Research Paper

The Effect of Foot Reflexology on the Quality of Life of Postmenopausal Women

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Citation Mahdavipour, F., Sadat, Z., Mirbagher-Ajorpaz, N., Kafaei-Atrian, M., 2022. The Effect of Foot Reflexology on the Quality of Life of Postmenopausal Women 2022. *Journal of Client-Centered Nursing Care*, 8(3), pp. 191-198. https://doi.org/10.32598/JCCNC.8.3.435.1

https://doi.org/10.32598/JCCNC.8.3.435.1

Article info:
Received: 13 Apr 2022
Accepted: 30 May 2022
Published: 01 Aug 2022

Keywords:
Postmenopause, Quality of life (QoL), Reflexology

ABSTRACT

Background: Menopausal women experience unpleasant physical and mental symptoms that adversely affect their quality of life (QoL). The aim of this study was to investigate the effect of foot reflexology on the QoL of postmenopausal women.

Methods: This quasi-experimental study was performed on 90 postmenopausal women who were referred to comprehensive health centers in Yazd, Iran. The subjects were randomly allocated to two equal groups: intervention and control. The intervention group received 15 minutes of foot reflexology on each foot, twice a week for six consecutive weeks. No intervention was performed for the control group. Data were collected through the menopause-specific quality of life (MENQOL) questionnaire. QoL scores were compared between the groups before, immediately after the intervention, and two months after the intervention using Repeated Measures ANOVA. Data analysis was performed using SPSS v. 19. The significance level was set at 0.05.

Results: The Mean±SD of the QoL in the intervention group before, immediately after, and two months after the study were 77.44±19.05, 58.02±15.29, and 55.26±12.37, respectively. In the control group, the Mean±SD were 75.71±19.02, 74.82±16.84, and 75.46±18.05, respectively. Using Repeated Measures ANOVA, the comparison of the mean scores of QoL in the intervention group indicated that the scores decreased over time (P<0.001).

Conclusion: The results showed that foot reflexology could improve postmenopausal women's QoL. Due to the simple and easy learning of reflexology, its training is recommended for all menopausal women to improve their QoL.

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Highlights

- Symptoms of menopause in women affect their quality of life.
- Reflexology is based on an ancient form of therapy that unblocks nerve impulses and improves blood circulation.
- Foot reflexology improved the quality of life (QoL) of postmenopausal women.

Plain Language Summary

The transition to menopause is associated with different physical and psychological changes that may affect women's health. Menopausal symptoms affect a woman's quality of life. The results of this study showed that foot reflexology can be effective in improving the quality of life of postmenopausal women.

1. Introduction

Menopause is the end of menstrual cycles and it is diagnosed when a woman has gone through 12 months without menstruation. It is a natural biological process and can occur in the 40s or 50s, but the average age in the United States is 51 (Borkoles et al., 2015). The world population of menopausal women was about 467 million in 2015 and will increase to 1.2 billion by 2030 (Dos Reis Lucena et al., 2021). Menopausal women may experience physical and psychological symptoms that include irregular menses, vaginal dryness, hot flashes, chills, night sweats, sleep problems, mood changes or anxiety, weight gain, decreased metabolism, and problems with memory and concentration (Yoeli et al., 2021). Increased burden of menopausal symptoms before and after menopause can threaten the quality of life (QoL). QoL assessment can provide valuable information about patients' emotional states, difficulties, and needs. It should be considered a gold standard in health promotion programs (Williamson et al., 2002). QoL in postmenopausal women can be increased by managing the menopausal symptoms (Gozuyesil and Baser 2016; Vallim et al., 2019).

Hormone replacement therapy is the most common and widely used treatment to reduce menopausal symptoms. However, it is associated with various side effects. Therefore, complementary treatments are introduced to the alleviation of menopausal symptoms and improvement of QoL (Oliveira et al. 2012). Various studies have suggested the use of complementary medicine, such as acupuncture, aromatherapy, and reflexology to reduce the symptoms of menopause (Moore et al., 2017; Nadal-Nicolás et al., 2020). Reflexology can be used to reduce menopausal vasomotor symptoms, improve QoL, stimulate the sympathetic and parasympathetic nervous systems, and strengthen the immune system. Moreover, it is effective in managing stress, anxiety, and depression (Gozuyesil and Baser 2016). Reflexology is based on an ancient form of therapy that unblocks nerve impulses and improves blood circulation (Moore et al., 2017; Kim & Kim 2012).

