



(RESEARCH ARTICLE)



Effects of pilates exercise on quality of life and menopausal symptoms in menopausal women: A quasi experimental study

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Abstract

Background: Menopause is an unspoken, unattended, reality of life, the cause of which is still undeciphered completely by human. Women can enjoy good quality of life after menopause even without hormones as exercise works by improving muscle mass, strength, flexibility and coordination. Pilates exercise has grown in popularity as a result of profound effects that it has had on both healthy and injured bodies. Nowadays Pilates exercise more formally into rehabilitation from more medical perspective.

Aim: To assess the effect of Pilates exercises on quality of life and menopausal symptoms in menopausal women.

Materials and Methods: A Study was performed on a total of 30 women. Subjects matching the inclusion criteria with age group 45-55 years were included for the study. They performed pilates exercise, 3 times a week for 8 weeks. Menopause Rating Scale and Menopause-specific Quality of Life were used as outcome measures to assess the pre and post effect of exercises. Data was analyzed using SPSS software 28.

Results and Discussion: There is a statistically significant difference in the outcomes of pre and post intervention. Paired t test was performed.

Conclusion: It is concluded that the Pilates training program in menopausal women helps to improve their quality of life and also beneficial in reducing the symptoms of menopause.

Keywords: Menopause; Quality of life; Pilates ; Menopausal women; Menopausal symptoms

1. Introduction

The menopause is defined as the permanent cessation of menstruation resulting from the loss of ovarian follicular activity, and it marks the end of a woman's reproductive capacity and not due to physiologic (e.g., lactation) or pathologic causes.^{[1][2]} Owing to lack of oestrogen women during menopause may experience compromised physical wellbeing and climacteric symptoms such as mucosal dryness, hot flushes, night sweats and emotional fluctuations.^[3] Clinical correlates of these changes can include incontinence, sexual dysfunction, increased risk of fracture, dysphoric mood, and increased risk of cardiovascular disease.^[4] Though not all women who report menopausal symptoms are bothered by them, several large studies have demonstrated an association between menopausal symptoms and lower quality of life.^[2]

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QOL has been defined by the WHO as the “individual's perceptions of their position in life in the context of the cultural and value systems in which they live and in relation to their goals, expectations, standards, and concerns.”^[8] Quality of life tends to decline in midlife women, and there is a need to determine what role, if any, symptoms commonly associated with the transition to menopause and early postmenopausal play in this phenomenon.^[5] The multiple paradigmatic pattern of symptoms associated with menopausal stage and the subjective evaluation of the impact of these symptomatology in the holistic welfare of woman are overlooked by the health personnel.^[6]

Some women have severe symptoms that greatly affect their personal and social functioning, and quality of life.^[5] Poor compliance to recommended lifestyle modifications and limited knowledge could impede a better overall health-related quality of life (QOL).^[6] Given the increase in life expectancy, particularly in women, hence the importance of improving their “health-related quality of life (HRQL)”.^[7]

Hippocrates (460–370 BC) stated “Eating alone will not keep a man well; he must also take exercise. For food and exercise, while possessing opposite qualities, yet work together to produce health”.^[9] It is well known that participation in regular physical activity confers many health benefits to the cardiovascular, endocrine and locomotor systems in the general population.^[7] Pilates is a mind-body exercise focusing on muscle strength, core stability, endurance, muscle control, posture, and respiration which seems to improve both the physical and psychological components in menopausal women.^[10]

A Pilates intervention has been proven to increase muscle strength and flexibility and is believed to minimize the harmful effects of menopause on function.^[11] Among all exercise modalities, Pilates can be used as an alternative practice to regular physical activities, being able to generate several beneficial results. Moreover this kind of exercise allows the accessibility to different clinical situations because it is a modality that has a large number of exercises that are adaptable to the patient condition.^[12]

Hormone replacement therapy, is known to be effective in ameliorating symptoms, however, reporting of side effects has resulted in alternative treatment options. The main objective of regular exercise is the prevention of physical deterioration and optimizing functional capacity to improve overall post-menopausal women's quality of life. Pilates is a system of exercises using special apparatus designed to improve physical strength, flexibility, dynamic postural balance, and enhance mental awareness. Some authors have presented improvements in neuromuscular and cardiovascular health through the practice of the Pilates Method, for both acute and long-term effects, but there still exists several gaps regarding how the application of Pilates can be effective in changes in climacteric symptoms. So there is a need of study to check whether pilates are effective or not.

