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A comparative study on physical component summary and mental component summary of perimenopausal and postmenopausal women

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Abstract
The objective of the study is to assess the significant difference between perimenopausal and postmenopausal women. Both the groups include physically active and inactive people. Each group consisted of 100 perimenopausal and postmenopausal women from various regions of Bilaspur and Raipur on the basis of stratified purposive random sampling. Each group was further divided into two groups i.e. physically active & physically inactive (50 women in each group). The age group of the subjects were in between 40-65 years. The variable of the study Physical Component Summary & Mental Component Summary was assessed using SF-36 questionnaire. The physical activity level of the menopausal women was assessed using the International Physical Activity Questionnaire (IPAQ). To compare the selected HRQOL variables (PCS & MCS) between perimenopausal & postmenopausal women, independent sample t-test was used. The level of significance was set at 0.05. The findings of the study revealed that there is a significant difference in Physical Component Summary & Mental Component Summary scores among perimenopausal & postmenopausal women. The selected variables of HRQOL among perimenopausal & postmenopausal women was t = 70.96, 50.11 and 20.85 respectively, p< 0.05 level. It is seen that the mean scores of perimenopausal women were higher in Physical Component Summary score and Mental Component Summary scores when compared to postmenopausal women.

Keywords: health related quality of life, perimenopausal women, postmenopausal, women, physical component summary, mental component summary

Introduction

Health-Related Quality of Life (HRQOL)

The distinctive area of life in which a person's fulfilment or joy gets influenced is named as Health-related quality of life (HRQOL). It can be incredibly recognized from personal satisfaction, which incorporates general prosperity of an individual, covering more extensive parts of improvement.

HRQOL is defined as how a health condition impacts an individual's ability to function and his or her perceived well-being in physical, mental and social domains of life (Hays and Morales, 2001) [1].

The term quality of life (QOL) refers the general well-being of individuals and societies. The term is used in a wide range of contexts, including the fields of international development, healthcare, and politics. Quality of life should not be confused with the concept of standard of living, which is based primarily on income. Instead, standard indicators of the quality of life include not only wealth and employment, but also the built environment, physical and mental health, education, recreation and leisure time, and social belonging (Johnston, *et al*, June 2009) [2].

Health-related quality of life (HRQL) is a broad, multi-dimensional concept covering significant domains of daily functioning and subjective experience, such as physical functioning, role and social functioning, somatic sensation, perceived health, and subjective well-being. It is well documented that chronic medical morbidity has a strong negative impact on functional domains of HRQL (Stewart *et al*., 1989; Verbrugge & Patrick, 1995) [3, 4]. HRQL is the value that an individual assigned to the duration of life as modified by impairments, functional states, perceptions and social opportunities that are influenced by disease, injury, treatment or policy (Patrick D and Erickson J, 1993) [5].

Several recent reports have found some domains of HRQL to be affected by the transition from before to after menopause, with depressive symptoms tending not to be affected (Crawford S & *et al*., 2001) [6]. Women before the menopause transition compared with women who had begun the transition differed in reports of pain, role limitations, and vitality, but adjustments for symptoms (leaking urine, vaginal dryness, night sweats, and hot flashes) and other variables reduced differences in HRQL to non-significance in a large cross-sectional study (Covin, A. *et al*., 2003) [7].

Menopause

Menopausal symptoms can affect women's health and wellbeing. It is important to develop interventions to alleviate symptoms, especially given recent evidence resulting in many women no longer choosing to take hormone replacement therapy.

The final menstrual period, which can be confirmed after 12 consecutive months without a period? This time marks the permanent end of menstruation and fertility. It is a normal, natural event associated with reduced functioning of the ovaries, resulting in lower levels of ovarian hormones (primarily estrogen) (https://www.menopause.org) [13].

Pre-menopause

The span of time from puberty (onset of menstrual periods) to perimenopause (https://www.menopause.org) [13].

Perimenopause

A span of time that begins with the onset of menstrual cycle changes and other menopause-related symptoms and extends through menopause (the last menstrual period) to 1 year after menopause. Perimenopause is experienced only with spontaneous (natural) menopause, not induced menopause. Also called the menopause transition (https://www.menopause.org) [13].

Postmenopause

The span of time after menopause (the final menstrual period) (North American Menopause Society) (https://www.menopause.org) [13].

Objective of the study

The objective of the study is to

- To compare the Physical Component Summary and Mental Component Summary scores among Perimenopausal and Postmenopausal women (physically active and inactive).
- To assess the Physical Component Summary and Mental Component Summary in perimenopausal women (physically active and inactive combined).
- To assess the Physical Component Summary and Mental Component Summary in postmenopausal women (physically active and inactive combined).

