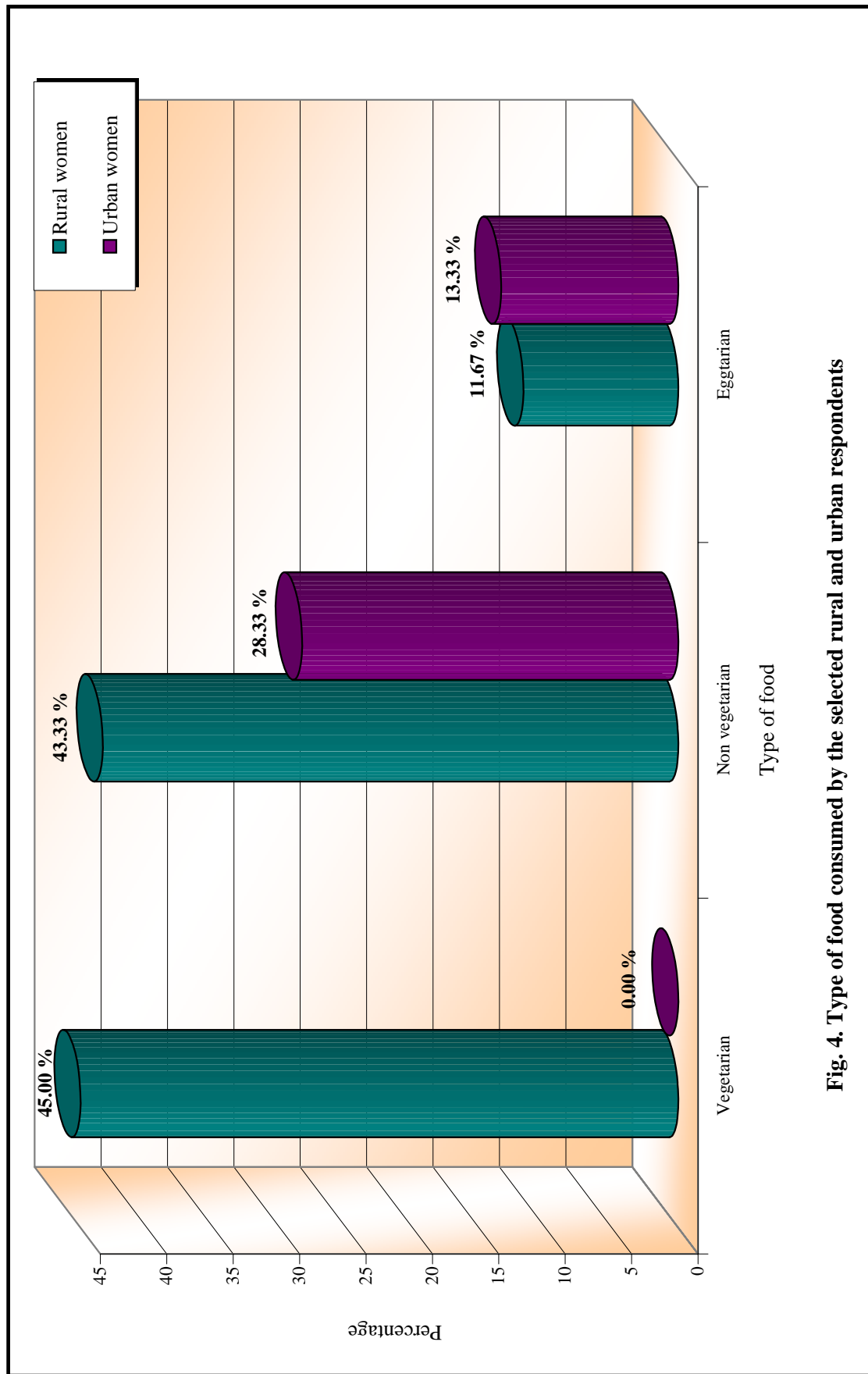


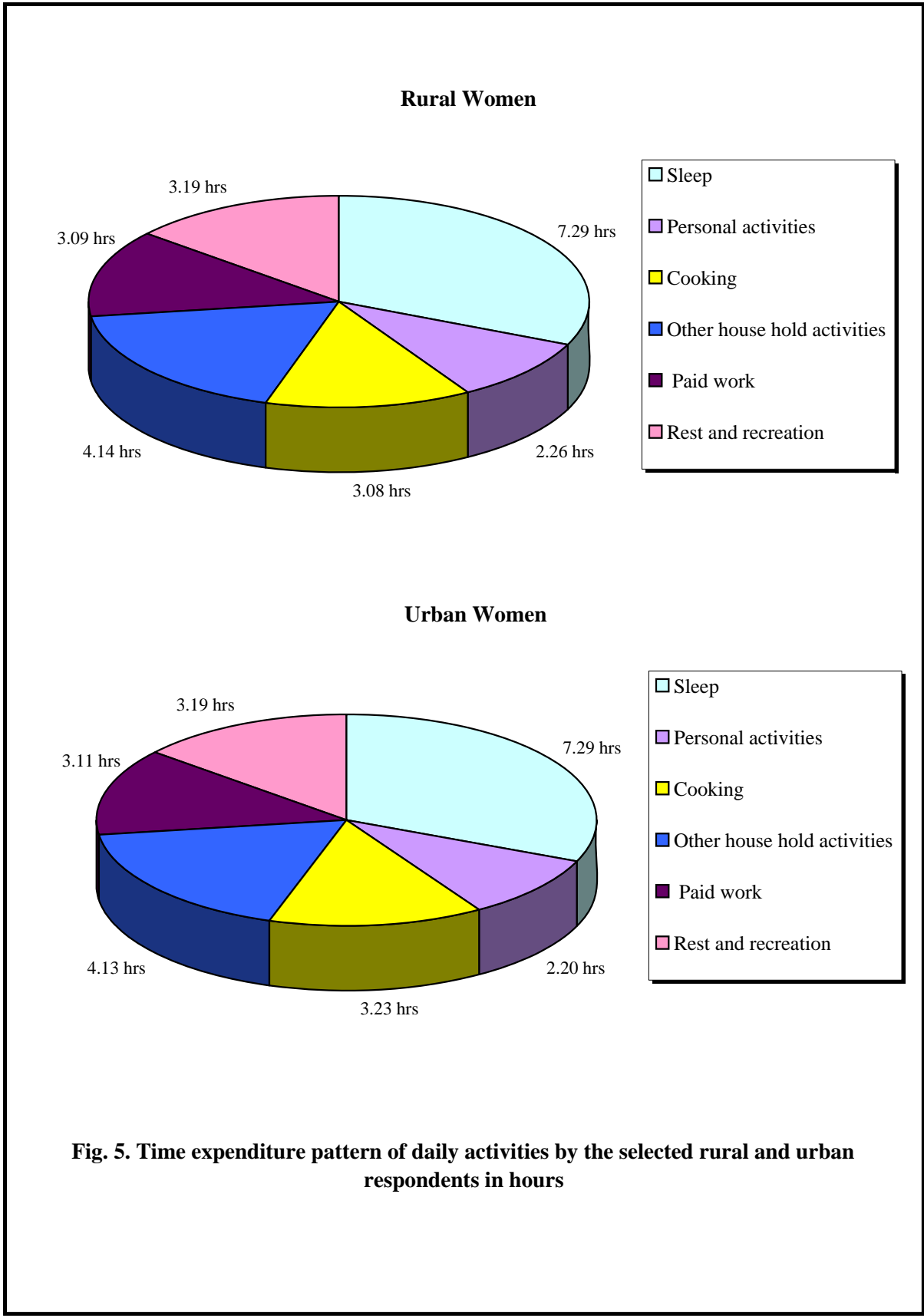
Fig. 4. Type of food consumed by the selected rural and urban respondents

**Table 4: Time expenditure pattern of daily activities by the selected rural and urban respondents**

**N=120**

Activities	Rural Women			Urban Women		
	Working n=30	Non Working n=30	Total n=60	Working n=30	Non Working n=30	Total n=60
Sleep	7.31 (±0.57)	7.21 (±0.43)	7.29 (±0.51)	7.28 (±1.39)	7.16 (±0.43)	7.29 (±0.55)
Personal activities	1.20 (±0.35)	3.07 (±0.48)	2.26 (±0.84)	1.12 (±0.44)	3.14 (±0.50)	2.20 (±0.83)
Cooking	2.30 (±0.51)	4.15 (±0.42)	3.08 (±0.85)	2.14 (±0.67)	4.05 (±0.41)	3.23 (±0.18)
Other house hold activities	4.10 (±0.61)	4.00 (±0.50)	4.14 (±0.77)	4.24 (±1.17)	4.12 (±0.48)	4.13 (±0.69)
Paid work	6.38 (±0.47)	-	3.09 (±3.17)	7.22 (±0.49)	-	3.11 (±3.20)
Rest and recreation	1.46 (±0.52)	5.17 (±0.68)	3.19 (±1.86)	1.25 (±0.85)	5.10 (±0.73)	3.19 (±1.92)

Note: Figures in parenthesis indicate standard deviation



**Fig. 5. Time expenditure pattern of daily activities by the selected rural and urban respondents in hours**

table notifies that on an average a urban working women spend 7 hours 28 minutes for sleeping, 7 hours 22 minutes for paid work, 4 hours 24 minutes for other house hold activities, 2 hours 14 minutes for cooking, 1 hour 25 minutes for rest and recreation, and 1 hour 12 minutes for personal activities. Urban non working women spend 7 hours 16 minutes for sleeping, 5 hour 10 minutes for rest and recreation, 4 hours 12 minutes for other house hold activities, 4 hours 05 minutes for cooking, and 3 hour 14 minutes for personal activities as shown in table 4.

#### **4.2.3 Exercises performed by women**

More than half of the rural respondents (55.00%) did not do any exercise at all. Whereas 31.67 per cent of the respondents did exercise daily followed by, 8.33 per cent doing exercise occasionally and 5.00 per cent did exercise weekly. Among both working and non working categories of rural respondents maximum percentage (53.33% and 56.67% respectively) did not do not exercise at all. Among the remaining respondents a higher per cent (36.67% and 26.67% respectively) of both working and non working category exercised daily. A very meager per cent of rural working women did exercise weekly and occasionally (3.33% and 6.67% respectively). Similarly meager percentage of rural non working did exercise weekly and occasionally (6.67% and 10% respectively) as depicted in table 5.

Similar results were observed in the case of urban respondents also. Out of the total respondents 45.00 per cent did not exercise at all. Whereas 41.67 per cent of the respondents did exercise daily, followed by 6.67 per cent doing exercise weekly, 6.67 per cent did exercise occasionally. Among both working and non working category of urban respondents maximum per cent (43.67% and 43.33% respectively) did not do exercise at all. Among the remaining respondents equal percentage of women (36.67%) exercised daily in both working and non working category respectively. A very meager percentage (6.67% and 13.33%) of the respondents did exercise weekly and occasionally respectively.

With regard to the type of exercise women preferred, 21.67 per cent of the rural women preferred to do walking followed by 13.33 per cent preferred doing yoga, and only 5 per cent preferred to do physical exercise. Very less percentage (3.33 %) preferred doing both walking and exercise or walking, exercise and yoga together. Similar trend was followed by both working and non working in rural women also as presented in table 5.

**Table 5: Details of exercise performed by the selected rural and urban respondents**

N=120

Exercise Details	Rural Women			Urban Women		
	Working n=30	Non Working n=30	Total n=60	Working n=30	Non Working n=30	Total n=60
<b>I. Frequency of doing exercise</b>						
No exercise	16 (53.33)	17 (56.67)	33 (55.00)	14 (46.67)	13 (43.33)	27 (45.00)
Daily	11 (36.67)	8 (26.67)	19 (31.67)	14 (46.67)	11 (36.67)	25 (41.67)
Weekly	1 (3.33)	2 (6.67)	3 (5.00)	2 (6.67)	2 (6.67)	4 (6.67)
Occasionally	2 (6.67)	3 (10.00)	5 (8.33)	-	4 (13.33)	4 (6.67)
<b>II. Type of exercise</b>						
Walking	7 (23.33)	6 (20.00)	13 (21.67)	7 (23.33)	7 (23.33)	14 (23.33)
Yoga	4 (13.33)	5 (16.67)	9 (15.00)	5 (16.67)	5 (16.67)	10 (16.67)
Physical exercise	2 (6.67)	1 (3.33)	3 (5.00)	3 (10.00)	2 (6.67)	5 (8.33)
Both walking and exercise or walking, exercise and yoga	1 (3.33)	1 (3.33)	2 (3.33)	1 (3.33)	3 (10.00)	4 (6.67)
<b>III. Time spent for exercise(Minutes)</b>						
10	3 (10.00)	3 (10.00)	6 (10.00)	1 (3.33)	3 (10.00)	4 (6.67)
20	4 (13.33)	4 (13.33)	8 (13.33)	7 (23.33)	5 (16.67)	12 (20.00)
30	6 (20.00)	3 (10.00)	9 (15.00)	4 (13.33)	4 (13.33)	8 (13.33)
40	1 (3.33)	3 (10.00)	4 (6.67)	2 (6.67)	3 (10.00)	5 (8.33)
50	-	-	-	1 (3.33)	1 (3.33)	2 (3.33)
60	-	-	-	1 (3.33)	1 (3.33)	2 (3.33)

Note: Figures in parenthesis indicate percentage

In urban areas 23.33 per cent of the women preferred to do walking followed by 13.33 per cent preferred doing yoga and only 8.33 per cent preferred to do physical exercise. Very less per cent of women (6.67%) preferred doing both walking and exercise or walking exercise and yoga together. Simile trend was followed by both working and non working in urban areas.

