

The Effects and Comparison of Connective Tissue Massage and Pilates Exercises on Quality of Life in Post-Menopausal Cases

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Purpose: The aim of this study is to investigate the effects of Connective Tissue Massage (CTM) and Clinical Pilates exercises (CPE), which is a manipulative method, upon the quality of life in women who have gone through menopause.

Method: 40 post-menopausal women aged 50-70 years diagnosed with menopause and met the condition of not having a menstrual cycle for at least 12 months, were included in the study. Randomly divided into two groups, all participants were evaluated with the Menopause-Specific Quality of Life Measurement (MSQLM) just prior to the start of the application. Group 1 (n=20) received six sessions of connective tissue massage for three weeks, two sessions per week. In Group 2 (n=20), clinical pilates exercises were applied as two sessions per week for four weeks, a total of eight sessions. After the end of the treatments, all participants were reassessed in terms of outcome with the MSQLM.

Results: As a result of the assessment, while there was a statistically significant difference between the preliminary and final measurements of both the patients in the pilates exercise group and the patients in the connective tissue massage group seen, the difference between the groups was not statistically significant. ($p<0.05$).

Conclusion: This study determined that pilates exercises or cooperative tissue massage applied to women in the post-menopausal period increased their quality of life.

Keywords: Menopause, quality of life, exercise, pilates, cooperative tissue massage

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Citation: Demet Biçki, Gülsüm Budak (2023) The Effects and Comparison of Connective Tissue Massage and Pilates Exercises on Quality of Life in Post-Menopausal Cases, *International Journal of Health Administration and Education (Sanitas Magisterium)*, 9(2), 23-30.

Introduction

The post-menopausal period is a process that represents after the last menstrual cycle that is caused naturally or unnaturally (Özdemir et al., 2018). As a result of the decrease in estrogen level, the ovaries lose their functions, whereby some changes are observed in women. Sleep problems, irritability, fatigue and weakness, hot flashes and related sweating, sexual function disorders, increased hairiness, skeletal system disorders, osteoporosis, changes in appetite and weight problems appear in post-menopausal women, whereby a lack of concentration and vaginal itching may also occur. (Arısan, 1997, Babuna 1990, İlkin et al., 2020). These mentioned effects negatively affect women's quality of life (Mishra et al., 2011).

Pilates, a popular exercise program, is named after the founder of the method, Joseph Pilates, who began to develop it in the 1920s. Comprised of a series of low-intensity exercises, it is thought to increase flexibility and strength in the whole body (Chang, 2000).

CTM was first applied by the German physiotherapist Elizabeth Dicke in 1929. As a result of the diagnosis of endarteritis obliterans, which is his own disease, it was decided to amputate the lower extremity. Physiotherapist Dicke, who complained a lot about low back pain, applied pulls on himself with his fingers. (Holey, 2000, Yüksel et al., 2016). Considering the mechanism of action of CTM, vasomotor symptoms such as hot flushes and sweating that occur in the climacteric period, and partially hormonal psychological symptoms such as fatigue, sleep disorders, headaches, irritability, depression, and emotional instability can be expected to benefit from this application (Akarcalı, 1992).

2. MATERIALS AND METHOD

Participants

With the aim of examining the effects of connective tissue massage and pilates exercises on the quality of life in post-menopausal women, this study was conducted with the participation of 40 post-menopausal women between the ages of 50-70 who received or were receiving physical therapy at the FİZYOİST wellness center. The study was evaluated by Istanbul Aydın University Non-Interventional Clinical Research Ethics Committee with the decision dated 20/02/2023 and No. B.30.2.AYD.0.00.00-50.06.04/21 and deemed in compliance with medical ethics. Sample size was determined according to statistical power analysis procedures by using Power Analysis.

