The Use Aromatherapy For Symptom Management In Hemodialysis: A Systematic Review

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Abstract: Patients undergoing hemodialysis may suffered from various complication symptoms associated with chronic kidney disease, such as problem in sleep quality, fatigue, pruritus, pain, anxiety and depression. Aromatherapy was a complementary therapy, which benefits from essential oils to manage some problems related to hemodialysis. The aim of this study was to explain the effect of aromatherapy to various symptoms on hemodialysis patient. We searched for 13 research articles that met the inclusion criteria. The articles consist of Randomized Controlled Trials (RCTs) and Quasi Experiments from several database sources such as Scopus, ScienceDirect, PubMed and Pro-Quest with the last 10 years time limitation (from 2009 to 2018). The findings of this review reported benefit use of aromatherapy especially aromatherapy lavender, citrus aroma and damask rose could increase comfort, decreased fatigue level, reduced the pain of fistula needle insertion, improved sleep quality, reduced uremic pruritus, decrease anxiety and depression in patients undergoing hemodialysis. Although results of the studies presented aromatherapy as a complementary therapy, had positive impact to overcome symptom with no adverse effect on hemodialysis patients, it could not be determined that there is sufficient evidence to conclude its effectiveness as a non-pharmacological approach to the reduction of hemodialysis complication symptom.

1 INTRODUCTION

Chronic renal failure is a progressive, irreversible kidney disorder in which the body’s ability to maintain liquid and electrolytes is lost; it is considered a major problem in the health system, and is one of the leading causes of death and inability worldwide. The number of patients with end stage renal failure is on the rise. The prevalence of chronic renal failure is 242 cases per one million people and this increases 8% annually worldwide (Dehghanmehr et al., 2017). These patients suffer from many other medical conditions and different problems (Bagheri-Nesami et al., 2016).

Hemodialysis (HD) treatment which is one of the most commonly used treatments in the treatment of CRF patients increase the life expectancy of individuals and reduces the mortality and also raises intense physical and psychological. Common psychological effects include depression and stress (Tayebi et al., 2015), anxiety (Tayebi et al., 2015; Dattatraya, 2012; Dehghanmehr et al., 2017), fatigue (Bicer, 2017; Balouchi et al., 2016; Muz and Taçı, 2017), sleep disorder (Lenjan, 2014) Other common complications of physical condition include nausea, vomiting, headache (Biçer, Ünsal and Demir, 2015) and pruritus (Ozkan and Ulusoy, 2011; Cürcani and Tan, 2014; Abdelghfar et al., 2017).

Hemodialysis nurse should assess patients in a holistic way and should help in line with their requirements. Nurses should be able to notice complications and symptoms which may occur in patients. They should be guiding in applying necessary drugs or non-drug therapies with other health professionals and should implement the necessary nursing care (Wang and Che, 2012). Complementary medicine and herbal medicine have developed globally, and these new treatments have gained a special status and value. Nurses in over 30 countries are licensed to use complementary medicine therapies, such as aromatherapy, in nursing care (Dehghanmehr et al., 2017) The administrations can be performed in order to minimize various symptoms of patients undergoing hemodialysis (Bicer, 2017). The aim of
this study was to explain the effect of aromatherapy in various symptoms hemodialysis patient.

2 METHOD

This systemic review consist of Randomized Controlled Trials (RCTs) and Quasi Experiments from several database sources such as Scopus, ScienceDirect, PubMed and Pro-Quest with the last 10 years time limitation (from 2009 to 2018). The keywords used are Aromatherapy, Hemodialysis, Chronic Kidney Disease and Complementary Therapy. The inclusion criteria are set to limit the scope of the systematic review. The inclusion criteria of this systematic review include the research using the essential aromatherapy of lavender or mixture, the sample consists of at least 25 people, the sample age of at least 25 years, the final stages undergoing hemodialysis therapy 2 times a week