The objective of this study is to evaluate if a program of activities based on Pilates exercises could improve the quality of life of a community sample of menopausal women and to evaluate if a program of activities based on Pilates exercises could improve the menopausal symptoms of a community sample of menopausal women.

2. Materials and methods

A quasi experimental study consisting of 30 menopausal women of age between 45-55 years chosen from Anand district using simple random sampling, was performed.

2.1. Inclusion Criteria

- Female who are in perimenopause or postmenopausal state.
- Age Group: 45-55 years.
- MRS scale is 8 or more than 8.
- Had not received medication for menopausal symptoms within the past 6 months.
- Not participated for any formal exercise programme.
- Patient willing to participate.

2.2. Exclusion Criteria

- Any lower limb surgery.
- Any neurological condition.
- Any Musculoskeletal disorders, cardiovascular disease.

Materials: Pen, Paper, Questionnaire, Consent form, Mat, Stop-watch, Sanitizer, Marker

2.3. Procedure

The subjects who were willing to participate in the study were selected from various community area in Anand district using simple random sampling. All selected individuals were rectified by inclusion and exclusion criteria. Informed consent was obtained from all the individual participants included in the study. The subjects were explained about the survey. An initial assessment was conducted using the data collection which comprises of Menopause Rating Scale (MRS) and quality of life questionnaire (MENQOL). The procedure was explained to patient and measures for safety and close monitoring of the patient was done to avoid any injuries. The subjects practiced Pilates for 1 hour, 3 times per week for 8 weeks. After 2 months again subjects filled the questionnaire and MRS.

2.4. Method

The exercise program consisted of 7–10 min for the warm-up, 35–40 min for the main program, and 5–7 min for the cool-down. The main program consisted of exercises that emphasize the 6 principles of Pilates such as: The Hundred, Roll Up, Leg Stretch (single and double), Leg Circles (single and double), Rolling like a Ball, Spin Stretch Forward, Saw, Teaser, Swan Dive, Crisscross, Cockey Curl, Curl Up and Swimming.

Each exercise will be repeated 10 times for 2 sets in first 4 weeks and 3 sets in last 4 weeks, with a 10-sec rest per repetition and 60 sec between sets. The rating of perceived exertion (RPE) was used to gradually increase the program intensity. The program was divided into 3 phases: phase 1 (RPE, 9-11), phase 2 (RPE, 9-13), and phase 3 (RPE, 9-11).

2.5. Outcome measures

2.5.1. Menopause Rating Scale

The MRS scale is obviously a valuable tool for assessing health related quality of life of women in the menopausal transition and is used worldwide.^[15] The currently available methodological evidence points towards a high quality of the MRS scale to measure and to compare high risk quality of life of aging women in different regions and over time, it suggests a high reliability and high validity as far as the process of construct validation could be completed yet.^[16] An MRS score of 14 or more, according to the woman own perception, indicates the need to receive some therapy to treat climacteric symptoms.^[17]

2.5.2. Quality of life questionnaire [MENQOL]:

The Menopause Specific Quality of Life Questionnaire (MENQOL) is a validated questionnaire for the assessment of menopausal women's symptoms and an effective instrument, although most researchers have recommended an investigation of the validity of this tool for use in different cultures and nations.^[14] The MENQOL a good metric instrument for assessing the level of disturbance of menopausal symptoms among midlife women. ^[13]The MENQOL is self-administered and consists of a total of 29 items in a Likert-scale format. Each item assesses the impact of one of four domains of menopausal symptoms, as experienced over the last month: vasomotor (items 1–3), psychosocial (items 4–10), physical (items 11–26), and sexual (items 27–29). Items pertaining to a specific symptom are rated as present or not present, and if present, how bothersome on a zero (not bothersome) to six (extremely bothersome) scale.^[18] Cronbach's alpha coefficient for the Serbian MENQOL was 0.957 (Vasomotor: 0.917, Psychosocial: 0.907, Physical: 0.928, Sexual: 0.913^[13]) The internal consistency using the Cronbach's alpha showed high reliability (0.993) between the MENQOL-E and MENQOL-O questionnaires.^[19]

