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Comparison of anthropometric and physiological health status of pre and post menopause women belong to different habitat

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Abstract

Menopause is a stage of every woman's life when normal menstrual cycles permanently ceased due to aging. This phase of life typically occurs between 45 to 55 years of age. Several changes occur in woman's body after attending the menopause stage. Present study also designed to find out the changes occurred on selected physiological health parameters among women after attending the menopausal stage. A total of 30 women in between the age of 40 to 50 years were selected randomly for this study. Among them 15 were in pre-menopause stage and aged between 40-45 years (group-A) and rest 15 were selected in between 45-50 years (group-B) who were in post menopausal stage. Selected anthropometric and physiological health parameters were considered for comparison. All parameters were measured by standard tools and procedures. Mean and standard deviation have used as descriptive statistics and significance of difference between mean was computed by using t-test. Only 0.01 level of significance was considered in this study. Results revealed that the difference in the mean value for weight, chest circumference, waist circumference and hip circumference were higher for Gr-A than the mean value of Gr-B and were statistically significant. The mean value for BMI of Gr-A were also higher than the Gr-B and the t-value found also significant. But the difference in mean values for WHR and PBF of Gr-A were not significant statistically. In physiological parameters studies reported no-significantly difference in RHR and systolic and diastolic blood pressure between pre and post menopausal women.

Keywords: menopause stage, anthropometric health, physiological health, middle aged women

Introduction

Menopause is a stage of every woman's life when normal menstrual cycles permanently ceased due to natural bring to an end of ovarian oocytes from aging. This phase of life typically occurs between 45 to 55 years of age. In menopause stage woman's fertility end permanently. Menopause is a normal condition of life that all women experienced when they attend middle age. Several physiological and anthropometric changes occur on women's body due to menopause. Menopause is not a disease but, it does trigger some profound changes in a woman's body. A menopause is confirmed when a woman has not had a menstrual period for at least twelve months. However, the symptoms of menopause generally appear before the end of that one-year period. The symptoms include hot flashes, vaginal dryness, Irregular periods, night sweats, disturbed sleep, urinary problems, emotional changes etc. Study reported that blood pressure, BMI and Waist Hip Ratio (WHR) was significantly increased in post menopausal women. The study concluded that with advancing age body mass index increases and fat distribution pattern also change. Centripetal fat distribution ratio has been shown higher values in menopausal women (Hazarika and Bora, 2017) [1]. Another study found obesity was 42.1% among the menopause women subjects and the WHR and waist circumference were 82.1% and 77.1% among them (Ranasinghe, Shettigar and Garg, 2017) [3]. Hypertension is a major risk factor for cardiovascular disease in women and men. Post menopause women had significantly higher systolic and diastolic blood pressure and body fat percentage than pre-menopausal women. After menopause, the prevalence of hypertension in women is higher than it is in men (Lima, Wofford and Reckelhoff, 2012) [5]. The Estrogen level is significantly lower in menopausal stage than premenopausal stage among women (Tanu and Jyotsna, 2012) [6].

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The estrogen level ($P<0.001$), LTL ($P<0.05$), high-density lipoprotein level ($P<0.05$), and CRF ($P<0.001$) were lower in postmenopausal women than in premenopausal women. The body fat percentage ($P<0.05$) and triglyceride concentration ($P<0.05$) were also found higher in postmenopausal women than in premenopausal women (Shin and Lee, 2016) [7]. Present study also designed to find out the changes occurred on selected physiological health parameters among women after attending the menopausal stage.

Materials and Method
The Subject
A total of 30 women in between the age of 40 to 50 years were selected randomly for this study. Among them 15 were selected in between 40-45 years (group-A) who were in pre menopausal stage and rest 15 were selected in between 45-50 years (group-B) who were in post menopausal phase. All the subjects of Group-A were selected from the Metropolitan city, Kolkata but all the subjects of Group-B were selected from the different rural areas/villages of Burdwan and Nadia districts.

Criterion Measure
The following criterions were measured in this study as anthropometric and physiological parameters. These includes weight, height, body mass index (BMI), chest circumference, waist circumference, hip circumference, waist hip ratio (WHR), percent body Fat (PBF), resting heart rate (RHR), systolic and diastolic blood pressure (SBP & DBP) and Peak expiratory capacity (PEC).

