

A Review of the Effect of Foot Reflexology on Pain in Patients

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Abstract

Today, massage therapy is one of the most widespread forms of complementary therapy. One of the types of massage therapy is reflexology or reflection therapy. Reflexology is a special form of massage that is associated with applying pressure on the reflex points that are usually in the feet, it is believed that these points are connected to all parts of the body, and pressure on them can stimulate the body's physiological responses. The purpose of this study was to evaluate the effectiveness of the studies conducted in the field of reflexology on different body systems. The present study was a review study that examines the studies done in the field of reflexology effects. In these studies, variables such as fatigue, sleep, constipation, intensity and duration of labor, vomiting after chemotherapy, anxiety, physiological indicators, PMS symptoms, back pain, and restlessness were studied. The total findings of this review study show the favorable effect of reflexology on various diseases and disorders. Although reflexology cannot be used as an alternative treatment, it can be said that reflexology is a side treatment method and a pleasant and relaxing experience. It seems that reflexology can reduce the pain of patients after surgery. Therefore, it is recommended that nurses and staff of operating rooms and surgery centers use reflexology to reduce the pain of patients.

Keywords: Massage therapy, Reflexology, Foot reflexology, Pain

INTRODUCTION

Pain is a common phenomenon after all surgical procedures and surgical procedures are among the causes of acute pain, with approximately 70% of patients complaining of severe pain on the first postoperative day. Pain can severely affect the general condition of patients. The amount of pain depends on the extent of the surgery, the patient's pain tolerance threshold, and the patient's response to pain [1, 2]. Evidence shows that in people whose postoperative pain is not well controlled, the rate of heart failure increases three times and the rate of infection after surgery increases five times. Pain delays wound healing and increases the chance of thromboembolic complications. The type and duration of the operation, the type of anesthesia and anesthesia used, as well as the mental and emotional state of the person, all have an effect on the severity of pain after the operation [3, 4].

A high level of pain after surgery causes an increase in the consumption of narcotics, a decrease in the vital capacity of the lungs, pneumonia, tachycardia, an increase in blood pressure, and a delay in recovery. Although drug therapy is the most common intervention for pain control, the prevalence of postoperative pain is still high (80%) [5, 6]. Drug complications and other existing problems such as lack of availability or inappropriateness of pain relievers have caused the attention of nursing systems to be drawn to non-pharmacological pain relief techniques [7-9].

In recent years, there have been many researches about non-drug and alternative (complementary) pain control methods. Reflexology is one of the most common methods of complementary treatments [10]. Using this technique, one can alter the body's energy flow by applying pressure on the soles of the feet with the fingers, particularly the thumb [11]. Among the advantages of this method, it can be mentioned that it is cheap and economical, patient satisfaction [10, 12], easy to use, and not dependent on technology. In a review study of twenty articles related to the effect of reflexology on pain, eighteen articles confirmed the positive effect of reflexology on pain reduction [13]. On the contrary, in his

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How to cite this article: Vindis K, Hozan CT, Coțe A, Szilagyi G. A Review of the Effect of Foot Reflexology on Pain in Patients. Arch Pharm Pract. 2024;15(1):12-6. <https://doi.org/10.51847/7egqJLQbwh>

review, Ernst pointed out the lack of convincing evidence on the effectiveness of reflexology for the treatment of any medical condition (including pain) [14].

The existence of such doubts in the medical community about the effectiveness of complementary medicine makes it necessary to have strong research support for complementary medicine [15-17]. Therefore, the present study was conducted to determine the effect of foot reflexology massage on patients' pain.

Physiological and Therapeutic Effects of Reflexology

Massage is an ancient therapeutic technique. Massage has been used for healing in many ancient civilizations. Today, massage therapy is one of the most widespread forms of complementary therapy in the United States of America [18]. One of the types of massage therapy is reflexology or reflection therapy. Reflexology is a special form of foot massage that involves applying pressure on reflex points that are usually located on the feet. It is believed that these points are connected with all the points of the body and the pressure on them can affect the physiological responses of the body, which is thought to promote recovery and return to homeostasis [19].

The mechanism of reflexology is not exactly known, but recently it has been shown to have profound physiological effects, some of which are attributed to touch-induced effects. However, short-term and immediate responses to treatment have been frequently reported [20, 21].