Evaluation of the Cases

The cases were evaluated with the same methods before and after the treatment. In order to evaluate the quality of life, the 'Menopause-Specific Quality of Life Measurement' (MCQLS) was implemented on the participants. Turkish validity and reliability of this measurement was worked out by Turhan et al. in 2011. MCQLS contains 29 questions. These questions are comprised of four groups; vasomotor, psychosocial, physical and sexual. Each group is evaluated with a total of 1-8 points in the MCQLS. An increase in the participant's scores averages an increase in the severity of the complaint (Turhan et al., 2011).

Connective Tissue Massage Therapy

A total of six CTM sessions were applied to the CTM participants twice a week for three weeks, with each session lasting approximately 20 minutes. CTM is a kind of stretching applied to stimulate the connective tissue on the relevant area. These stretches are short and long divulsions the therapist applies with the distal middle finger. First, the patient sits on a stool with the hip and knee at a 90° angle. The patient is asked to sit up as straight as possible. The patient's arms are positioned on her thighs. The CTM application is applied to a total of four areas; the sacral, lumbar, lower thoracic and

anterior pelvic regions. Divulsions are repeated three-four times on all fields. Participants were warned about some reactions that may occur on the skin as a result of divulsions, whereas these reactions were carefully followed throughout the treatment.

Clinical Pilates Exercises Treatment

Clinical pilates exercise sessions were applied as twice a week for four weeks, for a total of eight sessions. A one-hour long theoretical training was given to all participants in the clinical pilates exercises group to explain the concept of stabilization. Participants were first taught the control of the abdominal core and the five basic principles of pilates. At the end of the training, participants were requested to maintain the ideal posture and respiratory protection throughout the exercises. Each exercise was completed with ten repetitions. The exercise program lasted an hour. Each session started with a Warm-up and ended with a cool-down. Slow walking, fast walking, slow and brisk running exercises, mini squat, roll down, toy soldier Cleopatra, chest stretch exercises were included in the warm-up and cool-down periods. Then the program was ended by performing hundreds, single-leg stretch, double-leg stretch, shoulder bridge, hip twist, single-leg kick swimming, clam, side kick, half roll back, single-leg circle, and the breast stroke.

3. ANALYSIS METHODS

Statistical analyzes were conducted using the IBM SPSS 26 package program. The assumption of normality in numerical variables was tested with the Shapiro-Wilk test by controlling the skewness and kurtosis values, whereas it was determined the data showed a normal distribution. Parametric analysis methods were applied as per the normal distribution of the data, whereas independent sample t-test was used for intergroup comparisons of numerical data.

The $p < 0.05$ level was considered statistically significant for the assessment of all analyzes.

4. FINDINGS

The Pilates program was applied to 20 of the patients included in the study, whereas the Connective Tissue Massage (CTM) program was applied to the other 20 patients.

Intergroup Comparison of Scores from Pre-Treatment Measurements

Results of the analysis conducted in order to ascertain whether there is a difference in pre-treatment measurements and sub-dimensions of the patient groups included in the study are provided in Table 1.

Table 1. Distribution of the Scores Obtained from Pre-treatment Measurements According to Groups

Measurements and Sub-Dimensions	Pilates Group (n=20)	CTM Group (n=20)	(p)
	$\bar{X} \pm Ss.$	$\bar{X} \pm Ss.$	
Quality of Menopausal Life	3,82 ± 1,10	3,76 ± 0,86	0,860 ^a
Quality of Vasomotor Life	3,57 ± 1,58	3,65 ± 1,74	0,876 ^a
Quality of Psychosocial Life	3,74 ± 1,45	3,94 ± 1,27	0,647 ^a
Quality of Physical Life	3,70 ± 1,09	3,55 ± 0,79	0,623 ^a
Quality of Sexual Life	4,97 ± 1,79	4,77 ± 1,24	0,685 ^a

$p < 0.05$; a: Independent Sample T-Test

While the average menopausal quality of life of the Pilates group patients that participated in the independent study during the pre-treatment period was measured as 3.82 ± 1.10 , the average menopausal quality of life of patients in the CTM group during the pre-treatment period was measured as 3.76 ± 0.86 . Thus, the difference of the average pre-treatment menopausal-specific quality of life between the two groups was deemed statistically insignificant ($p > 0.05$).

