Original Article

The effects of reflexology on chronic low back pain intensity in nurses employed in hospitals affiliated with Isfahan University of Medical Sciences

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Abstract

Background: Humans have been involved with the phenomena of pain and pain relief from the ancient times. Back pain is the most common pain. In fact, eight out of ten people experience it in their lifetime. However, individuals with specific jobs, including nurses, are faced with this problem more. Nursing is in the top ten careers suffering from the most severe musculoskeletal injuries. There are non-pharmacologic and pharmacologic treatments to relieve back pain. One of the non-medical treatments of pain is called reflexology which is a branch of complementary and alternative therapies. This research has been conducted to investigate the effect of reflexology on chronic low back pain intensity.

Materials and Methods: This study was a double-blind clinical trial. The study population consisted of 50 female and male nurses suffering from chronic low back pain working in hospitals affiliated with Isfahan University of Medical Sciences. The participants were divided into two groups of reflexology and non-specific massage. A questionnaire was completed through interviews and a 40 minute sessions of interventions were performed three times a week for two weeks. Pain intensity was measured by Numerical Analogue Scale for pain before and after the intervention. Descriptive and inferential statistics, including independent t-test and chi-square test, were used to analyze the data.

Findings: The results showed a significantly higher reduction in pain intensity scores in the reflexology group after the intervention as compared with the non-specific massage group. However, the non-specific massage was also significantly effective in reducing pain.

Conclusions: Reflexology can be effective in reducing the severity of chronic back pain, i.e. it is able to reduce pain from moderate to mild. Thus, this technique is recommended to be performed by nurses as a complementary therapy in patient care.

Key words: Pain, complementary therapies, nursing, reflexology, back pain

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Introduction

Human beings have always attempted to recognize and treat pain with continuous and tireless efforts. They have definitely made amazing and resuscitative achievements.[1] Based on the definition by the International Association of Pain, pain is an unpleasant feeling and emotional experience linked with tissue damage or injury[2] and has various aspects like severity, perception, quality, location, duration and acuteness or chronicity.[3] Chronic pain is known as an important medical problem throughout the world in which millions of people are involved each year. However, not all of these individuals receive appropriate treatments. Previous studies showed the prevalence of chronic pain to be 35.1% in Finland, 31.4% in Sweden, 23.4% in Spain, 16.0% among men and 21.0% among women in Denmark, and 17.1% in men and 20.0% in women in Australia.[4]

Low back pain is the most common type of pain after headache in the industrial world of today[5] and 15% of

low back pain patients are permanently disabled.[6] The factors affecting low back pain include age, sex, height, weight, abdominal muscles, muscles around the spine in the front and back, and lifestyle. Based on the results of studies on different kinds of jobs, nursing is in the top ten job groups that suffer from the most severe musculoskeletal injuries. In addition, low back pain represents the most important subgroup of musculoskeletal injuries in which nurses stand second after heavy industrial workers. Studies conducted over two decades showed higher incidence of back pain in nurses compared with the general population. This complication is the most common side effect of being a nurse with the prevalence of 56% to 90%.[7,8]

People with chronic back pain use medical and non-medical treatments to remedy their pain. Non-medical treatments include psychological techniques, electrical stimulation and treatment with the complementary and alternative therapies.[9] Complementary medicine has a long history and is used for health care and wellbeing, prevention, diagnosis, recovery and treatment of mental or physical disorders.[10] In recent years, the application of complementary and alternative therapies, including massage therapy, is increasing in therapy centers and communities. Massaging is defined as the technique of touching soft tissues of the body by hands in order to relieve the pain and increase the comfort in a patient.[11] Reflexology, also known as reflexotherapy, is one of the complementary treatments classified in hand massage treatment groups. It uses a special technique of touching or pushing the reflexology points on the palms and soles in order to make bio-physiological changes in the body.

