Effects of Reflexology on Sleep Quality of Elderly Women Undergoing Abdominal Surgery

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ABSTRACT

Background: Sleep disorder is one of most prevalent complaints in elderly people. Tension reduction can be effective in improving sleep quality. In this regard, reflexology can be effective in reducing anxiety and tension. This study aimed to determine reflexology effects on sleep disorders of elderly women undergoing abdominal surgery.

Methods: This study was a non-randomized clinical trial (quasi-experimental). A total of 80 elderly women undergoing abdominal surgery were selected by continuous sampling method and simple random selection of two hospitals (Hazrat-e-Rasool [PBUH] and Firouzgar). Then, they were assigned in experimental and control groups. The study instrument was sleep quality questionnaire (PSQI). Descriptive statistics included calculating mean and standard deviation and inferential statistics were performed through the independent t-test and paired t-test.

Results: There was no significant difference in terms of quality of sleep (P=0.504) between control and experimental groups, before the intervention. Also, There was no significant difference between means of quality of sleep scores (P=0.606) before and after the intervention in the control group. However, there was a significant difference between the means of quality of sleep scores (P=0.048) before and after the intervention in the experimental group. Finally, the means of quality of sleep scores of two groups after the intervention was significantly different (P<0.001).

Conclusion: Considering the significant effect of reflexology on improving the quality of sleep in elderly women undergoing surgery, it is recommended that this simple technique (which is available and low-cost as an alternative medicine) be used in reducing the postoperative pain and improving the quality of sleep of patients.

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1. Background

Sleep disorder, with an incidence of 9% to 15% in the general population worldwide, is one of the most common complaints of the patients (Ohayon et al. 2004). Sleep disorders may lead to fatigue, impaired daytime functioning, irritability, depression and anxiety disorders (Taylor et al. 2003).

According to Nobahar and Vafayi (2007), the incidence of dyssomnia in the elderly was about 67%, and 61% of them suffer mostly (28.5%) from (primary, alternate, and final) insomnia. The incidence of parasomnia was 29% and it was mostly in the form of having nightmares. With regard to treating methods, behavioral therapy is used by 57% of cases, mostly (25%) by focusing on body organs before sleep. About 95.5% of the patients were familiar with cognitive methods mostly (26%) about the effects of the age on sleeping. Also, 100% were aware of the sleep hygiene, and most of the them (39%) were at least familiar with the effects of 4 hygienic items on sleeping, and finally 20% took drugs (Nobahar & Vafaei 2007).

Although sleep patterns change during the lifetime, sleep problems are usually associated with chronic medical problems which are more common in the elderly. Sleep problems can lead to deterioration in focus, slowed reaction, and memory impairments, which is subsequently likely to increase the probability of stumbling and slipping and bring up the problem of falling in the elderly during the changes in the environmental conditions or during their short way to use toilet (Ancoli-Israel et al. 2003).

In this regard, some studies like Helbig et al. (2013) study about the relationship between insomnia and falls in the elderly emphasized that sleep disorders may lead to their fall. In 2014, Arasteh et al. studied the sleeping quality in the hospitalized patients and showed that generally the quality of sleeping in 26.7% of the hospitalized patients was desirable and in 73.3% undesirable, and being in the hospital was one of the most effective factors in the sleep disorders of these patients. Because on one hand, being in the hospital causes anxiety and stress, separation from family, and change in the sleeping place and the probability of the having pain on the other hand all affect sleeping and its conditions. Another important finding in this study was the relation of quality of sleep with the patients' gender, so that men had a more desirable and better sleeping quality than women (Arasteh et al. 2014).

Other studies had emphasized the relationship of the gender with the sleeping quality. For example, Kinja et al. (2004) claimed gender as one of the most effective factors on sleeping disorders and it was of more importance in elderly women since it was significantly related to the hormonal changes in menopause (Kravitz et al. 2008).