Table 1 Inclusion criteria

<table>
<thead>
<tr>
<th>Design</th>
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<tbody>
<tr>
<td>* Randomized Control Trial (RCT)</td>
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<td>* Quasi-Experimental Design</td>
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<table>
<thead>
<tr>
<th>Population</th>
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<tbody>
<tr>
<td>* Chronic Renal Failure Patients with Hemodialysis</td>
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<td>2-3 times a week</td>
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<thead>
<tr>
<th>Intervention</th>
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<tbody>
<tr>
<td>* Aromatherapy Inhalation</td>
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<td>* Aromatherapy Topical</td>
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<tr>
<th>Outcomes measured</th>
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<tbody>
<tr>
<td>* Anxiety</td>
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<tr>
<td>* Fatigue</td>
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<tr>
<td>* Quality</td>
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<tr>
<td>* Depression</td>
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<tr>
<td>* Headache</td>
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<tr>
<td>* Insertion Fistula pain</td>
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<td>* Pruritus</td>
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<td>* Restless Leg Syndrome (RLS)</td>
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<tr>
<th>Comparration</th>
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<tr>
<td>* Aromatherapy Intervention Versus No Treatment</td>
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<td>* Aromatherapy Intervention Versus Placebo</td>
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3 RESULT

Description of the Subjects

The first step in the preparation of this systematic review is the identification of 168 journals that have been collected from various databases based on the reviewer's defined keywords. The journals are selected according to predetermined inclusion criteria

Intervention Control

Eleven studies of Randomized Control Trials (RCTs have different comparison groups) Some studies compare the effectiveness of one aroma therapy with others, give flasebo aromatherapy, given only daily treatment, and the remaining two Quasi-Experimental Designs do not use a comparison group

Intervention group

The interventions in this review consisted of inhaled aromatherapy and aromatherapy massages. The description of the intervention described in Table 1.

Selection of Essential Oils

The essential oils used in this study are pure essential oils, diluted, or in a mixture of two or more essential oils of a certain ratio. Pure essential oils or diluted by the researchers are lavender oil, citrus oil and rose oil damask. But some researchers also combine several essential oils as well as a mixture of lavender with sweet orange oil, rosemary, sunflower oil, mint, sweet almonds, and jojoba oil.

Inhalation Aromatherapy

Seven of the thirteen researchers in this review chose inhaled aromatherapy. The aromatherapy inhalation technique used in this study is intended to provide psychological effects on patients, such as relieving anxiety (Tayebi et al., 2015; Dattatreya, 2012; Dehghanmehr et al., 2017), depression, reducing fatigue (Bicer, 2017; Balouchi et al., 2016; Muz and Taşcı, 2017) and improving sleep quality (Tayebi et al., 2015).

Aromatherapy Massage

Aromatherapy massage is a combination of aromatherapy and massage that offers the health benefits of both therapies and commonly used by healthy individuals(Ali et al., 2015). Aromatherapy massage used to relieve headache(Biger, Unsal and Demir, 2015), fistula pain insertion(Bagheri-Nesami et al., 2014)Ghods et al., 2015), reduce Restless Leg Syndrome (Hashemi, Hajbagheri and Aghajani, 2015) and relieve pruritus (Ozkan and Ulusoy, 2011)(Cürcani and Tan, 2014)(Abdelghfar et al., 2017) in hemodylysis patients.
Administration Protocol

Inhalation Aromatherapy

Although using the same techniques, there are differences in the research protocols in these journals. The main difference is the distance between the sources of aromatherapy and the subject's nose. In one study, subjects were asked to inhale the essential oil cotton right in front of their nostrils. In another study, aromatherapy was inhaled about 30 cm from the subject's nose or dropped on the participant's collar. The volume of essential oil used ranges from 1-3 drops. While the exposure time for the scent ranges from 5 to 20 minutes, the frequency of inhalation for anxiety, depression and fatigue is given 2-3 a week according to hemodialysis time, while to assess the quality of sleep done every day. The duration of the study varied, between 2 to 4 weeks.