Reflexology causes systemic and local physiological changes in the body and promotes a deep sense of body and mind harmony and reduces stress-related symptoms. Feet and hands contain numerous types of sensory nerve receptors, which convey neural impulses to the brain. In the reflexology process, by application of pressure to a specific area, a message is transmitted to the brain and sent back to an effector organ (muscle or gland) via ganglion, spinal cord, and motor neurons, thereby creating improved recovery and relief in muscle soreness and mobility (Mahdavipour et al., 2019). The mechanism of action of reflexology involves stimulating blood circulation and releasing the stagnant energy into the body. Applying gentle but firm pressure to the reflex point on the feet or hands stimulates peripheral nerves, which transmit signals to the central nervous system (the brain and spinal cord). The messages are transmitted from the central nervous system to the internal organs of the body (visceral organs), muscles, or glands, leading to the release of energy blockages, the flow of energy throughout the body, and activation of the body's natural powers of self-healing (Jang and Kim 2009; Mahdavipour et al., 2019).

Foot reflexology is based on the principle that the feet are the micro map of the entire body. In the foot reflexology treatment, the feet are divided into ten regions (each reflex zone targets an organ or part of the body). Applying specific pressure on the reflex points can reduce and eliminate glands and organ blockage (Jang & Kim 2009; Kim & Kim 2012). No special tools are

required for applying pressure to specific points on the feet in this method (Haefner 2017). Eunice Ingham is the founder of the reflexology technique. Ingham suggests that applying some forms of massage to certain points using touch improves the symptoms of disease (Mahdavipour et al., 2019; Candy et al., 2020).

Gozuyesil and Baser studied the effects of foot reflexology on vasomotor disorders and QoL among menopausal women. They suggested that reflexology might be beneficial in reducing vasomotor symptoms and improving QoL (Gozuyesil and Baser 2016). There is controversy about the therapeutic effect of reflexology. Some studies have shown that the reflexology technique has no effect on physical and psychological symptoms in various diseases (Gunnarsdottir & Jonsdottir 2007; Vallim et al., 2019). Williamson et al. suggested that foot reflexology is not more effective than non-specific foot massage in reducing menopause symptoms (Williamson et al., 2002). Given that the QoL of women after menopause as a mother and wife is of great importance, and due to the lack of studies and the existing contradictory results, this study was conducted with the aim of investigating the effect of foot reflexology on the QoL of postmenopausal women.

2. Materials and Methods

Design, setting, and sample

This quasi-experimental study was conducted in 2021 in a comprehensive health center affiliated with the Shahid Sadoughi University of Medical Siences, Iran. First, a comprehensive health center was selected from each region with appropriate, average, and unsuitable socioeconomic status (Panbekaran, Kashani, and Azad Shahr health centers). Then, in each center, a number of subjects were selected through convenience sampling according to the quota of the population, and intervention for all participants was performed in the Panbekaran comprehensive health center. According to a previous study using Pocock's formula, and based on the test power of 0.90, α=0.05, standard deviation of 2.55, mean difference of 5.54, and possible attrition rate of 20% in two assessment times, the sample size was estimated as 50 subjects in each group.

A total of 129 postmenopausal women who had missed at least 12 consecutive menstrual periods and one to five years had passed after their last period, were evaluated for eligibility. Ten women were excluded from the study due to unwillingness to participate, and 19 women did not meet the inclusion criteria. The subjects were randomly assigned to the intervention (n=50) and control (n=50) groups using random blocks and sealed envelopes (Figure 1).

The inclusion criteria were missing at least 12 consecutive menstrual periods, passing 1 to 5 years after their last period, having no hormone replacement therapy for the past six months, having a uterus and ovarian, no history of known mental health disorders, being 40-60 years old, being literate (reading and writing), willingness to participate in the study, no history of smoking and drug addiction, and lack of sensorineural problems in the feet. The exclusion criteria were reluctance to continue with the study, absence for more than two sessions in the intervention program, and failure to complete the questionnaires.

Instruments

Data were collected by a socio-demographic questionnaire (including age, education level, occupation, marital status, history of underlying disease, menopause duration, and income), and the Persian version of the menopause-specific quality of life (MENQOL).

