**Effect of Foot Reflexology with Aromatic Oil to Assess Sleep Quality among Healthy Individuals: A Narrative Review**

**ABSTRACT**

Objective: The primary objective of this literature review was to evaluate the effectiveness of foot reflexology with aromatic oil to assess Sleep quality among healthy individuals.

Introduction: Sleep is a vital activity that offers relaxation, stability, stress release, and the capacity to recuperate from physical or mental exhaustion, but not getting enough sleep can lead to tiredness, sleepiness, anxiety, dizziness, instability, disorientation, focus problems and a decline in quality of life (QoL).Due to its great frequency and correlation with both mortality and morbidity, inadequate sleep has emerged as a public health problem in several nations.

Methodology: A complete electronic search of published research publications was carried out utilizing databases such as Google Scholar, PubMed, and others. The search sought research that evaluated the benefits of foot reflexology with aromatic oil on sleep quality in healthy individuals. This literature review included papers that fit the requirements, such as randomized controlled trials, systematic reviews, meta-analyses, and pilot studies.

Results: This review investigated the ways in which foot reflexology combined with aromatic oil affects the quality of sleep and discovered that it greatly improves the quality of sleep and general well-being of healthy people.

Conclusion: This study found that using foot reflexology with aromatic oil can enhance sleep quality in healthy individuals. Regular practice of foot reflexology with aromatic oil may help to alleviate sleep-related difficulties and promote overall well-being, with no recorded negative effects.

Keywords: Foot Reflexology and Aromatherapy; Foot Reflexology and Sleep quality; Foot Reflexology and Quality of Life.

1. **INTRODUCTION**

Sleep is a vital activity that offers relaxation, stability, stress release, and the capacity to recuperate from physical or mental exhaustion (1). A third of a day is spent sleeping, and although getting enough sleep improves health and well-being, not getting enough sleep can lead to tiredness, sleepiness, anxiety, dizziness, instability, disorientation, and focus problems (2). Globally, the prevalence of sleep disturbances varies between 1.6% and 56.0% (3). Sleep disturbances affect around 10-15% of the adult population (4). Due to its great frequency and correlation with both mortality and morbidity, inadequate sleep has emerged as a public health problem in several nations (5). Over the lifespan, sleep duration fluctuates and is negatively correlated with age (6). Recommendations for sleep length provided by public health organizations are useful for monitoring, informing policies and interventions, and educating the general public about the need of getting enough sleep (7). The American Academy of Sleep Medicine and Sleep Research Society, for instance, recommends ≥7 h per night on a regular basis for people aged 18–60 (8), whereas the National Sleep Foundation recommends 7–9h per day for individuals (18–64 years) and 7–8h for older persons (≥65 years)(9).

Insomnia, or sleep problems, is a risk factor for chronic diseases such diabetes, hypertension, cardiovascular disease, and obesity (10).Medications like antidepressants and sedative-hypnotics are frequently utilized in clinical sleep disorders therapies (11). Although sedative-hypnotics have immediate benefits, their use can have a number of negative effects, including drug tolerance, dependence, misuse, and decreased cognitive function (11-13). For this reason, non-pharmaceutical treatments are preferred as first-line therapy for people with chronic insomnia (13). These could include complementary and alternative therapies including aromatherapy (14), music therapy (15), meditation (16), cognitive-behavioural therapy (17) and reflexology (18).

Reflexology has been used for healing since ancient times by Chinese, Egyptians, and North American indigenous tribes (19). According to McDonough et al.  Reflexology is the second most common kind of complementary and alternative medicine (CAM) in Northern Ireland, ranking within the top six in the UK. In 2007, a national poll in the USA found that 38% of adults and 12% of children used CAM. Similarly, a Norwegian survey found that 5.6% of the population used reflexology over the previous year (20).

Foot reflexology includes applying pressure to certain reflex spots in the foot with the fingers, particularly the thumb (21). The National Association for Holistic Aromatherapy (NAHA) describes aromatherapy as "the art" and "science" of using plant extracts to balance, harmonize, and support health in body, mind, and spirit (22). Foot reflexology massage with aromatic oil is recognized as a viable alternative medicine treatment. This therapy promotes patient comfort by producing physiological changes; pressure on the reflex areas activates hundreds of nerve endings in the soles, produces endorphins, and so inhibits pain transmission, induces relaxation, lowers tension, and enhances sleep quality in adults (23, 24, and 25).

