



ISSN (E): 2277- 7695

ISSN (P): 2349-8242

NAAS Rating: 5.03

TPI 2020; 9(5): 310-312

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Received: 24-03-2020

Accepted: 25-04-2020

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## A study on health status and physical fitness of rural women in Dharwad Taluk

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**DOI:** <https://doi.org/10.22271/tpi.2020.v9.i5f.4694>

### Abstract

Physical Fitness is the basis for dynamic and creative intellectual activity. The intelligence and skill can only function at the peak of their capacity when the body is healthy and strong. In the present situation there is need for the women to measure and analyze their physical fitness for their own benefit and improvement of health. Hence, the study was taken with the objective to analyse the health status and physical fitness of rural women. Sixty non-pregnant, non-lactating subjects without any cardio-respiratory complaints were selected for the studies were falling within the age range of 25-45 years. Maximum percentage of the women (28.33%) belonged to low weight normal category of body mass index. The mean lean body mass of the respondents was 45.91 kg and mean per cent fat was found to be 19.35 per cent. Majority of the respondents fell in the mesomorph body type. The estimation of aerobic capacity revealed that majority of the rural women (50.00%) had high average aerobic capacity of 26 to 30 ml/kg× min. The step test ergometer exercise showed that equal percentage of the respondents (33.33%) belonged to high average and low average physical fitness level.

**Keywords:** Body mass index, Per cent fat, Lean body mass, Aerobic capacity, Physical fitness

### Introduction

The specialist committee of the World Health Organization (1981) [6] 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 health and well-being. Each person has a different level of physical fitness which may perhaps change with time, place of work, situation and there is also an interaction between the daily activities, and the fitness of a human being, the point if where to put the level of optimum fitness. From the physiological point of view physical fitness may declare to be ability at the body to take on and recover from strenuous exercise (Chaudhary 1998).

Rural women are consider as back bone of Indian economy. She does the most tiresome and back-breaking tasks in agriculture, animal husbandry and homes. These tasks not only demand considerable time and energy but also are sources of hard work for rural women which are not yet precisely identified and quantified. A physically fit person with normal physical capacity to do the work and may experience less drudgery for the same amount of work than physically unfit persons. Therefore knowledge of physical fitness and its application is of principal importance. Hence, the present study is conducted with the following specific objectives.

- 1) To assess the health status of rural women by various physical and physiological parameters.
- 2) To assess the physical fitness of the selected rural women by using step test ergometer.

### Material and methods

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 supriliac with the help of skin fold callipers. The following formulae were used to calculate body density, per cent fat, fat weight and lean body mass of the selected subjects.

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

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

Fat weight = Body weight x Per cent fat / 100  
 Lean body mass (kg) = Body weight – Fat weight  
 Body soma to type is the method of classifying the human physique based on height and weight by using the following formula and can classified based on their ponderable index score (PI).

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

Aerobic capacity (VO<sub>2</sub> max) or maximal oxygen uptake is 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 and later the subjects are classified into various physical fitness categories according to the classification given by Saha *et al* (1996) [5].

$$VO_2 \text{ max (l/min)} = 0.023 \times \text{Body weight (kg)} - 0.034 \times \text{Age (yrs)} + 1.652$$

$$VO_2 \text{ max (ml/kg. min)} = VO_2 \text{ max (l/min)} / \text{Body weight} \times 1000$$

Physical fitness of women is determined by using step test ergometer. 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 responses are recorded by using the polar heart rate monitor. The subjects were asked to rest for five minutes and do the step tests exercise on the ergometer until they get exhausted. Immediately after exercise the subjects were asked to sit for five minutes. The heart rates after exercise were recorded during recovery time of five minutes. Later the subjects were classified as per the classification score given by (Varghese *et al.*, 1994).

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

**Results and discussion**

Physical and physiological parameters of the subjects are presented in the Table-1. The mean age of the rural women was 35.23 years, with mean height of 159.98cms and the mean weight of 57.57kgs. 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.