3. Result

3.1. Statistical Analysis:

Total 30 women were taken for the study who fulfilled the inclusion criteria and who were willing to participate. Basic Parameter like age was taken which is shown in the Table 1. All statistical analysis was performed using the Statistical Package for Social Sciences (SPSS) version 28 for windows. Microsoft Excel and Microsoft Word were used to generate graphs and master chart. Descriptive statistics including mean and Standard Deviation (SD) were analyzed by calculating mean and standard deviation of the pre-post data. Paired t-test was performed to compare the data.

3.1.1. Age

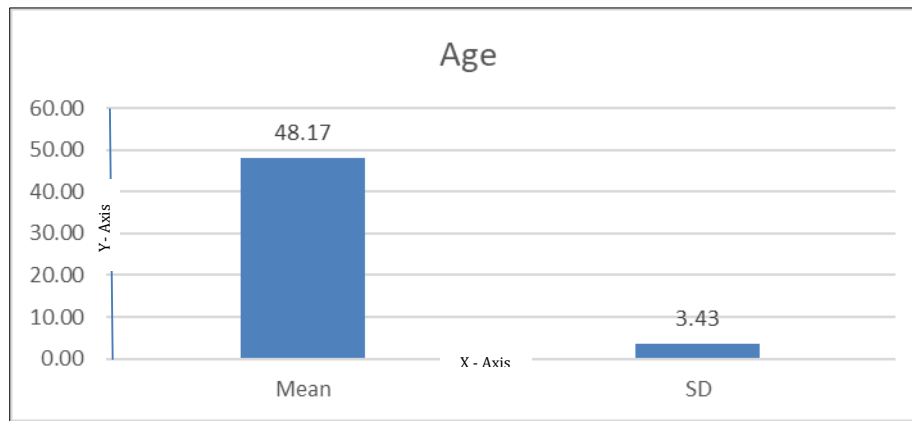


Figure 1 Mean and SD of the age

Above chart shows mean age of women. The mean age of all the 30 women is 48.17 years with SD 3.43 years.

3.1.2. Menstrual rating scale

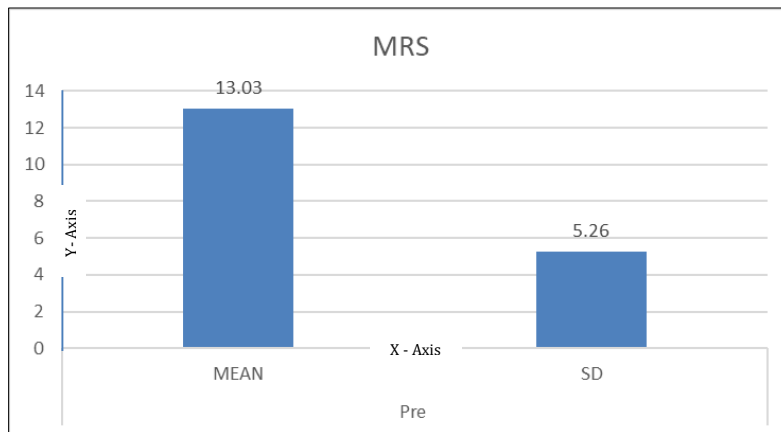


Figure 2 Mean and SD of MRS before intervention

Above chart shows mean score of MRS before the intervention. The mean score of MRS of all the 30 women is 13.03 with SD 5.26.

