

## Comparative Study on Resisted Exercises Vs Stretching Intervention Over Quality of Life in Postmenopausal Women

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### ABSTRACT

The term menopause indicates for the last menstrual flow experienced by a woman, the menopause occurs at some times between the ages of 45 and 55 years for most women. But varies with race, economic status and nutrition. Regardless of these factors, a few women experience a very premature menopause before 40 years. Prior to actual menopause, when menstrual cycles are erratic, a woman may be referred to as premenopausal and following the menopause as postmenopausal. Objective: The aim of this study is to compare the effects of different exercise programs (resisted exercise and stretching program) over quality of life in postmenopausal women. Study design: - Quasi-Experimental Design, comparative study. Subjects: Applying inclusion and exclusion criteria, 30 postmenopausal women were selected as postmenopausal women and were allotted with the exercise program. (15 women- resisted exercise program and 15 women- stretching exercise program). A format menopausal specific quality of life questionnaire, a simple questionnaire was filled up before the intervention period and at the end of 4 weeks after the intervention period. Instructions were given to the postmenopausal women according to the protocol of menopausal specific quality of life questionnaire. Results: The result of this study shows statistically significant difference between resisted exercise and stretching on menopausal symptoms by menopausal specific quality of life questionnaire in postmenopausal women. Conclusion: This study concluded that 4 weeks of resisted exercise and stretching both reduces the intensity of menopausal symptoms among postmenopausal women. And there by resisted exercises and stretching exercise program are both beneficial and can be included in physiotherapy intervention for postmenopausal women.

**Keywords:** menopause, quality of life, resisted exercise, stretching, menopausal women.

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### INTRODUCTION

The term menopause indicates for the last menstrual flow experienced by a woman, the menopause occurs at some times between the ages of 45 and 55 years for most women. But varies with race, economic status and nutrition. Regardless of these factors, a few women experience a very premature menopause before 40 years. Prior to actual menopause, when menstrual cycles are erratic, a woman may be referred to as premenopausal and following the menopause as postmenopausal<sup>1</sup>. Anatomical and physiological changes that occur during the menopausal and postmenopausal stage as women proceeds from her fertile to infertile years are termed the climacteric. These changes occur because the ovaries become exhausted of viable follicles, they shrink and fail to produce oestrogen. The Anterior pituitary gland is released from the cyclic inhibition of oestrogen and so continues to produce follicular stimulating hormone and luteinizing hormone. In some women oestrogen tend to be produced in suprarenal cortex and synthesis of androgens in fatty tissues in the mechanism of menopause<sup>1</sup>. The physical and physiological symptom during menopause are frequent hot flushes, night sweats, vaginal soreness, dyspareunia, urinary disorders, dry skin, reduced concentration, loss of

memory, inability to make decision, anxiety, mood swings, irritability, tiredness, and depression. Such unpleasant symptoms may begin during premenopausal stage and can continue for several years even after the menopause. Many women notice a gain in weight during menopause although their eating habits have not changed<sup>1</sup>. The peak of the persons bone mass is achieved during the second decade or in the third decade of the life. Then there is a slow, age related fall which accelerates when the ovaries cease to function, it has been shown that following removal of ovaries there is 2.5% bone loss per annum for the first four years which then decrease to about 1%. Thus it can be calculated that the following menopause, the average women may loss 20% of the bone mass by the age of 70 years. Both trabecular and cortical bone are lost. There is a greater prevalence of osteoporosis among slender women and they are at greater risk of fractures. Obesity may give some protection against osteoporosis by assisting oestrogen production and by the stressing effect of weight bearing on the skeletal. Fractures of femur, wrist, and vertebra are predominant and they affect independence and even may become life threatening<sup>1</sup>. Prevention continues in childhood by ensuring an adequate calcium intake in the first two decades of life, together with plenty of exercise in

