



**ORIGINAL RESEARCH PAPER**

**Physiotherapy**

**A CROSS-SECTIONAL STUDY COMPARING COMPONENTS OF PHYSICAL FITNESS AND QUALITY OF LIFE AMONG PRE, PERI AND POST MENOPAUSAL WOMEN**

**KEY WORDS:** : Menopause, Physical Fitness, Premenopausal, Quality of Life.

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**ABSTRACT**

Menopause has a profound impact on a woman's body and health as a whole. The selected parameters of physical fitness and quality of life are measured to study and compare the effect of menopause on them. This cross-sectional study included 258 women between 40-60 years who were classified according to their menstrual status into premenopause, perimenopause and postmenopause on the basis of PENN menopausal criteria. Selected outcome measures of body mass index, grip strength, five repetition sit to stand test, Medical Outcome Study Short Form-20 was measured. The data of outcome variables of the premenopausal, perimenopausal and postmenopausal groups was compared using descriptive statistics and multivariate analysis for controlling the age variable. The values of grip strength ( $p= 0.0000$ ), and physical functioning ( $p=0.000$ ) was significantly less while five repetition sit to stand test ( $p= 0.0007$ ) duration was significantly higher in postmenopausal women as compared to premenopausal women. There is significant deterioration in selected components of physical fitness and quality of life in postmenopausal women as compared to premenopausal women even after controlling for age.

**INTRODUCTION**

Menopause means the permanent cessation of menstruation at the end of reproductive life due to loss of ovarian follicular activity. The clinical diagnosis is confirmed following cessation of menstruation (amenorrhoea) for twelve consecutive months without any other pathology (Dutta, 2013).

Menopausal status is classified as premenopause, perimenopause or postmenopause according to the PENN-5 menopausal status definition. Premenopausal status was defined by regular cycles with no change in observed cycle length (21 – 35 days). A woman was considered perimenopausal if she had two menstrual cycles with cycle length changes of at least 7 days or her last menstrual period occurred > 3 but ≤11 months before the study. Women who had not menstruated within the previous 12 months were categorized as postmenopausal (Gao, Lin, Wei, Chen, & Wu, 2013).

These symptoms associated with menopause have been divided into three clusters: vasomotor, somatic and psychological symptoms which include backaches, joint aches, hot flushes, shortness of breath, irritability, fatigue, anxiety, decreased strength, urinary tract infection etc (Ho, et al., 1999). They are of sufficient magnitude in about 15 percent of women who have undergone menopause to warrant treatment (Hall & Guyton).

Most common symptoms associated with menopause like hot flushes, vaginal changes, irritability, fatigue, pain and anxiety are well researched and documented. The purpose of this study is to compare selected components of body strength, quality of life and BMI in 40–60-year-old women who are at different stages of menopausal transition.

A study by Kurina et al, concluded that progression to postmenopausal status was associated with a marginally significant decline in grip strength for all women in their study (Kurina, et al., 2004). Rachel Hess et al examined the impact of menopausal status on health-related on quality of life for 732 women aged 40-65 years were enrolled and concluded that composite of the RAND-36 is significantly lower in late peri, early post, and late postmenopausal as well as those who have had a hysterectomy (Hess, 2011).

Silva et al aiming to correlate menopausal symptoms and quality of life with physical performance in mid-aged women found that menopausal symptoms seemed to correlate with worse physical performance and the worst physical

performances were observed in women who reported a higher intensity of menopausal symptoms (Silva, et al., 2016).

The World Health Organization reported that by 2030, there would be 1.2 billion women at and over age of 50. Therefore, although the menopause seems like a natural process, it is a period that must definitely be followed and treated (Teoman, Ozcan, & Acar, 2004).

**MATERIALS AND METHODS**

- This study was discussed on 4/10/2019 at the ethics committee meeting of Human Research Ethics Committee. It was unanimously approved for research.
- Subjects for this study were women randomly selected from the premises of a public hospital, fulfilling the inclusion and exclusion criteria. The participants were provided with complete information in a language understood to them and their consent was obtained before enrolling them in the study.

**Inclusion criteria:**

- Women aged 40-60 years.
- Intact uterus with at least one ovary.
- Having entered into menopause naturally without any surgical or medical intervention.

**Exclusion Criteria**

- Currently pregnant or breast feeding.
- Using exogenous hormone preparation affecting ovarian or pituitary function in previous 3 months.
- Any disorder or disease that may prevent from performing the required tests.
- Women who have stopped menstruating as a result of hysterectomy or radiotherapy or chemotherapy.
- Women whose menstrual status could not be determined.
- Women refusing to participate

**Study Setting and Duration**

**Study Setting:** Study was conducted at New Civil Hospital, Surat

**Study Duration:** 5 months between October 2019 to March 2020

**Sample Size:** Sample size was calculated from openepi software on basis of prevalence rate of 20% and the resultant sample size for this study was found to be 258.