Several studies have found that foot reflexology with aromatic oil can benefit people of all ages. These research have shown that practicing foot reflexology with aromatic oils can improve sleep quality, alleviate constipation, lower blood pressure, reduce anxiety, and improve overall health quality (26, 27). This study aims to perform a literature review to investigate the effects of foot reflexology with aromatic oil on sleep quality in healthy individual.

1. **METHODOLOGY**

A systemic literature was conducted on electronic data base of Google Scholar, PubMed, Science direct using the terms “Foot Reflexology and Aromatherapy”, Foot “Reflexology and Sleep quality”, “Foot Reflexology and Quality of Life”. as key words. Results were filtered by the clinical trials.

* 1. **INCLUSION CRITERIA**
* Healthy Individuals
* Both male and female were included.
* All the age groups.
* Any studies of foot reflexology, aromatherapy intervention that measured sleep quality.
* Studies that include mechanism between aromatic foot massage and sleep quality.
* All RCT, Systematic review, Pilot studies using reflexology as a sleep inducing treatment.
	1. **EXCLUSION CRITERIA**

The studies were excluded in the narrative review if they were:

● Not based on the study.

● Abstracts and unpublished articles

**Table 1. Summary of literature review**

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| **Author and Year** | **Study Design** | **Methodology** | **Results** | **Conclusion** |
| 1. Leila Valizadeh, Alehe Seyyedrasooli,et all. 2015
 | A Controlled Clinical Trial | A total 60 elderly men were recruited. The two experimental groups had reflexology (n = 23) and foot bath (n = 23) interventions for 6 weeks. The reflexology intervention was done in the mornings, once a week for ten minutes on each foot. The participants in the foot bath group were asked to soak their feet in 41°C to 42°C water one hour before sleeping. | The results showed that the PSQI scores after intervention compared to before it in the reflexology and foot bath groups were statistically significant (P = 0.01 , P = 0.001); however, in the control group did not show a statistically significant difference (P = 0.14). | Reflexology and foot bath are effective on the sleep quality of the elderly and improve quality of sleep. |

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| **Author and Year** | **Study Design** | **Methodology** | **Results** | **Conclusion** |
| 1. J. E. M. McCullough, S. D. Liddle, M. Sinclair, C. Close, and C. M. Hughes 2014
 | A Systematic Review | Guidelines from the Cochrane Handbook of Systematic Reviews of Interventions were followed: the following databases were searched from inception to December 2013: AMED, CAM Quest, CINAHL Plus, Cochrane Central Register of Controlled Trials, Embase, Medline Ovid, Proquest, and Pubmed. | The twelve studies showed significant changes within the reflexology group, only three studies investigating blood pressure, cardiac index, and salivary amylase resulted in significant between group changes in favour of reflexology. | This systematic literature review is the first and it has demonstrated that a range of positive effects can be attributed to the treatment, specifically a reduction in stress parameters. |
| 1. Eri Eguchi, Narumi Funakubo, Kiyohide Tomooka , Tetsuya Ohira , Keiki Ogino , Takeshi Tanigawa 2016
 | A Crossover Randomized Controlled Trial | Fifty-seven eligible participants (5 men and 52 women) aged 27 to 72 were randomly divided into 2 intervention groups (group A: n = 29; group B: n = 28) to participate in aroma foot massages 12 times during the 4-week intervention period. | Aroma foot massage significantly decreased the mean SBP (p = 0.02), DBP (p = 0.006), and state anxiety (p = 0.003) as well as the proportion of participants with anxiety (p = 0.003). | The aroma foot massage may be an easy and effective way to improve mental health and blood pressure. |
| 1. Abd Al-Rahman Golbaf, Monir Ramezani , , Hamidreza Behnam Vashani , Shapour Badiee Aval and Fatemeh Moharreri 2024
 | A Randomized Clinical Trial | A total 60 children with autistic spectrum disorder in Mashhad, Iran were recruited and assigned to intervention and control groups. The intervention group received foot reflexology massage for 15 min by parents for 30 nights before bedtime for children with routine family care. The control group received routine care from the family. | The foot reflexology massage, with a score reduction of 8.13 ± 3.95 points, had a significant impact on the score of sleep habits in the intervention group (P = 0.002) compared to control group. | Foot reflexology massage improves the quality of sleep in children with autism and can be recommended as a safe intervention for parents of children with autism. |
| 1. [Jihoo Her](https://pubmed.ncbi.nlm.nih.gov/?term=Her+J&cauthor_id=34166869), [Mi-Kyoung Cho](https://pubmed.ncbi.nlm.nih.gov/?term=Cho+MK&cauthor_id=34166869) 2021
 | A systematic literature review and meta-analysis |  Included eight electronic databases for relevant studies published between January 2011 and December 2019 using the medical subheadings, "adult or elderly," "aromatherapy or aroma intervention," and "sleep quality or sleep satisfaction." | Quality evaluation revealed that the sleep quality after aromatherapy was significantly high in studies with methodological quality scores >8, with an effect size of 0.93. | Aromatherapy improves sleep quality and reduces stress, pain, anxiety, depression, and fatigue in adults and elderly people. |