Regarding time spent for doing exercise a maximum of the 15 per cent rural women spent 30 minutes for doing exercise followed by 13.33 per cent women spent 20 minutes for doing exercise. Very less per cent of the women (10.00% and 6.67%) spent 10 minutes and 40 minutes respectively for exercise. In rural working category 20 per cent spent about 30 minutes for exercise followed by 13.33 per cent spent, about 20 minutes for exercise and very less per cent (10% and 3%) spent about 40 minutes and 10 minutes. In rural non working category 13 per cent of the women spent about 20 minutes for exercise followed by 10 per cent spent about 10 minutes, 20 minutes and 40minutes for exercise respectively.

Among urban women, 20 per cent respondents spent 20 minutes for exercise followed by 13.33 per cent spent 30 minutes for doing exercise. Less than 10 per cent women spent 10, 40, 50 and 60 minutes respectively for doing exercise. In urban working category 23.33 per cent of the women spent about 20 minutes followed by 13.33 per cent spent about 30 minutes and 6.67 per cent spent 40 minutes for exercise. Only 3.33 per cent each spent about 10 minutes, 50 minutes and 60 minutes for exercising. In urban non-working category 16.76 per cent of the women spent about 20 minutes for exercise followed by 13.33 per cent spent about 30 minutes for exercise and 10 per cent each spent about 40 minutes and 10 minutes. Only 3.33 per cent each spent about 50 minutes and 60 minutes as shown in the table 5.

#### **4.2.4 Participation in sports**

Details of participation in sports by selected rural and urban respondents were depicted in table 6.

Majority of both rural (90%) and urban (65%) respondents did not participate in any sports during their past life until the period taken up for the study.

In rural sample 10 per cent of the respondents participated in sports and 5 per cent of them participated in school, 3 per cent in college and 1.6 per cent participated in both school and college. Among rural working category 5 per cent of the respondents participated in

**Table 6: Details of participation in sports by selected rural and urban respondents**

N=120

Participation in sports	Rural Women			Urban Women		
	Working n=30 Frequency (%)	Non Working n=30 Frequency (%)	Total n=60 Frequency (%)	Working n=30 Frequency (%)	Non Working n=30 Frequency (%)	Total n=60 Frequency (%)
No	25 (83.33)	29 (96.67)	54 (90.00)	16 (53.33)	23 (76.67)	39 (65.00)
Yes	5 (16.67)	1 (3.33)	6 (10.00)	14 (46.67)	7 (23.33)	21 (35.00)
<b>Place of participation</b>						
school	3 (10.00)	0 (0.00)	3 (5.00)	9 (30.00)	5 (16.67)	14 (23.33)
college	1 (3.33)	1 (3.33)	2 (3.33)	6 (20.00)	0 (0.00)	6 (10.00)
both school and college	1 (3.33)	-	1 (1.67)	-	1 (3.33)	1 (1.67)

Note: Figures in parenthesis indicate percentage

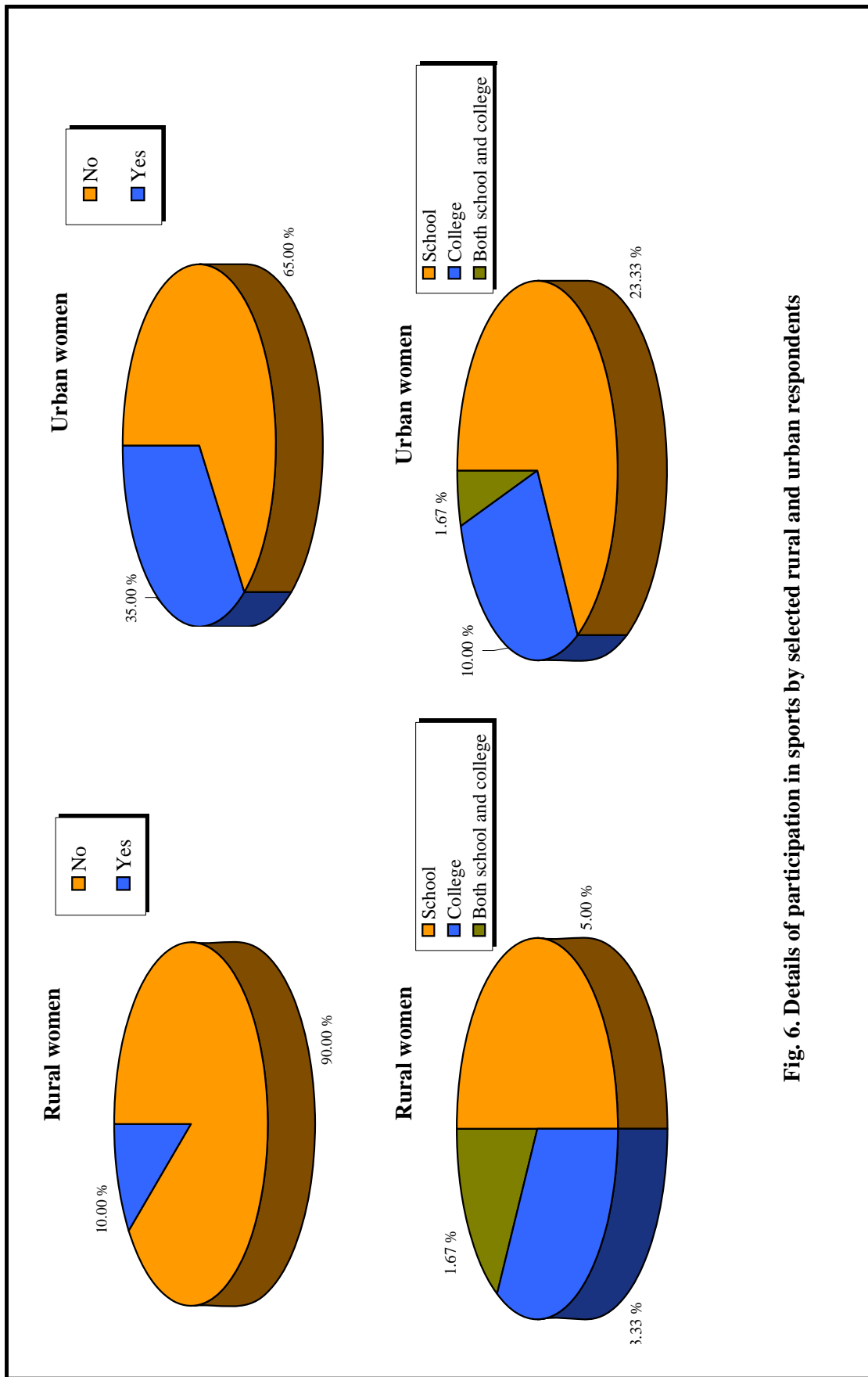


Fig. 6. Details of participation in sports by selected rural and urban respondents

sports, among them 10 per cent of them participated in schools, 3 per cent participated in college and 3 per cent both school and college. Where as in rural non working category 1.67 per cent of the respondents participated in sports, that to in college

Among urban sample 21 per cent of the respondents participated in sports. Among them 23 per cent were participated in school, 10 per cent in college, and 1.67 per cent participated in both school and college. In urban working category 46.67 per cent of the respondents participated in sports, 30 per cent of them participated in schools, 20 per cent participated in college and none of them participated in both school and college. Where as in urban non working category 23.33 per cent of the respondents participated in sports, of them 16 per cent participated in schools and only 3 per cent of them participated in school or school and college but none of them participated in college.

### **4.3 Physical and physiological parameters of selected rural and urban respondents**

#### **4.3.1 Physical parameters**

Details of physical parameters of selected rural and urban respondents are shown in table 7.

The mean age of the rural women was 35.23 years, with mean height of 159.98 cms and the mean weight of 57.57 kgs. Among rural working and non working category the mean age of the women was 35.50 years with 34.27 years, with mean height was 161.46 cms and 158.50 cms and mean weight of 57.47 kgs and 56,47kgs respectively.

The mean age of the urban women was 33.55 years mean height was 160.35 cms and the mean weight was 56.95 kgs. In urban working and non working category the mean age of the women was 33.27 years and 33.83 years. Mean height was 159.98cms and 158.12 cms and mean weight was 57.57 kgs and 59.40 kgs.

All the respondents were within the standard given by United States department of health and human services, Washington D.C for height, weight and age of the respondents.

An observation in to the table 7 reveals a significant difference in age of the rural and urban sample at 0.05 per cent level. The difference in height and weight of the rural and urban sample was non significant. The comparison of the results between rural working and urban working categories did not show any significant difference in all three physical parameters.

Table 7: Mean physical parameters of selected rural and urban respondents

N=120

Physical Parameters	Rural women			Urban women			't'- values		
	Rural Working Women n=30	Rural non Working Women n=30	Total n=60	Rural Working Women n=30	Rural non Working Women n=30	Total n=60	Rural Working and non Working	Urban Working and Non Working	Rural Women and Urban women
Mean age ( years)	35.20 (±5.56)	34.27 (±6.34)	35.23 (±5.99)	33.27 (±6.72)	33.83 (±7.47)	33.55 (±7.05)	1.42 <sup>NS</sup>	1.97 <sup>NS</sup>	2.84*
Mean height (Cm)	161.46 (±18.52)	158.50 (±17.76)	159.98 (±18.05)	158.12 (±12.18)	162.57 (±11.57)	160.35 (±11.99)	1.76 <sup>NS</sup>	1.76 <sup>NS</sup>	1.76 <sup>NS</sup>
Mean weight (Kg)	57.47 (±6.27)	56.47 (±7.81)	57.57 (±6.27)	59.40 (±9.78)	54.50 (±7.99)	56.95 (±9.19)	0.63 <sup>NS</sup>	0.17 <sup>NS</sup>	3.48 <sup>NS</sup>

**Note:** \*Significant at the 0.05 level

\*\* Significant at 0.01 level

Figures in parenthesis indicate standard deviation

Standards given by United States Department of Health and Human Services, Washington D.C

### 4.3.2 Physiological parameters

Details of physiological parameters of selected rural and urban respondents were depicted in table 8.

The mean blood pressure among rural women was observed to be 120/ 80.00 with the pulse rate of 80.73beats/min. The average grip strength of right and left hand of the respondents was 14.30 kg and 13.87 kg respectively. The mean body temperature was 96.98° F. Similarly the mean blood pressure among rural working women category was observed to be 119/80 with the pulse rate of 80.57beats/min and body temperature of 97.11° F, The mean grip strength of right and left hand of the respondents was 15.67 kg and 14.66 kg respectively. Among rural non working women category the mean blood pressure was observed to be 121/80 with the pulse rate of 79.67beats/min and body temperature of 96.85° F. The mean grip strength of right and left hand of the respondents was 12.93 kg and 13.30 kg respectively.

An observation of the data of urban women revealed that the mean blood pressure was 119/80 with the pulse rate of 81.11beats/min, and body temperature of 96.78° F. The mean grip strength of right and left hand of the respondents was 13.89 kg and 13.76 kg respectively. The mean blood pressure among urban working women category was observed to be 118/81 with the pulse rate of 81.11beats/min and body temperature of 96.80° F. The mean grip strength of right and left hand of the respondents was 14.68 kg and 14.68 kg respectively. The mean blood pressure among urban non working women category was observed to be 120/81 with the pulse rate of 81.50beats/min and body temperature of 96.70° F. The mean grip strength of right and left hand of the respondents was 13.10 kg and 12.96 kg respectively.

Significant difference is not observed in blood pressure and pulse rate among working and non working women of both rural and urban categories.

Significant difference at 0.05 level was observed in grip strength of right hand of the rural working and non working women and the grip strength of left hand among urban working and urban non working categories.

Significant difference was not observed between the rural and urban women in any of the physiological parameters as shown in table 8.

### 4.3.3 Number of pregnancies

Table 9 depicts the number of pregnancies had by selected rural and urban women up till the period of investigation conducted.