Comparison of Scores from Post-Treatment Measurements

Results of the analysis conducted in order to ascertain whether there is a difference in post-treatment measurements and sub-dimensions of the patient groups included in the study are provided in Table 2.



Table 2. Distribution of Scores from the Post-Treatment Measurements by Groups

Measurements and Sub-Dimensions	Pilates Group (n=20)	CTM Group (n=20)	(p)
	X ± Ss.	X ± Ss.	
Quality of Menopausal Life	2,43 ± 0,81	2,54 ± 0,52	0,593 ^a
Quality of Vasomotor Life	1,90 ± 1,08	1,51 ± 0,75	0,201 ^a
Quality of Psychosocial Life	2,60 ± 1,12	2,19 ± 0,72	0,176 ^a
Quality of Physical Life	2,30 ± 0,76	2,67 ± 0,52	0,088 ^a
Quality of Sexual Life	3,35 ± 1,48	3,62 ± 1,08	0,517 ^a

p<0.05; a: Independent Sample T-Test

While it was observed that the average menopausal quality of life of the Pilates group patients included in the study during the post-treatment period was 2.43±0.81, the average menopausal quality of life of the CTM group patients during the post-treatment period was 2.54±0.52. Thus, the difference of the average post-treatment quality of menopausal life between the two groups was deemed statistically insignificant (p>0.05).

Comparison of Scores from Pre-Treatment and Post-Treatment Measurements

Results of the analysis conducted in order to ascertain whether there is a difference in the average measurement and sub-dimension scores within the group of patients included in the study, and to determine whether this difference is statistically significant between the two groups are provided in Table 3.

Table 3. Comparison of Pre-Treatment and Post-Treatment Measurement Scores

Measurements and Sub-Dimensions	Groups	Pre-Treatment	Post-Treatment	(p)	Intra-Group Exchange	(p)
		X ± Ss.	X ± Ss.		X ± Ss.	
Quality of Menopausal Life	Pilates Group	3,82 ± 1,10	2,43 ± 0,81	0,001^a	-1,39 ± 0,36	0,144 ^b
	CTM Group	3,76 ± 0,86	2,54 ± 0,52	0,001^a	-1,22 ± 0,36	
Quality of Vasomotor Life	Pilates Group	3,57 ± 1,58	1,90 ± 1,08	0,001^a	-1,67 ± 0,70	0,137 ^b
	CTM Group	3,65 ± 1,74	1,52 ± 0,75	0,001^a	-2,13 ± 1,17	
Quality of Psychosocial Life	Pilates Group	3,74 ± 1,45	2,60 ± 1,12	0,001^a	-1,14 ± 0,54	0,004^b
	CTM Group	3,94 ± 1,27	2,19 ± 0,72	0,001^a	-1,76 ± 0,72	
Quality of Physical Life	Pilates Group	2,70 ± 1,09	2,30 ± 0,76	0,001^a	-1,40 ± 0,42	0,001^b
	CTM Group	3,55 ± 0,79	2,67 ± 0,52	0,001^a	-0,89 ± 0,30	
Quality of Sexual Life	Pilates Group	4,97 ± 1,79	3,35 ± 1,48	0,001^a	-1,62 ± 0,88	0,050^b
	CTM Group	4,77 ± 1,24	3,62 ± 1,08	0,001^a	-1,15 ± 0,57	

p<0.05; a: Paired T-Test; b: Independent Sample T-Test

In examining the average scores of Quality of Menopausal Life;

It was observed that the average quality of menopausal life of the Pilates group patients prior to the treatment was 3.82 ± 1.10 and the average quality of menopausal life after the treatment was 2.43 ± 0.81 , while the difference between the quality of menopausal life averages prior to and after the treatment of the Pilates group patients was deemed statistically significant ($p < 0.05$).