**Sampling Technique:** Purposive sampling

**Anthropometric variables:**

- Stature (height in centimeters)

- Body mass (weight in kilograms)
- Body mass index (BMI) -Body composition

**Physical Fitness Variables:**

- Grip Strength
- 5 Repetitions Sit to Stand Test

**Questionnaire and scale:**

- Medical outcome study: 20- item short form survey instrument

**Tools and Materials:**

- Consent Form
- Data Recording Sheet
- Digital Weighing Scale
- Flexile measure tape
- Handgrip Dynamometer – Camry electronic hand dynamometer Model: Eh1011
- 43 cm high stool
- Stopwatch

**Procedure:**

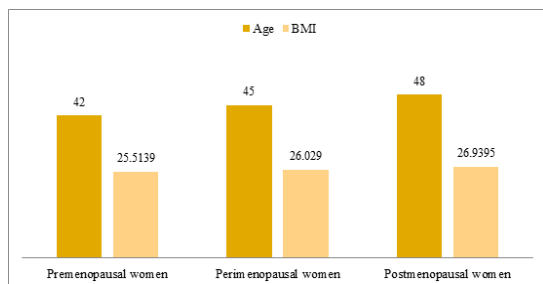
All the women approached were provided with a participant information sheet explaining the study in a language understood by them. They were requested for consent and screened to determine their eligibility for the study, according to the inclusion and exclusion criteria. Instructions related to all tests were given prior to administration with proper demonstration. The subjects were enquired about their menopausal status by asking them about their last menstrual cycle and its regularity. Their menopausal status was then determined on the basis of definition given by PENN-5. All tests were carried out by same researcher. The entire tests were carried out between 10.00 am to 4.00 pm. The same testing procedure and equipment were utilized for all participants. Readings were recorded in datasheet. Data on selected parameters: height, weight, grip strength, 5 repetition sit to stand test and physical fitness component of Medical Outcomes Study- Short Form 20 were obtained using standard procedures as explained in literature.

**STATISTICAL METHODS**

Descriptive statistics was used to calculate the mean and standard deviations of all outcome variables. Multivariate analysis was used to control the age variable and compare the significance for main outcome variables: grip strength, five repetition sit to stand test and physical functioning.

**RESULTS**

**Graph 1: Mean values of age and BMI of premenopausal, perimenopausal and postmenopausal women**



Graph 1 represents mean values of age and BMI for premenopausal, perimenopausal and postmenopausal women

**Table 1: A. Descriptive Statistics Of Grip Strength**

Menopausal status	Mean	Std. Deviation	N
Premenopausal	22.1151	4.06227	86
Perimenopausal	15.6360	5.03190	86
Postmenopausal	14.2674	4.15934	86

**B. Descriptive statistics of five repetition sit to stand test**

Premenopausal	10.7721	1.62036	86
Perimenopausal	14.6942	4.20191	86
Postmenopausal	16.0593	4.48583	86

**C. Descriptive statistics of Physical Functioning**

Premenopausal	94.6598	7.61178	86
Perimenopausal	84.5558	8.21731	86
Postmenopausal	80.5105	13.44217	86

Table 1 represents mean and standard deviation of A. Grip Strength, B. five repetition sit to stand test, C. Physical Functioning for premenopausal, perimenopausal and postmenopausal women

**Table 2: A. Age-adjusted Model Of Grip Strength**

Parameter	B	Std. Error	t	Sig.
Age	-0.12861*	0.05284	-2.43395	0.0156*
Perimenopausal women	21.77639**	2.566958	8.483344	0.0000**
Postmenopausal women	21.2916**	2.924598	7.280179	0.0000**
Premenopausal women	Reference Category			

**B. Age-adjusted model of five repetition sit to stand test**

Parameter	B	Std. Error	T	Sig.
Age	0.144284623**	0.043251	3.3360	0.0010**
Perimenopausal	7.805434171**	2.101128	3.7149	0.0002**
Postmenopausal	8.179013101**	2.393867	3.4167	0.0007**
Premenopausal	Reference Category			

**C. Age-adjusted model of Physical Functioning**

Parameter	B	Std. Error	T	Sig.
Age	-0.20699	0.120941	-1.7115	0.0882
Perimenopausal	94.43825**	5.875318	16.0737	0.0000**
Postmenopausal	91.81534**	6.693894	13.7163	0.0000**
Premenopausal	Reference Category			

Table 2 represent the age-adjusted multivariate analysis for A. grip strength, B. five repetition sit to stand test and C. physical functioning of perimenopausal and postmenopausal women with premenopausal as reference category

According to table 2.A, even after controlling for the age variable, we found significant decrease in grip strength of postmenopausal and perimenopausal women compared to premenopausal women, while there was no significant difference in grip strength between perimenopausal and postmenopausal women. Similarly, Kurina et al found that even after controlling for age, a significant decline in grip strength was associated with change in menopausal status from premenopause to postmenopause (Kurina, et al., 2004).

In table 2.B, using an age-adjusted model, we found that duration for five repetition sit to stand test was higher in perimenopausal and postmenopausal categories compared to premenopausal women. A study by Lindsey et al showed the mean value of 5 RSTST to be 8.8±2.9 for 116 postmenopausal women while this study gives the mean value of 5RSTST to be 16.0593±4.48 for postmenopausal women (Lindsey, Brownhill, Bohannon, & Ilich, 2005).

After using an age-adjusted model for physical functioning, it was found that physical functioning was significantly reduce in postmenopausal and perimenopausal women than premenopausal women, as shown in table 2.C. A study by Hess et al concluded that compared to premenopausal women, the physical health composite of the RAND-36 is significantly lower in late perimenopausal, early postmenopausal and late postmenopausal women thus supporting our result of decreased physical functioning of

postmenopausal women (Hess,2011).

### CONCLUSION

The findings from this study are supported by the results of various other studies proving that the selected parameters of physical fitness and quality of life of postmenopausal women are lower than premenopausal women. This study will shift focus on improving the quality of life and health of menopausal women, enabling them live a fulfilling life while also going into their senescence with an optimally healthy mind and body. A longitudinal study design would have been better suited to document the changes related to menopausal transition in women. We recommend this study to be conducted on a pan-India level so that the findings can be generalized for Indian women.

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