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RESEARCH ARTICLE

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THE EFFECTIVENESS OF STRUCTURED EXERCISE PROGRAMME ON PHYSICAL FITNESS AMONG RURAL POSTMENOPAUSAL WOMEN

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ABSTRACT

Introduction: Exercise prescription needs to be more specific for post menopausal women as per their health and fitness. Fitness during climatic and the reduced symptoms during climatic influence the performance of exercises. **Objectives:** To determine efficacy of structured exercise programme for rural post menopausal women on physical fitness using global physical assessment questionnaire, 6 minute walk test, chair stand test and arm curl test. **Methods:** Total of 100 subjects divided equally in to 2 group by random sampling, after checking criteria for selection. Group A experimental (n= 50) and group B control (n=50). Experimental group underwent 1month of structured exercise programme, whereas control group underwent normal working protocol. pre and post measurement were measured by using G-paq, 6 mwt, arm curl and sit to stand. The primary data of the sample population is recorded which includes demographic data/(age, Duration). As per the study the structured exercise programme, made into practice for samples under supervision for a period of 6 weeks. Results have to be analysed with appropriate statistical measures). **Results:** comparing between group the mean G-paq post score in Group A was 483.40 with a standard deviation of 27.90 and the mean G-paq post score in Group B was 415.92 with a standard deviation 31.12 which was statistically significant (p value <0.00012). The mean 6MWT post score in Group A was 342.08 with a standard deviation 6.10 and the mean 6MWT post score in Group B was 332.10 with a standard deviation 7.07 which was statistically significant (p value <0.00001). The mean Chair stand post score in Group A was 11.24 with a standard deviation 1.04 and the mean Chair stand post score in Group B was 8.78 with a standard deviation 0.74 which was statistically significant (p value <0.00001). The mean Arm curl post score in Group A was 11.42 with a standard deviation 0.76 and the mean Arm curl post score in Group B was 9.70 with a standard deviation 0.76 which was statistically significant (p value <0.00001). Hence Group A was better than group B. **Conclusion:** current study concludes that applying standard exercise protocol has substantial evidence suggested that. It can improve physical fitness in post menopausal woman in rural areas.

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INTRODUCTION

Women experience various changes in their life time, which may be developmental or transitional. Menopause is a unique stage of female reproductive life cycle, a transition from reproductive to non-reproductive stage. All women nearly around 50years or more go through a period of transition from reproductive to nonreproductive stage of life. The health status determines the correct period of menopausal age. The duration of climacteric with manageable symptoms depends on their quality of life. Menopause is a Greek word typically means "meno"-month; "pauis"-stop, it is the point at which menstruation ceases. Menopause is the end result of cessation of ovarian function (Chris Eschbach, 2012 and Gold et al. 2000). Socioeconomic status, living environment and attitude is a major determinant of quality of life of rural women as there exists a level of 'information poverty' where there is lack of sources related to

information technology and application skills of the same. Rural women are vital and productive workers in India's national economy. Rural Women work for longer hours including heavy laborious work and try to contribute substantially to family income. But they are not perceived as silent productive workers. Most of them are not acknowledged for their work in their family and improper way of handling domestic work leads to many health impairments. Studies in rural women shows some of the most common impairments as Intervertebral disc bulge, ligament strains and early osteoarthritis of knees, Urinary incontinence in women handling cattle, etc. Primary prevention is a rare phenomenon and cases of uterine prolapse are increasing in rural women. The health care needs of rural women is a challenge and only self-awareness and improving the health care knowledge can be the vital part of primary prevention (Lindsay, 1993; Mastana, 1996 and Akanksha Singh, 2014). Exercise prescription needs to be more specific for post menopausal women as per their

health and fitness. Fitness during climatic and the reduced symptoms during climatic influence the performance of exercises. Structured format of exercise which can be self administered and modified will be beneficial to the post menopausal women. In this study all the exercises components have been structured with total safety towards prevention of musculo skeletal injury and adaptation towards controlling the vasomotor symptoms and metabolic functions (Sellmeyer, 2001 and Frankenfeld, 2003). After menopause, a woman's risk of heart disease grows to almost equal the risk of a man. Falling estrogen levels may lead to high cholesterol levels. The hormonal changes in peri-menopausal women leads to decreased physical inactivity which in turn leads to decreased cardiovascular fitness & increase in incidence of obesity, most of which can be lessened by improving physical activity. Physical activity is defined as any bodily movement produced by skeletal muscles that result in energy expenditure beyond resting expenditure. Regular physical activity can prevent or lessen the impact of many of the physical and psychological changes in women experienced at this time. Rural women lack in performing regular exercises and defend as their work nature is higher which is not agreeable (Sternfeld, 2000; Nalini Mishra, 2011 and Barbara Sternfeld, 2001).

