Comparison of Nutritional Status: Body Mass Index (BMI) and Obesity amongst Perimenopausal and Postmenopausal Working and Non-Working Women

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ABSTRACT: Introduction: Present study sought to assess nutritional status: BMI and obesity amongst perimenopausal and postmenopausal working and non-working women. The purposive random sampling was used for the collection of data. A sample of 120 subjects was selected from the district Jodhpur at different work places for women, such as schools (govt. and private), university, hospitals (govt. and private) and door to door household too. The sample consist of 60 working (30 perimenopausal and 30 postmenopausal) and 60 non-working (30 perimenopausal and 30 postmenopausal) menopausal women, between 45 years to 55 years.

Objective: The main objectives of this study was to assess nutritional status: BMI and obesity in perimenopausal and postmenopausal working and non-working women.

Method: Anthropometric measurement – Height and weight of all the subjects of the study were noted and Body mass index (BMI) was calculated using the formula = Weight (kg) / Height2 (m). Assessment of obesity in menopausal women through BMI was calculated.

Result: Non-working perimenopausal and postmenopausal women was more obese in comparison to working perimenopausal and postmenopausal women. Percentage of normal BMI was high in working perimenopausal and postmenopausal women in comparison to non-working perimenopausal and postmenopausal women. Similar percentage (3-3%) of underweight was observed in the four groups.

Conclusion: Mean value of BMI of working postmenopausal women and non-working postmenopausal women was high in comparison to working perimenopausal women and non working perimenopausal women, but no significant difference was observed in the mean value of BMI of the four groups.

with a view to understanding the health and socioeconomic status of the population (Osmani, 1992).

Anthropometry is considered to be an important tool for assessing nutritional status of individuals or of the community. Hence, measurements namely stature, sitting height, weight and indices based on these measurements evolved by different scholars have been extensively used to define the extent of malnourishment. Body mass index (BMI) expressed as a ratio of weight to height square can be a good parameter to grade chronic energy deficiency (CED) in adults (Naidu et al., 1991). Based on the measurements made, the BMI (Body Mass Index, kg/m^2) was determined. The BMI values, determining the body structure, were divided into categories, according to the International Classification of adult underweight, overweight and obesity (WHO, 2000). These categories are: underweight (BMI<18.50), normal range(18.50<BMI<24.99), overweight (25.00<BMI<29.99), obesity I (30.00<BMI<34.99), obesity II (35.00<BMI<39.99) and obesity III (BMI>40.00). Based on the measurements, the WHR (Waist to Hip Ratio) and W/Ht (Waist/Height) indicators can also be calculated, indicating the central distribution of the fatty tissue. The advantage of the indicators is the possibility of use in early detection of obesity related diseases, even in individuals with normal body mass.

The prevalence of obesity is increasing worldwide and is reaching epidemic proportions. Majority of adults are becoming increasingly overweight and one of the subpopulations in which this prevalence is growing most rapidly is postmenopausal women. 8.3 million population is forecasted to be obese in age of 50 years or older in 2010 (Wang et al., 2007). Postmenopausal women have an increased tendency for gaining weight. It is as yet unclear whether the menopausal transition itself leads to weight gain, but is known that the physiological withdrawal of estrogen brings about changes in fat distribution (Dubnov et al., 2007), together with physical inactivity, are probably the major causes of this phenomenon. Other contributing factors include ethnicity, reduced lean mass, resting metabolic rate and treatment with certain drugs, e.g. steroids, insulin, glitazones (Samat et al., 2008). Women with abdominal obesity compared to other women have, high vasomotor scores, personal life dissatisfaction, nervousness, memory loss, depression, flatulence, muscle and joint pains, sleeping disorders lack of energy (Khajuria et al., 2008 and Dubnov et al., 2003).

Menopause is also called “the change” - perhaps more accurately, as this life change is not a sudden, but a gradual, process. It brings with it physical changes to the body and a host of symptoms, many of which are uncomfortable and can seriously affect women both at home and at work. It is also still a “taboo” subject which women may find difficult to raise when they are having difficulties at work because of it. Often women may not even be aware that the symptoms they are experiencing are because of the menopause. So representing menopausal women members at work can also be very difficult. (UNITE Factsheet, 2010).