Table 8: Mean physiological parameters of selected respondents

N=120

Mean physiological parameters	Rural women			Urban women			't'- values		
	Rural Working Women n=30	Rural non Working Women n=30	Total n=60	Rural Working Women n=30	Rural non Working Women n=30	Total n=60	Rural Working and Non Working	Urban Working and Non Working	Rural Women and Urban women
Blood pressure systolic / diastolic (mm/Hg)	119.92 /80.35 (13.56 /7.59)	121.54 /80.70 (18.09/ 11.57)	120.73 /80.00 (12.11/ 7.09)	118.72/ 80.07 (19.12/ 12.62)	120.73/ 81.70 (7.61/ 7.91)	119.38 /80.30 (9.73/ 8.07)	0.50 <sup>NS</sup> / 0.14 <sup>NS</sup>	0.80 <sup>NS</sup> / 0.73 <sup>NS</sup>	0.48 <sup>NS</sup> / 0.66 <sup>NS</sup>
Pulse rate	80.57 (±8.28)	79.67 (±11.92)	80.11 (±7.89)	80.73 (±8.33)	81.50 (±7.92)	81.11 (±8.13)	0.44 <sup>NS</sup>	0.63 <sup>NS</sup>	0.70 <sup>NS</sup>
Grip strength (kg) of right and left hands	15.67 (±4.10)	12.93 (±2.38)	14.30 (±3.61)	14.68 (±3.49)	13.10 (±2.52)	13.89 (±3.14)	3.31*	1.98 <sup>NS</sup>	1.68 <sup>NS</sup>
	14.66 (±2.45)	13.03 (±3.33)	13.84 (±3.01)	14.55 (±3.38)	12.96 (±2.69)	13.76 (±3.15)	1.25 <sup>NS</sup>	2.18*	1.28 <sup>NS</sup>
Body temperature (°C)	97.11 (±0.51)	96.85 (±1.11)	96.98 (±0.87)	96.80 (±1.00)	96.75 (±1.88)	96.78 (±1.49)	0.12 <sup>NS</sup>	0.87 <sup>NS</sup>	1.06 <sup>NS</sup>

Note: \*Significant at the 0.05 level

\*\* Significant at 0.01 level

Figures in parenthesis indicate standard deviation.

Table 9: Number of pregnancies the selected rural and urban women had

N=120

Number of pregnancies	Rural Women			Urban Women		
	Working n=30	Non Working n=30	Total n=60	Working n=30	Non Working n=30	Total n=60
0	5 (16.67)	6 (20.00)	11 (18.33)	6 (20.00)	4 (13.33)	10 (16.67)
1	-	2 (6.67)	2 (3.33)	1 (3.33)	4 (13.33)	5 (8.33)
2	3 (10.00)	6 (20.00)	9 (15.00)	4 (13.33)	7 (23.33)	11 (18.33)
3	7 (23.33)	6 (20.00)	13 (21.67)	10 (33.33)	7 (23.33)	17 (28.33)
4	10 (33.33)	8 (26.67)	18 (30.00)	5 (16.67)	5 (16.67)	10 (16.67)
5	5 (16.67)	2 (6.67)	7 (11.67)	4 (13.33)	3 (10.00)	7 (11.67)

Note: Figures in parenthesis indicate percentage

Thirty per cent of rural women had four pregnancies, followed by 21.67 per cent had three pregnancies. 18.33 per cent were had no pregnancies, 15 per cent and 11.67 per cent had two and five pregnancies respectively. Only 3.33 per cent were had one pregnancy. Among rural working category it can be observed that 33.33 per cent of women had four pregnancies followed by 23.33 per cent had three pregnancies, 16.67 each were had five pregnancies and no pregnancies respectively, and only 10 per cent were had two pregnancies. Where as in rural non working category 26.67 per cent were had four pregnancies followed by equal per cent 20.00 were had no, two and three pregnancies. Only 6.67 per cent were had one and five pregnancies.

Among urban women 28.33 per cent had three pregnancies followed by 18.33 per cent two pregnancies, 16.67 per cent four pregnancies. About 11.67 per cent women were pregnant for five times and only 8.33 per cent were for one time. Among urban working category it can be observed that 33.33 per cent were had three pregnancies followed by 20.00 per cent and 16.67 per cent were had four pregnancies and no pregnancies respectively. About 13.33 each had two and five pregnancies. Only 3.33 per cent had one pregnancy. Where as in urban non working category equal per cent of (23.33 %) women were pregnant for two and three times followed by 16.67 per cent and were had four pregnancies. About 13.33 each had no pregnancies and one pregnancy. Only 10.00 per cent were having five pregnancies.

#### **4.4 Health status of rural and urban women**

##### **4.4.1 Body mass index**

Detailed depiction of body mass index is shown in table 10.

Among rural women 28.33 per cent were belonged to low weight normal category of body mass index followed by 20.00 per cent were belonged to Chronic Energy Deficiency Grade I- Mild category. Equal per cent of 18.33 were belonged to CED Grade II-Moderate category and CED Grade III-Severe category of body mass index and 15.00 per cent were in to normal category of body mass index. None of the rural women were in Obese grade-I, Obese grad-II category of body mass index. In rural working women category 30.00 per cent each belonged to low weight normal and CED Grade I- Mild category of body mass index followed by 16.67 per cent belonged to CED Grade II-Moderate category of body mass index, 13.33 per cent belonged to CED Grade III-Severe and 10.00 per cent belonged to normal category of body mass index. In rural non working women the maximum percentage of 26.67

Table 10: Body Mass Index of selected rural and urban respondents

N=120

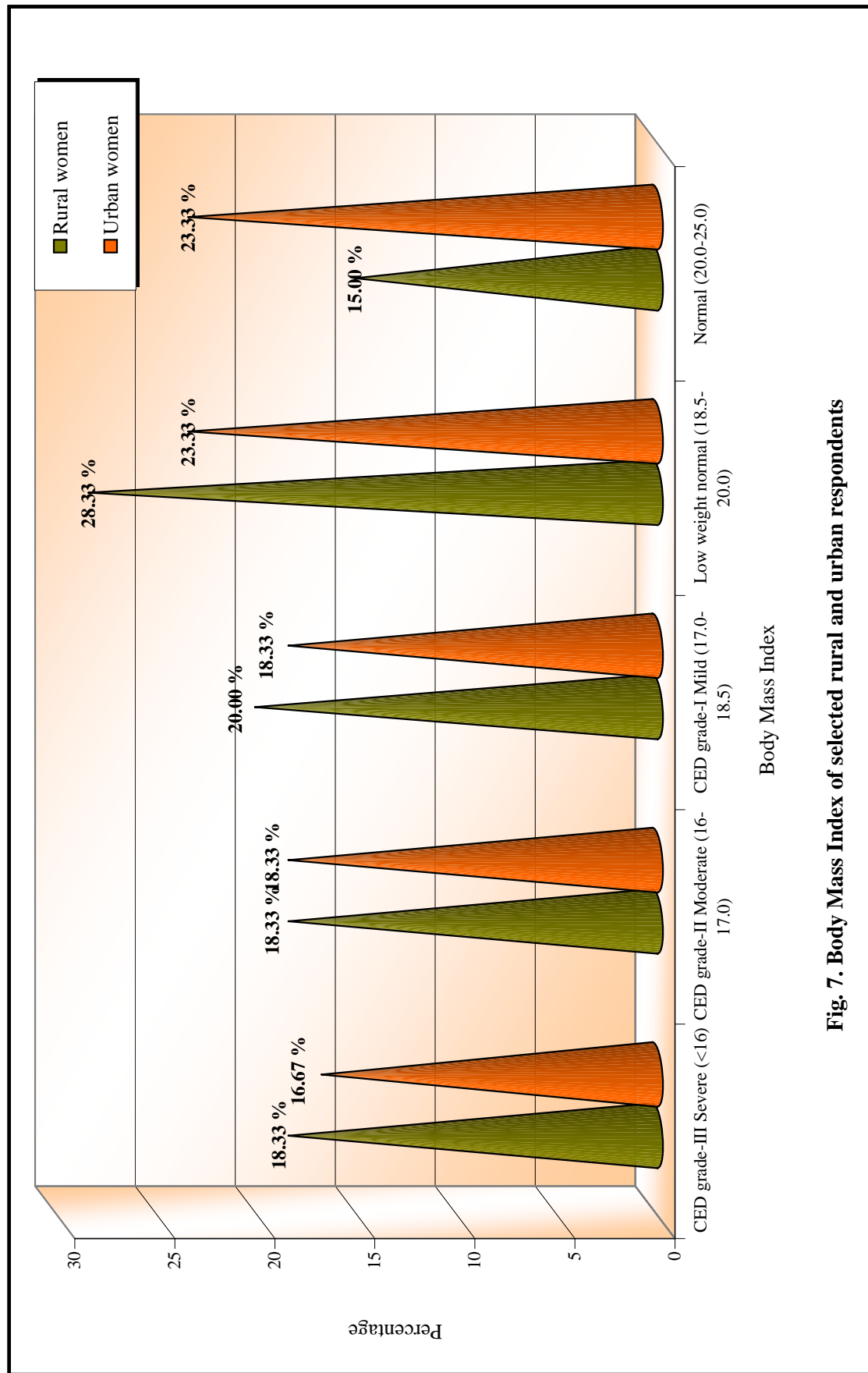
BMI	Rural women			Urban women		
	Working n=30	Non Working n=30	Total n=60	Working n=30	Non Working n=30	Total n=60
CED grade-III Severe (<16)	4 (13.33)	7 (23.33)	11 (18.33)	4 (13.33)	6 (20.00)	10 (16.67)
CED grade-II Moderate (16-17.0)	5 (16.67)	6 (20.00)	11 (18.33)	1 (3.33)	10 (33.33)	11 (18.33)
CED grade-I Mild (17.0-18.5)	9 (30.00)	3 (10.00)	12 (20.00)	8 (26.67)	3 (10.00)	11 (18.33)
Low weight normal (18.5-20.0)	9 (30.00)	8 (26.67)	17 (28.33)	5 (16.67)	9 (30.00)	14 (23.33)
Normal (20.0-25.0)	3 (10.00)	6 (20.00)	9 (15.00)	12 (40.00)	2 (6.67)	14 (23.33)

Note: CED Chronic energy deficiency

Figures in parenthesis indicate percentage

None of the respondents were in Obese grade-I, Obese grad-II category of BMI

Scores given by Garrow *et al.* (1987)



**Fig. 7. Body Mass Index of selected rural and urban respondents**

belonged to low weight normal category of body mass index followed by 23.33 per cent of them belonged to Grade III-Severe category. Equal percentage of 20.00 each belonged to CED Grade II-Moderate category and normal category. Only 10 per cent WERE belonged to CED Grade I- Mild body mass index category.

Equal percentage of the urban women (23.33%) belonged to low weight normal range and normal range of body mass index followed by again equal percentage of 18.33 women belonged to CED Grade I- Mild and CED Grade II-Moderate category. About 16.67 per cent belonged to CED Grade III-Severe category of body mass index. None of the urban women were in Obese grade-I, Obese grad-II category of body mass index shown in the table 10. Maximum percentage of urban working women (40.00%) belonged to normal range body mass index category followed by 26.67 per cent belonged to CED Grade I- Mild, 16.67 per cent belonged to low weight normal category, 13.33 per cent belonged to CED Grade III-Severe category of body mass index. Only 3.33per cent belonged to CED Grade II-Moderate category of body mass index. Whereas maximum percentage of urban non working women (33.33%) belonged to CED Grade II-Moderate category of body mass index, followed by 30.00 per cent belonged to low weight normal category 20.00 per cent to CED grade-III Severe and 10.00 per cent of the to CED Grade I- Mild category of body mass index. Only and 6.7 per cent belonged to normal category of body mass index as presented in table 10.

#### **4.4.2 Skin fold measurements**

Details of skin fold measurements of selected rural and urban respondents is shown in table 11.

The mean skin fold measurements of rural women at biceps region was observed to be 3.40 mm at triceps region 6.21 mm, at sub scapular region 11.78 mm, and at suprailiac 8.93 mm. among rural working category the mean skin fold measurements at biceps region was 3.50 mm, at triceps region 6.54 mm, at sub scapular region 11.66 mm, and at suprailiac 8.58 mm. among rural non working women the mean skin fold measurements at biceps region was 3.33 mm, at triceps region 5.88 mm, at sub scapular region 11.90 mm and suprailiac region 9.29 mm.

An observation into the urban category the data on mean skin fold measurements revealed that the at biceps region it was 3.53 mm, at triceps region 5.52 mm, at subscapular region 12.70 mm and at suprailiac region 11.61 mm. Among urban working women the mean

Table 11: Mean skin fold measurements of selected rural and urban respondents

N=120

Measurements of skin fold sites (mm)	Rural women			Urban women			't' - values		
	Rural Working Women n=30	Rural non Working Women n=30	Total n=60	Rural Working Women n=30	Rural non Working Women n=30	Total n=60	Rural Working and non Working	Urban Working and non Working	Rural Women and Urban women
Biceps	3.50 (±1.15)	3.33 (±1.63)	3.40 (±1.40)	2.93 (±1.95)	4.13 (±1.56)	3.53 (±1.85)	1.70	2.36*	1.40
Triceps	6.54 (±2.63)	5.88 (±3.03)	6.21 (±2.83)	5.54 (±3.16)	5.50 (±1.90)	5.52 (±2.59)	1.96 <sup>NS</sup>	1.45	1.51
Subscapular	11.66 (±2.61)	11.90 (±3.72)	11.78 (±3.18)	12.85 (±3.35)	12.55 (±2.27)	12.7 (±2.84)	1.39	1.43	1.55
Suprailiac	8.58 (±2.46)	9.29 (±2.80)	8.93 (±2.64)	11.15 (±3.63)	12.07 (±4.22)	11.61 (±3.93)	1.94 <sup>NS</sup>	3.85*	3.55**

Note: \*Significant at the 0.05 level

\*\* Significant at 0.01 level

Figures in parenthesis indicate standard deviation

skin fold measurements at biceps region was 2.93 mm, at triceps region 5.54 mm, at sub scapular region 12.85 mm, at suprailiac 11.15 mm. Similarly among urban non working women the mean skin fold measurements at biceps region was observed to be 4.13 mm at triceps region 5.50 mm, at sub scapular region 12.55 mm and at suprailiac region 12.07 mm as shown in table -11.