Methodology

Selection of Subjects

For the purpose of the present study 100 perimenopausal and 100 postmenopausal women postmenopausal women from various regions of Bilaspur and Raipur were selected. Each group was further divided into 50 physically active perimenopausal women and 50 physically inactive groups. The sampling method for the study was stratified purposive random sampling. The age group of the subjects ranged from 40- 65 years.

Table 1: Stratified Purposive Random Sampling Group Design

Perimenopausal women		Postmenopausal women	
100		100	
Physically Active 50	Physically Inactive 50	Physically Active 50	Physically Inactive 50

Selection of variables

The following HRQOL variables were selected for the present study:-

a. Physical Component Summary.
b. Mental Component Summary.

Criterion Measures

1. Health related quality of life (HRQOL) assessed through SF-36 Questionnaire.
2. 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 Questionnaire

Health related quality of life

Purpose

The SF-36® Health Survey is a generic outcome measure designed to examine a person's perceived health status.

Instrument Type

Self-report Questionnaire (generic health status measures). It is a brief (36 item) scale developed by Stewart, Hayes and Ware (1988) [8] from items included in the Medical Outcome Study. The SF-36 has a single item covering change in health status over the last year and an 8 multi-item scales.

Structure

The SF-36® Health Survey includes one multi-item scale measuring each of the following eight health concepts: physical functioning (PF); role limitations because of physical health problems; bodily pain (BP); social functioning; general mental health (psychological distress and psychological wellbeing); role limitations because of emotional problems; vitality (energy/fatigue); and general health perceptions. The SF-36 can also be divided into two aggregate summary measures the Physical Component Summary (PCS) and the Mental Component Summary (MCS) (Ware et al 1995) [9].

Scoring: The SF-36® Health Survey items and scales were constructed using the Likert method of summated ratings (Ware & Hays 1988) [8]. Answers to each question are scored (some items need to be recoded). These scores are then summed to produce raw scale scores for each health concept which are then transformed to a 0 - 100 scale. Scales is set up so that a higher score indicates better health.

International Physical Activity Questionnaire

Both perimenopausal and postmenopausal 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 behaviour. 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.

Statistical Method

A detailed descriptive statistics i.e. mean, standard deviation, minimum and maximum scores on each test selected sub-scales of health related quality of life ware calculated. To compare the selected HRQL variables between perimenopausal (Physically Active & Inactive) and postmenopausal (Physically Active & Inactive) women Independent sample t-test were used. The level of significance was set at 0.05.

Result and Discussions of the Study

Physical Component Summary Score

Table 2: Descriptive Statistics of Physical Component Summary Scores of physically active & inactive Perimenopausal & Postmenopausal women

Menopause Stage	Activity type	N	Mean	Std. Deviation
PERIMENOPAUSE	Physically Active (PA)	50	89.74	5.03
	Physically Inactive (PIA)	50	52.17	12.81
	Total	100	70.96	21.22
POSTMENOPAUSE	Physically Active (PA)	50	82.30	12.10
	Physically Inactive (PIA)	50	17.92	5.22
	Total	100	50.11	33.65

The above table represents that the statistical description of Physical Component Summary Scores of physically active & inactive Perimenopausal & Postmenopausal women. There were 100 women, in which 50 were physically active perimenopausal, 50 were physically inactive perimenopausal, 50 were physically active postmenopausal and 50 were physically inactive postmenopausal women. It is evident from the above table that the mean and standard deviation values obtained on Physical Component Summary various sub-scales of perimenopausal women and postmenopausal women were 70.96+21.22; 50.11+33.65 respectively.

After going through the Physical Component summary scores of perimenopausal and postmenopausal women, it is seen that the mean scores of perimenopausal were higher than mean scores of postmenopausal women. Before we interpret these means, we can examine the results through Independent T-test. To find out significant difference in various sub-scales of health related quality of life (HRQOL) between perimenopausal and postmenopausal women, Independent T-test was employed and result are depicted in the below table.

Table 3: Pair wise comparison of Physical Component Summary of perimenopausal & postmenopausal women.

Menopausal stage	Mean Value	Mean Difference	Std. Error	p-value (Sig.)
Perimenopausal	70.96	20.85*	1.348	.000
Postmenopausal	50.11			

*The mean difference is significant at the .05 level.

Table 3 shows, the pair wise comparison of perimenopausal& postmenopausal of different activity type. In the above table it is concluded that the mean difference value of perimenopausal and postmenopausal is 20.85, which is found significant at .05 level. The standard error is 1.348 and the p-value is 0.000

Table 4: Pair wise comparison of Physical Component Summary Scores of physically active and physically inactive Perimenopausal women.

