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The effect of Aromatherapy on sleep quality in the older adults: A review study

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Abstract

Insomnia has a major negative effect on the quality of life of the elderly and has a significant reduction in the quality of their daily functioning. Therefore, the present review study was conducted to determine the effect of aromatherapy on elderly sleep quality based on articles published from 2004 to the end of 2018. 129 articles were found, of which finally 123 articles lacked inclusion criteria of study after screening titles, abstracts and full text. These articles showed that aromatherapy had positive effects on sleep disorders and daytime drowsiness. Of course other factors such as sleep time, sleep latency, satisfaction after awakening, set the awaking time, daytime sleep disorder and reduction of the amount of sleep medication had changes. It is recommended that aromatherapy shows the potential to be applied as a therapeutic and safe complementary and alternative therapy for the management of sleep quality in the older adults.

Keywords: Aromatherapy, old adult (elderly), sleeps disorder

1. Introduction

Sleep is one of fundamental needs of humans, and any disruption to its natural process, in addition to crating mental problems, can also reduce individual performance^[1]. Although sleep disorders occur at any age, but are more common in the old adults^[2]. Research has shown that low quality sleep is in the third rank of elderly's problems and one of the most common problems and reason for referring to doctor^[3-4]. Epidemiological studies have shown that more than 57% of old adults report their sleep disorders and just 12% are satisfied with their sleep problems^[5]. Another research findings shows that sleeplessness disturbs the various areas of person's life, including communication with others, which denial of these communications will definitely cause depression, decreased immune function and heart disease^[6-7]. Also according to statistics, the most factor causes this problem in individuals is age factor. There some common ways to deal with this problem, which is usually the most common use of hypnotic drugs. In addition to the side effects of some of them, it also increases the life expenses for an elderly^[8]. Aromatherapy is one of the additional medical techniques and affects the brain and nervous system. This procedure is applicable via inhalation, bath, skin compresses and massage. For the massage, the oils extracted from aromatic or non-aromatic plant are used, which when massage is performed with aromatic oils, it is called an aromatherapy massage^[9]. Scent inhalation can shift autonomic balance to parasympathetic priority and subsequently it can make the individual relax. Also, after absorption of scent volatile molecule via nasal mucosa, chemical signals goes to the olfactory bulb, amygdala and limbic system and based on the type of scent, nerve cells apply their sedative effect through releasing various neurotransmitter such as Enkephalin, Endorphin and Serotonin^[10]. Based on some researches, the aromatherapy is a low-cost and non-complicated method to improve the sleep status of individuals and specially the elderly. Hence, studies in this area have had significant results. In this regard, Choi (2015) used a massage and a combination of Lavender and Chamomile scent to test for people over 60 years old with anxiety and sleep disorders which until then did not have aromatic massage and also did not show any allergies to these substances. The results indicated that with a specific dose of massage frequency and inhalation of above-mentioned scents, sleep disturbance is significantly reduced^[11]. Nasiri and Fahimzade (2017) also conducted a study on sleep disorders in the elderly over 60 year old living in care home. The results suggested that the sleep disorders were significantly reduced and improved sleep in elderly.

Sadeghpour and *et al.* (2017) also fully confirmed Nasiri's and Fahimzade's findings in their experiment [12-13]. Ilali and *et al.* (2017) did research on sleep disorders in elderly people but replace orange blossom with lavender. The results suggested that the orange blossom scent significantly improved sleep quality and greatly reduced sleep disorders in the elderly [14]. Takda *et al.* (2017) tested both of these scents on the elderly with dementia. The results showed that, as mentioned in other studies, the lavender and orange blossom scents improves the quality and positive factors of sleep. It also improved symptoms of dementia [15]. Regarding the high rate of sleep disorders in the elderly and its impact on the physical and mental health and life quality of these individuals and also according to the importance of using non-prescriptive therapies to improve the side effects of chemical drugs and reduce the cost of these drugs, this study aimed to investigate the possibility of using aromatherapy methods on sleep disorders in the elderly.

2. Materials and methods

In this study, which was a systematic review of published articles, Iran Doc, Magiran, Iran Medex, PubMed databases were used to access relevant domestic and foreign documents. The inclusion criteria of the study have been published according to the subject matter of the study, descriptive-analytical and interventional articles published in Persian and English from 2004 to the end of 2018 on the study of the effects of aromatherapy on the quality of sleep in older adults. To search for articles in English source, key words: aromatherapy, inhalation, sleep disorders, elderly, insomnia, old men and women were used with all possible combinations of these words.

2.1 Article selection criterion

Inclusion criteria of the study includes: 1- The study is a clinical trial. 2- Research units are 60 or more than 60 years old and have sleep disorders. 3- The study is conducted in the form of a group research (not Case series or Case report). 4- Full text of articles is available. 5- Articles unrelated to the subject of research and articles that were of qualitative, review, and descriptive type were excluded.