The comparison of data on skin fold measurements showed that there was highly significant difference in the skin fold measurements at suprailiac region among rural and urban respondents. Significant difference at 0.05 level with in working and non working women was observed for skin fold measurements at biceps and suprailiac region among women respondents.

The difference among rural working and non working group in all regions was non significant. Similar observations were made with respect to triceps and sub scapular regions with urban working and non working women groups and between rural and urban respondents.

#### **4.4.3 Body composition**

Details of body composition of the selected rural and urban respondents is shown in table 12.

Among rural women the mean fat weight was found to be 11.19 kg, with the lean body mass of 45.91 kg. The mean fat percentage was found to be 19.35 and the body density was found to be 1.05. The mean fat weight among rural working category was found to be 11.23 kg, with the lean body mass of 46.34 kg. The mean fat percentage of 19.53 and the body density of found to be 1.05. Whereas the rural non working category showed the mean fat weight of 10.99 kg, with lean body mass of 45.47kg. The mean fat percentage of 19.22 and the body density of 1.06.

The mean fat weight in urban women was found to be 11.86 kg, with the lean body mass of 45.09 kg. The mean fat percentage was 20.65 and the body density was 1.05. The mean fat weight among urban working category was found to be 12.17 kg with the lean body mass of 47.23 kg, mean fat percentage of 20.19 and the body density of 1.05. Where as the urban non working category showed the mean fat weight of 11.55kg with the lean body mass of 42.95kg. The mean fat percentage of 21.11 and the body density of 1.05.

Table 12: Body composition of selected rural and urban respondents

N=120

Body composition	Rural women			Urban women			't'- values			Standards	
	Working n=30 Mean (S.D)	Non Working n=30 Mean (S.D)	Total n=60 Mean (S.D)	Working n=30 Mean (S.D)	Non Working n=30 Mean (S.D)	Total n=60 Mean (S.D)	Rural Working and Non Working	Urban Working and Non Working	Rural Women and Urban Women	Essential fat	Standards
Fat weight (kg)	11.23 (±1.89)	10.99 (±3.07)	11.11 (±2.53)	12.17 (±3.74)	11.55 (±2.74)	11.86 (±3.28)	1.40 <sup>NS</sup>	1.02 <sup>NS</sup>	1.79 <sup>NS</sup>	Athletes	14-20%
Lean body mass (kg)	46.34 (±5.38)	45.47 (±5.99)	45.91 (±5.66)	47.23 (±7.07)	42.95 (±6.21)	45.09 (±6.94)	1.44 <sup>NS</sup>	1.78 <sup>NS</sup>	1.36 <sup>NS</sup>	Fit	21-24%
Per cent fat (%)	19.53 (±2.67)	19.22 (±4.46)	19.37 (±3.66)	20.19 (±4.22)	21.11 (±3.48)	20.65 (±3.86)	2.45*	3.02*	2.78*	Acceptable	25-31%
Body Density	1.05 (±0.01)	1.06 (±0.01)	1.05 (±0.01)	1.05 (±0.01)	1.05 (±0.01)	1.05 (±0.01)	1.58 <sup>NS</sup>	1.53 <sup>NS</sup>	1.74 <sup>NS</sup>	Obesity	>32%

Note: \*significant at the 0.05 level

\*\*significant at the 0.001 level

Figures in parenthesis standard deviation

Standards given by W.H.O

The student 't' test revealed that there is significant difference at 0.05 level in per cent fat between working and non working categories of both rural and urban samples and also between the total rural and urban women groups. Further is no significant difference was observed between fat weight, lean body mass and body density among rural and urban or among working and non working categories of both rural and urban samples.

As per the standards given by world health organization irrespective of any category all women selected for the study were having fat percentage more than the essential fat range of 10-13per cent. Both working and non working groups of rural women were having fat percentage less than 20 per cent and belonged to the athlete category as per the WHO standards classification. Whereas the urban women of both working and non working categories had the fat percentage of slightly above 20per cent and belonged to the fit category as shown in table 12.

#### **4.4.4 Body Somatic types**

Details of body type of selected rural and urban respondents is depicted in table 13.

It can be observed from the table that majority of the rural respondents (60%) fell in the mesomorph body type followed by endomorph body type (30.00%). Only 10 per cent fell in ectomorph body type category. Similar observations were made in rural working and non working women as shown in the table 13. Majority of the rural women in both working and non working categories (63.33% and 56.67%) belonged to Mesomorph body type followed by 30.00 per cent each in both the categories belonged to endomorph body type in rural area. Only 6.67per cent and 13.33per cent respectively belonged to ectomorph body type in working and non working groups among rural women.

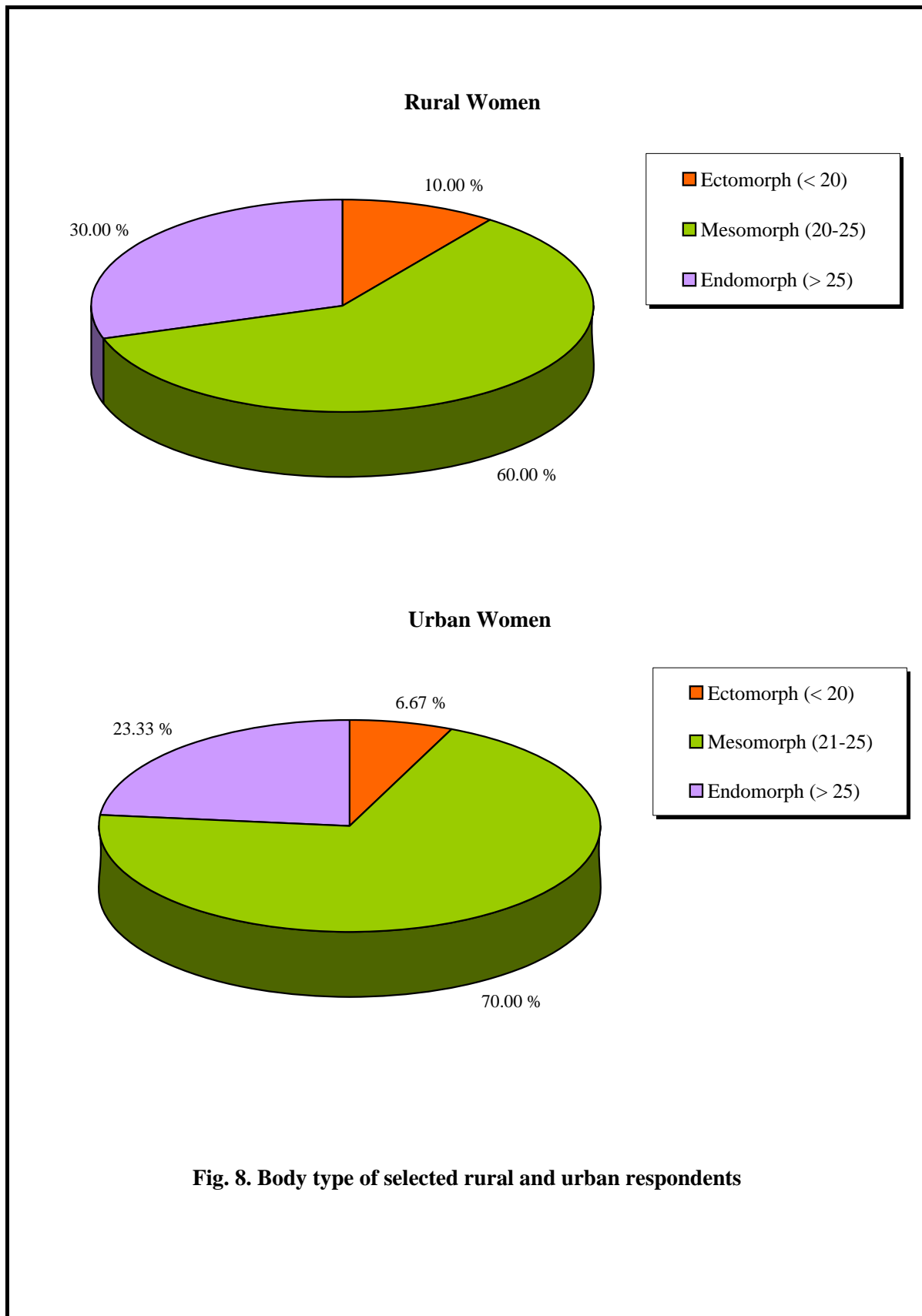
Similarly the majority of the urban respondents the (70%) fell in the category of mesomorph body type followed by endomorph body type (23.33%) and only 6.67 per cent fell in ectomorph body type. Majority of the urban women in both urban working and non working category (63.33% and 70.00%) respectively belonged to mesomorph body type followed by 36.67 per cent and 10.00 per cent in both urban working and non working belonged to endomorph body type respectively. None of the respondents belonged to ectomorph body type in urban working category where as in urban non working category only 13 per cent were belonged to ectomorph category.

Table 13: Body type of selected rural and urban respondents

N=120

Body type	Rural Women			Urban Women		
	Working n=30	Non Working n=30	Total n=60	Working n=30	Non Working n=30	Total n=60
Ectomorph ( $< 21.5$ )	2 (6.67)	4 (13.33)	6 (10.00)	0 (0.00)	4 (13.33)	4 (6.67)
Mesomorph (21.5-25)	19 (63.33)	17 (56.67)	36 (60.00)	19 (63.33)	23 (76.67)	42 (70.00)
Endomorph ( $> 25$ )	9 (30.00)	9 (30.00)	18 (30.00)	11 (36.67)	3 (10.00)	14 (23.33)

Note: Figures in parenthesis indicate percentage



#### 4.4.5 Aerobic capacity (VO<sub>2</sub> max)

Aerobic capacity of selected rural and urban respondents is presents in table 14.

It was clear from the table that majority of the rural women (50.00%) had high average aerobic capacity of 26 to 30 ml/kg× min. Followed by 46.67 per cent of the women were in good category aerobic capacity of ranging from 31 to 40 ml/kg× min. A major percentage (1.67%) each of rural women were in low average category with VO<sub>2</sub> Max consumption of 16.0- 25.0 ml/kg× min and in very good (VO<sub>2</sub> Max range of 41.0- 45.0 ml/kg× min) respectively. None of the respondents were either in excellent or in poor VO<sub>2</sub> Max Category. In rural working women category the majority of the women (63.33%) were in high average (VO<sub>2</sub> Max of 26 to 30 ml/kg× min) range followed by 36.67 per cent in good (VO<sub>2</sub> Max ranging from 31 to 40 ml/kg× min) range. None of the respondents were in any other categories. Where as in rural non working category the majority of the women (56.67%) were in good aerobic capacity (VO<sub>2</sub> Max ranging from 31 to 40 ml/kg× min), followed by 36.67 per cent belonged to high average (VO<sub>2</sub> Max of 26 to 30 ml/kg× min) category and equal percentage (3.33%) had low average (VO<sub>2</sub> Max of 16.0- 25.0 ml/kg× min) and very good category (VO<sub>2</sub> Max range of 41.0- 45.0 ml/kg× min) respectively.

An observation in to the data of urban women revealed that the majority of the urban women (58.33%) were in good aerobic capacity range (VO<sub>2</sub> Max in the range from 31 to 40 ml/min) followed by 26 per cent of the women belonged to high average aerobic capacity (VO<sub>2</sub> Max ranging from 26 to 30 ml/min). Only 11.67 per cent were in low average and 3.33 per cent were in very good aerobic capacity. None of the respondents were either in excellent or in poor category of VO<sub>2</sub> Max. Among urban working women category majority of the women (60.00%) were in good category (VO<sub>2</sub> Max category ranging from 31 to 40 ml/kg× min) followed by 26.67 per cent belonged to high average (VO<sub>2</sub> Max of 26-30 ml/kg× min) range, 10.00 per cent in low average (VO<sub>2</sub> Max of 16.0- 25.0 ml/kg× min) range. and Only 3.33 per cent were in very good VO<sub>2</sub> Max rang. In urban nonworking category the majority of the women (56.67%) were in good category (VO<sub>2</sub> Max ranging from 31-40 ml/kg× min) followed by 26.67 per cent falling in high average (VO<sub>2</sub> Max of 26-30 ml/kg× min) range, 13.33 per cent low average (VO<sub>2</sub> Max of 16.0- 25.0 ml/kg× min) range and only 3.33 per cent had very good VO<sub>2</sub> Max range.