order to build up a substantial peak bone mass. Studies found health promotion sessions with a gynecologist, nutritionist and physical therapist focusing and educating on diet and exercise can improve the general health of postmenopausal females<sup>1</sup>. Years ago there was no management for the menopausal symptoms and the women have to live with it. After years hormone replacement therapy was done to reduce the menopausal symptoms. But hormone replacement therapy has some complications like pulmonary embolus, uterine cancer, breast cancer, heart disease, abnormal vaginal bleeding, stroke etc<sup>2</sup>. Due to this reason other management has been developed over years which include the use of herbal drugs, diet/nourishment, exercise programs, and lifestyle modification programs<sup>2</sup>. Regular exercises which are one of the most outbursts among the management of postmenopausal symptoms had gained its importance as it can improve cognitive function, enhance mood and promote daytime alertness and nocturnal sleepiness. Exercises can increase endorphin levels which are the bodies' natural pain relievers. Exercises increase the cardiorespiratory function, if done regularly, it reduces the metabolic risks associated with declining estrogen. It increases high density lipoprotein, reduces low density lipoprotein, triglycerides and fibrinogen. There is an additional benefit of a reduced risk of high blood pressure, heart attacks, and strokes. It also increases the bone mass which is important to compensate the physiological loss during the menopausal period. Strength training and impact activities (like walking or running) can also help to offset the decline of bone mineral density and prevent osteoporosis. It is proven to reduce stress and improve the mood. It may help to reduce hot flushes, thereby minimizing the "Domino effect" of menopause. Exercises are administered in various forms to the postmenopausal women. There are document to provide various benefits. Aerobic exercises, free exercises, stretching program, Pilates are few among the recent evolving trends in the management of reduction of postmenopausal symptoms.

Lauve Metcalfe, Tim Lohman<sup>6</sup> (2001) concluded that the results of previous exercise programs for postmenopausal women that aimed to increase bone mineral density (bone mass density) demonstrate that resistance training is positively associated with an increase in bone mass density in older adults. Although aerobic exercise and weight-bearing activity are important in maintaining overall health, and may contribute to maintenance of healthy bone, resistance exercise seems to have a more significant impact on bone density. Recent advancement has been proved that aerobic and resisted exercises also drastically reduce the intensity of menopausal symptoms. For a long time stretching program also has been proven to reduce the menopausal symptoms. Stretching program had a lot of benefits over postmenopausal women. It reduces the muscle tightness and improves joint range of motion. It also helps in promoting relaxation. Shelley S. Tworoger, Yutaka Yasui<sup>8</sup> (2003) concluded that both stretching and exercise interventions may improve sleep quality in sedentary, overweight, postmenopausal women. Increased fitness was associated with improvements in sleep.

However, the effect of moderate-intensity exercise may depend on the amount of exercise and time of day it is performed. As most of the women complaints of difficulty and reduced feasibility in doing aerobic exercises in Indian set up, so this study was to compare the resisted exercise and stretching program over postmenopausal symptoms.

## METHODOLOGY

30 women were selected according to inclusion and exclusion criteria. The procedure was explained to subjects and written consent form was taken. A detailed history of ages when they went through menopause, their most serious health complaints, and medications they were using regularly. Before and after the study quality of life regarding health evaluations, menopause specific Quality of Life Questionnaire [MENQOL] was taken. Prior to the study, 30 menopausal women were randomly divided into two groups.

Group A: Resisted exercise.

Group B: Stretching.

Both groups attended the exercise programs 3 days per week for 4 weeks under the supervision of a physiotherapist. Cases in the resisted exercise groups were trained with the elastic bands on the big muscle groups.

Group A (Resisted exercises)

Prior to resistance exercise training, perceived exertion scale (BORG'S) was used to determine the elastic resistance regime of cases. 9 exercises with 2-4 sets for all main muscle groups, 10-15 repetitions should be given with 5 minutes relaxation between each repetition. Exercise that was used in the resisted exercise are:

- Sitting chess press.
- Standing strengthening abduction of both shoulders.
- Sitting strengthening flexion of both shoulders.
- Sitting strengthening extension of both the shoulders.
- Sitting strengthening flexion of both forearms.
- Strengthening extension of both knees in sitting position.
- Sitting strengthening abduction of both the thigh.
- Strengthening dorsiflexion of both ankles in sitting position.
- Pelvic bridging.

Group B (Stretching)

Patients in the Stretching sessions were trained with a 5minute walk around a room followed by 5 upper-bodies and 4 lower-bodies with 2 repetitions with hold time for each stretch will be 20 seconds for 30 minutes and 5 minutes relaxation between each stretch.

*Stretching of Upper-Body Includes*

- Stretching of sternocleidomastoid.
- Stretching of trapezius.
- Stretching of pectorals.
- Stretching of back extensors.