A structured physical activity regimen and specific relaxation exercises which are simple and easy to adopt should be imparted. Physical activity like brisk walking or some form of balancing exercise can make body and mind fit for day-to-day activity also make healthy life. Due to lack of awareness, facility and time rural people are neglected from physical activity. Physical activity and exercise can helps in increasing the cardio respiratory function, minimizing weight gain, reducing the metabolic risks associated with declining estrogen, increases HDL, reduces LDL, reduces risk of high blood pressure, heart attacks, and strokes, increases bone mass and prevent osteoporosis (Physical Activity Guidelines Advisory Committee, 2008; Jurca, 2004; Moilanen, 2012). Physical inactivity causes various physical and mental health problems in postmenopausal women and these are linked with menopause. Physical activities on the other hand are thought to be vital for physical and mental health of postmenopausal women. The role of exercise in the prevention of postmenopausal symptoms has been debated and recognized. According to the authors, encouraging women over the age of middle age to exercise regularly can dramatically reduce postmenopausal symptoms. Literature has reported that sustained and long duration physical activity improves mental functioning. Furthermore, the authors pointed out that physical therapy could improve patients health fitness and hence, quality of life. The literature, on the other hand, has devoted little attention to the probable association between physical activity/exercise and physical or mental health. To the best of authors' knowledge, limited reviews have been published on this topic. Attention needs to be paid to their health issues to establish strategies to prevent these problems (Swartzman, 1990; King, 1991 and Akdur, 2007). The purpose of the present review was to analyze the impact of physical activity on physical and psychological health of postmenopausal women. The ignorance and lack of awareness of post menopause woman towards eliciting a early sign and symptoms of health disorder have brought the necessity of research. There is a need to understand rural post menopausal woman cultures, barriers and facilitators regarding imparting regular physical exercise regimens. Study supports a lack of prevention of musculoskeletal; disorders in rural post menopausal women. There is a lack of literature related to physical fitness programme with relation to living environment and others. Hence this study trying to find out effect of structured exercise programme to improve physical activity in post menopause woman (Lakka, 2003).

MATERIALS AND METHODS

An experimental study was conducted with data collected from Cooper Corporation, Satara. Hundred post menopausal women of age group more than 51 years and completing 1 year duration were recruited randomly into two groups of fifty subjects each by convenience sampling. Consent was obtained from them prior to the study.

Inclusion criteria comprised Post menopausal woman completing 1 year duration, post Menopausal woman age > 51[as per WHO standards in India.], Those who can walk independently without support for 1 km. The non co-operative subjects with psycho-social issues, any form disability or impairment, Woman with psycho-social limitations, Bed- ridden woman, Subjects not attained menopause, Women with long standing climactic symptoms, Subject with early menopause, Surgical conditions like hysterectomy were excluded from the study (Physical Activity Guidelines Advisory Committee, 2008). The included subjects were then divided into two groups:

Group A- experimental: Fifty subjects who were treated with 1month of structured exercise programme

Group B- control: Fifty subjects who underwent normal working protocol

However, prior to commencement of the intervention, the pre-test of dependent variables were measured in all participants. Pre and post measurement were measured by using G-paq. 6 minute walk test (6 MWT), arm curl and sit to stand The primary data of the sample population is recorded which includes demographic data/(age, Duration). As per the study the structured exercise programme, made into practice for samples under supervision for a period of 6 weeks. Results have to be analysed with appropriate statistical measures. Data analysis was performed by SPSS (version 17) for windows. Alpha value was set as 0.05. Descriptive statistics was performed to find out mean, standard deviation for the demographic variable and outcome variables. Unpaired t test was used to find out significant difference between group for demographic variables such as age and BMI. Unpaired t test was used to find out difference in scores between groups for 6MWT, chair stand arm curl at baseline and post measurement. Mann Whitney U test was used to find out difference in scores between groups for G-paq at baseline and post measurement. Paired t test was used to find out significant difference with in group for 6MWT, chair stand arm curl. Wilcoxon signed rank sum test was used to find out significant difference with in group for G-paq. Microsoft excel, word was used to generate graph and tables.