**Table 14: Aerobic capacity (VO<sub>2</sub> max) of selected rural and urban respondents****N=120**

VO <sub>2</sub> Max	Rural Women			Urban Women		
	Working n=30	Non Working n=30	Total n=60	Working n=30	Non Working n=30	Total n=60
Aerobic capacity						
Low average ( 16.0- 25.0 )	0 (0.00)	1 (3.33)	1 (1.67)	3 (10.00)	4 (13.33)	7 (11.67)
High average (26.0- 30.0)	19 (63.33)	11 (36.67)	30 (50.00)	8 (26.67)	8 (26.67)	16 (26.67)
Good (31.0- 40.0)	11 (36.67)	17 (56.67)	28 (46.67)	18 (60.00)	17 (56.67)	35 (58.33)
Very good ( 41.0- 45.0)	0 (0.00)	1 (3.33)	1 (1.67)	1 (3.33)	1 (3.33)	2 (3.33)

Note: Figures in parenthesis indicate percentage

None of the respondents were in excellent and poor category of VO<sub>2</sub> Max Category

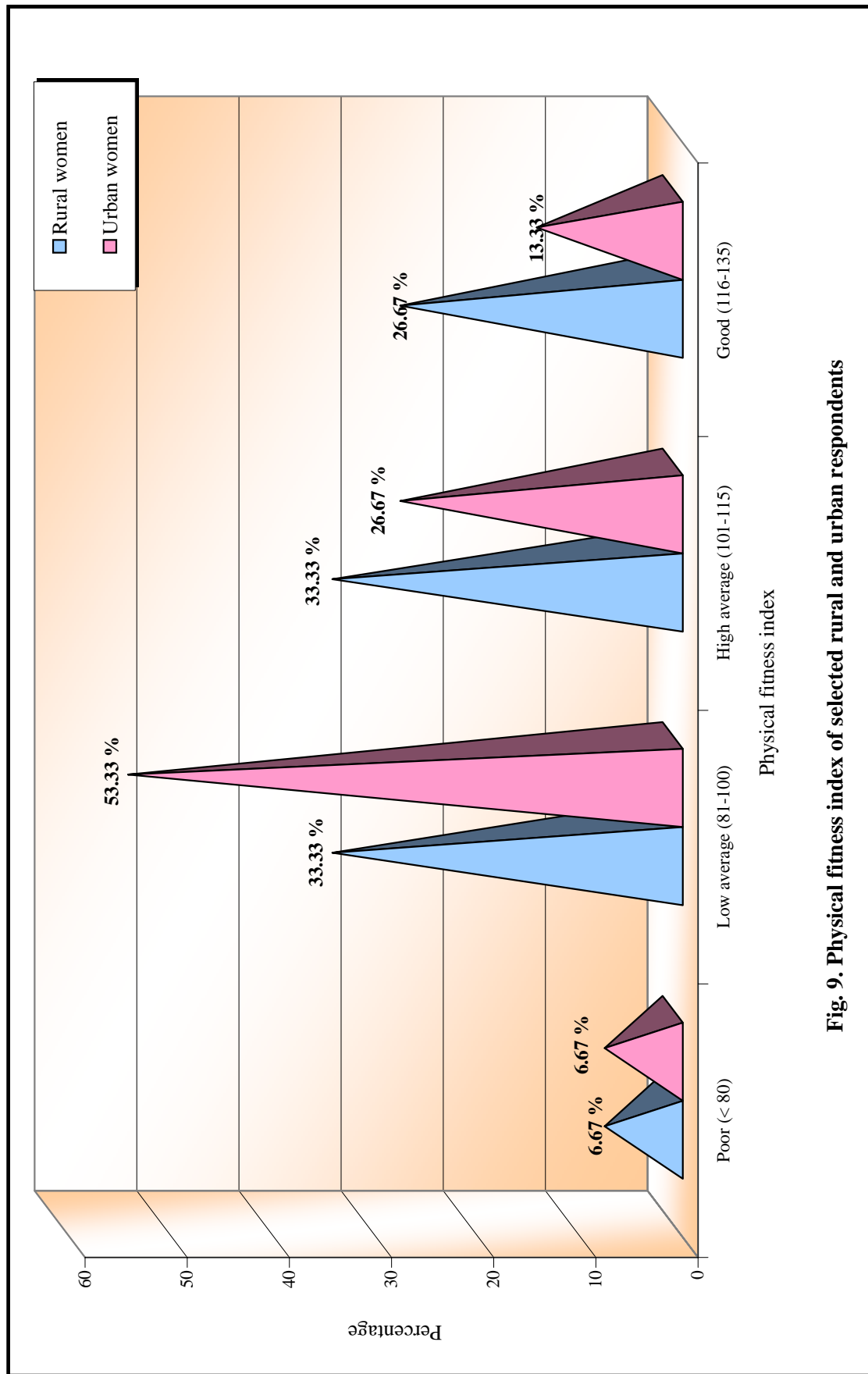


Fig. 9. Physical fitness index of selected rural and urban respondents

#### **4.4.6 Correlation matrix between physical and physiological characteristics**

Correlation matrix between physical and physiological characteristics of selected rural and urban women is depicted in table 15.

Application of Karl Pearson's correlation test revealed a highly significant negative relationship between the age and aerobic capacity ( $VO_2$  Max), where as there was significant positive relationship between age and the weight of the respondents irrespective of the groups.

Weight of the respondents showed highly significant positive relationship with the body mass index and per cent fat in the body, where as the highly significant negative relationship is observed between the weight of the respondents and body density and aerobic capacity ( $VO_2$  Max) of the selected respondents.

Both the fat percentage in the body and the aerobic capacity ( $VO_2$  Max) showed highly significant positive relationship with the body mass index. Whereas highly significant negative relationship is observed between body mass index and the body density. Similarly there was a highly significant negative relationship between body density and per cent fat of the selected respondents. Similarly negatively significant relationship was observed at 0.05 per cent level between per cent fat and aerobic capacity of the selected respondents.

#### **4.4.7 Comparison of physiological parameters between and within groups of selected rural and urban groups**

Comparison of physiological parameters between and within groups of selected rural and urban groups is depicted in table 16.

An observation in to table 16 showed a significant difference between the rural and urban respondents in the body type parameter. Similarly among the rural working and non working respondents a significant difference at 0.05 per cent level was observed for body type.

The table 16 also depicted a significant difference in all three parameters viz. Body Mass Index, body type and aerobic capacity at 0.05 per cent level between the urban working and non working women.

Table 15: Correlation matrix between physical and physiological characteristics

N=120

Physical and physiological characteristics	Age	Weight	Height	BMI	Body density	Per cent fat	VO <sub>2</sub> Max
Age	1						
Weight	0.781*	1					
Height	0.251	0.135	1				
BMI	0.141	0.768**	0.432	1			
Body density	-0.051	-0.667**	-0.007	-0.651**	1		
Per cent fat	0.034	0.773**	0.010	0.753**	-0.998**	1	
VO <sub>2</sub> Max	-0.776**	-0.781**	0.115	0.722**	0.178	-0.182*	1

Note: \*\* Correlation significant at 0.01 level

\* Correlation significant at 0.05 level

**Table 16: Relationship between within groups and between groups in physiological parameters of selected rural and urban respondents**

N=120

Physiological parameters	Rural Women			Urban Women			t-values between totals
	Working n=30	Non Working n=30	Total n=60	Working n=30	Non Working n=30	Total n=60	
Mean body mass index scores	17.98 (2.31)	18.03 (3.31)	18.00 (2.83)	18.03 (3.31)	16.81 (2.56)	17.81 (2.92)	
't' - value	1.07 <sup>ns</sup>			2.10*			3.84 <sup>ns</sup>
Mean body type score	24.17 (2.17)	26.44 (3.09)	26.31 (2.91)	24.71 (2.04)	26.37 (1.96)	24.04 (2.10)	
't' - value	2.42*			2.62*			3.57*
Mean VO <sub>2</sub> scores	30.29 (3.08)	31.01 (4.58)	31.01 (4.58)	31.60 (3.96)	33.48 (5.22)	32.28 (4.81)	
't' - value	1.48 <sup>ns</sup>			2.32*			1.47 <sup>ns</sup>

Note: Figures in parenthesis indicate standard deviation

## **4.5 Physical fitness of selected rural and urban respondents**

### **4.5.1 Heart rate responses during step test ergometer exercise**

Details of heart rate of selected rural and urban respondents during step test ergometer exercise are presented in table 17.

The average resting heart rate of the rural women was found to be 87.56 beats/min, average exercise heart rate was found to be 135.62 beats/min, and during recovery the average heart rate was found to be 98.48 beats/min. The average resting heart rate of the rural working category was found to be 86.93 beats/min with an average heart rate during exercise was 135.62 beats/min and during recovery the average heart rate was 94.44 beats/min beats per minute. The average heart rate of the rural non working category observed during rest was 86.93 beats/min, during exercise it was 135.62 beats/min and during recovery it was found to be 94.44 beats/min.

A glance in to the table 16 revealed that average resting heart rate of the urban women was found to be 87.54 beats/min with the average heart rate during exercise was 134.84 beats/min and the average heart rate during recovery was found to be 97.64 beats/min. The average resting heart rate of the urban working category was found to be 87.24 beats/min followed by average heart rate during exercise was 136.05 beats/min and the average heart rate during recovery was found to be 96.97 beats/min. Similarly the average resting heart rate of the urban working category the was found to be 86.09 beats/min, average exercise heart rate during exercise was 136.09 beats/min and during recovery it was found to be 96.46 beats/min.

### **4.5.2 Physical fitness index**

Details of physical fitness index of selected rural and urban respondents shown in table 18.

Step test ergometer exercise was administered to analyze the physical fitness of the selected rural and urban women. This revealed that equal percentage of the rural respondents (33.33%) belonged to high average and low average physical fitness level followed by good physical fitness level (26.67%) and poor (6.67%) physical fitness level. None of the respondents were in very good or excellent category of physical fitness Index. Majority of the rural working women (53.33%) belonged to good physical fitness level followed by high

**Table 17: Details of heart rate of selected rural and urban respondents during step test ergometer exercise**

**N=60**

Heart rate	Rural Women			Urban Women		
	Working n=30	Non Working n=30	Total n=60	Working n=30	Non Working n=30	Total n=60
Average resting heart rate for five minuets (beats/minuet)	88.19 (±0.74)	86.93 (±0.64)	87.56 (±0.84)	87.24 (±0.34)	86.09 (±0.45)	87.54 (±0.62)
Average exercise heart rate for three minuets (beats/minuet)	134.41 (±0.24)	135.62 (±0.38)	135.62 (±0.46)	136.05 (±0.64)	136.09 (±0.68)	134.84 (±0.72)
Average recovery heart rate for five minuets (beats/minuet)	94.44 (±0.64)	98.90 (±0.68)	98.48 (±0.66)	96.97 (±0.49)	98.46 (±0.56)	97.64 (±0.72)

Note: Figures in parenthesis indicate standard deviation  
 Figures in parenthesis indicate standard deviation

Table 18: Physical fitness index of selected rural and urban respondents

N=60

Physical fitness index	Rural Women			Urban Women			't'-value
	Working n=15 Frequency (%)	Non Working n=15 Frequency (%)	Total n=30 Frequency (%)	Working n=15 Frequency (%)	Non Working n=15 Frequency (%)	Total n=30 Frequency (%)	
Poor (< 80)	2 (13.33)	0 (0.00)	2 (6.67)	2 (13.33)	0 (0.00)	2 (6.67)	
Low average (81-100)	2 (13.33)	8 (53.33)	10 (33.33)	7 (46.67)	9 (60.00)	16 (53.33)	
High average (101-115)	3 (20.00)	7 (46.67)	10 (33.33)	3 (20.00)	5 (33.33)	8 (26.67)	
Good (116-135)	8 (53.33)	0 (0.00)	8 (26.67)	3 (20.00)	1 (6.67)	4 (13.33)	
Mean physical fitness index Scores (S.D)	100.51 (16.24)	109.20 (9.84)	102.26 (13.55)	104.09 (16.82)	99.84 (9.06)	96.96 (13.57)	
't'- value	3.32 **			3.25 **			3.79 **

Note: Figures in parenthesis indicate percentage

None of the respondents were in very good and excellent category of physical fitness index

average level (20.00%), and 13.33 per cent each belonged to low average and poor physical fitness levels. None of the respondents were in very good and excellent category of physical fitness Index. Whereas among the rural non working women 53.33 per cent belonged to low average physical fitness level, followed by 46.67 per cent belonged to high average physical fitness level. None of the respondents were in any other physical fitness category.

Majority of the urban respondents (53.33%) belonged to low average physical fitness level followed by High average (26.67%), good (13.33%) and poor (6.67%) physical fitness level as depicted in table 18. None of the respondents were either in very good or excellent category of physical fitness Index. Similarly majority of the urban working women (46.67 %) belonged to low average physical fitness level followed by 20.00 percentages belonged to high average and good fitness level and 13.33 per cent belonged to poor physical fitness level. None of the respondents were in very good and excellent category of physical fitness Index. Where as majority of the urban non working women (60.00%) belonged to low average physical fitness level followed by 33.33 percentage belonged to high average physical fitness level. Only 6.66 per cent belonged to good physical fitness level. None of the respondents were either poor or very good or excellent category of physical fitness Index.

#### **4.5.3 Perceived exertion of step test exercise**

Details of Perceived exertion of step test exercise by the selected rural and urban respondents are showed in table 19.

It was clear from the table that majority of the rural women (36.67%) perceived the exercise as heavy followed by 23.33 per cent of the women felt it as moderate exertion, and 20.00 per cent of the rural women had felt it was very heavy exertion. About 16.67 per cent women perceived the exercise as light exertion and 3.33 per cent felt it was very light exertion. Majority of the rural working women (46.67 %) perceived the step test exercise as felt heavy exertion. followed by 26.67 per cent feeling it as very heavy exertion, 13.33 per cent of women had felt it as light exertion. Very less percentage of working women (6.67 %) each felt the exercise as very light and moderate exertion. Whereas majority of (40 %) the rural non working women perceived the exercise as moderate exertion. While 26.67 per cent of the non working women felt heavy exertion followed by 13.33 percentages felt it was very heavy exertion.