MENQOL was first developed by Hilditch et al. (Hilditch et al. 1996). It has 29 items in four domains: vasomotor (three items), psychosocial (seven items), physical (16 items), and sexual (three items). The questionnaire items refer to bothersome menopausal symptoms. The items are scored using an eight-point Likert scale from 0-7. Score zero indicates that there is no experience of the symptom in the previous month. Score one indicates that the symptom is experienced, but it is not troublesome at all. Scores 2-7 indicate the increasing degree of the experienced troublesome symptoms. Higher scores indicate more experience of troublesome menopausal symptoms (worse status) and poorer QoL. In a study by Gazibara et al. (2018) the MENQoL correlated with the 36-Item Short Form Survey (SF-36) and Beck Depression Index (BDI) total scores, suggesting its good criterion validity (Gazibara et al., 2018). In Iran, content validity and Cronbach's alpha were used to ensure the validity and reliability of the translated version of the questionnaire, respectively (Fallahzadeh, 2010).

Procedure

The first author who has a reflexology teaching certificate performed the foot reflexology technique on the intervention group based on Embong et al. (2015). Stimulation of the reflex points is associated with the adrenal, hypothalamus, and pituitary glands, and the heart and lung (Embong et al. 2015) (Figure 2).

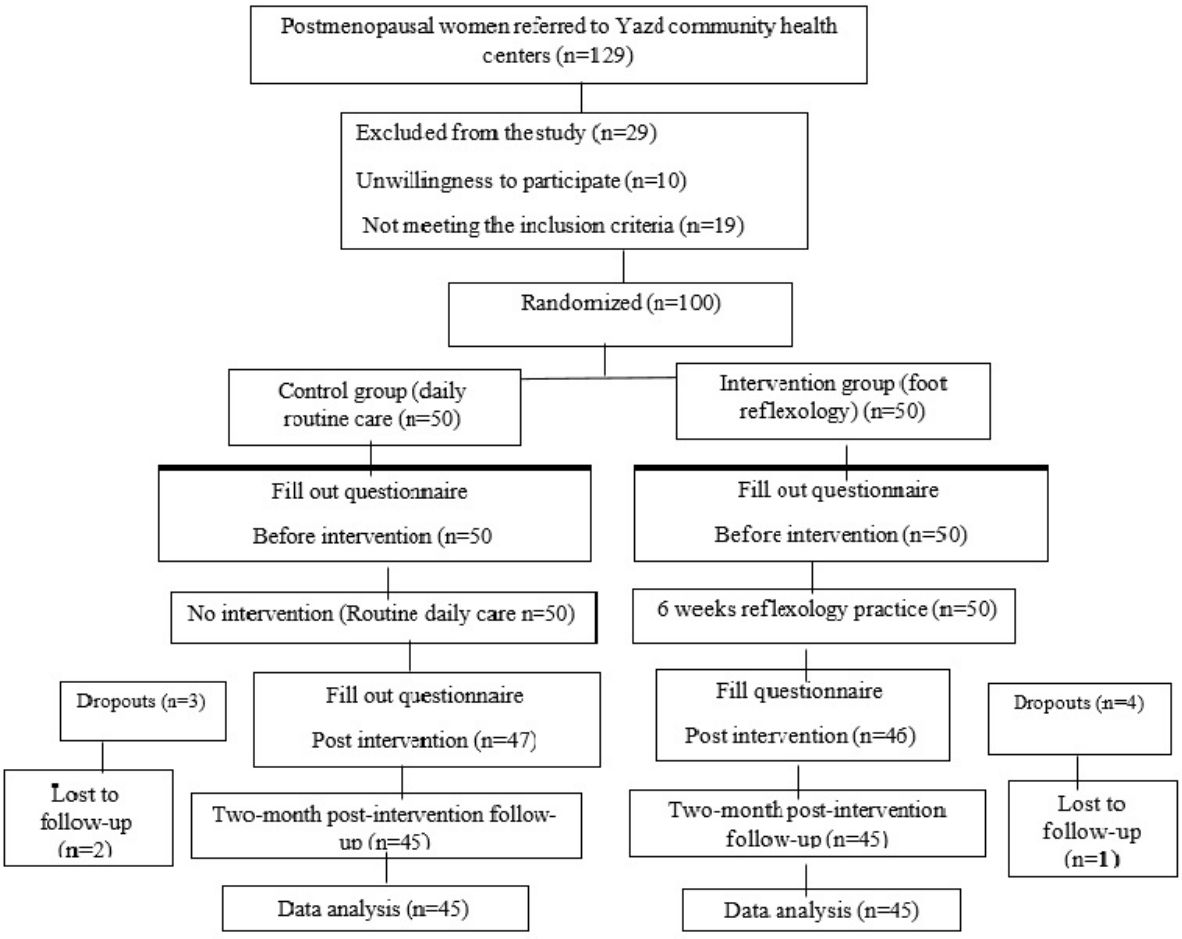

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Figure 1. The CONSORT flowchart of the study