Massage Aromatherapy

The difference in aromatherapy massage intervention is the frequency of administration. On the pruritus symptom, the use of grape seed, almond, or jojoba oil in pure vegetable. Oil during massage has been shown to have wonderful effects. This is also known as healing touch of massage therapy. In all study, All the participants had a skin test before undergoing massage with the oil to make sure they were not allergic to the oil like edema, itching, redness and rash (Cürcani and Tan, 2014) (Abdelghfar et al., 2017) (Shahgholian et al., 2010) (Bagheri-Nesami et al., 2014).

The use of aromatherapy topical oil by applying 1-2 drops of aromatherapy by using palms in the itch area. Aromatherapy containers at home and smeared twice daily (in the morning and evening) for 2 weeks (Abdelghfar et al., 2017) (Shahgholian et al., 2010)

Patients in experimental group received a six-week aromatherapy during dialysis sessions three times a week for a period of 7–15 minutes for each region of the pruritus (not applied to the arm with fistula). To that end, in the study, aromatherapy was applied for six weeks. lavender, tea tree, almond and jojoba oils are mixed and used for therapeutic purposes (Cürcani and Tan, 2014). For needle insertion, pain in both literature was measured use VAS pain intensity in both groups after each intervention for a total of three times in week.(Bagheri-Nesami et al., 2014). In headaches severity and Restless Leg Syndrome, Massage are given lasted three days a week for three weeks and with a total of nine sessions in line with massage-application protocol and each session lasted ten minutes.

Efficacy of Aromatherapy

Inhalation Aromatherapy

Three out of 6 studies evaluating the effect of inhalation aromatherapy reported beneficial effects to decrease fatigue symptoms in the subjects. Sevil Bicer (2013) found that lavender essential oil was
found to decrease the average fatigue score using the Brief Fatigue Inventory of the score before 42.92 ± 13.23 to 19.52.

Another study, Gamze Muz (2017) found a decrease in fatigue by using Visual Analogue Scale (VAS) for fatigue and Piper fatigue scale. He also found that inhalation of lavender and rosemary aromatherapy can improve sleep quality by using the Pittsburgh Sleep Quality Index (PSQI) (<0.05). Abbas Balouchi (2016) once compared the effects of lavender and orange oil in reducing fatigue in hemodialysis patients. Findings were indicative of higher effectiveness of orange extract compared to lavender extract on fatigue in hemodialysis patients.

Three studies evaluated the effect of inhalation
Inhaling combination of 5% lavender essential oil and sweet almond essential oil in anxiety. Fatemeh Kiani (2016) found significant difference between state and trait anxiety marks -13.86 ± 6.91 before examined groups to -6.04 ± 5.35 after intervention (P=0.001) (Dattatraya, 2012)

Same like her, Farzaneh Barati (2016) show that there any different between subject before rosemary aromatherapy intervention (State anxiety 47.47± 7.6 ) and after 4 week treatment (Trait anxiety 49.56 ± 13.8 to 37.1± 6.5 and 42.9 ± 10.1 (P < 0.001) (Dehghanmehr et al., 2017)

Alireza Kasra Dehkordi (2016) also comparing the effect of Damask Rose Essential Oil on Depression, Anxiety, and Stress. the result of his study are Aromatherapy can reduce depression, anxiety, and stress in hemodialysis patients (P <0.05)(Tayebi et al., 2015)

Massage Aromatherapy.

Three out of 7 studies show the effect of Massage Aromatherapy on decrease the pruritus on hemodialysis patient symptom. Nahid Shahgholian (2010) Applying a combine of peppermint essential oil and sunflower essential oil on pruritus skin and he found difference value before and after aromatherapy using (t = 5.81, p = 0.000). Shadia Zaghholi Abdelghfar (2017) also found the highly statistical significant difference before and after aromatherapy intervention (7.40 ± 1.18 to 5.85 ±1.69) with value p < 0.001(Abdelghfar et al., 2017)