Table 19: Perceived exertion by the selected rural and urban respondents

N=60

Perceived exertion Scores	Rural Women			Urban Women		
	Working n=15 Frequency (%)	Non Working n=15 Frequency (%)	Total n=30 Frequency (%)	Working n=15 Frequency (%)	Non Working n=15 Frequency (%)	Total n=30 Frequency (%)
Very light	1 (6.67)	0 (0.00)	1(3.33)	2 (13.33)	1 (6.67)	3 (10.00)
Light	2 (13.33)	3 (20.00)	5 (16.67)	3 (20.00)	3 (20.00)	6 (20.00)
Moderate	1 (6.67)	6 (40.00)	7 (23.33)	1 (6.67)	5 (33.33)	6 (20.00)
Heavy	7 (46.67)	4 (26.67)	11 (36.67)	7 (46.67)	5 (33.33)	12 (40.00)
Very heavy	4 (26.67)	2 (13.33)	6 (20.00)	2 (13.33)	1(6.67)	3 (10.00)

Note: Figures in parenthesis indicate percentage  
Five point rating scale given by Verghese *et al.* (1994)

Majority of the urban women 40 per cent had felt heavy exertion doing step test exercise, while equal per cent (20 %) of the women had felt it as light and moderate exertion followed by 10 per cent very heavy and very light exertion while doing step test exercise. Majority of the urban working women (46.67 %) had felt heavy exertion, followed by 20.00 per cent of the women feeling it as light exertion, 13.33 per cent each as of very light and very heavy exertion. Equal percentage of 33.33 per cent urban non working had felt moderate and heavy exertion. While 20.00 per cent of the women had light exertion followed by 6.67 per cent each was feeling very heavy and very light exertion as shown in table 19.

#### **4.6 Correlation between physical fitness with other physical and physiological parameters of selected rural and urban women**

##### **4.6.1 Correlation between physical fitness index and physical and physiological parameters**

The relationship between the physical fitness index and physical and physiological parameters is presented in table 20.

Among rural women the physical fitness showed negatively significant relationship with age and weight of the respondents at 0.01 per cent and 0.05 percent level respectively among the physical parameters. A glance in to the physiological parameter depicted a positive and highly significant relationship between physical fitness index and body mass index and aerobic capacity. Where as negatively significant relationship observed between percent fat at 0.05 percent level among the rural women. Similar trends were observed with respect to urban respondents also. Irrespective of the locality the total respondents data also depicted similar trend as far as the relationship between the physical fitness index and the physical and physiological parameters as shown in table 20.

##### **4.6.2 Correlation between physical fitness index and number of pregnancies women had**

Table 21 depicts the relationship between physical fitness index and number of pregnancies women had.

Negative and significant correlation was observed between the physical fitness index and number of pregnancies at 3<sup>rd</sup> and 4<sup>th</sup> and 5<sup>th</sup> pregnancy levels irrespective of locality as well as the rural and urban respondents. Increase in number of pregnancies significant reduction in the physical fitness index scores is observed in table 21.

**Table 20: Relationship between physical and physiological parameters and physical fitness index scores**

**N=60**

Physical and physiological	Physical fitness index scores		
	Rural women n=30	Urban women n=30	Total n=60
<b>Physical parameters</b>			
Age	-0.710**	-0.640**	-0.652**
height	0.251 <sup>NS</sup>	0.282 <sup>NS</sup>	0.293 <sup>NS</sup>
Weight	-0.55*	-0.480*	-0.590*
<b>Physiological parameters</b>			
Blood pressure	0.102 <sup>NS</sup>	0.154 <sup>NS</sup>	0.187 <sup>NS</sup>
Pulse rate	0.158 <sup>NS</sup>	0.157 <sup>NS</sup>	0.123 <sup>NS</sup>
Body temperature	0.2.19 <sup>NS</sup>	0.259 <sup>NS</sup>	0.256 <sup>NS</sup>
BMI	0.660**	0.681**	0.641**
per cent fat	-0.680*	-0.641**	-0.620**
Body density	-0.451 <sup>NS</sup>	-0.482 <sup>NS</sup>	-0.462 <sup>NS</sup>
Body type	0.254 <sup>NS</sup>	0.214 <sup>NS</sup>	0.271 <sup>NS</sup>
VO <sub>2</sub> Max	0.786**	0.84**	0.745*

Note: \*\* Correlation significant at 0.01 level

\* Correlation significant at 0.05 level

**Table 21: Relationship between physical fitness index and number of pregnancies women had**

**N=60**

Number of Pregnancies	Physical fitness index scores		
	Rural women n=30 r - Values	Urban women n=30 r - Values	Total n=60 r – Values
0	0.057 <sup>NS</sup>	0.188 <sup>NS</sup>	0.064 <sup>NS</sup>
1	0.124 <sup>NS</sup>	0.164 <sup>NS</sup>	0.158 <sup>NS</sup>
2	0.240 <sup>NS</sup>	0.358 <sup>NS</sup>	0.345 <sup>NS</sup>
3	-0.699*	-0.660*	-0.657*
4	-0.655*	-0.675*	-0.684*
5	-0.578*	-0.544*	-0.587*

Note: \*\* Correlation significant at 0.01 level

\* Correlation significant at 0.05 level

#### 4.6.3 Correlation between physical fitness index and life style factors

The relationship between physical fitness index and life style factors is depicted in table 22.

Vegetarian rural women have shown highly significant positive correlation with the physical fitness index. Vegetarian in urban women have shown significant positive correlation with the physical fitness index. Similar trend was observed between physical fitness index and vegetarians were significant at 0.05 percent level irrespective of the locality.

As far as frequency of doing exercise was concerned the data depicts highly significant positive correlation between the physical fitness index scores and all three groups of the respondents *viz* , rural, urban and both rural and urban together.

Similarly among the types of exercises performed by the selected women, the relationship between walking exercise and physical fitness index scores significant at 0.01 level among all three groups of respondents doing walking. Whereas the relationship of physical fitness index scores with the respondents performing yoga exercise was observed to be significant 0.05 per cent level in all three groups as shown in table 22.

Among time spend for doing exercise the relation between physical fitness index scores and women doing exercise for 30 minutes was highly significant in all three groups. But doing exercise for 20 minutes was significant at 0.05 per cent level with physical fitness index scores among all three groups of respondents *viz*, rural and urban and total sample.

With regard to participation of women in sports during their life time, the physical fitness index scores were positively and significantly related to participation in sports at 0.01 per cent level among rural women and total significant at 0.05 per cent level among urban women as presented in table 22.

Table 22: Relationship between physical fitness index and life style factors

N=60

Sl. No	Life style factors	Physical fitness index scores		
		Rural women n=30 r – Values	Urban women n=30 r - Values	Total n=60 r – Values
<b>a.</b>	<b>Food Intake</b>			
1	Vegetarian	0.897**	0.785*	0.887**
2	Non- vegetarian	0.774 <sup>NS</sup>	0.647 <sup>NS</sup>	0.784 <sup>NS</sup>
3	Eggtarian	0.215 <sup>NS</sup>	0.354 <sup>NS</sup>	0.269 <sup>NS</sup>
<b>b.</b>	<b>Frequency of Doing Exercise</b>			
1	No exercise	0.468 <sup>NS</sup>	0.359 <sup>NS</sup>	0.347 <sup>NS</sup>
2	Daily	0.996**	0.985**	0.983**
3	Weekly	0.942**	0.963**	0.874**
4	Occasionally	0.257 <sup>NS</sup>	0.235 <sup>NS</sup>	0.249 <sup>NS</sup>
<b>c.</b>	<b>Type of Exercise</b>			
1	Walking	0.950**	0.876**	0.858**
2	Yoga	0.650*	0.544*	0.545*
3	Physical exercise	0.168 <sup>NS</sup>	0.246 <sup>NS</sup>	0.172 <sup>NS</sup>
4	Both walking and exercise or Walking, exercise and yoga	0.265 <sup>NS</sup>	0.269 <sup>NS</sup>	0.264 <sup>NS</sup>
<b>d.</b>	<b>Time Spent for Doing Exercise</b>			
1	10	0.289 <sup>NS</sup>	0.124 <sup>NS</sup>	0.188 <sup>NS</sup>
2	20	0.778*	0.745*	0.759*
3	30	0.977**	0.935**	0.985**
4	40	0.569 <sup>NS</sup>	0.679 <sup>NS</sup>	0.685 <sup>NS</sup>
5	50	0.256 <sup>NS</sup>	0.254 <sup>NS</sup>	0.299 <sup>NS</sup>
6	60	0.112 <sup>NS</sup>	0.120 <sup>NS</sup>	0.134 <sup>NS</sup>
<b>e.</b>	<b>Participation in Sports</b>			
1	Yes	0.965**	0.984*	0.964**
2	No	0.268 <sup>NS</sup>	0.134 <sup>NS</sup>	0.168 <sup>NS</sup>

Note: \*\* Correlation significant at 0.01 level

\* Correlation significant at 0.05 level

*Discussion*

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## **5. DISCUSSION**

In consistence with the objectives of the study, the results obtained under the study are discussed, interpreted and compared with related reviews and are presented in this chapter under the following headings.

5.1 Demographic profile and socio-economic status of the selected rural and urban women

5.2 Life style factors of the rural and urban women

5.3 Physical and physiological parameters of selected rural and urban women

5.4 Health status of rural and urban women

5.5 Physical fitness of rural and urban women

5.6 Relationship between physical fitness and physical and physiological parameters of selected rural and urban women

### **5.1 Demographic profile and socio-economic status of the selected rural and urban women**

With respect to age of the respondents it was concluded that majority of the women in all categories belonged more than 38 years age group. Among total rural women more than 80 percent of the respondents were married. Whereas in total urban sample more than 60 percent of the respondents were married. Reason behind highest percent of respondents being married was majority of them have crossed the age of marriage and in India due to cultural and traditional practices most the women get married by the age of 25 years. The data on education of selected respondents in rural areas showed that 30.00 per cent were educated up to P.U.C, whereas data on education of selected urban respondents showed that 36.67 per cent were graduates. The possible reason for less percentage of graduated in rural areas might be existing rural social environment might have not encouraged their parents to provide higher education. And in urban areas there are abundant educational facilities which made them to study till graduation in both the categories.

Among rural respondents it can be observed an equal percent of rural women (16.67%) were having income level ranging from Rs 2500 to Rs 4999 and Rs 5000 to Rs 9999 per month Among urban respondents it can be observed that majority of the women (16.67%)

per cent were having monthly income level ranging between Rs. 20000 to Rs. 49999 per month, The reason for less income among rural respondents might be since they were house wives or labour they yearn less than R.s 5000/- per month.

The overall socio economic status of the respondents, revealed that at highest percentage of rural respondents (66.67%) belonged to lower middle class socio economic status. Where as majority of urban respondents (63.33%) belonged to the upper middle class socio economic status. The possible reason might be because lower education and lack of interest for moving to other places for good occupation they were in lower socio economic status in rural areas. The employment opportunities are more in urban areas and higher in their socio economic status. In both the categories none of the respondents were in upper high class and very poor category of socio economic status. The study conducted by Viswanath and Bond (2007) who showed that the body of evidence linking socio-economic status with health outcomes is large and invariably suggests that higher socio-economic status levels are usually positively associated with health protective behaviours and negatively associated with health-impeding behaviours. And according to study conducted by Prasad *et al.* (2009) on socio-economic status, health and hygiene of rural women of Godda Distt, Jharkhand, showed that majority (58.00%) of them were belonging to young age 20 years to 34 years, followed by middle age 35years to 50years, and only 10.7 per cent were old age that is above 50years. With regard to to the education of respondents half of the respondents were illiterates (56.29%) followed by 31.35 per cent were had primary and secondary schooling 16.29 per cent were had high schooling or P.U.C and none of them were graduates. Observing the occupation of the respondents the majority (57.04%) of them were chosen agriculture as their main occupation, followed by 15.56 per cent were employed in government service, 14.82 per cent business, 10.37 per cent labour and less than 10.00 per cent were carpenters blacksmiths, gold smiths, painters, and barbers, and looking in the annual income of the respondents Majority (62.22%) of the respondents families had an monthly income above Rs.1500/-.

## **5.2 Life style factors of the rural and urban women**

It can be observed from the table 3 that majority of the women in both rural and urban areas were vegetarians. The possible reason might be the majority of the selected respondents belonged to Hindus and they have the vegetarian diet pattern in family. The results obtained by the present study was in line with Bhatnagar and Mahajani (2014) who showed that

maximum respondents were vegetarian (69.44%) in each income class. Remaining were non-vegetarian and eggitarian (26.11% and 4.45%, respectively) similarly Priyanka and Singh (2014) observed that out of total population of 629, maximum subjects *i.e.* around 44.67 per cent were observed as vegetarian, followed by 34.82 per cent were non vegetarians, only 20.51 per cent were eggitarian.