Instrument and Tools Used
Following tools and instruments were used to collect data in this study. These includes weigh machine, measuring tape (standard), skin fold calliper, stethoscope, sphygmomanometer and peak flow meter.

Design of the Study and Statistical Procedure
Mean and standard deviation have used as descriptive statistics and significance of difference between mean was computed by using t-test. Only 0.01 level of significance was considered in this study. All statistical calculations have done by the standard statistical software (Excel 2010).

Results and Findings
The mean value and standard deviation for all the selected anthropometric parameters for both groups have been presented in Table-1. The difference in mean value between the groups was also computed by the t-test and result have included in the same table. Result revealed that computed t-value for age (t=8.53) was statistically significant ($p<0.05$) and t-value for weight, chest circumference, waist circumference and hip circumference were $t=2.44$, $t=4.63$, $t=4.05$ and $t=3.92$ respectively were statically significant ($p<0.05$). Result revealed that the t-value for BMI, WHR and PBF were $t=2.09$, $t=1.5$ and $t=0.63$ among which the t-value for BMI was found statistically significant ($p>0.05$) whereas the t-value for WHR and PBF were statistically insignificant ($p<0.05$). The findings for age & weight, Chest, waist and hip circumferences, BMI and PBF and WHR have also presented graphically in Figure-1, Figure-2, Figure-3 and Figure-4 respectively.

Table 1: Presentation of analyzed data and result for anthropometric parameters

Parameters	Group-A		Group-B		t-value
	Mean	SD	Mean	SD	
Age	42.07 yr	2.15	47.87 yr	1.51	8.53*
Weight	62.27 Kg	11.53	54.8 Kg	7.31	2.44*
Chest circumference	98.93 cm	10.36	85.13 cm	5.1	4.63*
Waist circumference	87.87 cm	11.9	73.87 cm	6.17	4.05*
Hip circumference	103.33 cm	12.33	89.6 cm	5.6	3.92*
BMI	26.2 Kg/m^2	4.24	23.42 Kg/m^2	2.9	2.09*
WHR	0.85	0.05	0.82	0.04	1.5
PBF	26.42%	5.49	20.96%	3.88	0.63

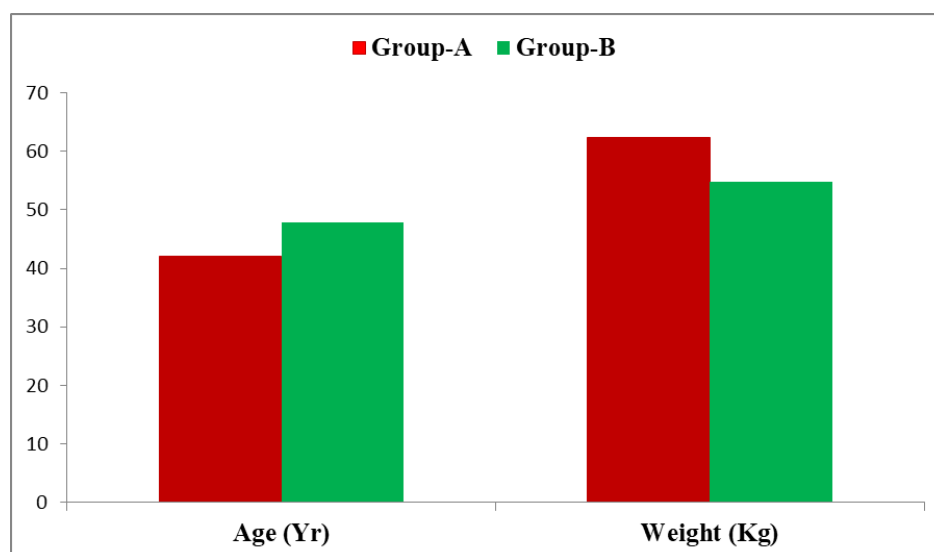*Significant at 0.05 level as table value of t = 2.05 at df=28

