

Research Paper

The Effect of Acupressure on Pain Intensity and Activities of Daily Living of Elderly Women



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Citation Mehdipour, F., Bastani, F., Haghani, H., Jahani, H., 2022. The Effect of Acupressure on Pain Intensity and Activities of Daily Living of Elderly Women. *Journal of Client-Centered Nursing Care*, 8(3), pp. 223-232. <https://doi.org/10.32598/JCCNC.8.3.58.1>

doi <https://doi.org/10.32598/JCCNC.8.3.58.1>



Article info:

Received: 27 Apr 2022

Accepted: 13 Jun 2022

Published: 01 Aug 2022

Keywords:

Aging, Pain, Activities daily living, Acupressure, Women's Health

ABSTRACT

Background: Chronic pain is one of the most common and serious problems in old age that if not controlled, leads to reduced daily activities. The aim of this study was to determine the effect of acupressure on pain and daily activities in elderly women.

Methods: This was a quasi-experimental study with a pre-test and post-test design, which was conducted on 80 elderly women who were referred to the health centers of Qazvin, Iran. The subjects were randomly assigned to the experimental (n=40) and control (n=40) groups. The data were collected by visual analogue scale (VAS) and barthel index (BI). The experimental group received ten sessions of acupressure for three consecutive weeks on the related acupoints (LIV3, UB62, SP9, GB34, UB17, GB30, UB (UB25-UB11), GB20, GB21). Each acupoint was massaged for one minute in a circular motion until the elderly could bear it. The control group received sham acupressure. Post-test was performed one week after the end of ten intervention sessions. The data were analyzed by Chi-square test and independent t-test using SPSS software v. 20. The significance level was set at $P < 0.05$.

Results: Before the intervention, there was no statistically significant difference in the level of pain intensity ($P = 0.352$) and daily activities ($P = 0.420$) between the groups. After the intervention, the pain intensity of the subjects in the intervention group decreased ($P < 0.001$) and their daily activities improved compared to the control group ($P < 0.001$).

Conclusion: According to the findings, acupressure is an affordable, low-cost, easy, and non-invasive complementary therapy, which is recommended to reduce pain intensity and promote activities of daily living in older women.

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Highlights

- Chronic pain is one of the most common and serious problems in older adults.
- If chronic pain is not controlled, it leads to advanced disability and will reduce the activities of daily living in the elderly.
- Acupressure is a non-invasive and low-cost treatment, which leads to health promotion
- Acupressure is effective in reducing the severity of pain and promoting daily activities. of older women.

Plain Language Summary

Several health problems, including chronic pain and disability, are observed in the elderly, which if left unchecked, can lead to reduced daily activities. Acupressure is a complementary therapy that works by massaging the acupoints. The results of this study showed that acupressure is effective in reducing the severity of pain and increasing the daily activities of older women.

1. Introduction



aging is a critical period in the life of every human being and paying attention to the issues and needs of this stage of life is a social necessity. During this period, various systems of the body are degraded and human ability is practically reduced.

This process is accompanied by a gradual decrease in motor and functional ability (Ghazi Mohseni, Soleimani, and Heidarnia 2016). Worldwide, a person who reaches the age 65 years in 2015-2020, can expect to live, on average, an additional 17 years. By 2045-2050, this figure is expected to increase to 19 years. The highest life expectancy at age 65 is currently experienced by older persons in Australia and New Zealand (21 years) followed by Europe and Northern America (19 years). Between 2015-2020 and 2045-2050, life expectancy at the age of 65 is projected to increase in all regions (Kasai 2021). According to the latest data from the Statistics Center of Iran in 2016, the number of people over the age of 60 who are called the elderly is 7 million and 450 thousand people, which is 9.3% of the total population (Sherizadeh et al., 2016).

Chronic pain is one of the most common problems in old age as one-third of the elderly experience it on a daily basis (Patel et al., 2014). Chronic pain is pain that lasts for more than three months. This pain is very common, so that its rate in the adult community is very significant and between 10 and 30%. Chronic pain leads to serious problems in patients' general health and affects their daily functioning and quality of life (Wang & Mullally 2020). If not controlled, these pains will

cause suffering and despair in the elderly, increase the use of health services, and also impose exorbitant costs on society (Karttunen et al., 2014). The common misconception about chronic pain in the elderly is that pain is part of old age and a natural phenomenon in this period, and instead of trying to treat and control it, it must be tolerated (Herr et al., 2011).