Mehtap Cu¨rcani (2014) using pruritus score scale and laboratory parameters regarding the pruritus To determine the effect of aromatherapy on pruritus observed in haemodialysis patients. The experimental group’s mean post-test pruritus scores (7.20 ± 3.14) were found to be lower than that of control group patients (10.00 ± 2.47), and a highly significant difference was found between the groups (p < 0.001). In the between-groups comparisons of experimental and control group’s laboratory parameters, the experimental group’s post-test blood urea nitrogen levels (118.26 ± 36.76) were found to be lower than that of control group patients (138.80 ± 48.69), and the between-groups difference was found to be statistically significant (p < 0.05) (Cu¨rcani and Tan, 2014)

Pain in hemodialysis patients is one of the most commonly seen problems. It is established that 50%. of hemodialysis patients mainly undergo headache. Aromatherapy massage can reduce the severity of headache on three week p<0.001 (Biçer, Ünsal and Demir, 2015)

Patients undergoing hemodialysis experience anxiety and pain related to the insertion of hemodialysis needles, estimated 320 times in total per year. The pain experienced is mostly caused by needle insertion into a fistula. According to the study conducted by Masoumeh et al. and Ali et al Lavender aromatherapy may be an effective technique to reduce pain following needle insertion into a fistula in hemodialysis patients (Bagheri-Nesami et al., 2014)

Restless legs syndrome (RLS) disorders are common among patients undergoing dialysis for end-stage renal disease (Zhadeh Saraji et al., 2016). The most frequently reported causes of secondary RLS are iron deficiency, neurological lesion on a peripheral nerve or the spinal cord, uremia, and medications, which are frequent medical problems among patients with chronic renal disease (Hashemi, Hajbagheri and Aghajani, 2015). Determine the effects of massage with lavender oil on RLS symptoms in hemodialysis patients by using lavender oil and control group received routine care for three weeks. At the end of study, the mean RLS score significantly decreased in the intervention group, while this score remained relatively un-changed in the control group (12.41 ± 5.49 vs. 23.23 ± 4.52, P < 0.0001) (Hashemi, Hajbagheri and Aghajani, 2015)
Table 1. Description of the interventions and protocols used in the selected studies.