Reflexologists believe that feet are a small map of the whole body on which all organs and body parts are reflected. The areas associated to different parts of the body on the legs are similar to their places on the body. The history of reflexology in China and India goes back to about 5,000 years ago. Two Americans named Dr. Fitzgerald and Eunice Ingham turned to reflexology in the last century. By applying pressure on reflex areas in the feet, they noticed the sedative effects of the areas associated with these points.[12]

A new and validated approach to nursing considers the nurse as a healing agent with an independent role in the treatment of patients. The term "holistic nursing" arose from this approach. Nurses can develop their professional practices to enhance complementary medicine.[13] This study was conducted to compare pain scores in a massage group, before and after the intervention.

Materials And Methods

This study was a double-blind clinical trial. The study population consisted of all nurses working in hospitals affiliated to Isfahan University of Medical Sciences. Nurses were included if they had low back pain, chronic non-specific back pain diagnosed by a neurosurgery specialist for more than 3 months, healthy feet without injury or damage, and willingness to participate in the study. On the other hand, subjects were excluded if they had participated in another clinical research during the past 3 months, had an experience or knowledge of reflexology, were pregnant or lactating, used other methods of complementary therapy during the study, or had a vascular disease, thrombophlebitis or diseases such as urinary tract infection or kidney stones (with pain in the lower back). They were also excluded if any physical damage, making the subjects unable to continue their participation, was made or if they used new medical treatments (new drugs effective on pain, physical therapy or other methods).

After obtaining approvals from the School of Nursing and Midwifery at Isfahan University of Medical Sciences, as well as hospital authorities, announcements were posted in hospitals and subjects were directly invited. Following the confirmation of a certified neurologist, individuals who fulfilled the inclusion criteria entered the study. Finally, a total of 50 nurses with chronic back pain were selected by simple random sampling method. They were then randomly numbered. Afterwards, individuals with odd and even numbers were assigned to the reflexology (test group; n = 25) and nonspecific massage (control group; n = 25) groups, respectively. However, the patients and the questioner were blinded to the groupings.

In order to collect data, a three-part questionnaire was filled out by the participants. The first part of the questionnaire involved demographic data such as age, gender, marital status, educational degree, position, work experience and the underlying diseases. The second part was about the characteristics of the pain including duration, length and frequency of pain, the history of visiting a doctor and treatments received, actions undertaken by the person, the number of days absent from work, pain intensity based on a numerical scale for pain (during the past one and two weeks), and the history and results of the drugs used. The third part assessed the pain intensity at the time of completing the questionnaire based on the Numerical Analogue Scale for pain as the most reliable tool for measuring pain. The validity of the

questionnaire was approved by 10 faculty members of the School of Nursing and Midwifery at Isfahan University of Medical Sciences. In order to assess reliability, the questionnaires were given to 10 patients with chronic low back pain. After 10 days, the questionnaires were distributed among the same people and collected again. The Pearson correlation coefficient between the scores of the items of the questionnaire was calculated. The reliability of the questionnaire was confirmed with a value of 0.81.

After learning the technique under the supervision of a qualified reflexology expert, the researchers performed 6 forty-minute sessions of interventions, i.e. twice a day, three days a week for two weeks. Every day, the researchers referred to Al-Zahra and Kashani Hospitals to carry out the interventions in the morning from 8 to 12 and in the afternoon from 2 to 6, respectively.

Interventions in the test and control groups were conducted during the first and second two weeks, respectively. In the test group, first the legs were washed with body shampoo and dried. Then, the subjects were placed in a comfortable position, usually lying on the back, with their pants being removed up to their knees. While standing in front of the patient, the researcher started a simple massage from the lower legs to the ankles, soles and finally toes. This was repeated for several times. As the heel was supported by one hand, the ankle was twisted many times to loosen the legs and make the subject ready for the specific reflexology. The specific massage was then performed on all reflex points on the feet. Some points were massaged by using thumbs or other fingers continuously without losing contact with the skin. Massaging was also conducted on the lower arch-edge of the foot (corresponding to lumbar region) for about 5 to 10 minutes. Index and pointing fingers were placed on reflex points. They moved apart and reached back for several times in a worm-like movement.[12] However, simple massaging was not followed by deep stimulation of reflexology points in the control group.[14]

Finally, descriptive and inferential statistics, including independent t-test and chi-square test, were used to analyze the data.

