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A study of selected obesity indicators between physically active and inactive perimenopausal women

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Abstract
The purpose of the study was to determine the selected obesity indicators between physically active and inactive perimenopausal women**.** A sample of 100 (50 physically active and 50 inactive perimenopausal women) from various regions of Bilaspur and Raipur were taken as sample on the basis of stratified purposive random sampling. The age group of the subjects were ranged from 40 - 65 years. The selected various obesity indicators, i.e., Body Mass Index was calculated by dividing the subject's body weight in kg by height in meters square (BMI=weight in kg/ height in meter square) and Resting Metabolic Rate was assessed using Maltron Body Composition Analyzer. To compare the selected various obesity indicator variables between physically active and inactive women, Independent sample t-test was used. The level of significance was set at 0.05. It was concluded from the findings of the study that significant difference was obtained in Body Mass Index and Resting Metabolic Rate (RMR) (The selected various obesity indicator variables) between physically active and inactive perimenopausal women (t= 4.018* and 307.220* respectively, p<0.05). It was seen that the Physically active women have more BMI when compared to physically inactive Perimenopausal women. (Inactive Mean = 29.37, Active Mean = 25.35) and Physically inactive women have more RMR when compared to physically active Perimenopausal women. (Inactive Mean = 1841, active Mean = 1534).

Keywords: obesity indicators, physically active perimenopausal women, physically inactive perimenopausal women, body mass index, resting metabolic rate

Introduction

Obesity

A percentage of population is found obese in the age group ranging from 50-59 years. Causes of obesity are mostly divided into genetic and environmental factors. The emerging causes of obesity in the population are primarily due to environmental factors acting on genetic susceptibility (JO Hill, 1998) [1]. BMI has shown a monotonic association with mortality in several recent cohort studies (Lee *et al*. 1993; Manson *et al*. 1995; Willett *et al*. 1995) [2].

Obesity and increase in weight gain of women had mentioned the significant decrease in physical activity (Jessica Nolen 2006) [3]. There is a greater dependency on motor vehicles by women, instead of walking for transportation purpose. Due to lack of employment there is more need of sedentary jobs. Various prominent factors affecting sedentary lifestyles were video games and computers, the increase in number of hours people watch television, and our propensity for convenience all contribute to our sedentary lifestyles (Spence-Jones, 2003) [4].

It has been found that the number one nutritional disorder in developed countries is obesity. The study conducted by National Health and Nutrition Examination Survey (NHANES III, 1988-1994) [5], between U.S. men and women, people above 20 years are overweight, and nearly one-fourth are clinically obese.

Numerous studies depict that cardiorespiratory fitness is greatly related with metabolic disorder (Lee *et al*., 2005) [6], cardiovascular disease (Carnethon, Gulati, & Greenland, 2005) [7] and a greater risk of mortality (Katzmarzyk, Church, Janssen, Ross, & Blair, 2005) [8].

Menopause

Menopausal symptoms can affect women's health and wellbeing. It is important to develop interventions to alleviate symptoms, especially there have been evidence, where many women no longer choosing to take hormone replacement therapy.

Pre-menopause

Premenopause

The span of time from puberty (onset of menstrual periods) to perimenopause. (NAMS, 2006) [9]

Perimenopause

The 2 to 8-years prior to menopause when fluctuating hormones cause menstrual changes and some of the symptoms experienced during menopause (NAMS, 2006) [9]. Perimenopause ends once you have been without a period for one full year.

Postmenopause

This time frame encompasses all of the years a woman remains alive after transitioning through menopause (NAMS, 2006) [9]. It is the period of time after a woman has experienced 12 consecutive months without menstruation.

Physically Active

In this study the researcher has defined the term physically active to those who go for physical work out in any form

inspite of their daily routine of household work or job. It may include walking, running, gardening and any leisure activity.

Physically Inactive

In this study the researcher has defined the term physically inactive to those who did not achieve MET scores above 6000 MET - min/week. The MET scores were calculated from the amount of physical work out in any form inspite of their daily routine of household work or job. It included walking, running, gardening and any leisure activity. (Guidelines for data processing and analysis of International Physical Activity Questionnaire (IPAQ) November 2005) [10].

Body Mass Index (BMI)

Body Mass Index (BMI) is a measurement of a person's weight with respect to his or her height. It is more of an indicator than a direct measurement of a person's total body fat.

The formula is - BMI = (Weight in kilograms) divided by (Height in metres squared)

A normal BMI score is one that falls between 18.5 and 24.9. This indicates that a person is within the normal weight range for his or her height. A BMI chart is used to categorize a person as underweight, normal, overweight, or obese.