2.2 Qualitative assessment of articles

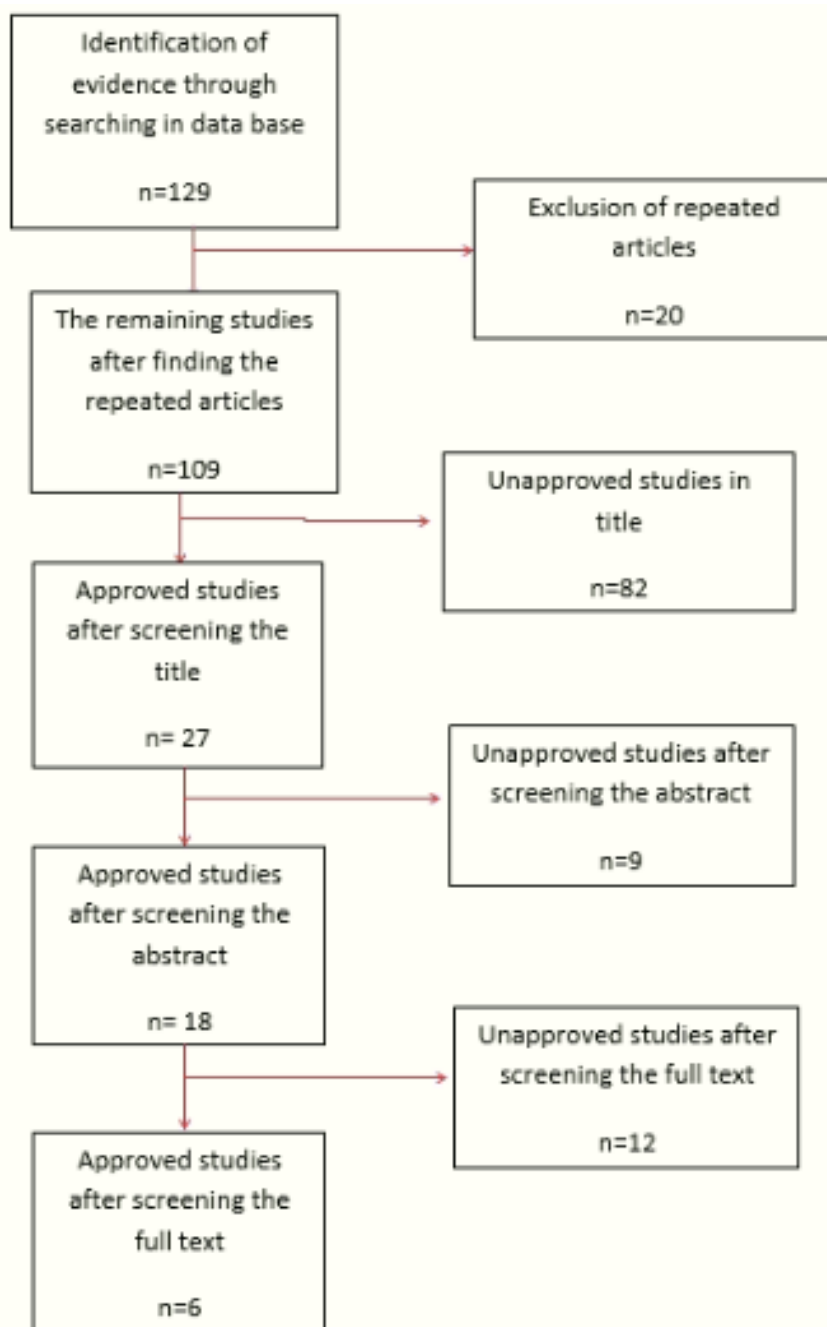
To evaluate the quality of the articles after completing the search for resources, the titles of all articles obtained by two of the contributors to the project were separately reviewed and repeated and unrelated ones were removed. Then the title and abstracts of the remaining articles were carefully examined and articles lacking the inclusion criteria of this structured

review were deleted. Finally, the full text of relevant articles was reviewed and qualified articles were selected. If the articles did not include, the rejection reasons were mentioned. In the next step, the information about the selected articles was recorded in a form that was already designed in Excel software and the results were presented qualitatively. The flowchart for selecting study is shown in Table 1.