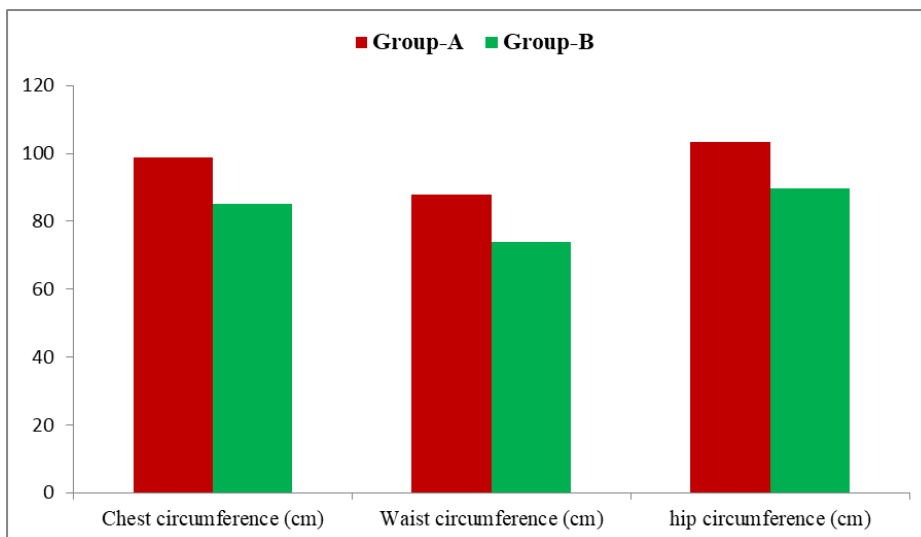**Fig 1:** Graphical comparison of mean value for age and weight between Gr-A and Gr-B

Fig 2: Graphical comparison of mean value for chest, waist and hip circumference between Gr-A and Gr-B
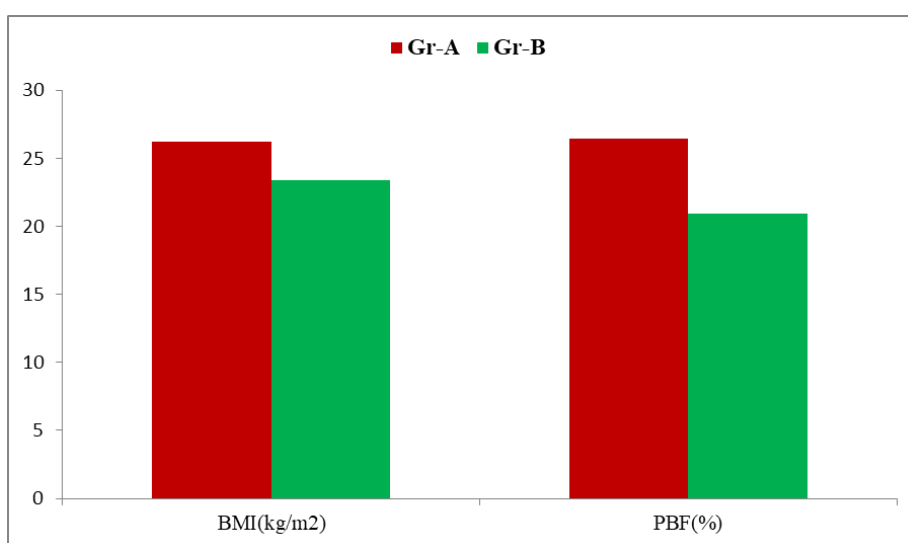

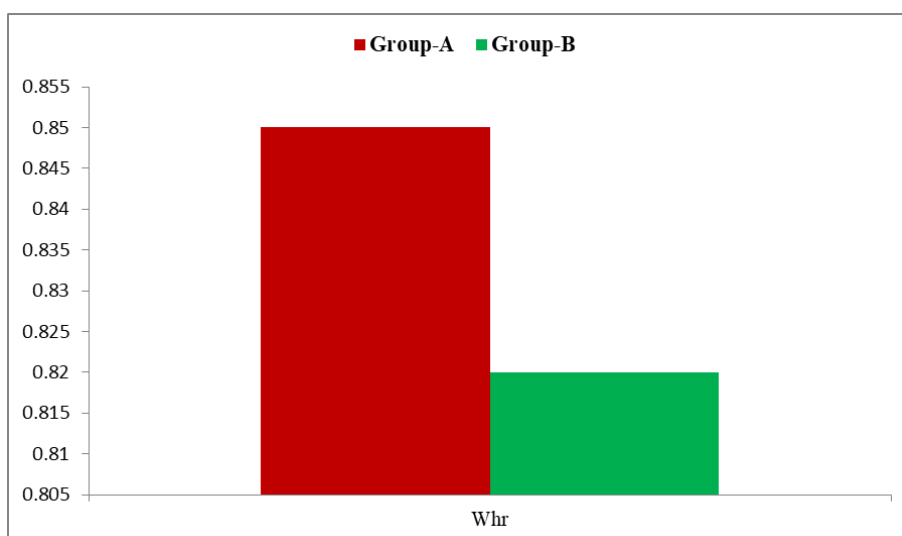**Fig 3:** Graphical representation of BMI and PBF between GR-A and Gr-B