The average quality of menopausal life prior to treatment of the CTM group patients was observed to be 3.76 ± 0.86 , whereas the average quality of menopausal life after treatment was 2.54 ± 0.52 . Thus, the difference between the average quality of menopausal life before and after the treatment of the CTM group patients was deemed statistically significant ($p < 0.05$).

The change in the average quality of menopausal life of patients in the Pilates group (-1.39 ± 0.36) was ascertained to be higher than the change in the average quality of menopausal life of the CTM group patients (-1.22 ± 0.36). Thus, the difference between the groups was deemed statistically insignificant ($p > 0.05$).

In examining the average scores of Quality of Vasomotor Life;

It was observed that the average quality of vasomotor life prior to the treatment of the Pilates group patients was 3.57 ± 1.58 , whereas the average quality of vasomotor life after treatment was 1.90 ± 1.08 . The difference between the average vasomotor quality of life of the Pilates group patients prior to and after the treatment was deemed statistically significant ($p < 0.05$).

It was observed that the average quality of vasomotor life prior to treatment of the CTM group patients was 3.65 ± 1.74 , whereas the average quality of vasomotor life after treatment was 1.52 ± 0.75 . The difference between the average quality of vasomotor life of the CTM group patients prior to and after treatment was statistically significant ($p < 0.05$).

The change in the average quality of vasomotor life of the CTM group patients (-2.13 ± 1.17) was ascertained to be higher than the change in the average quality of vasomotor life of the Pilates group patients (-1.67 ± 0.70). The difference between the groups was deemed statistically insignificant ($p > 0.05$).

Upon examining the average scores of Quality of Psychosocial Life;

It was observed that the average quality of psychosocial life prior to the treatment of the Pilates group patients was 3.74 ± 1.45 and the average quality of psychosocial life after treatment was 2.60 ± 1.12 . The difference between the average psychosocial quality of life of the Pilates group patients prior to and after the treatment was deemed statistically significant ($p < 0.05$).

It was observed that the average quality of psychosocial life prior to the treatment of the CTM group patients was 3.94 ± 1.27 , whereas the average quality of psychosocial life after the treatment was 2.19 ± 0.72 . The difference between the average psychosocial quality of life of the CTM group patients prior to and after treatment was deemed statistically significant ($p < 0.05$).

The change in the average quality of psychosocial life of the CTM group patients (-1.76 ± 0.72) was ascertained to be higher than the change in the average quality of psychosocial life of the Pilates group patients (-1.14 ± 0.54). The difference between the groups was deemed statistically significant ($p < 0.05$), with the quality of psychosocial life of the CTM group patients increasing more than the Pilates group patients.

Upon examining the average scores of the Physical Quality of Life;

It was observed that the average quality of physical life prior to the treatment of patients in the Pilates group was 2.70 ± 1.09 , whereas the average quality of physical life after treatment was 2.30 ± 0.76 , whereby the difference between the average quality of physical life of patients in the Pilates group prior to and after the treatment was deemed statistically significant ($p < 0.05$).

It was observed that the average quality of physical life prior to the treatment of patients in the CTM group was 3.55 ± 0.79 and the average quality of physical life after treatment was 2.67 ± 0.52 , whereas the difference between the average quality of physical life of patients in the CTM group prior to and after treatment was deemed statistically significant ($p < 0.05$).

The change in the average physical quality of life of the patients in the Pilates group (-1.40 ± 0.42) was ascertained to be higher than the change in the average quality of physical life of patients in the CTM



group (-0.89 ± 0.30). The difference between the groups was deemed statistically significant ($p < 0.05$) in that the physical quality of life of patients in the Pilates group increased more than that of patients in the CTM group.

In examining the average scores of the Quality of Sexual Life;

It was observed that the average quality of sexual life prior to the treatment of patients in the Pilates group was 4.97 ± 1.79 , whereas the average quality of sexual life after treatment was 3.35 ± 1.48 . The difference between the average sexual life quality of patients in the Pilates group prior to and after the treatment was deemed statistically significant ($p < 0.05$).