Chronic pain-related limitation in the elderly means a set of problems, such as decreased activity, increased dependence, and impaired physical, mental, and social well-being, which on the one hand reduces the quality of life of older people and their families, and on the other hand, leads to several problems in the process of their treatment and care (Shirazi et al., 2015). The approximate prevalence of chronic pain based on its location in the elderly over 65 years is as follows: headache: 4.4%, neck pain: 20%, low back pain: 45%, hand pain: 15%, pelvic pain: 20%, knee pain: 18%, and leg pain: 14% (Domenichiello & Ramsden 2019). A study in Iran found that 85% of older people suffer from pain in more than one area of their body (Shirazi et al., 2016). There are gender differences in the elderly in terms of depression and pain experiences, with women reporting lower threshold levels and more pain (Ahmad et al., 2020).

In 2011, a US National Health Interview survey reported that 20.7% of adults 85 years and older, 7% of 75-84 years, and 3.4% of adults 65-74 years need help with daily living activities (Adams, Kirzinger, & Martinez 2012).

Disability in the elderly is often complex and multifaceted and the result of the interaction of physical, social, and

attitudinal environments (Duba et al., 2012). Maintaining independence in the activities of daily living (ADL) and instrumental activities of daily living (IADL) are important in old age, but as the elderly population continues to grow, the number of people with ADL and IADL limitations is likely to increase. In order to promote successful aging, it is therefore important to identify and target high-risk individuals to reduce their dependency (Backholer et al., 2012; Lowry, Vallejo, & Studenski 2012). Basic activities of daily living (BADLs) are activities that require less ability to perform and are more basic to continue living and include eating, dressing, getting into or out of a bed or chair, taking a bath or shower, and using the toilet (Rodrigues, Mendonça, and Martins 2020).

Wang showed that risk factors for the functioning of the elderly in society are as follows: cognitive impairment, chronic disease, upper and lower limb dysfunction, multiple medications, high or low body mass index (BMI), inactivity, low levels of social activity, and a small number of social connections. He noted that interventions for elderly patients whose disabilities are most affected by environmental factors should be more focused on reducing barriers to activity by improving life and environmental adaptation to physical activity (Wang et al., 2020). In addition, impaired mobility accompanied by pain can lead to loss of independence and increased social burden, and poorer quality of life, which in turn can lead to social isolation and depression (Fässberg et al., 2016).

The use of complementary and alternative medicine methods along with common medical techniques in both the patient community and service providers is expanding and can be used as a way to solve the problems of the elderly and improve their quality of life (Baussant and Bercovitz 2011). Acupressure, finger acupressure, or needleless Chinese medicine, which is more than three thousand years old, has been introduced as an effective way to maintain human health. There are 365 to 700 major acupoints in the human body that are located on the meridian lines. Of these, 108 points can be stimulated with a finger, which can be used in pressure therapy (Yeh et al., 2012)

Acupressure, as a type of massage therapy, is one of the most common complementary therapies in nursing. This intervention is a way to express love and communication with the patient and helps the healing process and is considered a supportive medicine for elderly patients. Acupressure increases relaxation, relieves pain, and reduces anxiety and depression, especially in the elderly. It is relatively inexpensive, safe, non-invasive, and easy to use and is performed

by hands, elbows, or various equipment to apply physical pressure on acupoints (Field 2016). By applying pressure to specific areas of the body as mentioned earlier, muscle spasms are relieved, blood circulation and vital energy are improved, and the patient is relaxed (Adib-Hajbaghery, Etri, and Hosseinian 2012). Only the hands are used to perform this method and there is no need to use medicine, needles, or other tools, and even if it is done wrong, it will not leave any negative side effects (Hosseinabadi et al. 2015). Accordingly, this study was conducted to determine the effect of acupressure on pain intensity and ADL of elderly women in daycare centers in Qazvin Province, Iran.