Fig 4: Graphical representation of Whr between Gr-A and Gr-B

The mean values and standard deviation of two groups for the physiological parameters have presented in Table-2. The difference in mean value between the groups was also computed by the t-test and result have included in the table-2. The inferential statistics stated that inter group difference (t-value) for RHR, SBP and DBP were 0.91, 0.78 and 0.95 and all these t-value were statistically insignificant ($p>0.05$). But the t-value for PEC (t=2.22) in this study found statistically significant ($p<0.05$). The findings also presented graphically in the Figure-5, 6 and 7 below.

Table 2: Presentation of analyzed data and result for physiological parameters

Parameters	Group-A		Group-B		t-value
	Mean	SD	Mean	SD	
RHR	77.47 beat/m	8.71	75.27	3.59	0.91
SBP	120.67 mmHg	9.8	117.67	11.16	0.78
DBP	74.87	8.63	77.67	7.53	0.95
PEC	269.33	83.28	330	65.14	2.22*

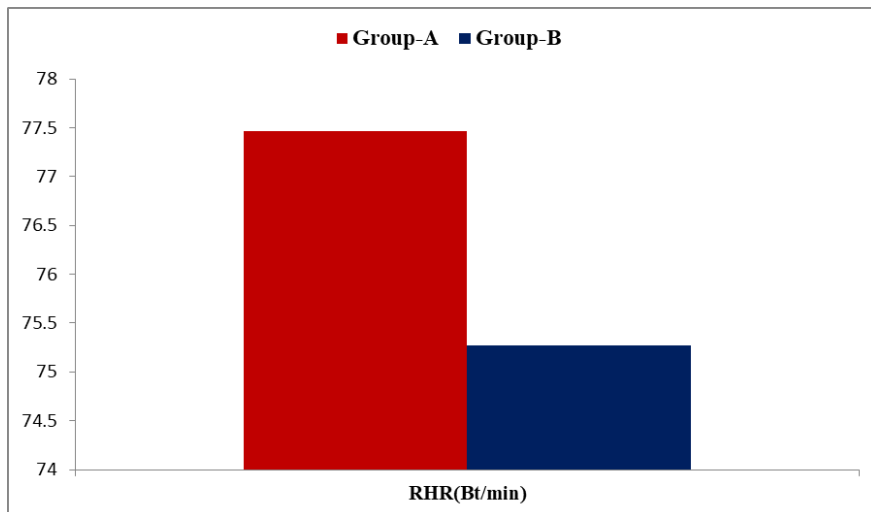*Significant at 0.05 level as table value of t = 2.05 at df =28

Fig 5: Graphical representation of RHR between Gr-A and Gr-B
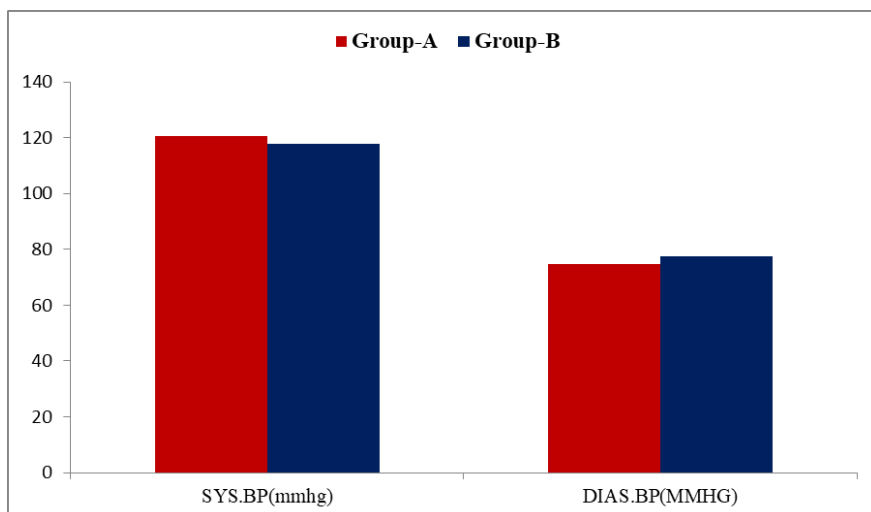