Legs are sensitive to tension and movement. The skin contains a variety of sensory nerve receptors, each of which has different anatomical and physiological characteristics. Various degrees of pressure, such as massage and touch, stimulate the sensory nerve endings connected to these receptors. Meissner's corpuscles are located about 0.7 cm below the surface of the skin and just below the hairless epidermis, which responds to surface touch and slow vibration. Ruffini Cutaneous Mechanoreceptors are situated in the center of the dermis area and react to light pressure, whereas tactile cutaneous corpuscles are found in the epidermis and respond to touch and light pressure. Pacinian receptors (Pacinian corpuscles) are located at a deeper level and about 2 mm below the surface of the skin, in the dermis and the layers under the skin of the joints, periosteum, and some viscera, and they respond to stronger pressure and faster vibration. Stimulation, such as touch or continuous pressure, activates an action potential that is caused by electrical discharge in the cells, and this action potential is transmitted to the brain for interpretation through sensory nerves and then to the muscles of the corresponding area to create a response [22].

Reflexive therapies rely on the existence of life energy, the balance of energies in the body, crystal structures, the

existence of energy exchange channels, and manipulation of the body's energies, which is also very controversial [23].

They believe that reflexology can relieve stress and pain in different parts of the body by manipulating the feet. This claim explains that the pressure received in the feet sends messages to the nervous system that cause the balance in this system or release chemicals such as endorphins, thereby reducing pain and it to become stressful [23].

Energy flow obstruction results from an inability to move longitudinally between the energy channels in the feet and the corresponding places in the body. This can lead to discomfort, illnesses, and diseases that need to be treated. By using reflexology, by applying pressure techniques on the problem points and based on the reflex point of each organ, the obstruction in the path of energy flow is removed, and as a result, the movement of energy flows in its channels [24].

Another theory called the theory of neural impulses or autonomic-somatic integration, proposes that pressure applied to the feet during reflexology compresses receptors in plasma membrane cells (which have open ion channels) and a potential that initiates local action to transmit messages to the spinal cord or brain. Similar to involuntary spinal impulses, these impulses originate from the spinal cord and are a rapid knee reflex at the neuronal junction between the motor and sensory branches of the spinal cord. Through the intrinsic connection with the spinal cord's neurons, reflexology directly affects the muscles by fusing the movement structures that supply the muscles with sensory information from the legs [25].

Different studies indicate the positive effect of reflexology in different conditions. In a systematic review and meta-analysis, Lee *et al.* reviewed 44 studies on the effect of reflexology on sleep, fatigue, and pain and reported that reflexology is a nursing intervention and method for improving pain and fatigue. To investigate its effect on pain, more studies are needed [25]. Ernst *et al.* reviewed 23 clinical trial studies of reflexology. In this review study, conditions such as diabetes, premenstrual syndrome of cancer patients, and MS disease were examined, and in 17 studies, the positive effect of reflexology was reported [26]. A systematic review of controlled clinical trials was conducted by Yeung *et al.* under the title acupressure, reflexology, and ear acupressure in the field of sleep. From the total of 40 studies reviewed in this meta-analysis, five studies were related to the effect of reflexology on sleep, and the results obtained from all these studies in this systematic article show that this intervention is a safe and effective intervention for insomnia. Is. However, it requires more studies with higher accuracy and power [27]. Therefore, due to the increasing desire of people to use complementary medicine, especially massage therapy, the attention of researchers to investigate the effects of such methods is increasing day by day. So far, many studies in this field have been published by researchers. On the other hand, to accept or reject a treatment method, the effects of that method must be ensured in different conditions.

RESULTS AND DISCUSSION

The results of this study showed that reflexology can reduce the pain of patients after surgery [28]. In a research, it was found that the intensity of pain after foot reflexology massage intervention was significantly reduced in patients undergoing lumbar disc surgery [29]. Another study on 122 patients suffering from persistent pain and 70 patients suffering from chronic pain showed that in patients suffering from persistent pain, foot reflexology significantly reduced the average pain score after each intervention session [30]. However, Albert *et al.*'s research, which was conducted on heart surgery patients, showed that the average pain scores of the patients after the intervention did not have a statistically significant difference compared to before the intervention, which is not consistent with the results of our study. The reason for the contradiction between the mentioned research and the current study is that in the aforementioned study, all heart surgery patients, including repair or replacement of heart valves, and people who had both operations performed at the same time, were included in the study, while due to Different length, operation duration, location and pain level of these patients will be different from each other [31].