1. **RESULTS AND DISCUSSION**

This literature review summarizes the impact of foot reflexology with aromatic oil on sleep in healthy individuals. Notably, no previous research has focused solely on foot reflexology with aromatic oil in healthy individuals. Sleep is a fundamental physiological function that plays an important part in human health and is a significant element in mortality reduction (28). Age-related changes in sleep patterns are likely to lead to sleep disorders. With increasing age, sleep efficiency relative to sleep time decreases (29). Foot reflexology massage involves applying pressure to certain reflex points on the foot, such as the solar plexus, pineal gland, and others. Reflexology massage is based on the stimulation of these points and the use of neural pathways that are linked to several organs, glands, and systems in the body (20). According to the Chinese people, massage improves life energy by releasing neurotransmitters and nerve hormones (serotonin and melatonin), resulting in less exhaustion and better sleep. (30).

A Noh's study examined the effects of aroma hand massage on sleep status in hospitalized elderly patients in a long-term care hospital. The authors proposed that the relaxation effects of foot massage, combined with the sleep improvement effects of lavender oil, contributed to improved sleep quality. The patient, who had significant edema in both legs, showed improvement after receiving an aroma foot massage. The relaxation of blood vessels enhanced blood circulation and boosted lymphatic flow, thereby reducing the edema (31).

Aromatherapy massage stimulates the amygdala and hippocampus in the limbic system of the brain, resulting in physical, emotional, and mental advantages. Essential oils, such as lavender (Lavendula stoechas), are massaged into the skin to give sedative and muscular relaxant, anxiolytic, antidepressant, neuroprotective, and anti-inflammatory properties. According to various research, lavender can help with hemodialysis problems such as discomfort, exhaustion, anxiety, and sleep quality (27).

A recent study found that inhaling ylang-ylang, a commonly used aroma oil, reduced blood pressure (BP) in healthy individuals who participated in a randomized controlled trial (RCT). Similarly, an RCT crossover study of 36 female high school students found that inhaling aroma essential oils reduced stress levels considerably in the intervention group compared to the placebo group. According to one study, participants who received an aroma body massage once a week for four weeks and applied aroma cream to their arms, legs, and belly on a regular basis had lower blood pressure. Moreover, aroma massages twice a week for four weeks reduced prefrontal cortex dysfunction and mild depression in five individuals with depression. These data suggested that aroma massage is linked to a more relaxed mental state, lower blood pressure, and decreased anxiety (32).

According to Jiang's study, reflexology was more effective than hypnosis for reducing sleep disorders. Yeung et al.'s systematic review found reflexology to be a safe and effective remedy for insomnia, but recommended further research (28).

.Bagheri-Nesami et al. investigated the effects of foot massage on sleep quality in patients admitted to the CCU with ischemic heart disease and concluded that acupressure had a therapeutic effect on enhancing sleep quality in Acute Coronary Syndrome patients(33).

This review found that foot reflexology and aromatherapy improve sleep in healthy people. Some research found that foot reflexology combined with aromatherapy was more helpful for enhancing sleep, while others found that the two techniques had similar results.

1. **CONCLUSION :**

Inadequate sleep primarily affects an individual’s physical and mental wellbeing, resulting in significant mortality and morbidity worldwide**.** This study highlights the benefits of foot reflexology with aromatic oil in alleviating sleep related complications, such as diabetes, hypertension, cardiovascular disease, obesity, disorientation, focus problems, anxiety and related symptoms. Reflexology and aromatherapy not only improves sleep quality, but it also enhances general physical and mental wellness.