Procedure

Group A- Fifty subjects treated with 1month of structured exercise programme

Structured exercise programme: Each exercise components of the structured exercise protocol has been designed specifically with the view of physical fitness and application for the rural post menopausal women in the western regimen of Maharashtra. Performance limitation and progression of exercise has been well managed while structuring the exercise protocol. Major barriers for rural PMW are environmental limitation, non adaptability of fitness centre, cultural barriers and difficult mode of transports. The subjects were included in the exercise programme for 6 weeks period with the frequency of 3 times a week. The programme started with warming up exercises consisting of stretching exercises and the 5 min low-intensity walking. Warming-up exercises were followed by a programme starting with 20 min and increasing up to 40 min at the end of 6 weeks.

This programme included the exercises detailed below:

- Cognitive exercises like reading skills and mental imaginary training.
- Plank exercises.
- Dual task training
- Normal pace Walking for lower extremity endurance training from 5 to 15 min;
- Exercise on the step board for lower extremity endurance from 2 to 6 min; –
- Posture exercises at an across a mirror for neck and back muscles (10 times); –
- Strengthening exercises with isoflex bands, free weights for back and abdominal muscles, pectoral, scapular muscles,

and for upper-lower extremity muscles; –

- Balance exercises for balance training; – Flexibility exercises for pectoral, hamstring, gastrocnemius-soleus, back muscles.
- Alternate heel/toe lifting - In a sitting position, subjects lift their heels plantar-flexing their ankle joints while keeping the tips of their toes on the floor, put down their lifted heels, and then lifted their toes by dorsiflexing their ankle joints while keeping their heels on the floor.
- Towel gathering - A towel laid on the floor is gathered completely with the right toe, then with the left toe.
- Beanbag transfer - Soft beanbags are placed in a basket on the floor. The objective is to gather the beanbags with the right toe and then with the left toe bringing them out of the basket and placing them on the floor.
- Weight-bearing on toes - The toes are kept in a spread position with web pads. Individuals balance themselves on the anterior part of a chair, trunk bent forward. Weight is then placed on the toes for 2 seconds.
- Body weight stand with a chair - Using hands; without the use of hands; and without the use of hands using a lower chair.
- Lower body strength with ankle weights - Knee extension, standing hip extension, standing hip abduction.
- Upper body strength with dumbbells - Overhead press, bicep curls, triceps extension. Resistance band - The exercise involves placing the band underneath the feet and reaching in front and to the side with the handles with resistance (Manjusha, 2014).

RESULTS

Hundred post menopausal women subjects were selected for the study and divided into two groups. Group A was treated with structured exercise programme and Group B was normal working protocol.

Table 1. Baseline data for demographic variable

Sl.No:	Variable	Group A	Group B	p-Value
1	Age	56.70±1.94	56.10±1.74	>0.107
2	BMI	23.72±1.29	23.92±1.46	>0.465

Data are mean ± standard deviation (sd). In the Group A, the mean Age is 56.70 and sd is 1.94 and in the Group B, the mean Age is 56.10 and sd is 1.74 which was not statistically significant (p value >0.107). In the Group A, the mean BMI 23.72 and sd is 1.29 and in the Group B, the mean BMI is 23.92 and sd is 1.46 which was not statistically significant (p value >0.465). Data was homogenous among both groups for base line data of demographic variables

Table 2. Baseline data for outcome variables

Sl.No:	Variable	Group A	Group B	p-Value
1	G-paq	411.42±29.09	414.58±27.28	>0.549
2	6MWT	332.98±6.84	331.68±6.63	>0.337
3	Chair stand	8.34±0.69	8.16±0.71	>0.201
4	Arm curl	8.70±0.84	8.90±0.65	>0.185

In the Group A, the mean G-paq was 411.42 with standard deviation of 29.09 and in the Group B, the mean G-paq is 414.58 with standard deviation of 27.28 which was not statistically significant (p-value >0.549). In the Group A, the mean 6MWT was 332.98 with standard deviation of 6.84 and in the Group B, the mean 6MWT is 331.68 with standard deviation of 6.63 which was not statistically significant (p-value >0.337). In the Group A, the mean Chair stand was 8.34 with standard deviation of 0.69 and in the Group B, the mean Chair stand is 8.16 with standard deviation of 0.71 which was not statistically significant (p-value >0.201). In the Group A, the mean Arm curl was 8.70 with standard deviation of 0.84 and in the Group B, the mean Arm curl is 8.90 with standard deviation of 0.65 which was not

statistically significant (p-value >0.185). In summary data were homogenous among both groups for baseline data.