The intervention was performed in a private room. In the first session of intervention, the method of foot reflexology was explained to the subjects. The reflexology sessions included preparation, warm-up, stimulation, and massage techniques. The foot reflexology massage was performed for the left and right foot, respectively. Each foot reflexology session lasted 30 minutes (15 minutes for each foot) twice a week for six consecutive weeks (Lee, 2006). The subjects were asked to lie on the bed and close their eyes. The foot reflexology massage involved the following steps:

The first stage was the preparation, in which a general foot massage was performed for 10 minutes. The second stage was the warming of the feet, in which the foot was warmed by the researcher using specific movements for 10 minutes. In the third stage, stimulation and massage techniques (10 minutes) were performed, which included holding the foot with both hands and making movements of bending the foot back and forth, rotating the foot inward and backward, and movements in the heel. It also included twisting and pulling the big toe, touching the sole of the foot with the researcher's thumb (zigzag movements), pulling the researcher's wrist on the sole of the subject's foot, and sweeping the foot. After massaging the foot with the left hand, the researcher held the heel and pressed it to the sole of the foot and bent it right from the wrist, and then with the thumb on the point of the solar plexus in the arch of the foot (in the border of the upper and middle third of the sole of the foot, in the part where the crease of the foot is formed when the sole of the foot is bent and is located along the second and third toe), applied a direct pressure in a circular and pressurized manner for 5 minutes within the patient's tolerance (Lee, 2006). No intervention was performed for the control group. Both groups completed the MENQoL questionnaire before, immediately after, and two months after the intervention.

Data collection was performed by a research assistant and data were analyzed by descriptive and inferential statistics. The Skewness and Kurtosis were applied to determine the normal distribution of the data. Categorical and quantitative variables were compared using

Figure 2. Foot reflexology points

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the Chi-square test and t-test, respectively. Repeated measures Analysis of Variance (ANOVA) was used to compare the mean score of QOL before, immediately after, and two months after the intervention. Data were analyzed using SPSS 19. (IBM SPSS Statistics, Armonk, NY). The significance level was set at 0.05.

3. Results

The Mean±SD age of the subjects in the intervention and control groups was 53.82±4.82 and 53.62±4.89, respectively. The socio-demographic data of the subjects are presented in Table 1. There was no significant difference between the groups in terms of socio-demographic characteristics (P>0.05).

Table 2 shows the mean scores of QoL and its dimensions in the intervention and control groups, before the intervention, immediately after the intervention, and two months after the intervention. No significant difference was found in the mean scores of QoL and its dimensions between the groups before the intervention (P>0.05). The Mean±SD of QoL and its dimensions before, immediately after, and two months after the intervention was 77.44±19.05, 58.02±15.29, and 55.26±12.37, respectively and according to repeated measures ANOVA, the differences were statistically significant (P<0.001). In the control group, the Mean±SD of QoL and its dimensions before, immediately after, and two months after the intervention was 75.71±19.02, 74.82±16.84, and 75.46±18.05, respectively and the differences were not statistically significant (P>0.05). As shown in Table 2, the mean scores of QOL and its dimensions in the intervention group decreased over time. According to repeated measures ANOVA, the interaction between time and group was significant (P<0.05) (Table 2).

4. Discussion

The present study examined the effect of foot reflexology on the QoL of postmenopausal women. The results showed that foot reflexology reduced the menopause-related symptoms and improved QoL in postmenopausal women. There are a few studies to address the effects of foot reflexology on menopausal symptoms. Gozuyesil and Baser investigated the effects of foot reflexology on vasomotor disorders and QoL in menopausal women. They suggested that reflexology might be beneficial in reducing vasomotor symptoms and improving QoL (Gozuyesil and Baser 2016). Lee and Yeun suggested that foot massage therapy combined with cognitive-behavioral therapy can reduce psychophysiological stress response in middle-aged women (Lee & Yeun 2017). Pinto and Paul concluded that foot reflexology is an effective technique for the relief of menopausal symptoms and improvement of QoL (Pinto & Paul 2012), which was