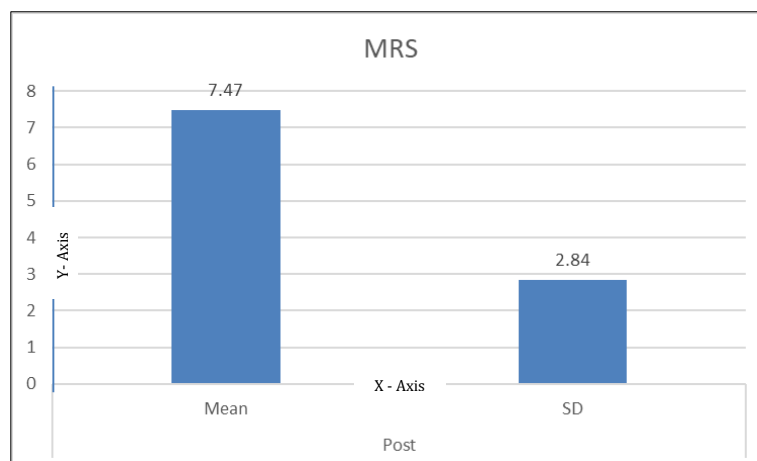


Figure 3 Mean and SD of MRS score after the intervention

Above chart shows mean score of MRS after the intervention. The mean score of MRS of all the 30 women is 7.47 with SD 2.84.

3.2. Comparison between pre-post score of Menstrual rating scale

Pre-Post (Before-After) comparison was done by using paired t test.

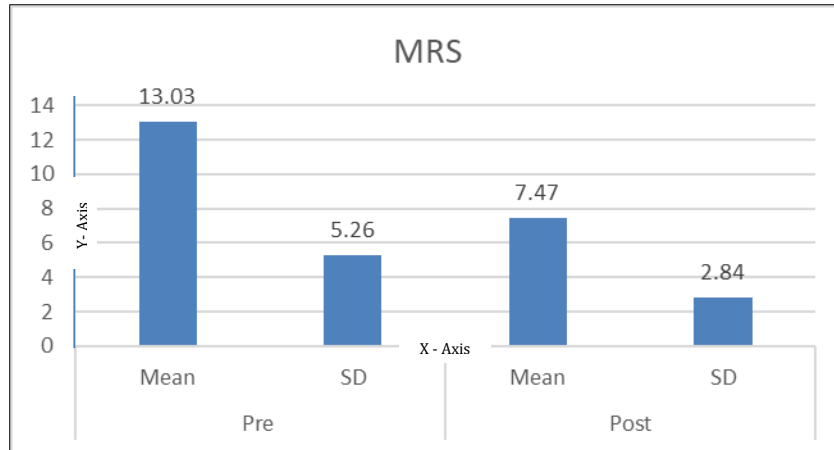


Figure 4 Paired t test of MRS outcomes

According to the outcomes of the MRS questionnaire, the mean (SD) MRS score in the pre-group was 13.03±5.26 and the post-mean (SD) MRS score was 7.47±2.84, which indicated a statistically significant decrease of 5.56. ($p < 0.05$).

3.2.1. Mensrual quality of life

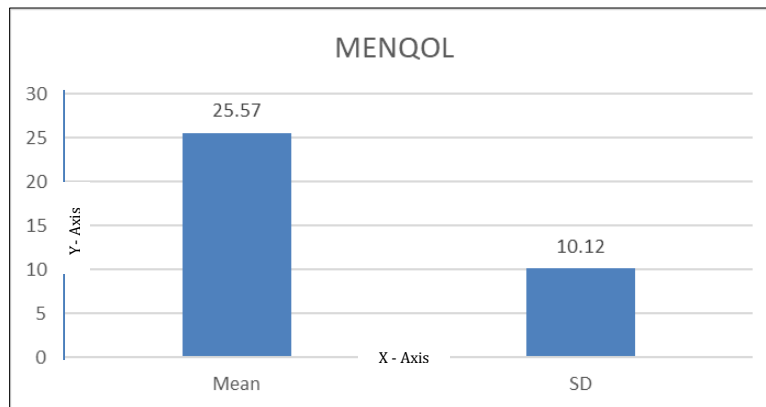


Figure 5 Mean and SD of MENQOL score before the intervention

Above chart shows mean score of MENQOL before the intervention. The mean score of MENQOL of all the 30 women is 25.57 with SD 10.12.