Table 3. Pre-Post in Experimental group

Sl.No:	Variable	Pre	Post	p-Value
1	G-paq	411.42±29.09	483.40±27.90	<0.00001
2	6MWT	332.98±6.84	342.08±6.10	<0.00001
3	Chair stand	8.34±0.69	11.24±1.04	<0.00001
4	Arm curl	8.70±0.84	11.42±0.76	<0.00001

In the study, the pre mean G-paq score was 411.42 with standard deviation of 29.09 was improved to post mean G-paq score was 483.40 with standard deviation of 27.90 which was statistically significant (p-value <0.00001). In the study, the pre mean 6MWT score was 332.98 with standard deviation of 6.84 was improved to post mean 6MWT score was 342.08 with standard deviation of 6.10 which was statistically significant (p-value <0.00001). In the study, the pre mean Chair stand score was 8.34 with standard deviation of 0.69 was improved to post mean Chair stand score was 11.24 with standard deviation of 1.04 which was statistically significant (p-value <0.00001). In the study, the pre mean Arm curl score was 8.70 with standard deviation 0.84 was improved to post mean Arm curl score was 11.42 with standard deviation of 0.76 which was statistically significant (p-value <0.00001).

Table 4. Pre-Post in Group B

Sl.No:	Variable	Pre	Post	p-Value
1	G-paq	414.58±27.28	415.92±31.12	<0.00001
2	6MWT	331.68±6.63	332.10±7.07	<0.002
3	Chair stand	8.16±0.71	8.78±0.74	<0.00001
4	Arm curl	8.90±0.65	9.70±0.76	<0.00001

In the study, the pre mean G-paq score was 414.58 with standard deviation of 27.28 was improved to post mean G-paq score was 415.92 with standard deviation of 31.12 which was statistically significant (p-value <0.00001). In the study, the pre mean 6MWT score was 331.68 with standard deviation of 6.63 was improved to post mean 6MWT score was 332.10 with standard deviation 7.07 which was statistically significant (p-value <0.002). In the study, the pre mean Chair stand score was 8.16 with standard deviation of 0.71 was improved to post mean Chair stand score was 8.78 with standard deviation of 0.74 which was statistically significant (p-value <0.00001). In the study, the pre mean Arm curl score was 8.90 with standard deviation 0.65 was improved to post mean Arm curl score was 9.70 with standard deviation of 0.76 which was statistically significant (p-value <0.00001).

Table 5. Difference between groups

Sl.No:	Variable	Group A	Group B	p-Value
1	G-paq	483.40±27.90	415.92±31.12	<0.00001
2	6MWT	342.08±6.10	332.10±7.07	<0.00001
3	Chair stand	11.24±1.04	8.78±0.74	<0.00001
4	Arm curl	11.42±0.76	9.70±0.76	<0.00001

However when comparing between group the mean G-paq post score in Group A was 483.40 with a standard deviation of 27.90 and the mean G-paq post score in Group B was 415.92 with a standard deviation 31.12 which was statistically significant (p value <0.00012). The mean 6MWT post score in Group A was 342.08 with a standard deviation 6.10 and the mean 6MWT post score in Group B was 332.10 with a standard deviation 7.07 which was statistically significant (p value <0.00001). The mean Chair stand post score in Group A was 11.24 with a standard deviation 1.04 and the mean Chair stand post score in Group B was 8.78 with a standard deviation 0.74 which was statistically significant (p value <0.00001). The mean Arm curl post score in Group A was 11.42 with a standard deviation 0.76 and the mean Arm curl post score in Group B was 9.70 with a standard deviation 0.76 which was statistically significant (p value <0.00001). Hence Group A was better than group B.