*Stretching of Lower-Body Includes*

- Stretching of piriformis.
- Stretching of hamstrings.
- Stretching of quadriceps.
- Stretching of calf muscle.

## **RESULTS AND DISCUSSION**

This study was focused on to compare two types of exercise programs on vasomotor symptoms, psychological, physical and sexual problems in postmenopausal women. Menopause is a physiological process during which women go through a new biological state. This process is accompanied by many biological and psychosocial changes which reduce the quality of life in postmenopausal women. A gradual decline of quality of life was seen from pre- to peri-and postmenopausal women. Statistically impaired quality of life was associated with postmenopausal women in vasomotor, physical, psychological and sexual domains. Early postmenopausal presented the worst quality of life in vasomotor, psychological and physical domains Chen, ying (2008)<sup>18</sup>. This study found that 87.85% of the participant reported vasomotor symptoms, 100% psychological, 100% physical and 10.6% sexual problems among 30 participants of postmenopausal women in this study which is consistent with Akanksha Singh, Shishir Kumar Pradhan (2014) who concluded that a large proportion of postmenopausal women suffered from menopausal symptoms. The most common menopausal complaints reported by the postmenopausal women were sleep disturbances, muscle or joint pain, hot flushes and night sweats. Sexual life was also affected by menopause. Moreover, postmenopausal women suffered from depression and anxiety. In past, the menopausal women have to live with all these symptoms. Now due to recent advancement in the field of women's health in physiotherapy, different concepts of training are evolving to enhance the quality of life in postmenopausal women. This may highly be useful for the postmenopausal women to overcome symptoms related to menopausal period. Various studies and compilation in Cochrane database say that physical activity and taking part in exercise program have been proven to have positive effect on symptoms related to menopause. This was supported by the result of this study which showed that regular exercise has positive effect on vasomotor, psychological, physical and sexual symptoms among both stretching and resisted exercise group in postmenopausal women. The statistical results of this study showed that there was a statistically significant difference in vasomotor symptoms, psychological and physical in Group A subjects who underwent resisted exercise ( $p < 0.05$ ). Most of the postmenopausal women are reluctant to fill the outcome with sexual issue due to cultural beliefs. So the correlation and  $t$  cannot be computed because standard error of the different is 0. The results go in hand with Aysegul Agil<sup>20</sup> (2010) who had concluded that Resisted exercises are found to have a positive impact on menopausal symptoms, psychological health, depression, and quality of life. The statistical result of this study showed that there was a statistically significant difference in vasomotor symptoms, psychological and physical in group B subjects who underwent stretching ( $p < 0.05$ ). The result goes in hand with Shelley S. Tworoger, Yutaka Yasui<sup>8</sup> (2003) who concluded that stretching and exercise interventions may improve sleep quality in sedentary, overweight,

postmenopausal women. Increased fitness was associated with improvements in sleep. However, the effect of moderate-intensity exercise may depend on the amount of exercise and time of day it is performed. Significant changes in all subscale points of the scale expect for sexual symptoms showed that both exercise programs increased the quality of life of the cases. It can be correlated that improvement in quality of life is parallel to improvement in both the interventional groups. There were less studies that compared the effects of resisted exercise and stretching on menopausal symptoms in postmenopausal women. On this criterion, the two different forms of exercises, like resisted exercise and stretching were compared in this study. The statistical results of this study showed that there was a statistically significant difference in vasomotor symptoms between Group A subjects who underwent resisted exercises Group B subjects who underwent Stretching exercises ( $p < 0.05$ ). The results goes in hand with Lotta Lindh-Åstrand (2004)<sup>10</sup> who concluded that apart from many other health benefits regular physical exercise may decrease vasomotor symptoms and increase quality of life in postmenopausal women, but this has to be further evaluated scientifically. Exercise should be introduced gradually to ensure compliance.