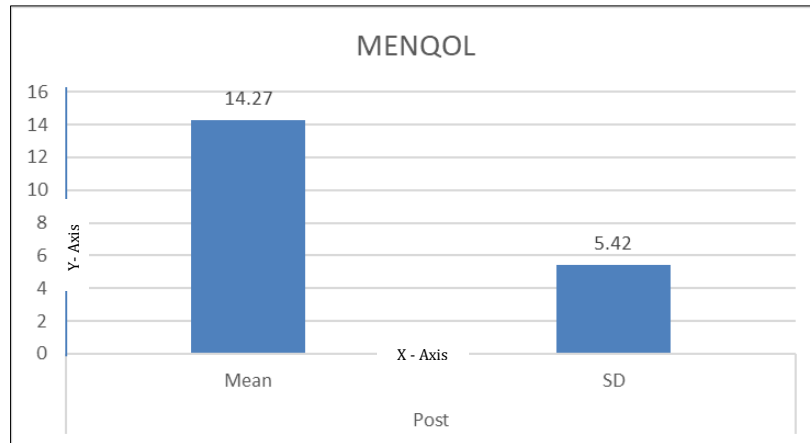


Figure 6 Mean and SD of MENQOL score after the intervention

Above chart shows mean score of MENQOL after the intervention. The mean score of MENQOL of all the 30 women is 14.27 with SD 5.42.

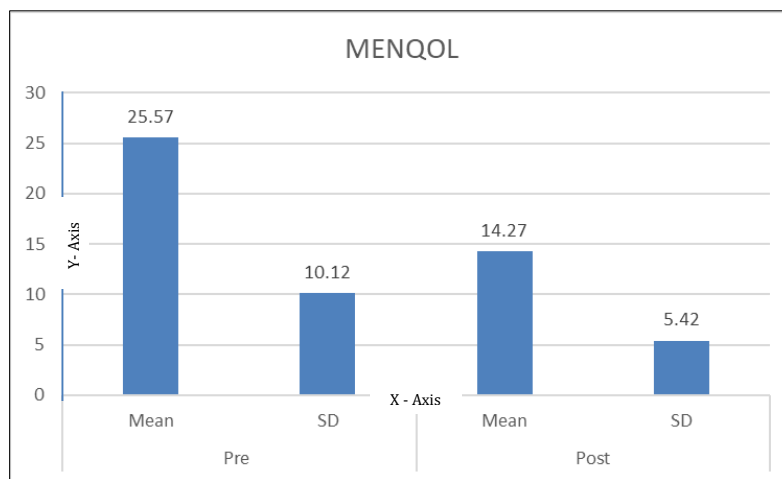


Figure 7 Paired t test of MENQOL outcomes

According to the outcomes of the MENQOL questionnaire, the mean (SD) MENQOL score in the pre-group 25.57 ± 10.12 and the post-mean (SD) MENQOL score was 14.27 ± 5.42 . The paired t test revealed a statistically significant decrease in MENQOL by 11.30 from pre to post. ($p < 0.05$).

4. Discussion

Previously many studies have been conducted to see the effect of pilates in women, but studies providing information regarding different menopausal symptoms and quality of life in menopausal women between the age group of 45 to 55 were lacking. The present study aimed to find out the effect of pilates exercise on the quality of life and menopausal symptoms in menopausal women. With an increase in life expectancy throughout the world most women will live through menopause. In developing countries, the mean age of menopause is 44-45 years as compared to developed countries where the figures are slightly higher on the side. Most of our participants were overweight and obese whereas more than half had an abnormally high percentage of body fat. We believe that this is representative of Greek menopausal women in this respect as previous studies in Greece have presented similar results. This study included a total 30 menopausal women and the score shows that the mean age of participants was 48.16 with SD of 3.43 years.