**RESEARCH METHODOLOGY**

**Samples of the study :**

The purposive random sampling technique was used in the selection of sample for the present study. Samples of 120 subjects were selected from the district Jodhpur. The sample consist of 60 working (30 perimenopausal and 30 postmenopausal) and 60 non-working (30 perimenopausal and 30 postmenopausal) menopausal women, between 45 years to 55 years.

**Locale of the study :**

The study was conducted in district Jodhpur at different work places for women, such as schools (govt. and private), university, hospitals (govt. and private) and door to door household too.

**Tools:**

Anthropometric measurement – Height and Weight of all the subjects of the study were noted and Body mass index (BMI) and obesity was calculated using the formula = Weight (kg) / Height^2 (m). Body Mass Index is calculated as follows:

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BMI = \frac{\text{Weight (kilograms)}}{\text{Height (meters)}^2}
\]

**Analysis of data :**

Measures of percentage, standard deviation, *t*-test and significance of differences were calculated and discussed with the help of reviewed literature.

**RESULTS AND DISCUSSION**

Table 1 represents the classification of BMI of working and non-working perimenopausal and postmenopausal women. In reference of BMI 20 per cent of perimenopausal and 23.33 per cent of postmenopausal working women comes under the category of obese I. 33.33 per cent of and 26.67 per cent of perimenopausal working and postmenopausal working women comes under the category of obese II. 46.67 per cent of perimenopausal and 36.67 per cent of postmenopausal working women have normal BMI. 16.67 per cent of perimenopausal and 30 per cent of postmenopausal non-working women comes under the category of obese I 40 per cent of perimenopausal and 43.33 postmenopausal non-working comes under the category of obese II. 26.67 per cent of perimenopausal and 16.67 per cent of postmenopausal non-working women have normal BMI. Only 3-3 per cent of working and non-working...
perimenopausal and postmenopausal women comes under the category of underweight.

The study of Hariram and Sowmya et al. (2011) also suggests more or less similar findings; they suggested that BMI gradually increase according to the menopause age of the women. The heart rate and blood pressure showed insignificant increase from 4 th year of menopause period whereas remarkable increase was observed in all parameters from 8 years of menopause period.

Another study of Badaruddoza and Hundal (2009) examined in a random sample of 489 pre- and 191 postmenopausal Punjabi women. Post-menopausal women had a higher blood pressure and pulse rate than pre-menopausal women (<0.001). The metric measurements such as weight, BMI, waist and hip circumferences, WHR were also higher in post-menopausal women (<0.001).

Fig. 1 depicted that percentage of obese grade I was high in working postmenopausal women. BMI of working perimenopausal women was normal in comparison to working postmenopausal women. Only 3 per cent working menopausal women were affected of chronic energy deficiency (CED).

Fig. 2 depicted that percentage of obese grade II was high in non-working postmenopausal women. Obese grade I was high in non-working perimenopausal women as well as non-working perimenopausal women. BMI of non-working perimenopausal women was normal in comparison to non-working postmenopausal women. Some non-working perimenopausal women were affected of chronic energy deficiency (CED).

Table 2 represents comparison (Mean) of working and non-working menopausal women for Height, Weight measurement and BMI. There were minor differences between mean values of working and non-working women during menopause. The mean height was equal in both groups (160.28%, 160.56%). The mean weight was more of non-working menopausal women in comparison to working menopausal women (68.53%, 64.74%). Mean BMI was equal in both groups (0.83%, 0.88%). Perry et al. (1998) studied 240 overweight premenopausal women (age 40-54 years) of Miami. The waist to hip ratio was used to classify the subjects. Those with waist to hip ratio more than 0.90 had a significantly greater body weight, BMI and greater waist circumference than other categories of women. Women with