<table>
<thead>
<tr>
<th>No</th>
<th>Problem</th>
<th>Design</th>
<th>Subject</th>
<th>Intervention</th>
<th>Comparison</th>
<th>Mean±SD (p value)</th>
<th>Time</th>
</tr>
</thead>
</table>
| 1  | Fatigue                          | Randomized Control Trial (RCT) | 30 samples | Group 1 inhaling orange essential oil  
Group 2 inhaling lavender essential oil | Orange was more effective than lavender in reducing fatigue (P=0.012) | * Paired t-test | 3 times a week (For 4 weeks) |
| 2  | Sleep quality and fatigue level  | Randomized Control Trial (RCT) | 62 samples | Patients inhaling the aromatherapy (combining sweet orange essential oil and sweet lavender essential oil (1:1)) | Standard HD treatment  
Aromatherapy increased sleep quality and decrease fatigue compared to the control group (p<0.05) | 2 times a week (for 4 weeks) | |
| 3  | Fatigue Level                    | Randomized Control Trial (RCT) | 50 samples | Inhaling of lavender essential oil and rosemary essential oil (3:3) | Daily care  
Aromatherapy Group
- BFI mean score 42.92 ±13.23 to 19.52 ± 6.7  
- VAS 7.16 ± 1.54 to 3.04 ± 1.39 (p < 0.05).  
Control group
- BFI mean score 46.32 ±10.56 to 45.08 ±11.88  
- VAS 7.56 ± 1.08 to 6.60 ± 1.25 (p> 0.05) | * Student t test | 3 times a week (for 1 week) |
| 4  | Depression, Anxiety, and Stress | Randomized Control Trial (RCT) | 56 samples | Inhaling of damask rose oil 2% | Daily care  
Aromatherapy can reduce depression, anxiety, and stress in hemodialysis patients (P <0.05) | 2 times a week (For 4 weeks) | * independent t test |
| 5  | Anxiety                          | Randomized Control Trial (RCT) | 70 samples | Inhaling combination of 5% lavender essential oil and sweet almond essential oil | Daily care  
Level and trait anxiety -13.86 ± 6.91 to -6.04 ± 5.35 (P=0.001) | 2 times a week (For 4 weeks) | * Independent t test |
| 6  | Anxiety                          | Randomized Control Trial (RCT) | 46 samples | Inhaled rose water aromatherapy | No Intervention  
Before and After 4 weeks intervention State anxiety 47.47 ± 7.6 to 37.1± 5.6  
Trait anxiety | 2-3 times (for 4 weeks) | |
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<table>
<thead>
<tr>
<th>Page</th>
<th>Condition</th>
<th>Design</th>
<th>Sample Size</th>
<th>Intervention</th>
<th>Outcome Measure</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Headache Severity</td>
<td>Randomized Control Trial (RCT)</td>
<td>50 samples</td>
<td>Aromatherapy massage Facial Area</td>
<td>Daily care</td>
<td>Aromatherapy massage can reduce the severity of headache on three week p&lt;0.001</td>
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<td></td>
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<td>* One-Way ANOVA</td>
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</table>
| 8    | Pain needle insertion into a fistula | Randomized Control Trial (RCT) | 46 samples | inhaling lavender essential oil and almond essential oil 10% | Inhaling the scent of lavender therapy placebo | • Score before the intervention was 3.78 ± 0.24 and 4.16 ± 0.32 (p=0.35)  
• After three sessions was 2.36 ± 0.25 and 3.43 ± 0.31 (p = 0.009) |
|      |           |        |             |              |                | * Paired t-test |
| 9    | Pruritus | Randomized Control Trial (RCT) | 80 samples | applying a combination of aromatherapy lavender, tea, almond and jojoba essential oil on pruritus skin | Daily care | Post-test pruritus scores  
• Intervention group 7.20 ± 3.14  
• Control group 10.00 ± 2.47 (p < 0.001)  
Post-test nitrogen levels  
• Intervention group (118.26 ± 36.76)  
• Control group (138.80 ± 48.69) (p < 0.05) |
|      |           |        |             |              |                | * independent t-test |
| 10   | Uremic Pruritus | Quasi-Experimental Design (pretest-posttest control group design One) | 30 samples | Applying a combine of peppermint essential oil and sunflower essential oil on pruritus skin | The difference before and after aromatherapy using (t = 5.81, p = 0.000). |
|      |           |        |             |              |                | twice a day (for 2 weeks) |
| 11   | Pruritus | Quasi-Experimental Design | 24 samples | Applying a combination of lavender and mint essential oil 5% on pruritus skin | Pruritus score before intervention 7.40 ± 1.18 after intervention 5.85 ± 1.69 (p < 0.001) |
|      |           |        |             |              |                | 3 times a week (for 2 weeks) |
4 DISCUSSION

Effectiveness of Inhalation Aromatherapy

In the present systematic review, 6 out of 13 studies used inhalation therapy as a modality of aromatherapy. Inhalation of essential oils has given rise to olfactory aromatherapy, where simple inhalation has resulted in enhanced emotional wellness, calmness, relaxation or rejuvenation of the human body. The release of stress is welded with pleasurable scents which unlock odor memories. Essential oils are complemented to medical treatment and can never be taken as a replacement for it.

Aromatherapy Massage

Aromatherapy massage is another modality employed in 8 out of the 12 studies selected in which 5 studies showed positive effect of the intervention. Aromatherapy massage is a combination of aromatherapy and massage that offers the health benefits of both therapies and is commonly used by healthy individuals particularly for stress management.

The use of grape seed, almond, or jojoba oil in pure vegetable oil during massage has been shown to have wonderful effects. This is also known as healing touch of massage therapy. Massage is typically relaxing and enjoyable for people experiencing many types of pain. In addition to the physical benefits associated with aromatherapy, a pleasant scent may play a key role in patient satisfaction. Most participants who received aromatherapy treatment had the benefit of special treatment sessions outside of normal treatment protocol (Lakhan, Sheafer and Tepper, 2016).