**Table 1:** Physical and physiological parameters of the subjects selected for experiment

n=60	
Physical and physiological Parameters	Mean (S.D)
Age ( years)	35.23 (±5.99)
Height (cm)	159.98 (±18.05)
Weight (Kg)	57.57 (±6.27)
Blood pressure systolic / diastolic (mm/Hg)	120/80 (12/ 7)
Pulse rate	80.11 (±7.89)
Grip strength of right hands (Kg)	14.30 (±3.61)
Grip strength of left hands (Kg)	13.84 (±3.01)
Body temperature (C°)	96.98 (±0.87)

**Body composition**

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 is shown in the table-2. Similar results were found by Jyotsna *et al.* (2005).

**Table 2:** Body composition of the subjects selected for step test exercise

n=60	
Body composition	Mean (S.D)
Fat weight (kg)	11.11 (±2.53)
Lean body mass (kg)	45.91 (±5.66)
Per cent fat (%)	19.37 (±3.66)
Body density	1.05 (±0.01)

**Determination the health and physical fitness of the rural women**

The physical fitness according to various parameters of health are presented in table-3 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 15.00per cent were in normal category of body mass index. None of the rural women were in Obese grade-I, Obese grad-II category of body mass index.

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.

The estimation of maximum oxygen consumption capacity based on height and weight revealed that majority of the 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. None of the respondents were either in excellent or in poor category of VO<sub>2</sub> Max.

**Table 3:** Distribution of respondents according to body mass index, body type and VO<sub>2</sub> Max

n=60	
Parameters	Frequency (%)
<b>Body mass index</b>	
CED grade-III Severe (<16)	11 (18.33)
CED grade-II Moderate (16-17.0)	11 (18.33)
CED grade-I Mild (17.0-18.5)	12 (20.00)
Low weight normal (18.5-20.0)	17 (28.33)
Normal (20.0-25.0)	9 (15.00)
<b>Body type</b>	
Ectomorph (< 20)	6 (10.00)
Mesomorph (21-25)	36 (60.00)
Endomorph (> 25)	18 (30.00)
<b>VO<sub>2</sub> Max</b>	
Low average ( 16.0- 25.0 )	1 (1.67)
High average (26.0- 30.0)	30 (50.00)
Good (31.0- 40.0)	28 (46.67)
Very good ( 41.0- 45.0)	1 (1.67)

**Physical fitness index of selected rural women**

Step test ergometer exercise was administered to analyze the physical fitness of the selected rural. 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 as shown in Table-4.

**Table 4:** Physical fitness index of selected rural women

n=30

Physical fitness index	percentage
Poor (< 80)	2 (6.67)
Low average (81-100)	2 (6.67)
High average (101-115)	10 (33.33)
Good (116-135)	8 (26.67)

Correlation between physical and physiological parameters and physical fitness index scores among rural women showed in table-5. 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. Whereas negatively significant relationship observed between percent fat at 0.05 percent level among the rural women.

**Table 5:** Correlation between physical and physiological parameters and physical fitness index scores

n=30

Parameters	r- values
<b>Physical parameters</b>	
Age	-0.710**
height	0.251 <sup>NS</sup>
Weight	-0.55*
<b>Physiological parameters</b>	
Blood pressure	0.102 <sup>NS</sup>
Pulse rate	0.158 <sup>NS</sup>
Body temperature	0.2.19 <sup>NS</sup>
BMI	0.660**
per cent fat	-0.680*
Body density	-0.451 <sup>NS</sup>
Body type	0.254 <sup>NS</sup>
VO <sub>2</sub> Max	0.786**

## Conclusion

Physical fitness is the important factors to perform of any physical activity. 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. This research throws light on the physical fitness of the women in agriculture. It is evident for the study that the selected women in rural areas are healthy and have a good physical fitness index. For better efficiency and work output, they should be trained to use the improved technologies.

## Recommendations

Strength, speed, endurance, (cardio vascular capacity) and other desirable physical qualities can only be achieved through vigorous activity but complete fitness is achieved through a sustainable balance of all those provisions adopted to age, maturity and capability of individual.

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