1. **LIMITATIONS** :

The objective of this study was to conduct a literature review on the effects of foot reflexology with aromatic oil on Sleep quality in healthy individuals. The findings of this review reveal that while foot reflexology with different types of aromatic oil can be systematically examined and assessed for its benefits on sleep quality in healthy individuals.

1. **CONSENT AND ETHICAL APPROVAL**

It is not applicable

**COMPETING INTERESTS DISCLAIMER:**

Authors have declared that they have no known competing financial interests OR non-financial interests OR personal relationships that could have appeared to influence the work reported in this paper.

1. **REFERENCES:**
2. Foreman MD, Wykle FM. Nursing standard-of-practice protocol: sleep disturbances in elderly patients: alterations in the sleep-wake cycle call for immediate assessment and intervention. A NICHE Project protocol. Geriatr Nurs. 1995; 16:238–43. https://doi.org/10.1016/S0197-4572 (05)80173-9.
3. Seo HS, Sohng K. The effects of footbaths on sleep and fatigue in older Korean adults. J Korean Acad Fundam Nurs. 2011; 18:488–96.
4. Kavurmac M. Determination of the effects of lavender oil quality of sleep and fatigue of students. 2021; March:1–8.
5. Lin P, Lee P, Tseng S, Lin Y, Chen S, Hou W. Effects of aromatherapy on sleep quality: A systematic review and meta-analysis. 2019; 45(May):156–66.
6. Liu Y, Wheaton AG, Chapman DP, Cunningham TJ, Lu H, Croft JB. Prevalence of healthy sleep duration among adults—United States, 2014. MMWR Morb Mortal Wkly Rep. 2016; 65:137–41.
7. Chaput JP, Dutil C, Sampasa-Kanyinga H. Sleeping hours: what is the ideal number and how does age impact this? Nat Sci Sleep. 2018;10:421–30.
8. Chaput JP. The integration of pediatric sleep health into public health in Canada. Sleep Med. 2019;56:4–8.
9. Watson NF, Badr MS, Belenky G, Bliwise DL, Buxton OM, Buysse D, et al. Joint Consensus Statement of the American Academy of Sleep Medicine and Sleep Research Society on the Recommended Amount of Sleep for a Healthy Adult: Methodology and Discussion. Sleep. 2015; 38:1161–83.
10. Hirshkowitz M, Whiton K, Albert SM, Alessi C, Bruni O, DonCarlos L, et al. National Sleep Foundation’s updated sleep duration recommendations: final report. Sleep Health. 2015; 1:233–43.
11. Itani O, Jike M, Watanabe N, Kaneita Y. Short sleep duration and health outcomes: a systematic review, meta-analysis, and meta-regression. Sleep Med. 2017; 32:246–56.
12. Hong SB. Sleep disorders medicine. J Korean Med Assoc. 2013; 56:410–22. https://doi.org/10.5124/jkma.2013.56.5.410.
13. Hung HM, Chiang HC. Non-pharmacological interventions for pregnancy-related sleep disturbances. Non-Pharmacol Interv Pregnancy. 2017; 64:112–19. https://doi.org/10.6224/JN.000015.
14. Sharon SR, Lauren B, Daniel B, Cynthia D, Michael S. Clinical guideline for the evaluation and management of chronic insomnia in adults. J Clin Sleep Med. 2008; 4:487–504. https://doi.org/10.5664/jcsm.27286.
15. Kupfer DJ, Reynolds CF. Management of insomnia. N Engl J Med. 1997; 336:341–6. https://doi.org/10.1056/NEJM199701303360506.
16. Kim ME, Jun JG, Hur MH. Effects of aromatherapy on sleep quality: A systematic review and meta-analysis. J Korean Acad Nurs. 2019; 49:655–76. https://doi.org/10.4040/jkan.2019.49.6.655.
17. Liu YH, Lee CCS, Yu CH, Chen CH. Effects of music listening on stress, anxiety, and sleep quality for sleep-disturbed pregnant women. J Women Health. 2016; 56:296–311. https://doi.org/10.1080/03630242.2015.1088116.