The time spent for sleeping by respondents irrespective of region was almost same *i.e.*, 7 ½ hours per day. whereas urban women spend more time for paid work *i.e.*, around 7 hours 22 minutes compared to rural women who spend around 6 ½ hours for paid work. for other house hold activities both rural and urban women spent around 4 hours 15 minutes which was all most same. For cooking rural women spent around 3 hours 8 minutes but in urban women spend around 3 ½ hours. And for personal activities both rural and urban women spent around 2 ½ hours. Similar studies conducted by Borah and Kalita (2011) who analyzed the daily activities performed by the women revealed that the activities like cooking, after cooking, serving food, sweeping, fetching water, washing of vessels, child care and personal care activities were performed daily by all the land holding categories. Weekly performed activities were dusting and mopping. Occasional and leisure time activities such as marketing, care of sick/elder person, pounding of rice for food preparation and weaving were performed ‘monthly’ or ‘seasonally’ (as revealed by 85.67, 58.82, 42.67 and 82.47 percent respondents respectively) depending on their requirement.

More than half of the rural and urban respondents (55.00 % and 41.67%) did not do any exercise at all. The reason for not doing for exercise might be they were not aware about health benefits of exercise, non-availability of proper facilities for exercising in villages. Where as in urban areas they did not do exercise due to lack of time, heavy work load at homes and at work place. Among women who do exercise, type of exercise they preferred to do both in rural and urban areas was walking, 21.67 per cent 23.33 percentage of the women preferred to do walking. This may be because women felt walking is the easiest exercise with more health benefits.

Regarding time spent for doing exercise maximum percentage of women in both rural and urban areas spend 20 minutes and very meager percentage of women had participated in sporting activities in school or college periods. Similar studies conducted by (Allson *et al.* 1993) states that regular and proper exercising strengthens people’s figures and body

functions and improves people's quality of working efficiency and recreation at the same time Furthermore the exercise physicists (Hsich, 1999) Also evidenced that steady and well planned exercise can improve and prevent hyperkinetic disease

### 5.3 Physical and physiological parameters of selected rural and urban respondents

The mean age of the rural women was 35. 23 years, with mean height of 159.98 cms and the mean weight of 57.57 kgs. The mean age of the urban women was 33. 55 years with a mean height of 160.35 cms and the mean weight of 56.95 kgs. Similar observation are made by Jyotsna *et al.* (2005) who conducted a study on ergonomic evaluation of the rural women while performing wheat harvesting activity. The results revealed that mean age of the respondents was 32 years with the mean height was 158.6 cm with mean weight of 48 kg. Similarly Hasalkar *et al.* (2010) revealed that mean age of the rural respondents was 35 years and the mean height was 152.2cm with mean weight of 48.70 kg in their studies on "Physiological indices and physical performance capacity of farm women"

An observation in to the table 7 reveals a significant difference in age of the rural and urban sample at 0.05 per cent level because the mean age of both rural and urban respondents varied. The difference in height and weight of the rural and urban sample was non significant may be because the population chosen for the study were from nearby areas *ie* from Dharwad city and adjacent villages so the comparison of the results between rural and urban categories did not show any significant difference in all three physical parameters.

The mean blood pressure among rural women was observed to be 120.73/80.00 mm/hg with the pulse rate of 80.73beats/min. And the mean body temperature was 96.98°. The average grip strength of right and left hand of the respondents was 14.30 kg and 13.87 kg respectively. Where as the mean blood pressure was among urban women revealed that 119.38/80.30 mm/hg with the pulse rate of 81.11 beats/min. And the mean body temperature of 96.78° F. The mean grip strength of right and left hand of the respondents was 13.89 kg and 13.76 kg respectively.

Because care was taken to select the sample for the study who were of healthy, non-pregnant, non-lactating and without any cardio vascular complaints. Similar results were found by Preethi *et al.* (2010) who reported that the mean blood pressure of the women were found to be normal *i.e.* 101.92/88.17mm/Hg.

Significant difference was not observed between the rural and urban women in any of the physiological parameters as shown in table 8.

Thirty percent of the respondents had four pregnancies in rural women and 28.33 per cent of the respondents had three pregnancies in urban areas. Because of they were less aware about the family planning programmes.

#### **5.4 Health status of rural and urban women**

Among rural women majority (28.33%) were belonged to low weight normal category of body mass index category. This may be because of vegetarian diet habit, and they did not do exercise daily. Equal percentage of the urban women (23.33%) belonged to low weight normal range and normal range of body mass index. Slight variation can be seen in urban category when compared with rural category in body mass index may be because of those who do exercise daily in urban category were more when compared with rural category and over all socio economic statue was also more in urban category when compared with rural category. The results of the present study was not in accordance with study conducted by Hasalkar et al. (2010) results on body mass index data of the sample depicted that maximum percentage of (43.33%) of the women were in the normal body mass index range followed by low weight normal range. None of them belonged to CED grade III- Severe and obese grade II range because the age group chosen by the Hasalkar et al. (2010) was of younger age group when compared with the present study.

Among rural women the mean fat weight was found to be 11.19 kg, with the lean body mass 45.91 kg. The mean fat percentage of 19.35 and the body density was found to be 1.05. Among the urban women the mean fat weight was found to be 11.86 kg, with the lean body mass of 45.09 kg. The mean fat percentage of 20.65 and the body density was found to be 1.05. As per the standards given by world health organization irrespective of any categories of women selected for the study were having fat percentage more than the essential fat range of 10-13 percent. The studies conducted by Passmore and Eastwood (1979) found that women have larger body fat mass and lower lean body mass in comparison to men at entry to adulthood. Changes in body composition occur over time. Average body fat increases with age. Average body fat for young man is considered to be about 15 per cent and 18-23 per cent for young women. As age increases, the amount of muscle tends to drop, and fat accounts for a greater percentage of weight. The results obtained in the present study were in coherence with the studies conducted by Hasalkar *et al.* (2010). Whose data on body composition revealed that mean body density was 1.05, the mean per cent fat 21.13 with the fat weigh of 12.35 kg. And the lean body mass was found to be 39.73 kg. And also with the studies

conducted by the Borah *et al.*, (2014) revealed that the lean body mass of women was found to be 29.60 kg and fat percentage (19.61%) respectively.

In both the categories majority of the respondents (60% and 70%) fell in the mesomorph body type. Because majority of the respondents in both rural and urban are of middle age group and they had maximum of 3 to 4 pregnancies and also fall in essential fat per cent category of standards given by world health organization. The present findings were in not accordance with the studies conducted by the Hasalkar *et al.* (2010) who observed that equal percentage of the women was having ectomorph and endomorph body type that is (43.33%) followed by (13.34%) having mesomorph body type. And also with the studies conducted by because the age group chosen by the Hasalkar *et al.* (2010) was younger age adults when compared with the present study.

It is clear from the table 14 that majority of the rural women (50.00%) had high average aerobic capacity similarly among urban women the majority of the urban women (58.33%) were in good aerobic capacity. Similar results were also found by Hasalkar *et al.* (2010) who revealed that the majority of (53.33%) women were in good fitness range followed by 30.00 per cent falling in the high average range And Umrikar *et al.* (2010) also found that the maximum women (58.00%) have high average category, followed by 25.00 per cent of the women have good category of aerobic capacity

Application of Karl Pearson's correlation test revealed a highly significant negative relationship between the age and aerobic capacity ( $VO_2$  Max) because as the age increases the consumption of oxygen level per minute decreases. There was significant positive relationship between age and the weight of the respondents irrespective of the groups, because as the age increases there will be increase in weight of the person. Weight of the respondents showed highly significant positive relationship with the body mass index. As the weight of the respondents increases there will be increase in body mass index. Highly significant negative relationship is observed between the weight of the respondents and body density and aerobic capacity ( $VO_2$  Max) of the selected respondents.

Both the fat percentage in the body and the aerobic capacity ( $VO_2$  Max) showed highly significant positive relationship with the body mass index. Whereas highly significant negative relationship is observed between body mass index and the body density. Similarly there was a highly significant negative relationship between body density and per cent fat of

the selected respondents. Similarly negatively significant relationship was observed at 0.05 per cent level between per cent fat and aerobic capacity of the selected respondents.

Significant difference between the rural and urban respondents in the body type parameter was observed. A significant difference in all three parameters viz. Body Mass Index, body type and aerobic capacity at 0.05 per cent level between the urban working and non working women selected for the study.

### **5.5 Physical fitness of rural and urban women**

The average resting heart rate of the rural women was found to be 87.56 beats/min, average exercise heart rate was found to be 135.62 beats/min, and during recovery the average heart rate was found to be 98.48 beats/min. Average resting heart rate of the urban women was found to be 87.54 beats/min with the average heart rate during exercise was 134.84 beats/min and the average heart rate during recovery was found to be 97.64 beats/min. Similar observation were made in study conducted by Khambhati and Patel (2015) who revealed that the average resting heart rate of the rural women was found to be 87.56 beats/min. The average exercise heart rate was found to be 134.62 beats/min, and during recovery the average heart rate was found to be 94.48 beats/min.

Step test ergometer exercise was administered to analyze the physical fitness of the selected rural and urban women. This revealed that equal percentage of the rural respondents (33.33%) belonged to high average and low average physical fitness level. Among urban respondents majority of the (53.33%) belonged to low average physical fitness level. The results of the present study was in line with the studies conducted by Jyotsna *et al.*, (2005) who the results revealed that maximum number of respondents falls under the category of high average (60%). and Ranjwan and Zend (2007) conducted a study on health Status of women employed in unorganized and self-employed sector the results found that physical fitness of the majority of subjects was low average in all occupational groups.

It was clear from the table 19 that majority of the rural and urban women (36.67% and 40.00% respectively) perceived the exercise as heavy activity. The present study was in line with the study conducted by Borah *et al* (2009) who revealed that in both the age groups which indicated that higher the heart rate higher was the respondents experiencing exertion. It was observed that heart rate and energy expenditure is highly co-related with perceived exertion of the respondents.

## 5.6 Relationship between physical fitness and the physical and physiological parameters of selected rural and urban women

Among rural women the physical fitness showed negatively significant relationship with age and weight of the respondents at 0.01 per cent and 0.05 percent level respectively as shown in the table 20 A glance in to the physiological parameter depicted a positive and highly significant relationship between physical fitness index and body mass index and aerobic capacity. Where as negatively significant relationship was observed between percent fat and physical fitness at 0.05 percent level among the rural women. Similar trends was observed with respect to urban respondents also.

Negative and significant correlation was observed between the physical fitness index and number of pregnancies at 3<sup>rd</sup> and 4<sup>th</sup> and 5<sup>th</sup> pregnancy levels irrespective of locality as well as the rural and urban respondents is observed in table 22. Increase in number of pregnancies significant reduction in the physical fitness index scores

Irrespective of locality vegetarian rural and urban women showed highly significant positive correlation with the physical fitness index.

As far as frequency of doing exercise was concerned the data depicts highly significant positive correlation between the physical fitness index scores and all three groups of the respondents *viz.*, rural, urban and both rural and urban together.

The relationship between walking exercise and physical fitness index scores was significant at 0.01 level among all three groups of respondents doing walking. Where as the relationship of physical fitness index scores with the respondents performing yoga exercise was observed to be significant 0.05 per cent level in all three groups as shown in table -22

Among time spend for doing exercise the relation between physical fitness index scores and women doing exercise for 30 minutes was highly significant in all three groups. But doing exercise for 20 minutes was significant at 0.05 per cent level with physical fitness index scores among all three groups of respondents *viz.*, rural and urban and total sample.

With regard to participation of women in sports during their life time, the physical fitness index scores were positively and significantly related to participation in sports at 0.01 per cent level among rural women and total significant at 0.05 per cent level among urban women as presented in table 22.

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*Summary and  
Conclusions*

## 6. SUMMARY AND CONCLUSIONS

Physical fitness is the state of body in which a person can do work for a longer duration effectively and efficiently, without undue fatigue. Good health provides sound and solid foundation on which fitness rests and at the same time fitness provides one of the most important key to health and living one's life to fullest.

Physical fitness of women is considered as an essential element for understanding her endurance and sustainability of managing the work loads of different activities. The expert committee of the World Health Organization (1981) described physical fitness as “the ability to undertake muscular work satisfactorily.” Physical fitness is the capacity to withstand various forms of physical activities reasonably well, without being unduly tired and is a measure of individual's health and well-being. The relationship between physical activity and fitness was established by Boucher and Shepherd 1994. Every person has a different level of physical fitness which may change with time, place of work, situation and there is also an interaction between the daily activities, and the fitness of an individual. From the physiological point of view physical fitness may said to be ability of the body to adopt and recover from strenuous exercise studies on physical fitness was limited to only sports category fitness of general population, particularly on women was neglected field hence this study was chosen to assess the physical fitness of rural and urban women.

The present research study entitled ‘Physical fitness of rural and urban women’ was conducted with the following objectives.

### **Objectives taken for the study are:**

1. To assess the socio economic status of selected rural and urban women.
2. To analyze the physical and physiological parameters of fitness among rural and urban women.
3. To assess the physical fitness of the selected rural and urban women by using step test ergometer.

