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Effect of aromatherapy interventions on hemodialysis complications: A systematic review

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ABSTRACT

Background and purpose: Aromatherapy, a CAM therapy, is a natural way of treating the mind, body and soul of individuals. The purpose of this study was to systematically review the literature to determine the effect of aromatherapy on hemodialysis complications.

Methods: In this systematic review, international (PubMed, Google Scholar, Web of Science, CINHAL, EMBASE and Scopus) and national databases (SID and Magiran) were searched from inception of the databases to 30 December 2017.

Results: The results showed that aromatherapy reduced some of the complications of hemodialysis, including anxiety, fatigue, pruritus, pain of arteriovenous fistula puncture, sleep quality, depression, stress and headache. In one case, it improved the quality of life of hemodialysis patients.

Conclusion: Considering the complications and heavy costs of managing complications in patients undergoing hemodialysis, it appears that aromatherapy can be used as an inexpensive, fast-acting and effective treatment to reduce complications in hemodialysis patients.

1. Background

Today, chronic kidney disease (CKD) is a widespread health problem, with more than 500 million people suffering from CKD globally [1]. Hemodialysis is the most important treatment for CKD as, of the 3 million people undergoing replacement renal treatment (RRT), 2.5 million (80%) use hemodialysis [2]. Hemodialysis has saved the lives of millions, but is associated with physical (fatigue, sleep disorders and pruritus) and psychological complications (depression, quality of life and anxiety) [3–5].

Complications of hemodialysis are treated using medications which are associated with adverse effects and, in the long run, cause dependence and exacerbation of disease-related complications [6,7]. Alternative treatments using complementary and alternative medicine (CAM) approaches have gained popularity in the last decade [8]. Aromatherapy, a CAM therapy, is a natural way of treating the mind, body and soul of individuals [9]. Aromatherapy is an inexpensive, popular and widely used method [10–12].

In aromatherapy, essential oils extracted from plants, flowers, fruits and the roots of the trees are used as the therapeutic agent [13]. Methods of using aromas include inhalation, massage, and simple use on the skin. Aromatherapy has been used to treat improve complications related to sleep quality and to reduce stress and anxiety. Aromatherapy results in the secretion of endorphins and noradrenaline by influencing the nervous system to create positive psychological and physical effects in the body. The major types of aromatherapy are: Cosmetic (used in hygiene products for skin, body and hair) [14]; Massage (with the use of oil) [15]; Medical (in clinical settings) [16]; Olfactory (inhalation to improve physical symptoms) [10]; Psycho-aromatherapy (to relieve psychological symptoms) [17]. Bergamot, lemon, lime, sweet orange and tangerine are all used in aromatherapy. In terms of safety, the aromas are usually safe and many are approved safe by the US FDA [18].

Individual studies have shown that aromatherapy can be used to treat fatigue, improve sleep quality and reduce anxiety in hemodialysis patients [17,19–22]. Hemodialysis complications impose high costs annually to the health system. Considering its lack of major complications, low cost, ease of use and beneficial effects, aromatherapy can be used to treat hemodialysis complications.

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According to the researchers' knowledge, no systematic review has been conducted to assess the effects of aromatherapy intervention on the complications of hemodialysis. The aim of this systematic review of experimental studies (clinical trials and quasi-experimental studies) was to assess the effect of different aromatherapy interventions (massage and inhalation aromatherapy) by using lavender, rosemary, rose water, peppermint oil, sunflower oil, chicory essence, tea tree oil, almond and jojoba oil aromas on hemodialysis complications including fatigue, stress, pain, depression, anxiety, sleep quality, pruritus, headache and quality of life in patients undergoing hemodialysis.

2. Methods

2.1. Registration and eligibility criteria

The protocol of the present systematic review is registered in the Center for Reviews and Dissemination in PROSPERO (CRD42018092376). The methods adopted for this systematic review are consistent with the guidelines detailed on the PRISMA checklist [23]. All clinical trials (controlled or not) and semi-experimental clinical trials that investigated the effect of aromas (lavender, rosemary, rose water, peppermint oil, sunflower oil, chicory essence, tea tree oil, almond and jojoba oil) on the complications of hemodialysis patients administrated by massage and inhalation methods and assess complications (fatigue, stress, pain, depression, anxiety, sleep quality, pruritus, headache and quality of life) were included. Review studies, case reports, case series, letter to editors and descriptive studies were excluded. Target population was all hemodialysis patients undergone dialysis for more than six months.