Operation is one of the factors which can cause postoperative pain and sleeping disorders. In this regard, one of the ways to improve the quality of sleeping is using sleeping pills. However, medications may have adverse effects in the elderly, including drowsiness, cognitive dysfunction, transient amnesia, falling, and loss of mental functioning although an undeniable improvement is seen in the adequate use of these drugs (Bloom et al. 2009). Despite continuous advancement and improvements in pharmacologic and non-pharmacologic treatments of insomnia, using alternative medicine with conventional medication is common. A survey is America had shown that 4.5% of the elderly reported that they have used a complementary or an alternative medication for the treatment of their insomnia or sleep disorder in the past year (Lee et al. 2011).

In a review study by Yang et al. on the effects of acupuncture, reflexology, and ear acupuncture on people with insomnia (not necessarily the elderly), it was found that reflexology, as an effective treatment of insomnia, compared to the different psychological cares such as counseling, relaxation training, sleep hygiene education, lifestyle changes, and the use of some sleep-aid drugs, has always been considered in some groups (Yeung 2012). Reflexology is a complementary therapy with no side effects and its learning and applying is easy. A little knowledge is necessary for its application and it gained popularity among the general population (Yang 2005). In a study by Li et al. on the effects of the reflexology on exhaustion, sleeping, and pain, it was shown that reflexology is one of the interventions that could be effective on the reduction of sleeping disorders, exhaustion, and patients' pain (not necessarily the elderly). Furthermore, some other studies emphasized on performing more research on the effects of the reflexology as a nursing intervention on the variable outcomes of exhaustion, sleeping, and pain (Lee et al. 2011).

With regard to few studies conducted on the effects of non-pharmacological interventions such as reflexology on the sleep quality of the elderly hospitalized patients, several and sometimes irrecoverable and threatening complications of sleep disorders such as falling in the older people, the positive effectiveness of reflexology as a non-pharmacological approach with affordable nursing intervention, and also according to the results of a recent systematic review (Song et al. 2015) indicating the need

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for further and more accurate studies on reflexology (foot massage) management of symptoms (such as sleep disorders) in different people, this study aimed to determine the effects of reflexology (foot massage) on sleep disorders in female elderly patients undergoing abdominal surgery.

2. Materials & Methods

This research is quasi-experimental with pretest, posttest and control group, and in terms of purpose, is an applied study. The samples were chosen from the Hazrat-e-Rasol (PBUH) and Firoozgar (Operation Ward) hospitals.

Study participants

A total of 80 elderly women undergoing abdominal surgery were selected based on the sleep quality questionnaire by purposive sampling method among all older women undergoing abdominal surgery in 2015. Then, they were randomly assigned into two groups of control and experimental (each group 40 subjects).

The inclusion criteria were as follows:

- Undergoing abdominal surgery;
- Having trouble in sleeping;
- Absence of disease or foot deformity (corns, burning feet, amputations, or skin diseases);
- No history of drug use or mental disorders;
- The ability to self-report the pain.

The exclusion criteria were as follows:

- Lack of cooperation or death of the elderly subject;
- Not wanting to continue to participate in the study;
- Having any malignancy associated with surgery;
- Need for hospitalization in intensive care unit.

Study instrument

Pittsburg sleep quality index (PSQI) is a questionnaire designed to examine the sleeping disorder. This questionnaire has 7 components as follows:

- A general description of the quality of sleep;
- Sleep latency;
- Actual sleep duration;
- Sleep efficiency (actual sleep duration based on the ratio of the total time spent in bed);
- Sleep disturbances (awaking at night);
- The amount of consumed sleeping pills (dose);
- Daily functioning (individual experienced problems due to lack of sleep during the day).

The total score ranges from 0 to 21. The questionnaire had a sensitivity of 90% and specificity of 87%. Buysse and colleagues (Buysse et al. 1989) who designed the questionnaire calculated its internal consistency as 0.83 by using the Cronbach α. In Iranian version of the questionnaire, the validity and reliability were 0.89 and 0.86, respectively (Heidari et al. 2010). In 2013, Beirami and colleagues used this questionnaire in their research on sleep disorders in older adults in which the test-retest reliability of the survey was reported between 0.93 and 0.98 (Beyrami et al. 2014).