Table 1

Body mass index (BMI)	Weight status
Below 18.5	Underweight
18.5 - 24.9	Normal
25.0 - 29.9	Overweight
30.0 plus	Obese

Resting Metabolic Rate (RMR)

Resting metabolic rate (RMR) is the amount of energy the body burns during rest and the measurement is sometimes used as a benchmark for how efficiently your metabolism is working.

Objective of the Study

The following were the objective of the present study:

- To compare the selected obesity indicators Body Mass Index (BMI) between physically active and inactive perimenopausal women.
- To compare the selected obesity indicators Resting metabolic rate (RMR) between physically active and inactive perimenopausal women.

Methodology

Selection of Subjects

For the purpose of the present study 50 physically active perimenopausal women and 50 physically inactive perimenopausal women from various regions of Bilaspur and Raipur were selected. The sampling method for the study was stratified purposive random sampling. The age group of the subjects ranged from 40-65 years.

Selection of Variables

The following were the selected obesity indicator variables selected for the present study:

1. Body Mass Index (BMI)
2. Resting metabolic rate (RMR)

Criterion Measures and Administration of Test

1. IPAQ–The physical activity level was assessed using the International Physical Activity Questionnaire. The questionnaire was used to assess physical activity undertaken across a comprehensive set of domains including Leisure time physical activity, domestic & gardening (yard) activities, work related physical activity and transport related physical activity**.**

Administration of International Physical Activity Questionnaire

Perimenopausal women were asked to fill IPAQ questionnaire for assessing their physical activity level. The questionnaire was administered on the subjects to inquire about the previous 7 days version of physical activity levels. Additionally, questions relating to "work" will be modified to "college" to reflect the population being samples. IPAQ assesses physical activity undertaken across a comprehensive set of domains including:

a. Leisure time physical activity.
b. Domestic and gardening (yard) activities.
c. Work-related physical activity.
d. Transport-related physical activity.

Structure

The IPAQ is used to assess PA during the past 7 days. There are two versions, the long form (27 items) and the short form (7 items), which can be self administered or administered during in-person or telephone interviews. The IPAQ used in the present study is the long version which covers four domains of PA: occupational (6 items), transportation (6 items), household/gardening (6 items) and leisure-time activities (6 items), time spent sitting (2 items).The IPAQ Long form asks details about the specific types of activities undertaken within each of the four domains. The items in the IPAQ long form were structured to provide separate domain specific scores for walking, moderate-intensity, vigorous-intensity activity within each of the work, transportation, domestic chores and gardening (yard) and leisure-time activities. The questionnaire also includes two questions about the time spent on sitting as an indicator of sedentary behavior. The number of days per week and the time spent on walking per day as well as moderate and vigorous activities from all four domains were recorded. Computations of the total scores of the long form were done with the summation of the duration (in minutes) and frequency (days) for all the types of activities in all domains. Domain specific scores or activity specific sub-scores was calculated. Domain specific scores require summation of the scores for walking, moderate-intensity and vigorous intensity activities within the specific domain and activity - specific scores require summation of the scores for the specific type of activity across domains.

Administration Method and Scoring

The IPAQ data were converted to metabolic equivalent scores (MET-minweek-1) for each type of activity, by multiplying the number of minutes dedicated to each activity class by the specific MET score for that activity. METs are multiples of resting metabolic rate and a MET-minute is computed by multiplying the MET score of an activity by the minutes performed. The MET score weighs each type of activity by its energy expenditure. Based on the MET value, groups were divided into physically active and inactive women. Scores above 6000 MET - min/week are in physically active group and those MET scores below 6000 MET – min/week are in physically inactive group.

(Guidelines for data processing and analysis of International Physical Activity Questionnaire (IPAQ) November 2005)[9]

Body Mass Index

Body Mass Index is the weight/height ratio often used in field settings. It is a measure of body composition typically used in large scale public studies.

- Weight is the simplest measurement of growth and nutritional status (Swaminathan, 1985). Weight was operationalized as the exact body weight measured with minimal clothes, footwear and marked in an erect standing posture with head, abdomen and legs in the same plane, using standard weighing machine, by Jeliffe method (1966). It was measured using Standard weighing machine in Kilograms.
- Height was measured using Stadiometer.

BMI was computed using the following formula:

BMI=Weight (kg)/Height (meter square)

Resting Metabolic Rate

The subject was asked to lie down empty stomach for 30 minutes. Required details of the subject were fed in the MALTRON Body Composition Analyser. After testing time the machine gives the RMR value.

Statistical Method

A detailed descriptive statistics i.e. mean, standard deviation, minimum and maximum scores on each test selected obesity indicator variables were calculated. To compare the selected obesity indicator variables between physically active and inactive women, Independent sample t-test were used. The level of significance was set at 0.05.