The statistical results of this study showed that there was a statistically significant difference in psychological symptoms between Group A subjects who underwent resisted exercises Group B subjects who underwent Stretching exercises ( $p < 0.05$ ). The statistical results of this study shows that there was no statistical significant difference in physical symptoms between Group A subjects who underwent resisted exercises Group B subjects who underwent Stretching exercises ( $p > 0.05$ ). The results goes in hand with Jennifer W. Bea<sup>22</sup> (2011) who concluded that resistance training is a viable long-term method to prevent weight gain and deleterious changes in body composition in postmenopausal women. Resisted exercise increases body's basal metabolic rate with increase in muscle mass, which promotes long-term fat loss, also improves muscle tone and appearance, increased endurance and enhanced bone density. Resisted exercise increases levels of dopamine, serotonin and norepinephrine, which can help to improve mood and counter feelings of depression. Stretching may have a similar effect to hormone replacement therapy in the amelioration of vasomotor symptoms by increasing the presence of hypothalamic and peripheral beta endorphin production. In addition there is evidence that as endorphin increases, the frequency and amplitude of luteinizing hormone decreases, which regulate gonadotropin releasing hormones level. Research has shown that active individuals have higher basal levels of beta endorphin than those who are inactive, by these mechanisms exercises may help to stabilize the thermo regulatory centers and diminish the risk of hot flushes. It has been suggested that stretching can improve strategy from daily worries and that exercise can enhance individuals feeling of accomplishment thereby improving self-esteem. Stretching also increases blood flow, relax the muscles, increase range of motion and flexibility, and better one's

Table 1: Comparison of pre and post test values of vasomotor symptoms of menopause specific quality of life questionnaire in group A subjects treated with resisted exercises.

Group A	Mean	Std.deviation	Std.error	t	Sig
Pre test	1.7527	.56977	.14711	4.017	.001
Post test	1.3293	.30707	.07929		

In this table  $p < 0.05$  which shows that there is a significant difference in vasomotor symptoms among group A subjects treated with resisted exercises.

Table 2: Comparison of pre and post test values of psychological symptoms of menopause specific quality of life questionnaire in group A subjects treated with resisted exercises.

Group A	Mean	Std.deviation	Std.error	t	Sig
Pre test	1.8367	.68782	.31142	3.224	.006
Post test	1.3487	.29530	.07624		

In this table  $p < 0.05$  which shows that there is a significant difference in psychological symptoms among group A subjects treated with resisted exercises.

Table 3: Comparison of pre and post values of physical symptoms of menopause specific quality of life questionnaire in group A subjects treated with resisted exercises.

Group A	Mean	Std.deviation	Std.error	t	Sig
Pre test	2.8445	.88855	.22942	3.928	.002
Post test	1.9360	.44572	.11509		

In this table  $p < 0.05$  which shows that there is a significant difference in physical symptoms among group A subjects treated with resisted exercises.

Table 4: Comparison of pre and post values of vasomotor symptoms of menopause specific quality of life questionnaire in group B subjects treated with stretching exercises.

Group A	Mean	Std.Deviation	Std.Error	t	Sig
Pre test	2.1667	1.20611	.31142	3.224	.006
Post test	1.9227	.96566	.24933		

In this table  $p < 0.05$  which shows that there is a significant difference in physical symptoms among group A subjects treated with resisted exercises.

Table 5: Comparison of pre and post values of psychological symptoms of menopause specific quality of life questionnaire in group B subjects treated with stretching exercises.

Group A	Mean	Std.Deviation	Std.Error	T	Sig
Pre test	2.2405	.66233	.17101	3.465	.004
Post test	1.9360	.052962	.013675		

In this table  $p < 0.05$  which shows that there is a significant difference in psychological symptoms among group B subjects treated with stretching.

Table 6: Comparison of pre and post values of physical symptoms of menopause specific quality of life questionnaire in group B subjects treated with stretching exercises.

Group A	Mean	Std.Deviation	Std.Error	T	Sig
Pre test	2.9449	.79864	.20621	6.008	.000
Post test	1.7680	.49185	.12699		

In this table  $p < 0.05$  which shows that there is a significant difference in physical symptoms among group B subjects treated with stretching.

Table 7: Comparison of post values of vasomotor symptoms of menopause specific quality of life questionnaire between group a subjects treated with resisted exercises and group b subjects treated with stretching program.

Post Test	Mean	Std.Deviation	Std.Error	t	Sig
GROUP A	1.3293	.30707	.07929		
GROUP B	1.9227	.96566	.024933	-2.268	.031

In this table  $p < 0.05$  which shows that there is a significant difference in vasomotor symptoms between group A subjects treated with resisted exercises and group B subjects treated with stretching.

performance and can prevent injury. It was seen that both resistance and stretching have positive effects on menopausal symptoms, psychological health and quality

of life, however resisted exercise is significant more effective in reducing menopausal symptoms than stretching. Thus Group A subjects treated with resisted

Table 8: Comparison of post values of psychological symptoms of menopause specific quality of life questionnaire between group a subjects treated with resisted exercises and group b subjects treated with stretching program.