18. Ji X, Ivers H, Beaulieu-Bonneau S, Morin CM. Complementary and alternative treatments for insomnia/sleep depression-anxiety symptom cluster: meta-analysis of English and Chinese literature. Sleep Med Rev. 2019; 64:177. https://doi.org/10.1016/j.smrv.2021.101445.
19. Geiger-Brown JM, Rogers VE, Liu W, Ludeman EM, Downton KD, Diaz M. Cognitive behavioral therapy in persons with comorbid insomnia: a meta-analysis. Sleep Med Rev. 2015;23:54–67. https://doi.org/10.1016/j.smrv.2014.11.007.
20. Gunnarsdottir TJ, Peden-McAlpine C. Effects of reflexology on fibromyalgia symptoms: a multiple case study. Complement Ther Clin Pract. 2010;16(3):167–72. https://doi.org/10.1016/j.ctcp.2010.01.006.
21. McCullough JE, Liddle SD, Sinclair M, Close C, Hughes CM. The physiological and biochemical outcomes associated with a reflexology treatment: a systematic review. Evid Based Complement Alternat Med. 2014; 2014:502123. https://doi.org/10.1155/2014/502123.
22. Iqbal U. Reflexology: basic guide. Glob J Addict Rehabil Med. 2018; 6:26–27.
23. Reis TJ. Aromatherapy using essential oils as a supportive therapy. 2017;21(1):19–22.
24. Pitman V, MacKenzie K. Reflexology: a practical approach. Nelson Thornes; 2002.
25. Mackey BT. Massage Therapy and Reflexology Awareness. Nurs Clin North Am. 2001;36(1):159–69. https://doi.org/10.1016/s0029-6465(22)02536-1.
26. Lee M, Lim S, Song J-A, Kim M-E, Hur M-H. The effects of aromatherapy essential oil inhalation on stress, sleep quality and immunity in healthy adults: Randomized controlled trial. Eur J Integr Med. 2017;12:79–86.
27. Kang JI, Lee EH, Kim HY. Effects of Aroma Foot Massage on Sleep Quality and Constipation Relief among the Older Adults Living in Residential Nursing Facilities. Int J Environ Res Public Health. 2022 May 4;19(9):5567. https://doi.org/10.3390/ijerph19095567.
28. Eguchi E, Funakubo N, Tomooka K, Ohira T, Ogino K, Tanigawa T. The Effects of Aroma Foot Massage on Blood Pressure and Anxiety in Japanese Community-Dwelling Men and Women: A Crossover Randomized Controlled Trial. PLoS One. 2016 Mar 24;11(3):e0151712. https://doi.org/10.1371/journal.pone.0151712.
29. Valizadeh L, Seyyedrasooli A, Zamanazadeh V, Nasiri K. Comparing the Effects of Reflexology and Footbath on Sleep Quality in the Elderly: A Controlled Clinical Trial. Iran Red Crescent Med J. 2015 Nov 1;17(11):e20111. https://doi.org/10.5812/ircmj.20111.
30. Lee KN. A Variable Related to Constipation of the Elderly. Daegu Catholic University: Kyoungsan, Korea; 2008.
31. Mardasi F, Tadayon M, Najar S, Haghighizadeh MH. The Effect of Foot Massage on Sleep Disorders among Mothers in the Postpartum Period. Iran J Obstet Gynecol Infertil. 2013;16(73):19–28.
32. Kang JI, Lee EH, Kim HY. Effects of Aroma Foot Massage on Sleep Quality and Constipation Relief among the Older Adults Living in Residential Nursing Facilities. Int J Environ Res Public Health. 2022 May 4;19(9):5567. https://doi.org/10.3390/ijerph19095567.
33. Ghasemi M, Rejeh N, Bahrami T, Heravi-Karimooi M, Tadrisi SD, Vaismoradi M. Aromatherapy Massage vs. Foot Reflexology on the Severity of Restless Legs Syndrome in Female Patients Undergoing Hemodialysis. Geriatrics (Basel). 2021 Oct 11;6(4):99. https://doi.org/10.3390/geriatrics6040099.
34. Rahmani A, Naseri M, Salaree MM, Nehrir B. Comparing the Effect of Foot Reflexology Massage, Foot Bath and Their Combination on Quality of Sleep in Patients with Acute Coronary Syndrome. J Caring Sci. 2016 Dec 1;5(4):299–306. <https://doi.org/10.15171/jcs.2016.031>.