Result and Findings of the Study

Table 2: Descriptive Statistics of Selected obesity Indicator Body Mass Index of Physically Active Perimenopausal and Inactive Perimenopausal Women

Menopause stage	Activity type	Mean Value	Mean Difference	Std. Error	Sig.
Peri	Active	25.356	4.018*	.648	.000
	Inactive	29.374			

*The mean difference is significant at .05 level.

Table 1 shows, the pair wise comparison of physically active & inactive perimenopause of different activity type. In above table it concluded that the mean difference value of physically active & inactive perimenopausal is 4.018, which is found significant at .05 level. The standard error is 0.648 and the p-value is 0.000.

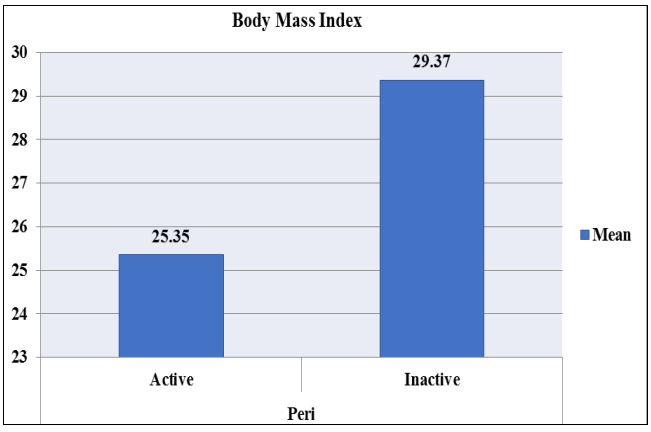

Fig 1: Graphical representation of Mean values of Body Mass Index, physically active and inactive Perimenopausal women

Table 3: Pair wise comparison of Resting Metabolic Rate scores of physically active and physically inactive Perimenopausal women.

Menopause stage	Activity type	Mean Value	Mean Difference	Std. Error	Sig.
Peri	Active	1534.04	307.220*	49.396	.000
	Inactive	1841.26			

*The mean difference is significant at .05 level.

Table 2 shows, the pair wise comparison of physically active & inactive perimenopause of different activity type. In above table it concluded that the mean difference value of physically active & inactive perimenopausal is 307.220, which is found significant at .05 level. The standard error is 49.396 and the p-value is 0.000.

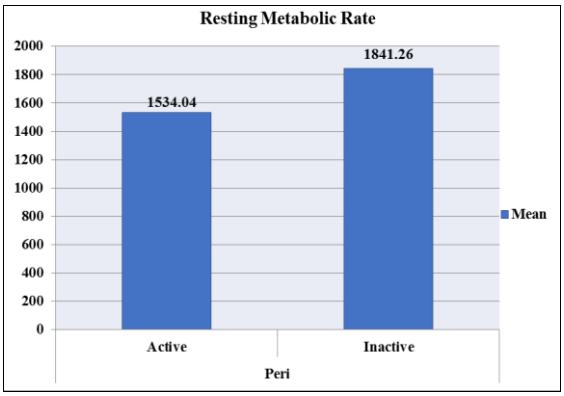

Fig 2: Graphical representation of Mean values of Resting Metabolic Rate, physically active and inactive Perimenopausal women

Discussion and conclusion of Results

Analysis of data pertaining to the assessment of various selected obesity indicator variables Body Mass Index and Resting Metabolic Rate between physically active and inactive perimenopausal women revealed significance differences. It is seen that the mean scores of physically active perimenopausal were lowest in Body Mass Index and Resting Metabolic Rate when compared to physically inactive perimenopausal women. Lowest mean values shows that Body Mass Index and Resting Metabolic is good in physically active compared to physically inactive perimenopausal women.

On the basis of the finding of the study, the following conclusions are drawn in relation to selected obesity indicator variables:

1. Physically active and physically inactive Perimenopausal women significantly differ in BMI. Physically active women have more BMI when compared to physically inactive Perimenopausal women. (Inactive Mean = 29.37, Active Mean = 25.35)
2. Physically active and physically inactive Perimenopausal women significantly differ in RMR. Physically inactive women have more RMR when compared to physically active Perimenopausal women. (Inactive Mean = 1841, active Mean = 1534)

The mean values of selected obesity indicators were better in active perimenopausal women than compared to inactive perimenopausal women. The probable reason for the difference was regular exercise, as the researcher feels the active life style of a woman in perimenopausal stage gives greater results than inactive perimenopausal women. The

perimenopausal women face a lot of challenges in terms of obesity because of the physiological changes experiencing during this stage, which could be overcome by involving in formal or informal physical activities.

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