2. Materials and Methods

Design, setting and sample

This was a quasi-experimental study with a pre-test and post-test design, which was performed on 80 elderly women. The study population included all elderly women who had files in daily health centers in Qazvin. The study setting was daycare centers in Qazvin that provided comprehensive health care services for the elderly. These centers also have care departments for the elderly and offer services, such as blood pressure control, blood sugar measurement, training classes, and physiotherapy. The inclusion criteria were the age of 60 years and older, having chronic persistent pain for at least the last three months, obtaining a moderate pain score (score four or higher on the visual analogue scale [VAS]), the absence of mental disorder based on a score of seven and above from the Persian version of the abbreviated mental test score (AMTS), no smoking, no alcohol and drug use (according to the health records), and no use of psychiatric drugs (according to the health records). Exclusion criteria were not participating in more than two intervention sessions and unwillingness to continue cooperation in this experiment. The subjects were first recruited by stratified sampling. To do this, from all health centers, two health centers were selected by lot.

To determine the required sample size at a 95% confidence level and test power of 80% and also considering two points for the statistically significant effect of acupressure on the pain of the elderly in comparison with the control group, the sample size in each group was estimated to be at least 36 people and by calculating a 10% attrition, it was calculated as 40 people. Sampling was done from December 25, 2020, to March 18, 2021. By referring to the selected health centers, 40 elderly women were recruited from each center based on the inclusion criteria and were assigned to the experimental and control groups (20 people per group) by simple random allocation.

Due to the fact that all subjects were not available at the same time, sampling was done during a 4-month period and continued until the desired sample size was obtained. Three subjects in the intervention group and two in the control group were excluded due to displacement and/or unwillingness to cooperate and non-participation in more than two intervention sessions, respectively. Finally, the data of 75 elderly women (37 in the intervention group and 38 in the control group) were analyzed (Figure 1).

Procedure

To perform the intervention, first, the elderly person slept in an open arch and underwent acupressure on the acupoints on leg, and then, she returned to her abdomen calmly and the back of the leg was subjected to acupressure. The acupressure massage was performed on the acupoints (LIV3, UB62, SP9, GB34, UB 17, GB30, UB (UB25-UB11), GB20, GB21). The intervention was performed by a female researcher who had passed the training course on accurate identification of acupoints and working methods under the supervision of traditional Chinese and acupuncture specialists and had successfully received the certificate of completion of the course.

Depending on the acupoints, the massage or pressure lasted about 10 minutes. The related questionnaires were completed by the subjects before the intervention and one week after the last session of the intervention.

Study tools

Abbreviated mental test score (AMTS) is a 10-point test to quickly assess elderly patients for the possibility of dementia. This tool is one of the most widely used screening tests for the cognitive status of the elderly in the world, which was used for the cognitive assessment of the subjects entering the study. It includes ten questions (such as age, place, time, etc.) and a score of seven or lower on this test means a cognitive impairment (Bonaiuto et al., 1992). The sensitivity and specificity of the tool according to DSM-IV criteria are equal to 0.62 and 0.62, respectively (Bonaiuto et al. 1992). The Persian version of the test has very high sensitivity and specificity in distinguishing people with mild to moderate dementia from those with normal cognitive status (Bakhtiyari et al. 2014).

Visual analogue scale (VAS) as a valid, accurate, and sensitive tool was used to determine pain intensity (Hawker et al. 2011). It is a linear scale with scores from zero to ten and is used to assess pain intensity in con-

scious and adult patients. The number zero on this scale means no pain and the number ten is indicative of very severe pain. Numbers one to three indicate mild pain, four to six exhibit moderate pain, and seven to nine indicate severe pain (Cavalieri 2002).

Barthel index (BI) was used to determine the level of daily functioning ability of the elderly, which is the most common tool due to features, such as simplicity, sensitivity, accuracy, ease of scoring, quick assessment, and ease of use by researchers and health personnel. The index contains 11 items, but for each person, the item "mobility status" or "wheelchair use" is completed according to the patient's condition. Each item is assigned a score of 0-15, depending on the individual's conditions and the nature of the item. Items "Move from chair to bed and vice versa" and "Mobility" is given a maximum of 15 points each, according to the patient's status. The items "going up and down the stairs", "using the bathroom", "stool control", "urine control", "eating" and "dressing", each is given a maximum of ten points, and the items "wheelchair use", "bathing" and "personal hygiene" are assigned a maximum of five points each. In general, this tool determines the individual's ability in different dimensions of daily performance on a 0-100 basis, with higher scores indicating better status. A score of 0-20 is considered complete dependence, 20-60 is considered severe dependence, 61-90 is moderate dependence, 91-99 is partial dependence, and 100 is considered complete independence (Fricke and Unsworth 2010; Shah, Cooper, and Maas 1992).