As knowledge about the menopausal transition increases it may turn out the ovary is not the only area that should be studied- the brain may undergo changes as well. Coping with menopausal symptoms may differ for women in different parts of the world, as culture may affect perceptions towards menopause ; which was shown by bahri et al who found that women having positive view towards menopause considered aging as natural process and vice versa. Several

studies have shown that postmenopausal women are more prone to sedentary habits and loss of fitness which is clearly associated with deterioration in health and lower quality of life. Therefore, it is important for postmenopausal women to change their sedentary lifestyles by performing physical activities like pilates exercise. Sagdeo and Arora in comparative study in rural and urban women showed that most common problem was joint and muscular symptoms (60.4%) followed by hot flushes and night sweats (36.75%). In the current study most prevalent symptoms reported were feeling of irritation, feeling of tired, decrease in stamina, frequent urination and joint and muscular pain as common among all.

Previous studies have demonstrated an impact of menopausal symptoms on HRQOL across a variety of cultures and measures our analysis provides further confirmation that women who experience menopausal symptoms exhibit impaired HRQOL compared to those who report no symptoms of menopause. The results also suggest that depression and anxiety are two symptoms with largest effects on mental HRQOL and joint stiffness and heart palpitations are two symptoms with largest effects on physical HRQOL. Additionally in psychosocial, physical domains, women who were in the postmenopausal stage less than 5 years ago had lower scores than those who were in postmenopausal stage more than 5 years ago. The concept of quality of life is defined as the perception of individual about his/her situation in the life in context of the framework of that individual's culture and value systems, goals, expectations, standards and interests. Quality of life is used as an important measurement in assessing health status and effects of therapies.

Active lifestyle has beneficial effects on satisfaction with life physical, and emotional well being and positively associated with minimal sleep disorders, mood swings and better cognitive functions. Women should be educated through awareness programs so that they can get proper medical attention. Health professionals should also assess symptoms with a standard tool. Regular screening of such women can make a huge difference and their quality of life can be improved. The side effects of menopause could be associated with burdens of housework, which further complicate matters and diminish quality of life. Working women also tend to have better mental health than stay-at-home ones and given their routine exposure to social setting outside home are better able to withstand the symptoms of menopause. Quality of life in menopause is related to the degree to which a woman is able to cope with changes and symptoms appearing in her body with onset of menopause and her sense of satisfaction and happiness in her life during the period of transition.

The concept of pilates exercise focuses on flowing movement throughout the whole body. The intensity of movement is final range of motion at a tightness point without discomfort. Pilates method of exercise focuses on achieving two main goals; toning the deep core stabilizer muscles and enhancing the mind control over the movements of the body and its segments. The defining element of pilates exercise system consists of bringing into practitioners attention link between body and mind. Elnagger et al (1991) compared the effects of spinal flexion and extension exercises on the severity of low back pain and thoracolumbar spinal mobility. The results did not indicate whether a specific type of exercise may be more worthwhile than others in increasing coronal and transverse mobility of thoracolumbar spine. Pilates is good intervention for menopausal women because it helps improve not only physical fitness like balance and flexibility but also mental fitness. Thus, the continuous participation of women in pilates exercise program may help to enhance their health and ability to live independently after menopause. A study conducted by Eyigor et al showed that pilates exercises were a healthy and effective method for improving the functional capacity, flexibility, fatigue, depression and quality of life of breast cancer patients. Physical exercise to successfully and significantly decrease postmenopausal women's fatigue is evident in past studies. Dettori et al (1995) compared two types of exercise and observed that flexion or extension exercises were more effective for treating patients with acute low back pain. Thus, together with previous results, the present study may suggest the effectiveness of crunch exercises with and without pilates principle regardless of stability of lumbar spine.

In this present study we used MRS and MENQOL for assessing severity of menopausal symptoms and quality of life of menopausal women for both pre-post assessments. The MENQOL is self-administered specific instrument covering 29 climacteric symptoms or complaints. Symptoms are combined into four independent dimensions vasomotor (3 items), psychosocial (7 items), physical (16 items), and sexual (3 items). Menopause rating scale questionnaire has been widely used in many epidemiological and clinical research when investigating menopausal symptoms. Although MRS is self-reporting questionnaire, in the view of substantial number of women studied does not have formal education, in order to include these illiterate women, interviews were used instead in collecting data, women are asked to provide some retrospective information such as menopausal symptoms experienced in preceding one month, last menstruation etc.