Findings

The mean (SD) age of subjects was 42.28 (8.02) years in the test group and 39.48 (5.73) years in the control group. In both groups, 40% were females and 60% were male. Overall, 84% of the test group and 92% of the control group were married. Moreover, 96% of the test group and 84% of the control group had a bachelor's degree. Mean (SD) work experience was 17.68 (8.06) in the test group and 15.72 (5.79) in the control group. Overall, 76% and 72% of the test and control groups had no underlying diseases, respectively. There was no significant difference in terms of personal details between the two groups ($p > 0.05$).

The comparison of pain characteristics between the two groups did not indicate a significant difference ($p > 0.05$). Determining and comparing the average pain scores before the intervention showed no significant difference between the two groups ($p > 0.05$). However, comparing the average pain scores before and after the intervention in the study groups revealed a significant reduction in pain scores in both test and control groups ($p < 0.001$) (Table 1). In addition, comparing the average pain scores after the intervention in the control and test groups showed a significantly higher score reduction in the test group than the control group ($p < 0.001$) (Table 2). Furthermore, comparing mean changes of pain scores before and after the intervention in the test and control groups indicated the change in the test group to be significantly higher than the control group ($p < 0.001$) (Table 3).

Discussion

Based on the findings of this research, pain intensity significantly reduced from a moderate level to a mild level after reflexology. Quinn et al. reported a significant

Table 1. Comparing mean pain intensity before and after the intervention in the study groups

	Before the intervention	After the intervention	p	df	t (even)
Test Group	5.000 (0.7071)	2.7200 (0.8907)	< 0.001	24	10.740
Control Group	5.2400 (0.7789)	3.8800 (0.9713)	< 0.001	24	8.981

The values before and after the intervention are presented as mean (SD).

Table 2. The comparison between mean pain scores in the test and control groups after the intervention

	Mean (SD) pain score	p	df	t (independent t-test)
Test Group	2.7200 (0.8907)	< 0.001	1	4.40
Control Group	3.8800 (0.9713)			

Table 3. Comparing mean changes of pain scores in the test and control groups before and after the intervention

	Mean (SD) change of pain scores	p	df	t (independent t-test)
Test Group	-2.28 (1.06)	< 0.001	48	3.52
Control Group	-1.36 (0.75)			

reduction in pain after six weeks of reflexology. They also observed the reduction in the 12th and 18th weeks after the completion of reflexology.[14]

Moreover, our results showed nonspecific massaging to reduce pain intensity from moderate to low. Similarly, according to Nahavandi-Nejad, recent researches and theories about pain, its causes, mechanism, transmission, and perception showed the effect of massaging on pain control through the release of endorphins and controlling the pain opening".[12] Massaging effectively relieve pain through relaxation of muscles, and increasing blood circulation and waste removal resulting from the metabolism. Massaging also reduces anxiety and causes stress relief and sleep improvements.

The focus of the therapist on the patient, combined with a pleasant physical sensation resulting from massaging, creates a kind of close relationship between the patient and the therapist.[12] Shutes and Weaver believed that years of research on massaging has shown this method to effectively reduce and control pain, increase blood circulation, increase the lymphatic flow in superficial lymph capillaries, improve respiratory function, clear mucus of the respiratory system, promote the immune system, and reduce stress, anxiety and depression.[15] According to the results of the present study, significant differences existed between mean changes in pain intensity before and after the intervention in the test and control groups. In fact, reflexology was able to reduce pain more effectively.

Mackereth and Tiran considered reflexology to have more definite effects than simple massaging.16 In a study by Sirawal , the patients had less pain after one week of reflexology than the control group ($p < 0.001$).[17] Like the present study, the findings of Mirzaei et al. showed reflexology to cause significant pain reduction compared to a control group ($p < 0.001$).[18]

Conclusion

Recognizing the impact of reflexology on chronic back pain makes it possible to use this technique as a complementary intervention with other treatments for complicated conditions such as back pain in which patients do not usually benefit from other methods. In addition, reflexology can be easily taught to people in order to take effective steps to reduce chronic pain. The treatment team can also take advantage of this method for treating low back pain patients.

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