It was observed that the average quality of sexual life prior to the treatment of patients in the CTM group was 4.77 ± 1.24 , whereas the average quality of sexual life after treatment was 3.62 ± 1.08 . The difference between the average sexual life quality of patients in the CTM group prior to and after the treatment was deemed statistically significant ($p < 0.05$).

The change in the average sexual life quality of patients in the Pilates group (-1.62 ± 0.88) was ascertained to be higher than the change in the average sexual life quality of patients in the CTM group (-1.15 ± 0.57). The difference between the groups was deemed statistically significant ($p < 0.05$) in that the sexual quality of life of patients in the Pilates group increased more than patients in the CTM group.

5. DISCUSSION

Physical, psychological, social and sexual changes experienced during menopause have a detrimental effect upon the quality of life in women (Ceylan et al., 2015).

In evaluating the quality of life of individuals in the post-menopausal period with MSQLM, our study determines that both pilates exercises or connective tissue massage sessions applied to post-menopausal women boosts their quality of life.

In conducting a study with 19 female participants in the climacteric period, Akarcalı had participants attend 15 CTM sessions for a total of three weeks, whereupon these participants were evaluated after the three-week long treatment period. Some hormonal changes occurred with the participants after CTM was applied whereas a statistically significant decrease was recorded in terms of depression. In the CTM evaluation, it was ascertained that parameters such as shortness of breath and psycholability were also positively affected (Akarcalı, 1992).

Although there are many studies stating that CTM is used in the treatment of various diseases, we were unable to encounter any literary study regarding its use to increase the quality of life in the treatment post-menopausal syndrome.

As a result of the literature review, many studies were found which indicate pilates exercises also have beneficial effects upon the quality of life of post-menopausal women (McGrath et al., 2011, Daley et al., 2007).

The relationship between physical activity level and hot flashes was examined in a study conducted with 20 symptomatic middle-aged women, whereas the results of half of the participants indicated there was a significant relationship between physical activity and hot flash symptom (Elavsky et al., 2012).

In a cross-sectional study by Brown et al., conducted with 639 women between the ages of 45-54 in order to investigate the relationship between menopausal symptoms, especially hot flashes, sleep quality and depressive symptoms, they ascertained that hot flashes were associated with waking up at night more than once, trouble sleeping, having insomnia once a week or more, and high depression (Brown et al., 2009).

44 post-menopausal female participants with an average age of 55.71 were included in the Uysal study (2016). Participants were divided into two separate groups; pilates exercise group ($n=21$), and home exercise group ($n=23$). The specified program was applied to both groups three days a week for eight weeks. Study results ascertained that the pilates exercises group was superior in terms of quality of life (Uysal, 2016).

A study conducted by Rodríguez-Fuentes et al., (2014) was comprised of 27 female cases. Pilates exercises were given to the subjects twice a week for 12 weeks. The cases were evaluated after exercise whereby positive results were obtained regarding their quality of life. These results were found to be statistically significant (Rodríguez et al., 2014).

In conclusion, this study showed that pilates exercises or CTM applied to women in the post-menopausal period increased their quality of life. One of the sub-parameters of MCQLS, the quality of vasomotor life, was improved in the pilates group and CTM group according to the results of the pre- and post-treatment evaluation of the two groups, but without any significant difference between the groups. In considering the quality of psychosocial life, that of the patients in the CTM group increased more than the patients in the pilates group, whereas the difference in improvement between the pilates and CTM groups was statistically significant. According to the results of the pre- and post-treatment evaluations regarding the quality of physical and sexual life, the pilates group was found to be superior to the CTM group. However, in terms of their effects on quality of life, there was no significant difference between the pilates exercises group applied to women in the post-menopausal period and the CTM group.

Admittedly, there were some limitations in this study. For instance, the placebo effect of the applications could not be eliminated as was no control group in our study, While our study was conducted in a single center, studies to investigate the quality of life in post-menopausal women even further should be planned by addressing women that represent different segments (i.e., rural, urban) and regions of Turkey.

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