3. Results

In the initial research, 129 articles were found, 20 articles after finding the duplicates, 82 articles after screening of the titles, 9 articles after screening of the abstracts, 5 articles due to the lack of full text and 7 articles due to lack of inclusion criteria of the article were rejected and finally 6 articles were approved. One article about the aromatherapy to examine the effects of massage with inhaling herbal scent on anxiety and sleep disorders, an article on sleep quality of elderly in the care home, two articles about the aromatherapy on elderly with disorders of dementia, an article about the aromatherapy on elderly with sleep disorders suffering from heart failure, an article about the aromatherapy to study the effect of herbal scent on sleep quality of elderly were include in analysis of this study. Of these, most of them were published in 2017, and 50% of papers were in Iran, and the remaining 50% were studied in Japan, Korea and Texas. Of the total of six articles, 5 articles had considered the minimum age of 60 years old and one article had considered the minimum age of 65 years old and all equally examined both elderly men and women. The total number of studied individuals was less than 50 just in two articles of Japan and Texas and the total number of studied individuals was more than 50 in other articles. In the term of interventional tool, pressure massage(zone therapy) with the inhalation of the scent is examined in on article and providing a scent through incense in one another article, while in other articles, the scent is inhaled directly; in 4 articles, lavender is used as a scent (in 3 articles the lavender is used as a scent and in one article lavender and a few more scent such as orange blossom, cedar, and pine are used), in one article orange blossom scent has been used alone. These scents were given to the patient through taking two drops on cotton according to the inhalation articles and through 10 drops on each palm of massager according to the articles reviewed massage and the scent has been used about 5-20 minutes. The test time varied from 3 nights to three months. In these articles, the condition to include the individuals to intervene, such as non-use of aromatic and freshener substances up to one hour before the intervention, lack of sensitivity to aromatic substance, lack of brain disorders due to smelling scents and satisfaction with the intervention.

Table 1: The flowchart of the study



The demographics of all individuals and groups were also evaluated and after data analysis, the results were not significant, it means that factors such as age, gender, marriage, divorce, religion, education and etc. did not affect the intervention. Nayoung Choi (2015) studied the effect of lavender with Jojoba oil massage which reduces pain and anxiety and as a result improves the quality of sleep in the elderly. In five other articles, factors such as sleep disorders, daytime sleepiness, effective sleep time, the amount of sleeping pills, daytime dysfunction, difficulty in falling asleep, satisfaction with sleep, night time awakenings and early morning awakening were studied which were based on Pittsburgh sleep quality index (PSQI). Meanwhile, Fahimzade and Nasiri (2017) showed that all factors which are included in Pittsburgh sleep quality index, except the amount of sleeping pills were significant where the lavender was used for 7 nights and every night for 8 hours and while according to Sadeghpour *et al.* (2017) research, where the lavender was used for 14 nights and every night 20 minutes before sleep, all

Pittsburgh sleep quality index factors were significant and improve the sleep quality at a remarkable level and reduced taking of sleeping and pain killer pills. Using orange blossom on individuals with heart weakness to improve the sleep quality showed significant varieties. All questions asked from patient such as:

1- How long did it take you to fall asleep last night? 2-At what time you wake in the morning? 3- At what time did you get up this morning? 4- How much did you sleep? 5- How much sleep did you have during the day? and other questions like this after using orange blossom scent only in three nights were meaningful. Among the methods that were used to provide interference among these articles, the most time was spent on the incense of the scent that was performed at the nursing room. In this article, the lavender and bergamot were used, of course once day incense but for three months, that results showed a decrease in sleeping drugs cost, in addition, the problem of insomnia was significantly reduced in intervention group. The significant point is that 78% of

intervention group cause diseases like Alzheimer, Dementia and brain disorders. In another study on the elderly with Dementia, inhalation method was used for 40 nights, 20 nights as testifier and 20 nights as an intervention time. Every night of intervention, lavender, orange blossom, Japanese cedar, cedar and pine scents were used as an intervention for eight hours and the result of Pittsburgh test showed that total sleep time (TST) was significant at 1 percent level and duration of longest sustained sleep period (DLSSP) and number of times of early morning awaking (EMA) were meaningful at 1 % level but other studied factors in Pittsburgh test didn't have significant difference with testifier.

4. Discussion

The aim of this study was to find out more about the effects of aromatherapy and essential oils on elderly sleep quality. A total of six studies were reviewed. The result of these studies has shown that in general, few researches are done on the area of aromatherapy. Based on the findings of the reviewed articles, the aromatherapy has had a positive effect on the quality of sleep in the elderly in all cases. In some studies, the studied elderly were suffering from diseases such as weakness of the heart or dementia that the intervention resulting from these studies did not cause any exacerbation of physical and psychological problems in individuals, so it can be concluded that the aromatherapy is a non-invasive method and suitable for improving sleep and sleep disorders in the elderly (Table 2). All of these articles looked at the effect of the aromatherapy on the sleep of people associated with their pain and stress and anxiety. In Choi's research (2015), Lavender scent and Jojoba oil massage proved to be effective in reducing chronic and localized pain in the elderly, as well, reduction of pain and stress by lavender scent was reported by Fahimzade *et al.* (2017), Yalali *et al.* (2017) and Ransem *et al.* (2017) [16]. In addition, Takda *et al.* (2017) tested hormone before and after the intervention and determined that the scents used to increase the serotonin and endorphin hormones in the blood and by binding endorphins in the blood when sleeping to melatonin, the elderly sleep quality Increased at night and also the waking up amount decreased from 3-4 times a day to 1-2 times, but none of these 1-2 times has led to