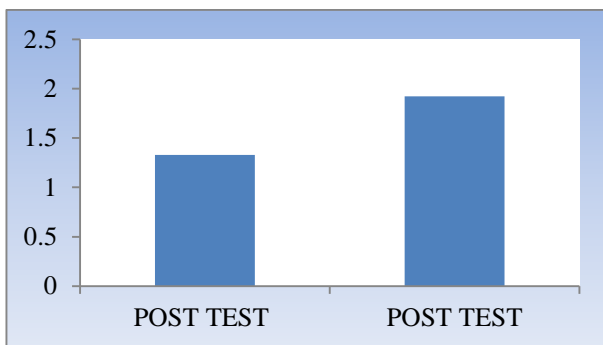
Post Test	Mean	Std.Deviation	Std.Error	t	Sig
GROUP A	1.3487	.29530	.07624		
GROUP B	1.9360	.52962	.13675	-3.751	.001

In this table  $p < 0.05$  which shows that there is a significant difference in psychological symptoms between group A subjects treated with resisted exercises and group B subjects treated with stretching.

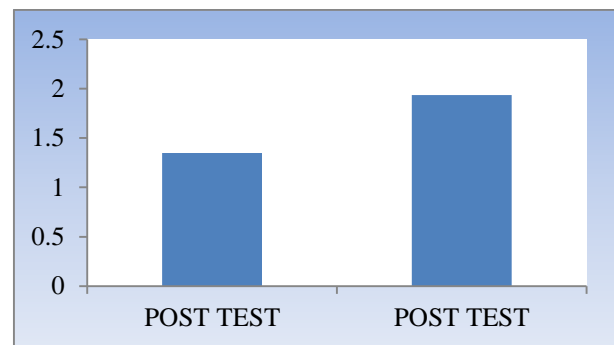
Table 9: Comparison of post values of physical symptoms of menopause specific quality of life questionnaire between group a subjects treated with resisted exercises and group b subjects treated with stretching program.

Post Test	Mean	Std.Deviation	Std.Error	t	Sig
GROUP A	2.0101	.44572	.11509		
GROUP B	1.7680	.49185	.12699	.1412	.169

In this table  $p < 0.05$  which shows that there is a significant difference in physical symptoms between group A subjects treated with resisted exercises and group B subjects treated with stretching.



Graph 1: Comparison of post values of vasomotor symptoms of menopause specific quality of life questionnaire between group a subjects treated with resisted exercises and group b subjects treated with stretching program. In this table  $p < 0.05$  which shows that there is a significant difference in vasomotor symptoms between group A subjects treated with resisted exercises and group B subjects treated with stretching.



Graph 2: Comparison of post values of psychological symptoms of menopause specific quality of life questionnaire between group a subjects treated with resisted exercises and group b subjects treated with stretching program. In this table  $p < 0.05$  which shows that there is a significant difference in psychological symptoms between group A subjects treated with resisted exercises and group B subjects treated with stretching.



Graph 3: Comparison of post values of physical symptoms of menopause specific quality of life questionnaire between group a subjects treated with resisted exercises and group b subjects treated with stretching program. In this table  $p < 0.05$  which shows that there is a significant difference in physical symptoms between group A subjects treated with resisted exercises and group B subjects treated with stretching.

exercise shows a significant difference or improvement in menopausal specific quality of life questionnaire post 4 weeks of treatment than the stretching group. So resisted exercises has a good effect on Quality Of Life In Postmenopausal Women than stretching program.

**CONCLUSION**

This study focused on the comparison of resisted exercises and stretching program on menopausal symptoms among postmenopausal women. The result of this study shows statistically significant a difference between resisted exercise and stretching on menopausal symptoms by menopause specific quality of life questionnaire in postmenopausal women. Resisted exercise has a better

clinical outcome with menopausal specific quality of life questionnaire than with stretching program. This study concluded that 4 weeks of both resisted exercise and stretching, reduces the intensity of menopausal symptoms among postmenopausal women. And there by resisted exercises and stretching exercise program can be included in physiotherapy intervention for treating postmenopausal women.

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