Table 1. Demographic characteristics of the groups

Variables		Mean±SD/No. (%)		P
		Intervention Group (n=45)	Control Group (n=45)	
Age (y)		53.82±4.82 (95% CI=52.37-55.27)	53.62±4.89 (95% CI=52.15-55.09)	t=0.19 P=0.84
Menopausal age		47.60±2.83(95% CI=46.74-48.45)	48.20±2.69 (95% CI=47.39-49.09)	T=-1.028 P=0.30
Marital status	Married	39(86.7)	36(80)	X^2=0.72 P=0.39
	Single	6(13.3)	9(20)	
Education	Elementary and High school	24(53.3)	18(40)	X^2=1.60 P=0.20
	Higher than High school	21(46.7)	27(60)	
Job	Housewife	39(786.7)	35(66.8)	X^2=1.21 p=0.27
	Employed	6(13.3)	10(22.2)	
Underlying disease	Yes	11(24.4)	9(20)	X^2=0.25 P=0.61
	No	34(75.6)	36(80)	
Income	Inadequate	15(3.3)	22(48.9)	X^2=2.52 P=0.28
	Medium	26(57.8)	21(46.7)	
	Adequate	4(8.9)	2(4.4)	

t=Independent samples t-test, X^2=Chi-squared test, CI= Confidence Interval

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Table 2. The Mean±SD of QOL and its dimensions in groups at three times assessment

Variables	Groups	Mean±SD			Repeated Measures ANOVA		
		Before Intervention	At the End of the Intervention	Two Months After the Intervention	Time	Time×Group	Group
Vasomotor dimension	Intervention	8.46±2.59	5.95±2.54	5.35±3.33	P=0.028	P=0.001	P=0.021
	Control	7.35±3.66	7.66±4.20	7.97±4.03			
Psychological dimension	Intervention	18.04±6.53	12.86±4.50	12.31±5.06	P<0.001	P=0.003	P<0.001
	Control	18.26±5.99	17.64±6.91	17.84±5.81			
Physical dimension	Intervention	41.80±12.65	32.77±11.02	31.24±9.34	P<0.001	P<0.001	P=0.003
	Control	41.22±13.69	40.93±11.24	41.28±12.25			
Sexual dimension	Intervention	9.13±3.59	6.42±2.24	6.35±3.09	P<0.001	P=0.021	P=0.008
	Control	8.86±3.50	8.57±4.07	7.86±3.77			
QoL	Intervention	77.44±19.05	58.02±15.29	55.26±12.37	P<0.001	P<0.001	P<0.001
	Control	75.71±19.02	74.82±16.84	75.46±18.05			

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consistent with the results of the present study. Kim and Kim found that reflexology massage could have positive effects on reducing stress, blood pressure, and fatigue in menopausal women (Kim & Kim 2012). A systematic review showed that reflexology can reduce the biological markers of stress and anxiety and it was suggested that reflexology can improve overall relaxation, be a profound sense of tranquility, and enhance the overall QoL (Candy et al. 2020), which is consistent with the results of the present study. Haefner reported that complementary health practices, including reflexology, induce local physiological and biochemical changes, leading to a deep sense of calm throughout the entire body and stress and anxiety reduction (Haefner 2017).

However, Gunnarsdottir and Jonsdottir studied the effect of reflexology on the anxiety of patients undergoing Coronary Artery Bypass Graft (CABG) surgery and concluded that reflexology did not have a positive effect on anxiety and depression in patients before/after CABG (Gunnarsdottir and Jonsdottir 2007). Also, Williamson et al. showed that foot reflexology was not more effective than non-specific foot massage in the treatment of menopausal symptoms (Williamson et al., 2002). This difference might be explained by differences in the sample size, study duration, and follow-up procedure of the studies. The benefits of reflexology using massager machines have been reported (Nadal-Nicolás et al., 2020). However, in the present study, the reflexology massage was performed by a practitioner.

5. Conclusion

Reflexology improves the QoL and all its dimensions, including vasomotor, physical, psychological, and sexual function in menopausal women. Reflexology can be utilized as an effective non-intrusive, non-hormonal, and complementary treatment for improving QoL and decreasing menopausal symptoms. Because reflexology is simple and easy to learn, its training is recommended for all menopausal women to improve their QoL. Further research in this area is recommended along with blinding the study.

That this study was not blinded, which could have biased the results. Clinical trials are suggested to be done in this field. Also, a comparison of the effect of reflexology with other complementary therapies on the QoL of postmenopausal women is recommended.

Ethical Considerations

Compliance with ethical guidelines

The study protocol was approved by the Ethics Committee of Yazd Shahid Sadoughi University of Medical Sciences (IR.SSU.REC.1399.287). The subjects were informed that contribution to the study is voluntary and they could leave the study without any consequences. Informed consent was obtained from the participants.

Funding

This study was financially supported by the Shahid Sadoughi University of Medical Sciences.

Authors' contributions

All authors equally contributed to preparing this article.

Conflict of interest

The authors declared no conflict of interest.

Acknowledgments

We thank all the postmenopausal women for their collaboration.

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