### Table 1: BMI of working and non-working menopausal women

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Obese II BMI &lt; 40</th>
<th>Obese I BMI &lt; 34</th>
<th>Normal BMI &lt; 24.99</th>
<th>Underweight BMI &lt; 18.50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perimenopausal Working</td>
<td>30</td>
<td>6</td>
<td>8</td>
<td>14</td>
<td>1</td>
</tr>
<tr>
<td>%</td>
<td>20.00</td>
<td>26.67</td>
<td>46.67</td>
<td>3.33</td>
<td></td>
</tr>
<tr>
<td>Perimenopausal Postmenopausal</td>
<td>30</td>
<td>7</td>
<td>10</td>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td>%</td>
<td>23.33</td>
<td>33.33</td>
<td>36.67</td>
<td>6.67</td>
<td></td>
</tr>
<tr>
<td>Total (a) :</td>
<td>60</td>
<td>13</td>
<td>18</td>
<td>25</td>
<td>3</td>
</tr>
<tr>
<td>%</td>
<td>21.67</td>
<td>30.00</td>
<td>41.67</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Perimenopausal Non-working</td>
<td>30</td>
<td>5</td>
<td>12</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>%</td>
<td>16.67</td>
<td>40.00</td>
<td>26.67</td>
<td>6.67</td>
<td></td>
</tr>
<tr>
<td>Postmenopausal Non-working</td>
<td>30</td>
<td>9</td>
<td>13</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>%</td>
<td>30.00</td>
<td>43.33</td>
<td>16.67</td>
<td>3.33</td>
<td></td>
</tr>
<tr>
<td>Total (b) :</td>
<td>60</td>
<td>14</td>
<td>25</td>
<td>13</td>
<td>3</td>
</tr>
<tr>
<td>%</td>
<td>23.33</td>
<td>41.67</td>
<td>21.67</td>
<td>5.00</td>
<td></td>
</tr>
<tr>
<td>Total (a+b) :</td>
<td>120</td>
<td>27</td>
<td>43</td>
<td>38</td>
<td>6</td>
</tr>
<tr>
<td>%</td>
<td>22.5</td>
<td>35.83</td>
<td>31.67</td>
<td>5.00</td>
<td></td>
</tr>
</tbody>
</table>
0.90 waists to hip ratio had an increased risk of cardio-vascular disease risk factors.

Table 3 depicting the mean, SD and t scores of working menopausal and non-working menopausal women for various measures. There was no significant difference observed among all the measures for working and non-working menopausal women. Body-mass index is known to be associated with overall mortality. Calle et al. (1999) examined the relation between body-mass index and mortality in US adult women. Results showed that among subjects with the highest body mass index, white women had a relative risk of death of 2.00, respectively, as compared with those of a body mass index of 23.5 to 24.9. Black women with the highest body-mass index had much lower risks of death (1.21), which did not differ significantly from 1.00. A high body-mass index was most predictive of death from cardio-vascular disease. Heavier women in all age groups had an increased risk of death.

Table 4 reflected the mean, SD and t scores of working perimenopausal and working postmenopausal women for various measures. It was found that there was little difference in the mean weight among working perimenopausal and working postmenopausal women, whereas the mean values of other measures were more or less similar. There was no significant difference observed among all the measures for working perimenopausal and working postmenopausal women. It reflects that irrespective of working perimenopausal and working postmenopausal status of women, the impact on BMI was equal. Tapadar et al. (2004) compared anthropometric measurements of 30 obese postmenopausal women aged 50 years with premenopausal women aged 40-45 years serving as control in Kolkata. Mean
height (150 ± 0.90 cm vs. 153.8 ± 1.4 cm), weight (59.1 ± 1.7 vs. 65.2 ± 2.1 kg) and BMI (26.4 ± 0.90 vs. 27.6 ± 3.4) of obese postmenopausal women was significantly less than pre-menopausal women. Tendency to overweight increased in postmenopausal group to 73 per cent from 60 per cent in pre-menopausal group.

Table 5 concluded the mean, SD and t scores of non-working perimenopausal and non-working postmenopausal women for various measures. It showed that little difference was observed in the mean weight among non-working perimenopausal and non-working postmenopausal women. There was no significant difference observed among all the measures of non-working perimenopausal and non-working postmenopausal women. It shows that irrespective of non-working perimenopausal and non-working postmenopausal status of women, the impact on BMI was similar.

**Conclusion :**

- In the present study, minor differences were observed in the mean values of selected measure of nutritional status: BMI and obesity between the two x two groups *i.e.* working perimenopausal and postmenopausal and non-working perimenopausal and postmenopausal women.
- In conclusion, reference to normal BMI of working perimenopausal and postmenopausal women it was observed that it was high in comparison to non-working perimenopausal and postmenopausal women. Non-working perimenopausal and postmenopausal women was more obese in comparison to working perimenopausal and postmenopausal women.
- There was no significant difference observed in the mean values of BMI of working perimenopausal and postmenopausal and non-working perimenopausal and postmenopausal women or in the selected four groups.
- Therefore, it can be concluded that once the menopausal stage has its onset in the life of women the influence on weight, obesity, blood pressure was observed to be high.


**WEBLIOGRAPHY**