According to the Hellenic Statistical Authority, more than half of online access in Greek households relates to health information. It would thus be possible to use it more widely among menopausal women, to identify those in need for specific management. According to the European Council, information technologies used in the field of health can boost the development and implementation of innovative data-driven technological solutions that will result in better health

outcomes and improved QoL for patients. Campos de oliveira et al(2015) compared static stretching exercise to pilates, which could significantly improve lower limb strength, posture, balance and health related QOL in older adults. The main pilates movements used in study improve muscle strength and flexibility by gradually reinforcing muscles, cartilage and conjunctive tissue of trunk segments.

In our study we found that pilates exercises were able to reduce postmenopausal fatigue. The exercises were shown to reduce general, physical and mental fatigue. Therefore, the present study shows that an 8 week pilates exercise program has positive effects on menopausal symptoms and lumbar strength and flexibility in postmenopausal women. The result shows that mean and SD of MRS (pre-scores) were 13.03 and 5.26 respectively and most importantly the value of mean and SD decrease by 7.47 and 2.84 respectively in post-scores of MRS which indicates a statistically significant decrease of 5.56 ($p < 0.05$). Similarly in another outcome measure MENQOL pre-mean (SD) score was 25.57 ± 10.12 and post-mean (SD) score was 14.27 ± 5.42 it shows that there was a statistically markable decrease in MENQOL by 11.30 from pre to post ($p < 0.05$). As the main objective of the study was to find effects of pilates exercise on menopausal symptoms and quality of life in menopausal women, after completion of our 8 weeks protocol we observed that the pilates exercise program shows significant improvement in joint and muscular pain and overall all lifestyle of this women. This shows that pilates exercise can be practiced to improve quality of life and reduce effects of menopausal symptoms in menopausal women between the age of 45-55 years of age group.

5. Conclusion

The results of current study demonstrates that there was a significant improvement seen in physical and mental health of the menopausal women who are practicing pilates. The study shows statistically significant difference in pre and post data of the menopausal women. Pilates seems to improve both physical and mental component as measured by questionnaires.

Significant improvement in muscular strength as well as reduction in fatigue level is marked in menopausal women who are practicing pilates. Also a pilates programme of 8 weeks (thrice a week) has a beneficial effect on cognitive abilities such as verbal fluency and executive functions in the menopausal women.

Hence it can be concluded that the pilates training program in menopausal and perimenopausal women helps to improve their quality of life and also beneficial in reducing the symptoms of menopause.

Limitations of the study

- The duration for the intervention was short.
- The sampling size is small.
- Participants in the study were taken from a single geographical area.
- There was no follow-up to ensure the long-term maintenance of the improvement.

Further recommendations

- Further studies should investigate the effects of pilates on menopausal women with a longer duration of intervention.
- Further studies can be done with a large sample and participants from various geographical area to get a better knowledge regarding the effects of pilates in women.

Compliance with ethical standards

Acknowledgements

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Disclosure of Conflict of interest

The authors declare no conflict of interest pertaining to the research.

Statement of ethical approval

This study involved human subjects in its data collections 1 being the author have taken necessary ethical approval.

Statement of informed consent

Informed consent was obtained from all the individual participants included in the present study.