Fatigue

Fatigue is the most common health problems in these patients, and 60-97% of patients suffer from fatigue (Manuscript, 2014). Fatigue is defined by reduced physical and mental capacity in the patient, which is a permanent feeling and cause a feeling of fatigue that is not resolved with rest. Lee et al. (2007) classified fatigue in hemodialysis patients into three integral areas of physical, emotional and cognitive fatigue. They believed that physiological factors (anemia, malnutrition, uremia, hemodialysis inadequacy, lack of physical activity, drugs’ side effects and psychological factors including depression, anxiety, sleep disorders) and socio-demographic factors (age, sex, race, education, marital status, job and treatment-related factors) affect the feeling of fatigue in patients. The first-line of treatment of psychiatric disorders in hemodialysis patients is drug treatment; however, the hypnotic drugs-induced sleep is an abnormal sleep. These drugs disrupt normal sleep periods. Many hypnotic drugs reduce nerve function and may create safety hazards for patients. They are associated with side effects and high costs, and their prescription is not a nursing responsibility (Balouchi et al., 2016)

<table>
<thead>
<tr>
<th>Study</th>
<th>Intervention</th>
<th>Sample Size</th>
<th>Method</th>
<th>Measurements</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>Pain needle insertion into a fistula</td>
<td>34 samples</td>
<td>Randomized Control Trial (RCT)</td>
<td>Topical lavender 2.91 ± 1.69</td>
<td>*Paired t-test</td>
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<td></td>
<td></td>
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<td></td>
<td>Placebo 4.18 ± 1.66 (p = 0.001)</td>
<td>3 times a week (for one week)</td>
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<tr>
<td>13</td>
<td>Restless Leg Syndrome</td>
<td>59 samples</td>
<td>Randomized Control Trial (RCT)</td>
<td>Lavender essential oil (1.5%) on patient leg</td>
<td>*Paired t-test</td>
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<td></td>
<td></td>
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<td></td>
<td>Daily care intervention group before 22.41 ± 7.67 After 22.90 ± 4.38 (P = 0.76)</td>
<td>3 times a week (for 3 weeks)</td>
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<tr>
<td></td>
<td></td>
<td></td>
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<td>Control group Before 12.4 ± 5.49 After 23.23 ± 4.52 (p &lt; 0.0001)</td>
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</tbody>
</table>
Despite the improvements in hemodialysis therapy, complications, which have non-ignorable frequency and are important at the extent to be life threatening, also emerge. When literature is examined, fatigue is found to be among the most frequent chronic complications affecting daily living function and quality of life in individuals with CRF.

Fatigue negatively affects working, making use of spare times, nutritional habits, sexual activity, getting pleasure out of life, and family and friend relationships of patients undergoing HD. Fatigue is an important problem concerning health care team because it has negative effects on individuals in terms of physical, social, and psychological aspects. In order to prevent fatigue symptom to affect individuals negatively, it is possible to cope with this symptom efficiently by assessing the fatigue and planning activities appropriate to individual (Bicer, 2017).

**Anxiety**

Anxiety is a common psychological problem in patients, with end-stage renal disease; it consists of unpleasant mental feelings, worry, and ambiguous tension along with physical symptoms such as perspiration, headache, restlessness, and heart palpitations. Normal anxiety can be rescuable. However, sometimes anxiety becomes escalated and changes into a mental disorder; such patients suffer from excessive anxiety (Tayebi et al., 2015).

In a study performed on dialysis patients, inhalation of the orange oil has proven effective in reducing hemodialysis patients’ anxiety without significant side effects (Tayebi et al., 2015).