Ernst *et al.* also stated in a review study that the effect of reflexology on various conditions of patients, including pain, is not clearly defined; It seems that because his study was a meta-analysis study and different studies were conducted in different conditions, as a result, it is a general result of the above studies and cannot be seen as a contradictory reason with other studies [26]. Shahriari *et al.*'s study showed that foot reflexology significantly reduced pain in patients after lower limb amputation [32]. Sadeghi Shermeh *et al.*'s study also showed that foot reflex massage caused a significant reduction in pain score from 4.6 ± 1.2 to 3.34 ± 1.5 in patients undergoing sternotomy [33]. However, in Hattan *et al.*'s study, foot massage did not significantly reduce the pain of patients undergoing coronary artery bypass surgery; perhaps the small size of the sample in this study (7 people in the experimental group and 9 people in the control group) was one of the factors affecting the result of this study [34]. Stephenson *et al.*'s study showed that foot reflexology massage can significantly reduce pain caused by metastatic cancer [35]. In Keller's study, reflexology massage of the soles of the feet reduced the pain intensity of patients after spine surgery in the short term [36].

The total findings of this review study show that reflexology has a favorable effect on various diseases and disorders. The results of most of the studies show that the effect of reflexology was greater compared to other methods [33, 37-39]. However, in some cases, the effectiveness of this method has not been proven [40-43].

In his systematic review, Ernest has examined 23 clinical trials conducted in the field of reflexology and reports reflexology as an effective and useful treatment method [14]. According to the results, it seems that the effect of reflexology on pain is hopeful and effective. In a review

study, Lee *et al.* reviewed 44 studies on the effect of reflexology on pain and sleep. In his study, he reports that reflexology has less effect on pain than sleep and fatigue, and more studies are needed to report its effects on pain [25]. Meanwhile, the results of this review show the positive effect of reflexology on pain.

The frequency of reflexology in the conducted studies varied from one session to 90 sessions. Also, the duration of the massage in each session varied from 10 minutes to 20 minutes for each foot. Therefore, it can be said that the duration and frequency of reflexology is not a factor affecting the initial results. However, the effect of the frequency of reflexology needs more investigation. Although reflexology cannot be used as an alternative treatment and endangers the patient's life, it can be said that reflexology is a side treatment and a pleasant and relaxing experience [44]. One of the limitations of this review is the lack of access to the results of all studies. Because some of the studies were limited to dissertations, conferences, and conferences, full access to the results was not possible. On the other hand, despite the great efforts of researchers in searching for studies conducted in the field of reflexology, some studies may not have been included in this research; Therefore, it is suggested that the studies that will be conducted in the future to investigate the effect of reflexology should be conducted with more accurate sampling methods, higher sample size and in compliance with the principles of the CONSORT agreement [45].

CONCLUSION

Reflexology is a special form of massage that is associated with applying pressure on the reflex points that are usually in the feet, it is believed that these points are connected to all parts of the body, and pressure on them can stimulate the body's physiological responses. The purpose of this study was to evaluate the effectiveness of the studies conducted in the field of reflexology on different body systems. This research was a review, looking at previous studies on the effects of reflexology. These studies looked at a variety of factors, including sleep, exhaustion, constipation, the length and intensity of labor, post-chemotherapy vomiting, anxiety, physiological markers, PMS symptoms, back pain, and restlessness. The total findings of this review study show the favorable effect of reflexology on various diseases and disorders. Although reflexology cannot be used as an alternative treatment, it can be said that reflexology is a side treatment method and a pleasant and relaxing experience. It is suggested that future studies should be conducted with more accurate sampling methods, a higher sample size, and follow the principles of the CONSORT agreement.

It seems that reflexology can reduce the pain of patients after surgery. Therefore, it is recommended that nurses and staff of operating rooms and surgery centers use reflexology to reduce the pain of patients.