The present study was conducted during the year 2016-2017, in rural and urban areas Dharwad district. Exploratory and experimental research design was used for the investigation. Purposive random sampling technique was used to select the sample. self structured interview schedule was formulated to collect general information of all the

respondents. The socio economic status was assessed by using O.P Agarwal scale (2005). The physical and physiological parameters were assessed by using various equipments such as anthropometric rod, weighing balance and skin fold callipers, grip dynamometer, digital blood pressure apparatus, and clinical thermometer respectively. Sub sample of 60 co-operative and willing women from the total sample of 120 were selected to assess the physical fitness by using step test ergometer. Care was taken to select the 30 women from each category of the total sample from rural and urban areas who were healthy, non pregnant, non lactating, and without any cardio vascular diseases. Pre - testing was done to check the reliability of the schedule developed for the study. Data was collected by personal interview method and it was coded, tabulated and interpreted using suitable statistical parameters. The summary of the findings are presented below.

#### **Demographic profile and socio-economic status of the selected rural and urban women**

- With respect to age of the respondents it was concluded that majority of the women in all categories belonged more than 38 years age group.
- Educations of selected respondents in rural areas showed that majority of 30.00 per cent were educated up to P.U.C, whereas 36.67 per cent urban respondents were graduates.
- Among rural respondents it can be observed an equal percent of rural women (16.67%) were having income level ranging from Rs 2500 to Rs 4999 and Rs 5000 to Rs 9999 per month Among urban respondents observed that majority of the women (16.67%) per cent were having monthly income level ranging between Rs. 20000 to Rs. 49999 per month.
- The socio economic status of the respondents as per Agarwal scale (2005) revealed that at highest percentage of rural respondents (66.67%) belonged to lower middle class socio economic status category and majority of urban respondents (63.33%) belonged to the upper middle class socio economic status category.

#### **Life style factors of the rural and urban women**

- The majority of the women in both rural and urban areas were vegetarians.
- The time spent for sleeping among rural working and non working was all most same i.e., 7½ hours, among rural working women spend 6 ½ hours for paid work, since they

were non working they do not spend time for paid work. Time spent for household activities spend about 4 hours among both the categories. among rural working category time spend for rest and recreation was only one hour one hour where as rural non working women spend about 5 hours similar trend was observed in urban working and non working categories.

- More than half of the rural and urban respondents (55.00 % and 41.67%) did not do any exercise at all.
- Among women who did exercise, walking was preferred by women in both rural and urban areas.

### **Physical and physiological parameters of selected rural and urban respondents**

- The mean age of the rural women was 35. 23 years, with mean height of 159.98 cms and the mean weight of 57.57 kgs. The mean age of the urban women was 33. 55 years with a mean height of 160.35 cms and the mean weight of 56.95 kgs.
- The mean blood pressure among rural women was observed to be 120.73/80.00 mm/hg with the pulse rate of 80.73beats/min. And the mean body temperature was 96.98°c.
- The average grip strength of right and left hand of the respondents was 14.30 kg and 13.87 kg respectively. Where as the mean blood pressure was among urban women revealed that 119.38/80.30 mm/hg with the pulse rate of 81.11 beats/min. And the mean body temperature of 96.78° F. The mean grip strength of right and left hand of the respondents was 13.89 kg and 13.76 kg respectively.
- Thirty percent of the respondents had four pregnancies in rural women and 28.33 per cent of the respondents had three pregnancies in urban areas.

### **Health status of rural and urban women**

- Majority of the rural women (28.33%) belonged to low weight normal category of body mass index category. Equal percentage of the urban women (23.33%) belonged to low weight normal range and normal range of body mass index.
- The mean fat weight of rural women was found to be 11.19 kg, with the lean body mass 45.91 kg. The mean fat percentage was 19.35 and the body density was found to

be 1.05. Among the urban women the mean fat weight was found to be 11.86 kg, with the lean body mass of 45.09 kg. The mean fat percentage of 20.65 and the body density was found to be 1.05.

- In both rural and urban categories majority of the respondents (60% and 70%) fell in the mesomorph body type.
- Majority of the rural women (50.00%) had high average aerobic capacity. whereas among urban women the majority of the urban women (58.33%) were in good aerobic capacity.
- Application of Karl Pearson's correlation test revealed a highly significant negative relationship between the age and aerobic capacity (VO<sub>2</sub> Max). There was significant positive relationship between age and the weight of the respondents irrespective of the groups was observed.
- Weight of the respondents showed highly significant positive relationship with the body mass index.
- Highly significant negative relationship is observed between the weight of the respondents and body density and aerobic capacity (VO<sub>2</sub> Max) of the selected respondents.
- A significant difference between the rural and urban respondents in the body type parameter as per the student 't' test.

#### **Physical fitness of rural and urban women**

- The average resting heart rate of the rural women was found to be 87.56 beats/min, average exercise heart rate was found to be 135.62 beats/min, and during recovery the average heart rate was found to be 98.48 beats/min. Average resting heart rate of the urban women was found to be 87.54 beats/min with the average heart rate during exercise was 134.84 beats/min and the average heart rate during recovery was found to be 97.64 beats/min.
- The step test ergometer exercise showed that equal percentage of the rural respondents (33.33%) belonged to high average and low average physical fitness level. Among urban respondents majority of the (53.33%) belonged to low average physical fitness level.

- Both rural and urban women (36.67% and 40 % respectively) perceived the exercise as heavy activity.

**Relationship between physical fitness with other physical and physiological parameters of selected rural and urban women**

- The physical fitness showed negatively significant relationship with age and weight of the respondents at 0.01 per cent and 0.05 percent level respectively among the rural women.
- The physiological parameter depicted a positive and highly significant relationship between physical fitness index and body mass index & aerobic capacity.
- Negatively significant relationship observed between percent fat at 0.05 percent level among the rural women. Similar trends was observed with respect to urban respondents also.
- Irrespective of the locality the total respondents data also depicted similar trend as far as the relationship between the physical fitness index and the physical and physiological parameters
- Relationship between physical fitness index and number of pregnancies showed negative and significant correlation. At 3<sup>rd</sup> and 4<sup>th</sup> and 5<sup>th</sup> pregnancy levels irrespective of locality of the urban respondents.
- The relationship between physical fitness index and life style factors is depicted that Vegetarian rural women have shown highly significant positive correlation with the physical fitness index. Vegetarian in urban women have shown significant positive correlation with the physical fitness index at 0.05 level. Irrespective of the locality similar trend was observed between physical fitness index and vegetarians were significant at 0.05 percent level.
- Among the types of exercises performed by the selected women, the relationship between walking exercise and physical fitness index scores showed significant co relation at 0.01 level among all three groups of respondents. Where as the relationship of physical fitness index scores with the respondents performing yoga exercise was observed to be significant 0.05 per cent level in all three groups.

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# *Appendices*

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## APPENDIX I

### ‘PHYSICAL FITNESS OF RURAL AND URBAN WOMEN’

#### INTERVIEW SCHEDULE

#### PART - I

#### GENERAL INFORMATION

Schedule No: \_\_\_\_\_

Date: \_\_\_\_\_

**1. Place:**

**2. Name of the women:**

**3. Address:** - \_\_\_\_\_  
 \_\_\_\_\_

**4. Phone number:** - \_\_\_\_\_

**5. Age:** - \_\_\_\_\_

**6. Ordinal position:** - \_\_\_\_\_

**7. Religion:**      a) Hindu              b) Muslim              c) Christine          d) Jain

**8. Caste:**            a) SC                      b) ST                      c) OBC                  d) other \_\_\_\_\_

**9. Marital Status:** a) Married              b) Unmarried          c) Single              d) Widow  
    e) Divorced

**10. Type of Family:** a) Nuclear          b) Joint                  c) Extended

**11. Head of the Family:** \_\_\_\_\_

**12. Occupation of the Family:** a) Main Occupation: \_\_\_\_\_

b) Subsidiary occupation: \_\_\_\_\_

**13. Family composition:**

Sl.No.	Name	Age	Relation with others	Education	Occupation	Income

**14. Family possessions:**

Refrigerator / TV / (Radio/Transistor/Music system)/ AC /Washing Machine/Telephone /Mobile /Credit Card/ Sanitary lat /any newspapers

**15. Type of house:**

- a. Own house/rented
- b. No. of rooms ( 5/3-4/1-2)
- c. Own juggi/ Rented juggi /Govt plots
- d. No place to live, pavement, mobile cart

**16. Possessions of vehicle in the family and number:**

Car/ 2 wheeler/ tractor

**17. Facility of water/ electricity:** Yes / No

- a. Both tap water supply and electricity
- b. Only one present. Electricity/water

**18. How many servants are being employed at home?**

Full time/part time (vessels/ sweeping/water/clothes/cooking)

**19. Has any family member(s) gone abroad in last three years?****20. Possession of agriculture land for cultivation?**

\_\_\_\_\_acres (Dry/Irrigated/garden) \_\_\_\_\_

**21. Parental non movable property? \_\_\_\_\_ Acres / house****22. Possession of non agricultural land/land for housing or other type of land site (no. & size)****23. Number of milch animals in the family:** Yes/ No Buffalo / cow/ goat**24. Presence of possessions (house, shed, shop etc.) other than the living house****25. Number of pet animals in the family:****26. Position held by any of the member in the family in social organization:**

(Membership in Panchayats Gram /Taluk/ Zillap)

**II. SPECIFIC INFORMATION****PART- II**

(Life style factors and Daily activity schedule of the respondents)

**1. Type of food you take**

- a) Vegetarian
- b) Non vegetarian
- c) Eggitarian

**2. Daily activity schedule:**

Timings	Activities
5am – 6am	
6am – 7am	
7am – 8am	
7am – 9am	
9am – 10 am	
10am – 11am	

Timings	Activities
11am – 12pm	
12pm -1pm	
1pm – 2pm	
2pm -3pm	
4pm - 5 pm	
6pm - 7pm	
8pm - 9pm	
10 pm -11 pm	

**3. Do you exercise daily?**

Yes/no

**4. Frequency of doing exercise**

a) Daily            b) Weakly            c) Occasionally

**5. What type exercises you do**

a) Walking            b) Yoga            c) Physical exercise    d) Both walking and exercise or  
Walking, exercise and yoga    e) any other \_\_\_\_\_

**6. How many hours do you spend for exercise: -**

a) 10 minutes    b) 20minutes    c) 30 minutes    d) 40minutes    e) 50minutes    f) 1hour

**7. Have you participated in sports? Yes /no**

If yes, where did you participate: -

a) School    b) College    c) Both school and college

**PART- III**

(Physical, physiological parameters and number of pregnancies, of the respondents)

**1. Physical parameters:**

**I. Anthropometric details:**

1. Height: \_\_\_\_\_ 2. Weight \_\_\_\_\_

**II. Skin fold calipers details:**

Area of body	Measurements(mm)			
	Rearing-1	Reading -2	Reading -3	Average
Biceps				
Triceps				
Sub scapular				
Super –iliac				

**PART-IV**

(Step test exercise details)

**4. Step test exercise details:**

1. Rest time \_\_\_\_\_
2. Exercise start time \_\_\_\_\_
3. Exercise completing time \_\_\_\_\_
4. Recovery Time \_\_\_\_\_
5. Body temperature before exercise \_\_\_\_\_
6. Body temperature after exercise \_\_\_\_\_

<b>Resting heart beat rate</b>	<b>Minutes</b>	<b>Readings</b>
	1	
	2	
	3	
	4	
	5	
<b>Heart beat rate during exercise</b>	1	
	2	
	3	
	4	
	5	
<b>Recovery heart beat rate</b>	1	
	2	
	3	
	4	
	5	

**Rate of Perceived exertion****7. How do you feel the exercise was**

- a) Very light    b) Light    c) Moderate    d) Heavy    f)Very heavy

# **PHYSICAL FITNESS OF RURAL AND URBAN WOMEN**

**CHANNAMSETTY MAHA LAKSHMI 2017**

**Dr. SUMA HASALKAR  
MAJOR ADVISOR**

## **ABSTRACT**

A study on physical fitness of rural and urban women is conducted during the year 2016-17 with the objective to assess the socio-economic status, to analyze the physical and physiological parameters and to assess the physical fitness of the selected rural and urban women by using step test ergometer. The sample of the study comprised of 120 women from 60 each from rural and urban areas. The data was collected from the respondents by personal interview method using structured pre-tested interview schedule. Physical measuring tools like anthropometric road, weighing balance, skin fold calipers, digital B.P apertures, grip dynamo meter, were used to record the data. Appropriate statistical techniques were used to depict the results. The socio economic status shows that among rural and urban respondents more than 60 per cent each belonged to lower middle class. In both the categories the mean age of the respondents was found to be more than 33.55 years with mean height of more than 159, the mean weigh of 56.95 kgs. The mean blood pressure, pulse rate, body temperature and grip strength was found to be normal. More than 23.33 per cent each belonged to low weight normal and normal range body mass index category respectively. The mean fat weight among both the categories was found to be 11 kg, with the lean body mass 45 kg. The mean fat percentage was more than 19 per cent and the body density was found to be 1.05. More than 60 per cent each fell in the mesomorph body type and aerobic capacity of high average and good category. The step test ergometer exercise showed that equal percentage of the rural respondents belonged to high average and low average physical fitness level and among urban respondents majority of the belonged to low average physical fitness level.