get up from the bed. In addition, the cases in this study suffered from dementia and the results of the research from the behavioral states of individuals indicated that positive cerebral and mental effects also occurred. Among these studies, only the use of orange blossom was applied to the studied cases for three days, and other studies lasted from one week to three months, which, of course, using the orange blossom scent had dramatic results in all stages of the study. When we look at Fahimzade *et al.* (2017) research with lavender scent inhalation method for one week (night to morning), it's found that in spite of using the lavender scent almost twice as long as the orange blossom, but no significant results are provided in the term of any decrease in consumption of hypnotic pills and effective sleep. While, the use of lavender more than 14 days also significantly reduced these factors that they were significant at 1% level. With these results, it can be concluded that Chen *et al.* (2008) Compared the inhalation of orange blossom with Xanax and the results indicated that the effect is not meaningful compared to Xanax [17], therefore, in Yallali *et al.* (2017) research, the intervention has a short time, but because of its high effect of the aroma of the orange blossom on the anxiety and depression, it showed better results compared to the use of Lavender. Sadeghpour *et al.* (2017) (inhaling the scent 20 minutes before sleep) examined the lavender scent for two weeks and received significant results based on the Pittsburgh test. After examining the people after the intervention, it was found that the lavender scent, after this time, stimulated the limbic system and produced Gama amino butyric acid (GABA), which prevents the acetylcholine neurotransmitter, resulting in a reduction in pain, that it can be assumed that reducing pain in elderly people will improve quality and sleep time and reduce sleep disorders. The aromatherapy with herbal scents have a positive effect on the improvement of elderly sleep quality and can be used as a non-invasive, easy and inexpensive method to treat sleep disorders in these patients. Of course, it was necessary to examine the impact of the scents on anxiety, pain, psychological and mental problems, and so on, because the results of our research have long been based on the premise that this method is a positive and desirable way for Patients.

Table 2: Results chart

Title	The effects of hand using massage aroma essential oil and music therapy on anxiety and sleeping elderly women in for the Sanatorium	Effect of The Inhalatio aromatherapy with lavender on sleep quality of the elderly in nursing care homes: A randomized clinical	The effect of lavender aromatherapy on sleep quality in the older adults: a single blind randomized clinical trial	Evaluation aromatherapy institutional elder care setting Texas long term care institute	The effect of Citrus scent on Aurantim sleep quality in older adults with heart failure: A randomized controlled trial	Effects inhalation aromatherapy on symptoms of sleep disturbance in with the elderly dementia
Author	Nayoung Choi	Fahimzade Leila	Sevda Sadeghpour	Ransom Sandy	Ehteram Sadat Illali	Takeda AI
Year	2015	2017	2017	2017	2017	2017
Country	Korea	Iran	Iran	Texas	Iran	Japan
Minimum age	60	60	60	60	60	65
Number of samples	72	50	80	26	80	22
Intervention	massage	Inhalation	Inhalation	Incense	Inhalation	Inhalation
Essential oil	Lavender and Jojoba	Lavender	Lavender	Lavender and bergamot	Orange blossom	Lavender, orange, cedar, pine
Dosage	ten drops on each palm of massager	two drops on cotton	two drops on cotton	Once a day in the sleeping room	two drops on cotton	Two to five drops on the handkerchief next to the pillow
Duration	5 minutes	8 hours a day	20 minutes before sleep	24 hours	20 minutes before sleep	8 hours a day
Test Trial	Twice a week for 1 month	7 nights	14 nights	3 months	3 nights	40 nights

<p>Result</p>	<p>It was shown that hand massage by aromatic oil decreased anxiety, distress and sleep disorders or the elderly and Linalool in lavender is functioned as a pain killer and sedative factor</p>	<p>Lavender had positive and non-invasive effect on the reduction of sleep latency, sleep distress and daytime drowsiness in the elderly</p>	<p>Using lavender is a safe, secure, non-invasive in treating sleep disorders</p>	<p>Using these scents in combination decreases the cost of drug consumption in care home and it made the environment more relaxed and happier which have positive effect on sleep quality of individuals</p>	<p>Aromatherapy by orange blossom improves sleep quality, reduces drowsiness, reduces boredom, increases satisfaction with sleep and reduces sleep distress</p>	<p>Showed that aromatherapy reduces sleep disorders in the elderly</p>
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