**Depression**

Depression is reported as the largest health concern in the 21st century. About 350 million people are currently suffering from depression. Major depressive disorder has been projected to be the highest cause of years of life lived with disability by 2030. The prevalence of depression has increased dramatically at a global level and one million people with depression commit suicide yearly. In USA, an annual economic loss around USD 210 billion is associated with depression, which is one of the diseases with highest economic burden (Greenberg et al., 2015). Depressive symptoms include feelings of guilt, sadness, worthlessness and desperation, inability to experience pleasure, changes in appetite and sleep patterns, lack of energy, poor concentration and memory, motor retardation, fatigue, and recurrent suicidal and death ideation which are experienced for more than 2 weeks (Sánchez-Vidaña et al., 2017).

**Stress**

Stress has both physiological and psychological effects and can negatively impact patients’ treatment and recovery (Manuscript, 2012). Aside from the stress that accompanies illness, hospitalization is a stressful life event that brings about changes in one’s daily life and the activities that they engage in. Consequently, patients often encounter psychological and social stress.

The intervention was aroma inhalation of lavender were chosen for their chemical properties and potential ability to reduce stress (Tayebi et al., 2015). Lavender and clary sage oils contain linalyl acetate. Linalyl acetate has been shown to decrease blood pressure, heart rate and respiratory rate, and decrease salivary cortisol and CgA concentrations (Seol et al., 2013; Toda & Morimoto, 2008). Research has also revealed that lavender and clary sage oils act on neurotransmitters in the brain (Songwin, 2016).

**Sleep Quality**

Sleep is a basic human need, and maintaining good sleep quality is extremely important in preserving a healthy lifestyle (Harding and Feldman, 2008). Intensive care unit patients may result in problems such as decreased cognitive function, irritability, aggression, and disruptions in the sleep-wake cycle, which are associated with symptoms of disorientation and are reported to lead to the development of hemodialysis patient syndrome. There is a high correlation between stress and sleep quality; therefore, there is an urgent demand for nursing intervention to decrease stress and increase sleep quality (Cho, Lee and Hur, 2017).

**Pruritus**

Pruritus and skin dryness are currently the main cutaneous presentations of kidney disease patients undergoing hemodialysis (Shahgholian et al., 2010). The intensity and spatial distribution of pruritus vary significantly over time and patients are affected to a varying degree throughout the duration of renal disease.

The intensity of uremic pruritus ranges from sporadic discomfort to complete restlessness during day and night time (Mettang et al., 2015). Uremic pruritus has significant effect on physical,
social and psychological status for most of patients undergoing hemodialysis. Mechanical skin damage as a result of continuous scratching with excoriations, superimposed infections and chronic lesions in the skin occurred which cause sleeping disturbances that cause chronic fatigue, are associated with disturbances of day and night rhythm and they had a negative influence on mental and physical capacity. Uremic pruritus has influence on social relation and work productivity, and also, has effect on mood and cause depression and anxiety (Abdelghfar et al., 2017)

Because of the poorly understood pathophysiological mechanisms of uraemic pruritus, the treatments for this condition have largely been empirical, and no treatment has been shown to have sufficient efficacy and safety (Cürcani and Tan, 2014)

Headache Severity
Pain in hemodialysis patients is one of the most commonly seen problems. It is established that 50% of hemodialysis patients mainly undergo headache (Manuscript and Magnitude, 2013)The most important characteristic of the headache is that it starts during hemodialysis and ends within 24 hours following hemodialysis. Headache may be caused by the possibility that large amount of change in liquid and electrolyte balance leads to changes in blood brain barrier and vascular volume of venous area. Pain management requires a multidisciplinary approach. This multidisciplinary treatment approach requires use of complementary and alternative treatments. Aromatherapy massages are among the complementary methods and are effective upon the pain control (Bücher, Ünsal and Demir, 2015)

Pain needle insertion
Dialysis vascular access is one of the key challenges in dialysis units. Patients undergoing hemodialysis experience anxiety and pain related to the insertion of hemodialysis needles, estimated 320 times in total per year (Brkovic, Burilovic and Puljak, 2016). The pain experienced is mostly caused by needle insertion into a fistula, precipitating a considerable amount of discomfort and stress in hemodialysis patients. When the pain is well managed, patients more readily accept needle insertion into their fistula, thereby improving their quality of life. Although needle insertion into a fistula causes less pain after the first 3 months, this pain reduction is not significant. Since patients’ comfort during hemodialysis (Bagheri-Nesami et al., 2014) is necessary for their long-term compliance with the treatment, it is necessary to find pain-relieving methods for hemodialysis patients. The results of a study conducted in 2008 showed that hemodialysis patients collectively suffer from needle pain, which is one of the factors causing patients over 65 years to give up hemodialysis (Ghods et al., 2015).

