**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 improves physiological as well as psychological well-being of an individual.

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). “Sleep deprivation increases the levels of exhaustion, worry, and depression, causing cognitive impairment, sleep-disturbed behaviors, and greater mortality” (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). “As people age, non-rapid eye movement (NREM) sleep declines and sleep stage 1 increases, resulting in spontaneous awakening, greater sensitivity to auditory stimuli, frequent waking, and insufficient sleep” (2).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., 2014; “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 "nerve impulse theory" explains that stimulating certain reflex areas on the foot improves neural connections to the appropriate body components (22).. “This is the most promising thoery at the moment, and it proposes that the advantages of reflexology might be attributed to autonomic nervous system regulation. The autonomic nervous system (ANS) governs unconscious bodily systems including breathing, heart rate, and blood pressure. These parameters are sensitive to stressors and fluctuate in response to an individual's physical or psychological changes, either through vagal modulation, which controls calming and restful changes and regular functioning, or sympathetic modulation, which controls arousal and the "fight or flight" response. Hughes et al. and Sliz et al also support ANS modulation” (23, 24).

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 (25).

Aromatherapy, which extracts essential oils from natural plants, is a safe, non-invasive, and self-administered treatment method (26).

“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” (27, 28, and 29).

Reflexology promotes blood circulation, lymphokinesis, metabolism, and relaxation, leading to reduced anxiety, tension, and discomfort (30).

Foot reflexology promotes psychological relaxation by raising skin warmth and enhancing peripheral blood circulation (31).

Recent studies have showened that aromatherapy and foot reflexology have been shown to alleviate depression, anxiety, and promote relaxation (32).

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 (33, 34). 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. **RESULS 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 individual. Sleep is a fundamental physiological function that plays an important part in human health and is a significant element in mortality reduction (35). “Age-related changes in sleep patterns are likely to lead to sleep disorders. With increasing age, sleep efficiency relative to sleep time decreases” (36). “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”. (37).

“A Noh's study examined the effects of aroma hand massage on sleep status in hospitalized elderly patients in a long-term care hospital. Kang JI, Lee EH, Kim HY,2022 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” (38).

“Aromatherapy massage stimulates the amygdala and hippocampus in the limbic system of the brain, resulting in physical, emotional, and mental advantages” (39). 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 (40).

“[Da-Jung Jung](https://pubmed.ncbi.nlm.nih.gov/?term=Jung+DJ&cauthor_id=24278868) et al,2013; 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)”(41). “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 Eguchi E,et al.2016 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” (34).

According to Jiang's study 2015, reflexology was more effective than hypnosis for reducing sleep disorders (28). Yeung et al.'s systematic review found reflexology to be a safe and effective remedy for insomnia, but recommended further research (42).

“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”(43).

Embong NH et al.2015 showened that foot reflexology may have reduced anxiety and depression by stimulating reflex zones with organ trigger points, leading to increased blood circulation. Including kidneys, adrenal glands, and liver, as well as physical and emotional detoxification (44).

“Aroma self-foot reflexology, conducted three times per week for 30 minutes (15 minutes each foot), decreased peripheral neuropathy, peripheral skin temperature, anxiety, and depression in gynaecologic cancer patients undergoing chemotherapy” (45).

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. This review's findings do not include dosage analysis or the influence of a regular diet and physical exercise on sleep during reflexology treatment.

**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.

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