The data were described using frequency distribution, mean, and standard deviation and analyzed by Chi-square test and independent t-test using SPSS software, v. 20. The significance level was set at $P < 0.05$.

3. Results

The age range of the subjects was between 60 and 80 years and their average age was 68.32 ± 6.28 years. Most subjects were illiterate (48.6%), married (73%), housewives (92%), insured (97.3%), and had several diseases (54%) (Table 1).

There was no significant difference between the groups in the mean score of pain intensity before the intervention ($P > 0.05$). A statistically significant difference was observed in the mean score of pain intensity after the intervention in the experimental group and also between the groups using the Chi-square test and independent t-test ($P < 0.01$). Before the intervention, the highest mean score of pain intensity was related to moderate and severe pain levels, but after the intervention, it was reduced

Table 1. Demographic characteristics and homogeneity test of the subjects in the experimental and control groups

Demographic Characteristics	No. (%)		Test Results	
	Intervention	Control		
Age categories (y)	60-64	30(11)	13(34.2)	P=0.869 $\chi^2=0.717$
	65-69	9(24.4)	9(23.7)	
	70-74	11(30)	8(21)	
	75-80	6(15.6)	7(18.5)	
Education level	Illiterate	18(48.6)	18(47.4)	P=0.881 Fisher-exact=0.489
	High school	12(32.4)	16(42)	
	Diploma	4(10.8)	2(5.3)	
	University	3(8.2)	2(5.3)	
Marital status	Married	27(73)	24(63.1)	P=0.536 Fisher-exact=1.496
	Divorced	0	1(2.7)	
	Widow	10(27)	13(34.2)	
Occupation	Free	0	1(2.6)	P=0.615 Fisher-exact =2.806
	Unemployed	0	1(2.6)	
	Housewife	34(92)	35(92.2)	
	Retired	3(8)	1(2.6)	
Dwelling	Personal	28(75.7)	29(76.3)	P=0.484 Fisher-exact=1.026
	Rent	1(2.7)	0	
	Relatives' house	8(21.6)	9(23.7)	
Life situation	Husband	27(73)	24(63.2)	P=0.492 Fisher-exact=2.517
	Children	4(10.8)	8(21)	
	Relatives	0	1(2.6)	
	Alone	6(16.2)	5(13.2)	
Insurance	Yes	36(97.3)	34(89.5)	P=0.358 Fisher-exact=1.971
	No	1(2.7)	4(10.5)	

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to mild pain levels, which indicates the effectiveness of the intervention (Table 2).

There was no significant difference between the mean score of ADL in the two groups using the chi-square test and independent t-test ($P>0.05$). A statistically significant difference was observed in the mean score of ADL in the two groups after the intervention ($P<0.05$) so that the dependence of most elderly in the experimental group to perform ADL was very low (Table 3).

4. Discussion

The results of the present study showed that acupressure massage on the acupoints (LIV3, UB62, SP9, GB34, UB17, GB30, UB (UB25-UB11), GB20, GB21) is effective in improving ADL and reducing pain intensity in elderly women, so that the average scores of ADL and pain of the intervention

group, after ten sessions of massage on the mentioned acupoints was significantly better than the control group ($P<0.05$).

Consistent with the results of this study, a study entitled "The effect of acupressure on anxiety in patients undergoing coronary angiography" showed a significant difference between the experimental and control groups (Rajai et al., 2015). Consistent with our results, a Randomized Clinical Trial (RCT) on women with multiple sclerosis showed that acupressure on the acupoints LI4, ST36, and SP6 significantly reduced the pain intensity in the experimental group (Bastani et al., 2012). In an RCT entitled "Massage therapy for patients with metastatic cancer: a pilot randomized controlled trial", the effect of massage therapy on reducing pain and anxiety in cancer patients undergoing chemotherapy in the age range of 18 to 60 years was assessed. The results showed that this method of intervention could improve their pain and anxiety (Toth et al., 2013).