ACKNOWLEDGMENTS: None

CONFLICT OF INTEREST: None

FINANCIAL SUPPORT: None

ETHICS STATEMENT: None

REFERENCES

1. Khoshtarash M, Ghanbari A, Yegane MR, Kazemnejhad E, Rezasoltani P. Effects of foot reflexology on pain and physiological parameters after cesarean section. *Koomesh*. 2012; 14(1):109-16.
2. Eghbali M, Safari R, Nazari F, Abdoli S. The effects of reflexology on chronic low back pain intensity in nurses employed in hospitals affiliated with Isfahan University of Medical Sciences. *Iran J Nurs Midwifery Res*. 2012;17(3):239-43.
3. Fayazi S, Shahriati A, Momeni M. The efficacy of Benson's relaxation technique on postoperative pain in coronary artery bypass graft. *J JundiShapur Educ Dev*. 2010; 8(4):479-89.
4. Sammour RN, Ohel G, Cohen M, Gonen R. Oral naproxen versus oral tramadol for analgesia after cesarean delivery. *Int J Gynaecol Obstet*. 2011;113(2):144-7.
5. Khaledifar A, Nasiri M, Khaledifar B, Khaledifar A, Mokhtari A. The effect of reflexotherapy and massage therapy on vital signs and stress before coronary angiography: An open-label clinical trial. *ARYA Atheroscler*. 2017;13(2):50-5.
6. Genc A, Isler SC, Oge AE, Matur Z. Effect of sagittal split osteotomy with medpor® porous polyethylene implant on masticatory reflex. *Ann Dent Spec*. 2022;10(3):12.
7. Rezaei R, Saatsaz S, Alipour A, Beheshti Z. Massage-therapy and post cesarean pain control. *Iran J Obstet Gynecol Infertil*. 2017;20(4):34-43.
8. Mehrandish L, Madani S, Khazaei S, Saleh E, Roozbahani N, Madani SH. Diagnostic value of beta-catenin immunohistochemical staining in papillary thyroid carcinoma. *Clin Cancer Investig J*. 2021;10(1):11-4.
9. Velusamy M, Nagarajan S, Rathinam V. Stability indicating RP-HPLC method development and validation of related substances for dolutegravir dispersible tablets. *Pharmacophore*. 2022;13(2):56-64.
10. Kaur J, Kaur S, Bhardwaj N. Effect of 'foot massage and reflexology' on physiological parameters of critically ill patients. *Nurs Midwifery J*. 2012;8(3):223-33.
11. Blunt E. Foot reflexology. *Holist Nurs Pract*. 2006;20(5):257-9.
12. AlHussain BS, AlFantoukh MA, Alasmari KM, AlHrab FA, Alotaibi FA, Alaybani WH, et al. Clinical knowledge of orthodontics complication and emergencies among interns and dentists in Riyadh city. *Ann Dent Spec*. 2022;10(2):45-51.
13. Nasiri K, Eyvanbagha R, Nazari N, Savadpoor MT, Soleymanifard P, Khalili Z. Physiological and therapeutic effects of reflexology in Iran: A systematic review. *Depiction Health*. 2016;7(1):49-61.
14. Ernst E. Is reflexology an effective intervention? A systematic review of randomised controlled trials. *Med J Aust*. 2009;191(5):263-6.
15. O'Mathúna DP. Evidence-based practice and reviews of therapeutic touch. *J Nurs Scholarsh*. 2000;32(3):279-85.
16. Negi A, Thakur S, Seam R, Gupta M, Gupta M, Fotedar V, et al. "A comparative study using conventional concomitant chemoradiotherapy (using cisplatin-based chemotherapy) with accelerated (six fractions a week) chemoradiotherapy in inoperable or nonresectable locally advanced non-small cell lung cancers:" A prospective randomized trial. *Clin Cancer Investig J*. 2021;10(1):36-41.
17. Volodikhina AA, Akhmedova AR, Uzdenov MB, Dzhabrailova ML, Voytleva RK, Achilov VI. Possibilities of correction of functional disorders of the gastrointestinal tract in patients with anxiety disorders. *Pharmacophore*. 2022;13(3):98-105.
18. Barnes PM, Bloom B, Nahin RL. Complementary and alternative medicine use among adults and children: United States, 2007. *Natl Health Stat Report*. 2008;(12):1-23.
19. Ernst E, Koder K. Reflexology: An overview. *Eur J Gen Pract*. 1997;3:52-7.
20. Tiran D, Chummun H. The physiological basis of reflexology and its use as a potential diagnostic tool. *Complement Ther Clin Pract*. 2005;11(1):58-64.
21. Aljulayfi IS, Almatrafi A, Alharbi AR, Aldibas AO, AlNajei AA. The influence of replacing anterior teeth on patient acceptance of removable partial dentures in Saudi Arabia. *Ann Dent Spec*. 2022;10(2):5.
22. Maeno T, Kokabashi K, Yamazaki N. Relationship between the structure of human finger tissue and the location of tactile receptors. *Bull Japan Soc Mech Eng*. 1998;41(1):94-100.