2.2. Search strategy

The searches were conducted by two independent researchers following consultation with a health sciences librarian and an expert in CAM, who assisted in development of the overall search strategy and the identification of key MESH search terms and free terms according to PRESS standards [24]. The keywords used were: aromatherapy, inhalation aromatherapy, massage aromatherapy and hemodialysis complications.

The electronic databases were searched from the inception of databases to December 30, 2017 and included international (CINHAL, PubMed, Scopus, EMBASE, ISI Web of Science and Google Scholar) and national databases (SID and Magiran), as well as the targeted publication journal (*Complementary Therapies in Clinical Practice*). Additional studies were identified by a manual search in proceedings from CAM conferences. Only complete papers available in English or Persian were included. To ensure literature saturation, the reference lists of the included studies were studied and relevant reviews were identified through the search. The MEDLINE strategy was first finalized, then adapted for search in other databases. PROSPERO was also searched for ongoing or recently completed systematic reviews.

2.3. Selection of studies and data extraction

Consistent with study protocol, the researchers independently screened the titles and abstracts for eligibility. The full text was then reviewed to confirm that the eligibility criteria were met and to extract the requisite information, which included the study characteristics (author, year, language, design, participants, gender, mean age and risk of bias), intervention details (comparison group, treatment group(s), type of aromatherapy, aromatherapy dose, treatment frequency, administration method, duration per session, total number of sessions and total duration of intervention) and measurements tools (main outcome, complications, scale, comparison group, type of aroma and results) were also collected. Duplicate studies were removed. Where a discrepancy existed between the researchers about inclusion of a study, discussions were held by the study authors to resolve the concerns through consensus.

2.4. Quality assessment and abstraction

The quality assessment of the studies included was assessed using the Jadad scale whose rating criteria take into account randomization, double blinding, and withdrawals or dropouts. The scoring range in the Jadad scale goes from 0 to 5 in which a higher score represents higher quality of the study [25]. Table 1 The quality of quasi-experimental studies was assessed by JBI quasi-experimental appraisal tool [26].

3. Results

3.1. Study selection

A total of 204 articles were retrieved from the initial search. Of the 119 non-duplicated studies in the title and abstract screening process, 71 were excluded because they had unrelated titles. Of the remaining 48 studies, 22 met the eligibility criteria. Of the 26 excluded studies, three were review articles, six used other type of CAM therapies, six were conducted on other populations, one was a letter to the editor, four did not have the complete text, four were not in either English or Persian and two did not meet quality requirements for inclusion (Fig. 1). Table 1 is a summary of the studies.

3.2. Study characteristics

The studies were conducted on 1087 hemodialysis patients having a mean age of 47 ± 14 (age range: 41.40–70.8 years). Most participants were female (n = 589; 54%). Of the 22 included studies, most (n = 16) used the RCT design. Most of the studies had a low risk of bias. and most (m = 16) were published in the English language (Table 1).

3.3. Intervention

The comparison groups used in the studies included no intervention or routine care (n = 6) [19,20,22,27–43] and placebo (n = 2) [21,44] groups. The identified methods for used for aromatherapy were inhalation (n = 6) [27,29,35,42–44] and massage (n = 16) [19–22,28,30–34,36–41]. Table 1 summarizes the details of the studies.

3.4. Selection of essential oils

The essential oils used were either pure, diluted or a mixture of two or more essential oils at a particular ratio. The selection of essential oils used was determined by the aromatherapist, the effect on physical and physiological states and subject preference based on other studies. The most commonly used essential oils for massage and inhalation aromatherapy were lavender (n = 17) [19–22,28,30–33,35,37,39–44], orange (n = 3) and tea tree oil (n = 3) [33,35,38,40,42,43] (Table 1).

3.5. Administration protocol

The most common aromatherapy administration method was inhalation aromatherapy, used in more than 72% of the studies (n = 16) [19–22,28,30–34,36–38,40,41], and the most common frequency of use was three times a week (n = 17) [19–22,28–33,35,36,38,39,42–44].

3.5.1. Inhalation aromatherapy

The aromatherapy doses were one to six drops, but the most frequent dose used was three drops [19,21,22,28,30–32,34,36]. The treatment frequency was every day to three days a week, but the most common frequency was three days a week [19–22,28,30–33,36,38,39]. The administration method differed between studies. In most, the method used for inhalation aromatherapy was by diluting the droplets and pouring the solution onto a cotton ball/handkerchief/gauze to be placed on the patient's collar at an appropriate distance (7–30 cm). The patient was then asked to breathe normally for a few minutes and the cotton ball was discarded.