Table 2. Comparison of pain intensity in the experimental and control groups before and after the intervention

Pain	Mean±SD		P
	Experimental	Control	
Before intervention	5.16±1.06	5.55±1.03	0.112
After intervention	1.91±1.25	4.26±1.20	<0.001
P	<0.001	<0.001	-

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Table 3. Comparison of activities of daily living in the experimental and control groups before and after the intervention

Activities of Daily Living	Mean±SD		P
	Experimental	Control	
Before intervention	72.48±70.19	74.7±68.2	0.188
After intervention	85.6±32.53	77.7±68.61	<0.001
P	<0.001	<0.001	-

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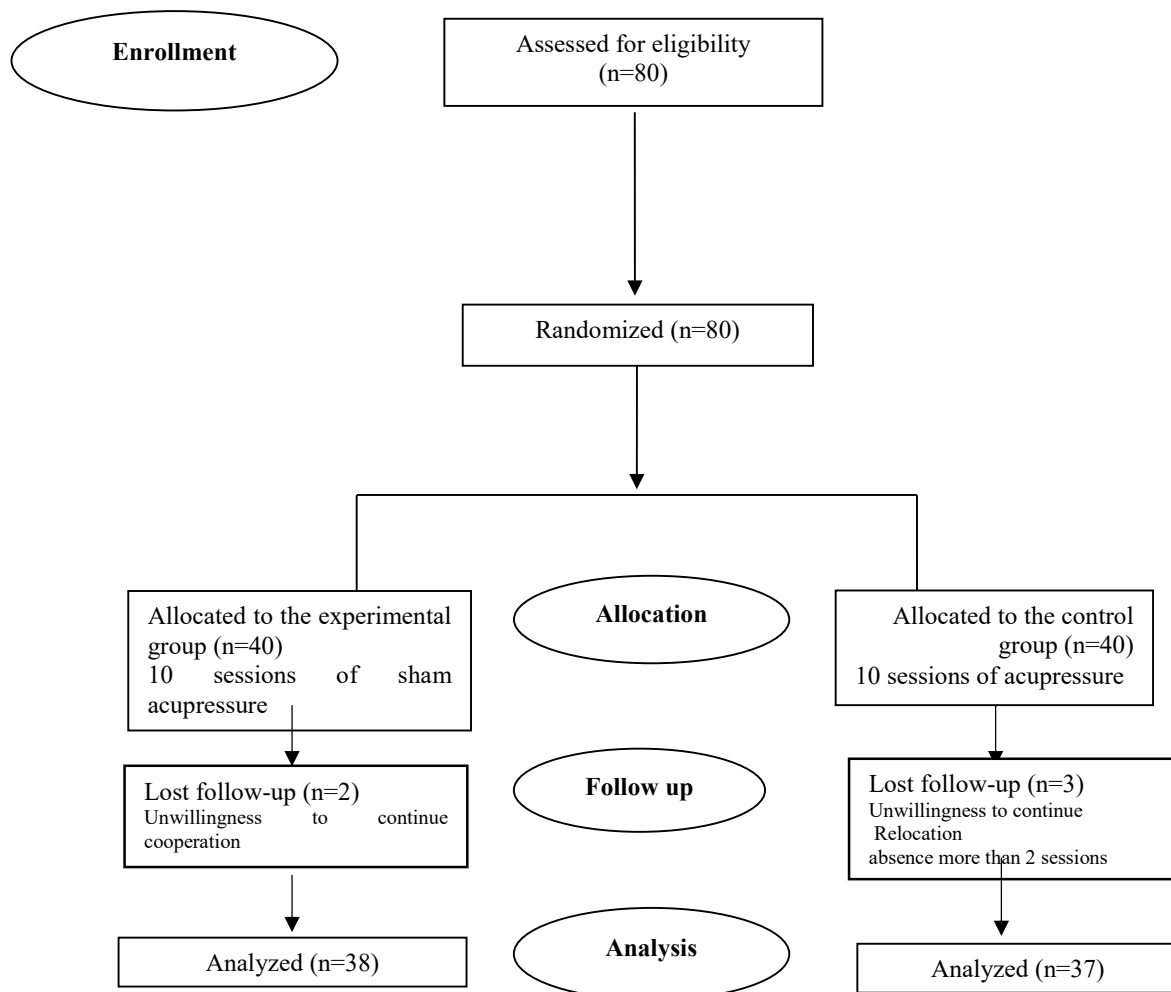