Menopause stage	Activity type	Mean Value	Mean Difference	Std. Error	Sig.
Peri	Active	8974.75	37.575*	1.907	.000
	Inactive	5217.25			

*The mean difference is significant at .05 level.

Table 4 shows, the pair wise comparison of physically active & inactive perimenopausal of different activity type. In above table it concluded that the mean difference value of physically active & inactive perimenopausal is 37.575, which is found significant at .05 level. The standard error is 1.907 and the p-value is 0.000.

Table 5: Pair wise comparison of Physical Component Summary Scores of physically active and physically inactive Postmenopausal women.

Menopause stage	Activity type	Mean Value	Mean Difference	Std. Error	P-Value
Post	Active	8230.50	6438.25*	1.907	.000
	Inactive	1792.25			

*The mean difference is significant at .05 level.

Table 5 shows, the pair wise comparison of physically active & inactive postmenopausal of different activity type. In above table it concluded that the mean difference value of physically active & inactive postmenopausal is 6438.25, which is found significant at .05 level. The standard error is 1.907 and the p-value is 0.000

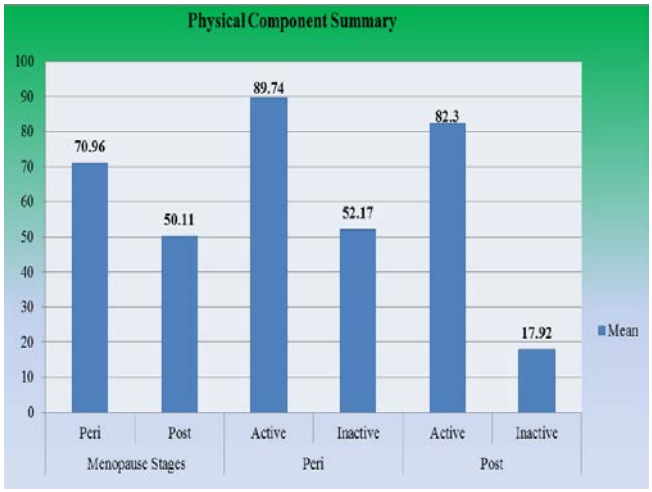

Fig 1: Graphical representation of Mean values of Physical Components Summary among various groups of women

Mental Component Summary Score

Table 6: Descriptive Statistics of Mental Component Summary Scores of physically active & inactive Perimenopausal & Postmenopausal women

Menopause Stage	Activity type	N	Mean	Std. Deviation
Perimenopausal	Physically Active (PA)	50	91.83	2.553
	Physically Inactive (PIA)	50	43.13	11.085
	Total	100	67.48	25.749
Postmenopausal	Physically Active (PA)	50	83.49	10.488
	Physically Inactive (PIA)	50	21.48	3.432
	Total	100	52.48	32.112

The above table represents that the statistical description of Mental Component Summary Scores of physically active & inactive Perimenopausal & Postmenopausal women. There were 100 women, in which 50 were physically active perimenopausal, 50 were physically inactive perimenopausal, 50 were physically active postmenopausal and 50 were physically inactive postmenopausal women. The mean value of PA peri and PIA peri are 91.83 & 43.13 respectively and the mean value of PA post and PIA post are 83.49 & 21.48 respectively. The value of standard deviation is 2.553, 11.085, 10.488, and 3.432 of PA peri, PIA peri, PA post & PIA post respectively.

Table 7: Pair wise comparison of Mental Component Summary Scores of perimenopausal & postmenopausal women.

Menopausal stage	Mean Value	Mean Difference	Std. Error	P-Value
Perimenopausal	67.48	15.00*	1.121	.000
Postmenopausal	52.48			

*The mean difference is significant at the .05 level.

Table shows, the pair wise comparison of perimenopausal & postmenopausal of different activity type. In the above table it concluded that the mean difference value of perimenopausal and postmenopausal is 15.00, which is found significant at .05 level. The standard error is 1.121 and the p-value is 0.000.

Table 8: Pair wise comparison of Mental Component Summary Scores of physically active and physically inactive Perimenopausal women.

Menopause stage	Activity type	Mean Value	Mean Difference	Std. Error	P-Value (Sig.)
Peri	Active	91.83	48.703*	1.585	.000
	Inactive	43.13			

*The mean difference is significant at .05 level.

Table 8 shows, the pair wise comparison of physically active & inactive perimenopausal women of different activity type. In above table it concluded that the mean difference value of physically active & inactive perimenopausal is 48.703, which is found significant at .05 level. The standard error is 1.585 and the p-value is 0.000

Table 9: Pair wise comparison of Mental Component Summary Scores of physically active and physically inactive Postmenopausal women.