23. Stephen B. Reflexology: A close look: UK: Health fraud, and intelligent decisions; 2004/sept/25. Available from: <http://www.quackwatch.com/01QuackeryRelatedTopics/reflex.html>.
24. Wills P. The reflexology manual. China, London: Healing Arts Press Rochester, Vermont; 1995.
25. Lee J, Han M, Chung Y, Kim J, Choi J. Effects of foot reflexology on fatigue, sleep and pain: A systematic review and meta-analysis. *J Korean Acad Nurs*. 2011;41(6):821-33.
26. Ernst E, Posadzki P, Lee MS. Reflexology: An update of a systematic review of randomised clinical trials. *Maturitas*. 2011;68(2):116-20.
27. Yeung WF, Chung KF, Poon MM, Ho FY, Zhang SP, Zhang ZJ, et al. Acupressure, reflexology, and auricular acupressure for insomnia: A systematic review of randomized controlled trials. *Sleep Med*. 2012;13(8):971-84.
28. Maryami Z, Modarresi M, Taavoni S, Rahimiforoushani A. The effect of foot massage on pain of patients after hysterectomy. *J Knowl Health*. 2018;12(4):61-8.
29. Raffei Z, Yarmohmadi P. The effect of foot reflexology massage on pain of patients undergoing lumbar disc surgery in Shahrekord hospitals. *J Clin Nurs Midwifery*. 2018;7(1):19-27.
30. Bertrand A, Mauger-Vauglin CE, Martin S, Goy F, Delafosse C, Marec-Berard P. Evaluation of efficacy and feasibility of foot reflexology in children experiencing chronic or persistent pain. *Bull Cancer*. 2019;106(12):1073-9.
31. Albert NM, Gillinov AM, Lytle BW, Feng J, Cwynar R, Blackstone EH. A randomized trial of massage therapy after heart surgery. *Heart Lung*. 2009;38(6):480-90.
32. Shahriari M, Khalili A, Shamsizadeh M, Mardani D, Paymard A, Molavi Vardanjani M. Effects of foot reflexology on pain in patients after lower limb amputation. *J Mazandaran Uni Med Sci*. 2016;26(139):18-26.
33. Sadeghi Shermeh M, Bozorgzad P, Ghafourian A, Ebadi A, Razmjoei N, Afzali M, et al. Effect of foot reflexology on sternotomy pain after coronary artery bypass graft surgery. *Iranian J Crit Care Nurs (IJCCN)*. 2009;2:51-4.
34. Hattan J, King L, Griffiths P. The impact of foot massage and guided relaxation following cardiac surgery: A randomized controlled trial. *J Adv Nurs*. 2002;37(2):199-207.
35. Stephenson N, Dalton JA, Carlson J. The effect of foot reflexology on pain in patients with metastatic cancer. *Appl Nurs Res*. 2003;16(4):284-6.
36. Keller G. The effects of massage therapy after decompression and fusion surgery of the lumbar spine: A case study. *Int J Ther Massage Bodywork*. 2012;5(4):3-8.
37. Mirzaei F, Kaviani M, Jafari P. Effect of foot reflexology on duration of labor and severity of first-stage labor pain. *Iran J Obstet Gynecol Infertil*. 2010;13(1):27-32.
38. Ansari S, Dastgheibshirazi H, Sehati F, Sayhi M, Davaridehkordi N. The effect of sole reflexology (Reflex Zone Therapy) on the intensity of premenstrual syndrome: A single-blinded randomized controlled trial. *Jundishapur J Chronic Dis Care*. 2014;3(1):32-40.
39. Babajani S, Babatabar H, Ebadi A, Mahmoudi H, Nasiri E. The effect of foot reflexology massage on the level of pain during chest tube removal after open heart surgery. *IJCCN*. 2014;7(1):15-22.
40. Ahmadi M, Veys Raygani A, Rezaee M, Heydarpour B, Taghizadeh P. Comparing the effect of metatarsus and ankle reflexology massage on patients' state anxiety after coronary artery bypass graft surgery. *IJCCN*. 2014;6(4):229-34.
41. Mohammad Aliha J, Behroozi N, Peyrovi H, Mehran A. The effect of foot reflexology massage on incisional pain in abdominal and chest surgery patients admitted to intensive care unit. *Cardiovasc Nurs J*. 2013;2(2):6-12.
42. Ilbeigi S, Mahjur M, Yaghobi H, Seghatoleslami A. Study of the effects of four months follow up following six weeks reflexology foot on pain and disability men with nonspecific chronic low back pain. *Anesth Pain*. 2015;6(1):55-63.

43. Samadi N, Allahyari I, Mazaheri E, Rostamnejad M, Mehrnoush N, Namadi M, et al. Effect of foot reflexology on physiologic index of neonates. *IJN*. 2014;5(1):19-22.
44. Grealish L, Lomasney A, Whiteman B. Foot massage. A nursing intervention to modify the distressing symptoms of pain and nausea in patients hospitalized with cancer. *Cancer Nurs*. 2000;23(3):237-43.
45. University of Oxford. Consort transparent reporting of trials. 2016. Available from: October 2010 <http://www.consort-statement.org/>, 1