Fig 6: Graphical representation of SYS.BP and DIAS.BP between Gr-A and Gr-B
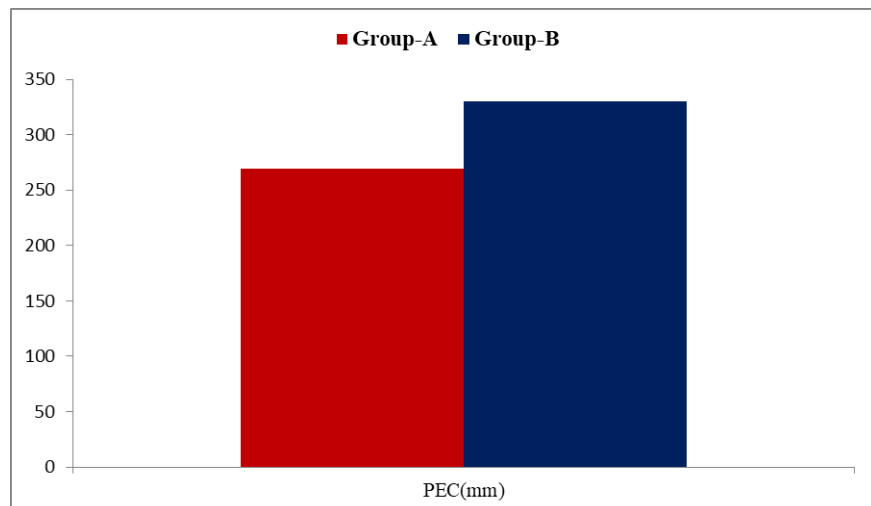

Fig 7: Graphical representation of PEC between Gr-A and Gr-B

Discussion on Findings

The t-value for age (t=8.53) was significant statistically which indicated that the age was significantly different between two groups. Present study found the mean value for weight, chest circumference, waist circumference and hip circumference were higher for Gr-A than the mean value of Gr-B. The computed t-value indicated all the difference between Gr-A and Gr-B for these parameters were statistically significant. The mean value for BMI of Gr-A were also higher than the Gr-B and the t-value for this parameter found also significant statistically. However, the mean value for WHR and PBF of Gr-A were also higher than the Gr-B though the t-value for these parameters indicated no significant difference between the groups statistically.

However, related research have been reported the different findings. Parvatha Rani and Neelambikai (2013) [2] reported post-menopausal women had higher BMI, had a higher waist and hip circumference as compared with the pre-menopausal women. When compared with WHR, the result shown that there was no significance difference between pre- menopausal and post-menopausal. Hazarika and Bora (2017) [1] reported significant higher BMI and waist hip ratio in post menopausal women. Ranasinghe, Shettigar and Garg (2017) [3] also found increased WHR and waist circumference among post menopausal women. Rinaldi *et al*. (2006) [4] reported increased breast cancer risk among post menopausal women as their weight, waist and hip circumference, BMI and adiposity increases. Other studies reported significantly more systolic and diastolic blood pressure, RHR among post menopausal women than the pre-menopausal women (Lima, Wofford and Reckelhoff, 2012, Parvatha Rani and Neelambikai, 2013) [5, 2].

Findings of the present study was opposite in nature where every selected anthropometric parameters were significantly less among post menopausal women (Group-B) in compare to pre-menopausal women (Group-A). This conflicting result in this study was might be due to that the subjects selected as Gr-A and Gr-B were not similar in all respect. As the study was cross sectional in nature, the women selected for Gr-A was from metropolitan city, Kolkata whereas all the subject of Gr-B was selected from the rural area of West Bengal. The life style, food habit, socio economic status was entirely different between these two groups. This difference between the groups might be the main cause of receiving such contradictory result in this context. Further research is required on the subjects, having similar geographical area, socio economic conditions and life style.

Conclusions

Within the limitations of the present investigations following conclusions were dawn on the basis of the obtained results:

1. There was significant difference on weight, BMI, chest, waist and hip circumference among pre and post menopausal women.
2. There was no significant difference on WHR, PBF, RHR, DBP, SBP and PEC among pre and post menopausal women.

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