Study procedure

The research is registered with the code No. IRCT2016010325625N2 at the clinical trial center. The researcher started sampling after getting the permission of the Ethics Committee of Iran University of Medical Sciences and the written introduction letter from the authorities of Nursing School as well as the informed consents of the patients who met the study inclusion criteria. After selecting the samples, they were placed in 2 groups. The control group did not receive any special treatments.

However, the experimental group received the reflexology intervention twice a day (20 minutes each time), one in the morning (an hour after breakfast) and one at night (an hour before sleeping) in the second and third day after the operation. The pretest was performed half an hour before the intervention on the second day of the post operation and posttest one day after finishing the intervention. Descriptive and inferential data analysis was conducted using mean, standard deviation, paired t-test and the Independent t-test.

3. Results

The main hypothesis of this research was "study of effects of reflexology on sleep quality of elderly women undergoing abdominal surgery" which in turn can be separated into three minor ones.

- The sleeping quality of older women undergoing surgery in the experimental group was different before and after the intervention (Table 1);

- The sleeping quality of older women undergoing surgery in the control group was different before and after intervention (Table 2);
- The sleeping quality of older women undergoing surgery in the control and experimental group was different before and after the intervention (Tables 3 and 4).

In the continuation, the study hypotheses are examined by statistical tests.

Hypothesis 1

The means and the standard deviations of the sleeping quality scores of the elderly women undergoing surgery in the experimental group were different before and after the intervention.

The results of the paired t-test are presented in Table 1. It shows that the mean sleeping quality scores had a significant difference (increase) before and after the intervention in the experimental group and after the intervention (P-value=0.048).

Hypothesis 2

The means and the standard deviations of the sleeping quality scores of the elderly women undergoing surgery in the control group were different before and after treatment. According to Table 2, the sleeping quality scores in the elderly women undergoing surgery in the control group did not show a significant difference before and after the intervention and remained unchanged (P-value=0.606).

Hypothesis 3

Numerical indices of sleep quality scores in the elderly women undergoing surgery in experimental and control groups were different before and after the intervention.

Before the intervention

Table 3 compares the difference of means of sleeping quality scores between the control and experimental groups before the intervention. Based on the Independent T-test results in Table 3, two groups did not show a significant difference in the sleeping quality before the intervention (P-value=0.504).

Table 1. The means and standard deviations of sleeping quality scores of elderly women in the experimental group before and after the intervention and its significant test.

Sleeping quality scores before the intervention		Sleeping quality scores after the intervention		Paired t-test
Mean	SD	Mean	SD	
16.10	2.85	17.33	1.81	t=1.54, df=39 P-value=0.048

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Table 2. The means and standard deviations of the sleeping quality scores of the elderly women in the control group before and after the intervention and its significant test.

Sleeping quality score after the intervention		Sleeping quality score before the intervention		Paired t-test
SD	Mean	SD	Mean	
2.88	15.29	3.37	15.63	t=0.521, df=39 P-value=0.606

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Table 3. The means and standard deviations of the sleeping quality scores of the elderly women in the control and experimental groups before the intervention and its significant test.

Sleeping quality score in the experimental group		Sleeping quality score in the control group		Independent t-test
SD	Mean	SD	Mean	
2.85	16.10	3.37	15.63	t=0.671, df=78, P-value=0.504

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Table 4. The means and standard deviations of the sleeping quality scores of the elderly women in the control and experimental group after the intervention and its significant test.

Sleeping quality score in the experimental group		Sleeping quality score in the control group		Independent t-test
SD	Mean	SD	Mean	
1.81	17.33	2.88	15.29	t=3.80, df=78, P-value<0.001

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After the intervention

Table 4 compares the difference in the sleeping quality scores after in the intervention between the control and experimental groups.

As it can be seen in Table 4, the control and experimental groups had a significant difference with regard to the mean of the sleeping quality scores after the intervention (P-value<0.001). Because the mean sleeping score of the experimental group was higher than the control group, and the higher score means better sleeping quality, it can be said that reflexology was effective in the improvement of the sleeping quality in the elderly women undergoing surgery.