References

- [1] Bruce D, Rymer J. Symptoms of the menopause. *Best practice & research Clinical obstetrics & gynaecology*. 2009 Feb 1;23(1):25-32.
- [2] Whiteley J, DiBonaventura MD, Wagner JS, Alvir J, Shah S. The impact of menopausal symptoms on quality of life, productivity, and economic outcomes. *Journal of women's health*. 2013 Nov 1;22(11):983-90.
- [3] Nusrat N, Nishat Z, Gulfareen H, Aftab M, Asia N. Knowledge, attitude and experience of menopause. *J Ayub Med Coll Abbottabad*. 2008;20(1):56-9.
- [4] Greendale GA, Judd HL. The menopause: health implications and clinical management. *Journal of the American Geriatrics Society*. 1993 Apr;41(4):426-36.
- [5] Mohamed HA, Lamadah SM, Zamil LG. Quality of life among menopausal women. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*. 2014 Sep 1;3(3):552-61.
- [6] Ganapathy T, Al Furaikh SS. Health-related quality of life among menopausal women. *Archives of Medicine and Health Sciences*. 2018 Jan 1;6(1):16-23.
- [7] Rodríguez-Fuentes G, de Oliveira IM, Ogando-Berea H, Otero-Gargamala MD. An observational study on the effects of Pilates on quality of life in women during menopause. *European Journal of Integrative Medicine*. 2014 Dec 1;6(6):631-6.
- [8] Karmakar N, Majumdar S, Dasgupta A, Das S. Quality of life among menopausal women: A community-based study in a rural area of West Bengal. *Journal of mid-life health*. 2017 Jan;8(1):21.
- [9] Stojanovska L, Apostolopoulos V, Polman R, Borkoles E. To exercise, or, not to exercise, during menopause and beyond. *Maturitas*. 2014 Apr 1;77(4):318-23.
- [10] Mohamed DM, Hussien AM, Kamel HE, Awad DM. Effect of Pilates exercises on fatigue in post-menopausal women. *Bulletin of Faculty of Physical Therapy*. 2023 Aug 23;28(1):31.
- [11] Lee H, Caguicla JM, Park S, Kwak DJ, Won DY, Park Y, Kim J, Kim M. Effects of 8-week Pilates exercise program on menopausal symptoms and lumbar strength and flexibility in postmenopausal women. *Journal of exercise rehabilitation*. 2016 Jun;12(3):247.
- [12] Tavares JB, Batista JP, Costa JG, Gonçalves LF, de Souza TC, Mariano IM, Amaral AL, de Lima Rodrigues M, Puga GM. Comparison of Mat Pilates training-induced changes on climacteric symptoms in hypertensive and normotensive postmenopausal women. *Journal of Bodywork and Movement Therapies*. 2022 Oct 1;32:102-9.
- [13] Gazibara T, Kovacevic N, Nurkovic S, Kurtagic I, Radovanovic S, Rancic B, Terzic M, Dotlic J. Menopause-specific Quality of Life Questionnaire: factor and Rasch analytic approach. *Climacteric*. 2019 Jan 2;22(1):90-6.
- [14] Jenabi E, Shobeiri F, Hazavehei SM, Roshanaei G. Assessment of questionnaire measuring quality of life in menopausal women: a systematic review. *Oman medical journal*. 2015 May;30(3):151.
- [15] Heinemann LA, Potthoff P, Schneider HP. International versions of the menopause rating scale (MRS). *Health and quality of life outcomes*. 2003 Dec;1:1-4.
- [16] Heinemann K, Ruebig A, Potthoff P, Schneider HP, Strelow F, Heinemann LA, Thai DM. The Menopause Rating Scale (MRS) scale: a methodological review. *Health and Quality of life Outcomes*. 2004 Dec;2:1-8.
- [17] Blümel JE, Arteaga E, Parra J, Monsalve C, Reyes V, Vallejo MS, Chea R. Decision-making for the treatment of climacteric symptoms using the Menopause Rating Scale. *Maturitas*. 2018 May 1;111:15-9.
- [18] Radtke JV, Terhorst L, Cohen SM. The Menopause-Specific Quality of Life (MENQOL) questionnaire: psychometric evaluation among breast cancer survivors. *Menopause (New York, NY)*. 2011 Mar;18(3):289.
- [19] Beura S, Patnaik L, Sahu M. Translation, reliability, and validity test of odia version of menopause-specific quality of life questionnaire among postmenopausal women for menopausal symptoms. *Journal of Mid-life Health*. 2022 Apr;13(2):121.