Restless legs syndrome (RL)
Restless legs syndrome (RLS) is a neurological disorder characterized by uncomfortable sensation of paresthesia in legs that subsequently causes involuntary and continuous movement of the lower limbs, especially at rest (Rafie et al., 2016)

Patients with chronic renal insufficiency who undergo hemodialysis may commonly encounter various complications including RLS, which might be experienced frequently. Approximately 20 - 80% of hemodialysis patients experience RLS, while its prevalence in general population is 2 to 15% (Manuscript, 2013). International restless leg syndrome study group has identified four main criteria for diagnosis of RLS including: a) urge to move the legs, usually accompanied by discomfort in legs, b) start or exacerbation of symptoms at rest or after inactivity, c) complete or partial relief of symptoms by activity, d) emergence of symptoms only at night or exacerbation of symptoms in the evening and night (Hashemi, Hajbagheri and Aghajani, 2015)

The most frequently reported causes of secondary RLS are iron deficiency, neurological lesion on a peripheral nerve or the spinal cord, uremia, and medications, which are frequent medical problems among patients with chronic renal disease (Kim et al., 2008).

Massage therapy, as a well-known traditional remedy, induces a feeling of health and sense of well-being and therefore has gained popularity. The active ingredients of essential oil of lavender can quickly be absorbed through skin and their sedative, antidepressant, and muscular relaxant effects, as well as their positive effects on the quality of sleep and feeling of wellbeing have been shown (Hashemi, Hajbagheri and Aghajani, 2015).

Clinical Recommendation
When using inhalation aromatherapy, inclusion of a pretest is important to ensure that subjects have adequate olfactory function before the commencement of the treatment. Furthermore, a longer exposure time and higher number of sessions should be considered in the inhalation
aromatherapy treatment since positive results were observed when a higher number of sessions and longer exposure times were used. Based on the protocols presented from the included studies, at least 8 sessions in the treatment are needed to assess the effectiveness of aromatherapy massage and beneficial effects to relieve depressive symptoms. In addition, it is suggested to apply aromatherapy massage treatment once or twice per week.

5 CONCLUSIONS

In the overall analysis carried out, aromatherapy showed potential to be used as an effective therapeutic option for the relief of depressive symptoms in a wide variety of subjects. Review reported benefit use of aromatherapy especially aromatherapy lavender, citrus aroma and damask rose could increase comfort, decreased fatigue level, reduced the pain of fistula needle insertion, improved sleep quality, reduced uremic pruritus, decreased anxiety and depression in patients undergoing hemodialysis.

Although results of the studies presented aromatherapy as a complementary therapy, had positive impact to overcome symptom with no adverse effect on hemodialysis patients, it could not be determined that there is sufficient evidence to conclude its effectiveness as a non-pharmacological approach to the reduction of hemodialysis complication symptom.

Limitations

This study only contains the effects of aromatherapy on common complaints are often perceived hemodialysis patients with limited literature sources. we need to add another literature to further strengthen the results of the review need special reviews from other studies that can clarify the effect on each variable, especially variable fatigue, anxiety, stress, depression, sleep quality, pain, pruritus and restless leg syndrome.

REFERENCE


Lenjan, S. (2014) ‘Effect of aromatherapy with Lavender on sleep quality among patients undergoing hemodialysis Abstract: Background: Sleep disorders are one of the most common problems in patients undergoing hemodialysis. The purpose of this study was to examine the effect’, 18(2), pp. 145–150.