Menopause stage	Activity type	Mean Value	Mean Difference	Std. Error	Sig.
Post	Active	83.49	62.008*	1.585	.000
	Inactive	21.48			

*The mean difference is significant at .05 level.

Table 9 shows, the pair wise comparison of physically active & inactive postmenopausal of different activity type. In above table it concluded that the mean difference value of physically active & inactive postmenopausal is 62.008, which is found significant at .05 level. The standard error is 1.585 and the p-value is 0.000

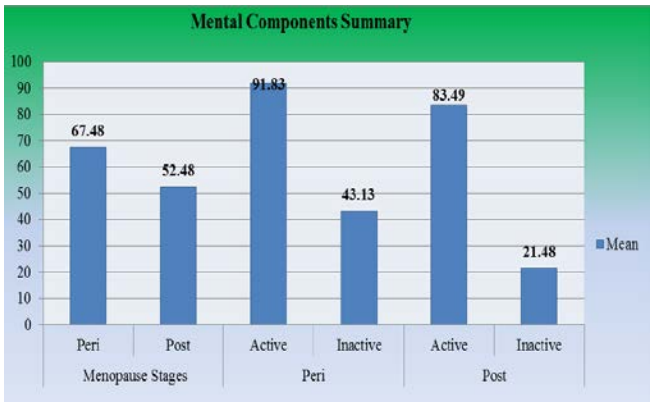

Fig 2: Graphical representation of Mean values of Mental Components Summary among various groups of women

Discussions

The research scholar examined the health related quality of life of physically active & inactive perimenopausal and postmenopausal women. The results of the study in general reveal that there is significant difference in selected HRQOL variables among various groups formed.

Analysis of data pertaining to the assessment of various sub-scales of health related quality of life (HRQOL) was done among various groups of the study. The null hypothesis was rejected in relation to HRQOL among overall perimenopausal and postmenopausal women. The mean value of perimenopausal was higher when compared to postmenopausal in Physical Component Summary. Also the mean value of Mental Component Summary was higher in perimenopausal compared to postmenopausal. The probable reason in higher means in PCS & MCS may be the

physiological effect of menopause, increase in age, professional, social responsibilities in postmenopausal women, and higher scores on various physical activities performed by perimenopausal women during that period. This result is supported by the study conducted by Javadivala & Kousha (2013) [10] on menopausal women, which showed that there was a positive significant relationship between psychological, social, and environmental domains of HRQOL with physical activity.

Assessment of Physical Component Summary & Mental Component Summary among Physically Active Perimenopausal and Physically Inactive Perimenopausal women was done. The mean value of physically active perimenopausal women was higher than physically inactive women in Physical Component Summary scores. Also, the mean value was higher in Mental Component Summary in physically active perimenopausal when compared to physically inactive perimenopausal women. The probable reason for higher mean in PCS and MCS in physically active perimenopausal women is the physical activity level. Due to regular physical activity there is greater improvement in PCS & MCS variables of HRQOL.

Analysis of data pertaining to the assessment of Physical Component Summary & Mental Component Summary scores Physically Active Postmenopausal and Physically Inactive Postmenopausal women. The mean value of physically active postmenopausal was higher when compared to physically inactive postmenopausal and prominent reason may be the physical activity performed in their day to day life. It's been supported by the study conducted by the Song & Ahn (2009) [11], where the postmenopausal women performing Tai Chi exercise had significant values of sub-scales of health perception and mental functioning. They concluded that Tai Chi exercise favourably affected cardiovascular health and quality of life in postmenopausal women after six months.

These results are also supported by study conducted by Luto & Moilanen (2012) [12] on menopausal women (sedentary symptomatic women, age 43-63 years) who showed significant improvement in physical functioning and role physical when undergone aerobic training. The study also showed that aerobic training, a form of physical activity may improve the quality of life among slightly overweight women. So it can be the probable reason for improvement in PCS & MCS in physically active postmenopausal women when compared to physically inactive postmenopausal women.

Conclusions

The conclusion of the study is there is a difference in Physical Component Summary & Mental component summary among perimenopausal and postmenopausal women. Both the variables were higher in perimenopausal women. The study also concluded that there is significant difference in Physical Component Summary & Mental component summary among physically active perimenopausal and inactive perimenopausal women. The mean scores of PCS & MCS were higher in physically active group. Further study concluded that there is significant difference in Physical Component Summary & Mental component summary in physically active postmenopausal and inactive postmenopausal women. Mean values of PCS & MCS were greater in physically active group.

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