4. Discussion

This study aimed at examining the effects of reflexology on sleeping quality of the elderly women undergoing abdominal surgery. The research results showed that reflexology was effective on improving the sleep quality of these patients.

The results of this research are consistent with the results of Boitor et al. (2015) study. They studied the effect of palm massage (reflexology) on postoperative pain in adults hospitalized in the intensive care unit. The intervention (palm massage) was performed on patients 2 to 3 times per day, each time 15 minutes. The results showed that after the second and third session of the massage, the patients' pain had significantly reduced. The main findings of this study showed that palm massage (reflexology) could alleviate postoperative pain caused by incision in cardiac surgery.

The results of this study are consistent with the results of Babajani et al. (2014) study entitled "the effects of the reflexology on the level of the pain during chest tube removal after coronary artery bypass graft".

The results showed that foot massage at the reflection spot of the chest is effective on reducing pain due to the removal of the chest tube. Foot reflexology massage is an effective nursing intervention in dragging chest tube after open heart surgery. In another research, Ashcandy et al. (2014) examined the effects of reflexology on the sleeping quality in the ischemic patients hospitalized in CCU in a clinical trial. Reflexology treatment was conducted on the experimental group for two nights each time for 20 minutes in succession (each foot 10 minutes).

The results showed that reflexology, as an easy, low-cost, and without adverse effects, is effective in the treatment of the insomnia in hospitalized patients with ischemic heart disease. Hashemi et al. (2012) in their experimental and applied study examined the effects of the reflexology on the foot sole in reducing backache caused by discopathy in 30 men suffering from backache. Reflexology was conducted on the subjects on alternate days (each time for 30 minutes) for one month. The results showed that the backache caused by discopathy can be reduced through foot sole massage.

Merdacy et al. (2013) conducted a study entitled "the effects of the foot massage on the mothers' sleeping disorders in post-delivery". This clinical study was conducted on 60 nulliparous mothers referring to the health centers of Khorramshahr City, Iran in 2013. The results showed that foot massage was effective on the improvement of the mothers' sleeping disorders and pain relief. The elderly, especially women experience a high level of anxiety (Segal et al. 2008).

Regarding that the elderly women, in this study, underwent an abdominal surgery, their level of the anxiety was high. One of the main causes of insomnia is anxiety (McGowan et al. 2016). Low sleeping quality in the elderly women undergoing surgery can be caused by their anxiety. Postoperative pain also affects this sleeplessness and intensifies it. In addition, it increases anxiety and aggravates pain feeling in the patients (Welch-McCaffery 1985). Therefore, insomnia will increase. Foot massage, easing muscle tension, relaxing muscles, and creating a sense of comfort in the patients, reduce the pain and relax the patient and will eventually decrease patient's anxiety (Dashtbozorgi et al. 2012; Hernandez-Reif et al. 2004; Krohn et al. 2011; Quattrin et al. 2006). On the other hand, foot massage reduces the level of catecholamines (epinephrine and norepinephrine), which play some role

in creating the anxiety (Dashtbozorgi et al. 2012; Field et al. 2005). Also foot massage increases the secretion of hormones like dopamine and serotonin, which their main role is creating euphoria and happiness in people, and consequently decreases the patients' anxiety (Hernandez-Reif et al. 2004; Field et al. 2005; Field 2002). Suppressing the anxiety can directly affect and improve the sleeping quality (McGowan et al. 2016).

The results of the present study verify the study hypotheses, and apparently reflexology is effective on the sleeping quality of the elderly in post abdominal surgery. Therefore with more research, reflexology, as an easy and safe non-pharmacological intervention, can be used to manage the sleeping problems (in the elderly) and postoperative problems, especially since it can be done very easily by a nurse or other people at home or elderly care homes. Therefore, based on the findings of this study, it is recommended that non-pharmacological methods of improving sleeping quality like reflexology be included in the geriatric health programs.

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Conflict of Interests

The authors declared no conflict of interests.

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