DISCUSSION

Physical activity and exercise can help in increasing the cardio respiratory function, minimizing weight gain, reducing the metabolic risks associated with declining estrogen, increases HDL, reduces LDL, reduces risk of high blood pressure, heart attacks, and strokes, increases bone mass and prevent osteoporosis. This study was conducted to find the effectiveness of structured exercise programme to improve physical activity in subject with post menopausal woman by using global physical assessment questionnaire, 6 minute walk test; chair sit test and arm curl up test. In the present study total of 1000 subjects were divided equally in 2 groups and group A underwent structured exercise programme and other group kept under control where they were performed normal day to day activity and usual regular exercise programme. All the included subjects received the allocated treatment for the complete study duration with no drop out. The outcome measures used in the study were standard, the reliability and validity of the scales used have already been discussed previously. Baseline and demographic data did not show any significant difference in both the groups. In this study in group A, the pre mean g-paq score was 411.42. was improved to post mean g-paq score was 483.40 which was statistically significant (P -value <0.0001) and the pre mean 6 MWT score was 332.98 was improved to post mean 6 MWT score of 342.08 which was statistically significant (P -value <0.00001). and the pre mean chair stand test score was 8.34 was improved to post mean chair stand test 11.24 which was statistically significant (P -value <0.00001) and also the pre mean arm curl test score was 8.70 was improved to post mean score of 11.42 which was statistically significant (P -value <0.00001). The changes that occur during the experiment may result in disruptions to normal daily living. Habitual participation in physical activity results in many health benefits, including increased longevity, decreased risk of cardio-respiratory and metabolic diseases and some cancers. It maintains the energy balance improves musculoskeletal, functional and mental health (Barbara Sternfeld, 2011). Physical activity and exercise training have risks that must be considered when recommending regular physical activity. The positive outcomes resulting from regular exercise and/or physical activity programs include increased cardiovascular fitness, improvements in body composition. Regular physical activity levels also improve the sensitivity of liver, skeletal muscle, and adipose tissue to insulin. Physical activity is also indirectly protective against CVD development because it decreases blood pressure and obesity. Duval K, Strychar I, Josee CM, they found that physical activity is a confounding factor of the relation between eating frequency (EF) and body composition 85 premenopausal women were studied and investigated effect of physical activity energy (PAEE) and physical fitness of that association, mean EF was $4.6 + 0.9$ eating associations (Fabiola, 2015). In control group also all the pre and post parameters showed statistical significance not as much as experimental group this could be due to the normal exercise programme they were performed as well as the confidence in performing the test, all subjects must have tried better performance in post assessment.

However when comparing between group the mean G-paq post score in Experimental Group was 483.40 and the mean g-paq post score in Control Group was 415.92 which was statistically significant (p value <0.00012). The mean 6 MWT post score in Experimental Group was 342.08 and the mean 6 MWT post score in Control Group was 332.10 which was statistically significant (p value <0.00001). The mean chair stand post score in Experimental Group was 11.24 and the mean chair stand post score in Control Group was 8.78 which was statistically significant (p value <0.00001). The mean arm curl post score in Experimental Group was 11.42 and the mean arm curl post score in Control Group was 9.70 which was statistically significant (p value <0.00001) Hence Experimental group is better than control group. This could be explained by a hypothesis where subject in experimental group were aware of their exercise and standard protocol and they were practicing regularly in the form of aerobic exercise, strengthening exercise as well as balancing exercise. Previous literature explained Obes Relat Metab Disord conducted a study on Body mass index in mid-life women: relative influence of

menopause, hormone use, and ethnicity and concluded that the menopausal transition affects body mass index in mid-life, but the effect is small relative to other influences. Interventions to increase physical activity are highly recommended to prevent increases in adiposity common in midlife. A number of studies have mentioned that body weight and body composition changes as a result of physical training. Lakka TA et al suggests that adult should accumulate at least 30 minutes of moderate intensity physical activity on most, preferably all days of the week to protect against chronic diseases and to improve cardiovascular fitness (Sheetal Kalra, 2022). Subject on performing dual task training and acknowledged importance of cognitive training in old age. In rural PMW found more convinced and interested in performing dual task activities and willing to progress better, this is evident from the data analysis of 6 minute walk test. While performing structured exercise programme strengthening exercise they appreciated the way of activating full range of motion on the postural exercises. They are able to plank exercises and the use of sustained of exercises as a parameter for fitness. This has been revealed from post rest of arm curl test. However there were few limitations identified No comment can be made on the long-term effects of the treatment administered to the subjects because no follow-up was done in this study. The severity of the condition was not mentioned in the study that could have had an effect on the treatment and duration of the study. The study did not mention the different type of physical activity and effect of each in detail. In order to generalize the findings, the study did not compare the influence of quality of life on each group. Hence this study accept experimental hypothesis and reject null hypothesis that there will be a significant difference in standard exercise programme to improve physical fitness in subjects with post menopausal women.

CONCLUSION

Based the study's findings and review of supporting evidences, this study accepts the experimental hypothesis while rejecting the null hypothesis. Thus the current study concludes that applying standard exercise protocol has a substantial evidence suggest that. It can improve physical fitness in post menopausal woman in rural areas.

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