Figure 1. The CONSORT flowchart of the study

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On the other hand, the results of our study were consistent with a study entitled “Comparison of the effect of acupressure and isometric exercise on pain, stiffness and physical function in female patients with knee osteoarthritis”. After the intervention, the acupressure group in the mentioned study showed a significant reduction in pain intensity compared to the other two groups (isometric and control). However, the scores of stiffness and physical function in the isometric group were significantly lower than in the other two groups (acupressure and control), and in general, no statistically significant difference was observed between the scores in the two groups (Sorour, Ayoub, and Abd El Aziz 2014). Consistent with our results, a study in China was done to investigate the effect of acupressure on postpartum Low Back Pain (LBP), salivary cortisol, physical limitations, and postpartum depression. The experimental group received ten acupressure sessions and the control group received ten sham acupressure sessions. According to the results, the intervention group had significantly lower levels of LBP intensity, daily activity limitations, physical activity limitations, and postpartum depression than those in the control group (Cheng et al., 2020).

Another study on the “effect of passive finger exercises on gaining strength and improving ADL for older people with dementia” found that although it had no effect on gaining strength, passive finger exercises resulted in a significant improvement in ADL compared to the control group (Liu et al., 2018).

Pressing acupoints relieves muscle spasms, improves blood circulation and vital energy, increases the secretion of endorphins and serotonin, and relaxes the patient (Adib-Hajbaghery, et al., 2012). Acupressure reduces inflammation by reducing the vasoactivity of damaged tissue. With age, muscle stiffness and spasm may increase due to increased tissue viscosity and decreased collagen elastic tissue. This therapy reduces pain by increasing the pain threshold by slowing down the conduction of nerve pathways. It also reduces muscle spasms by reducing the activity of the spindle and peripheral nerves. Muscle spasm is reduced by massage through increased blood flow (Arnstein 2009).

Massage therapy reduces pain, inflammation, and muscle spasm by reducing the activity of nociceptor pain receptors (Fitzgerald 2009). Acupressure is relatively easy to learn and can be used as an appropriate healthcare measure, along with other nursing care measures (Bagheri-Nesami et al., 2015). Therefore, educational interventions in this field can play an important role in promoting health and increasing self-efficacy and self-sufficiency of elderly and

frail women who have poor anatomical parameters or even in younger women (Dashtian et al., 2017).

By teaching strategies, such as acupressure to women and their families, effective steps can be taken to reduce pain and improve the quality of life of elderly women. In this study, we did not use random blocks to assign groups. Therefore, the results are better to be used with caution.

5. Conclusion

Acupressure as an accessible, cost-effective, and non-invasive approach of complementary therapies is effective in reducing pain intensity and promoting ADL in elderly women.

Ethical Considerations

Compliance with ethical guidelines

This study was approved by the ethical review board of the [Iran University of Medical Sciences \(IUMS\)](#) under the code: IR.IUMS.REC.1398.1227 and was registered at the [Iranian Registry of Clinical Trials \(IRCT\)](#) under the code: IRCT 20200427047217N1. The subjects were informed about the objectives of the study, the procedure, and the possibility of being in the intervention or control group. Written informed consent was obtained before entering the study from all the subjects.

Funding

The article was extracted from the MSc. thesis of the second author in the Department of Community Health Nursing and Geriatric Nursing, School of Nursing and Midwifery of the [Iran University of Medical Sciences \(IUMS\)](#). This study was financially supported by [Iran University of Medical Sciences \(IUMS\)](#).

Authors' contributions

Conception and design: Farideh Bastani and Farzaneh Mehdipour; Data collection: Farzaneh Mehdipour and Hossien Jahani; Data analysis and interpretation of the results: Hamid Hagani and Farzaneh Mehdipour; Approving the final version of the manuscript: Farideh Bastani, Farzaneh Mehdipour and Hossien Jahani.

Conflict of interest

No conflict of interest was declared by the authors.

Acknowledgments

We would like to express their sincere thanks to the research officials of the School of Nursing and Midwifery of [Iran University of Medical Sciences \(IUMS\)](#) and those who helped us to carry out and improve the quality of this research. We also appreciate all the women who participated in this study and those who helped us in Qazvin Province.

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