

Aromatherapy Interventions for the Elderly: A Review of Research Trends and Methodologies in Korea

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Abstract

This study aims to identify research trends and explore the latest methods of applying aromatherapy to the elderly. The main objective is to provide evidence in support of development of an aromatherapy nursing intervention program for the elderly. This investigation is in the form of a literature review focusing on the current status and trends in research conducted on aromatherapy intervention programs for the elderly in Korea over past decade. Published studies were identified through database such as KCI, RISS, DBpia, NDSL. A total 14 studies were selected for this review. The majority of selected articles fall within the field of nursing. The duration of the programs varied, ranging from less than 20 minutes to over 40 minutes, and consisted of 1 to 6 sessions. Most of methods involved massages using lavender oil in a hospital setting. Outcome variables were categorized into three main domains based on significance: psychological-emotional, interpersonal relationship, and physical-physiological. The variables within each category varied with 4 in psychological-emotional, 1 in interpersonal relationship, and 17 in physical-physiological. This review indicates that aromatherapy intervention programs have positive effects on the elderly and suggests the potential for developing similar interventions on a broader scale within community settings in the future.

Keywords: Aromatherapy, Complementary Alternative Medicine, Elderly, Intervention

1. INTRODUCTION

Human lifespan has been extended with the development of modern medicine and the diseases have gone from being acute to chronic while treatments have shifted from disease-centered to health-centered due to changes in the environment. Also there has been greater interest in quality of life with increasing in the elderly population. Accordingly, Complementary and Alternative Therapies(CAT) which emphasizes a holistic

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approach for symptom control, health promotion, and disease prevention rather than the treatment of the disease are emerging[1].

CAT is a collective term for various medical health care systems, treatments, and products that are not considered conventional medicine. CAT includes the basic concept of nursing that emphasizes harmony and balance with a holistic view of human beings. This CAT include massage, diet, manual therapy, music therapy, yoga, reflexology, and osteopathic medicine but in which aromatherapy is known as the most popular CAT in the 21st century[2].

Aromatherapy the compound word of aroma, meaning scent, and therapy which means treatment. Coined by French chemist Rene-Maurice Gattefosse in 1937, Aromatherapy is a fragrance therapy that purports to improve mental and physical health through various methods such as inhalation, bathing, and massage using essential oil that extracted from the flowers, fruits, stems, leaves, and roots of various plants[2].

Depending on the molecular weight of chemical components and biochemical characteristics aromatherapy claims to enhances the body's immune function, also affecting each internal organ, gland, and hormone production. It is also said to increase resistance to bacteria, viruses, and fungi. It is said to help with holistic healing by harmonizing the psychological and physical balance, as it may have the effect of reducing mental tension and relaxing muscles to relieve pain. Components contained in essential oils absorbed by the skin, circulatory system, and olfactory system, pass through the limbic system[3], and may have alleviating effects on ailments such as depression, anxiety and stress. It may also help with immunity enhancement, muscle relaxation, sleep promotion, and fatigue recovery[2]. Aromatherapy has the advantage of being easy to use and non-intrusive.

The application of aromatherapy as a CAT was effective in relieving constipation in children[4], and reduced academic stress and improved quality of life in middle school students with allergic rhinitis[5]. It also reduced maternal stress, fatigue and depression[6], and reduced stress by improving brain activity in adults[7]. Aromatherapy applied to the elderly reduced pain in patients with knee arthritis[8], reduced sleep disturbance[9], and enhanced cognitive abilities[10].

Aromatherapy has also been shown to improve physical performance when applied to athletes with positive effects on subjective vitality and agility[11]. The nose and lungs were stimulated by the aromatic scents, resulting in an inhalation reflex, which led to better respiratory muscle work, which in turn increased alertness, resulting in faster performance in running. Also, the parasympathetic nervous system was activated, resulting in improved accuracy and persistence during exercise[12]. In elderly with mental disabilities, aromatherapy including recreational use, has been shown to stimulate concentration and mental agility that improve balance and increase circulation as well as release serotonin and endorphins[13]. In other words, when aromatherapy is used as a tool for health promotion rather than disease treatment, aromatherapy can have a positive impact on physical and mental agility. As such, aromatherapy is applied in various ways according to the stages of life and shows results of improving physical and mental health.

By looking at previous studies related to systematic literature reviews of aromatherapy in Korea, several studies have been conducted: an aromatherapy study analysis for the elderly[14], an aromatherapy experimental study analysis for middle-aged women[15], and an analysis aromatherapy intervention in the nursing field[16]. In the future, it is expected that the application of aromatherapy to the elderly will increase as the elderly population increases and a growing interest in health promotion continues. Therefore, it is necessary to analyze the programs involve the application of aromatherapy.

Therefore, this literature review was conducted on the application of aromatherapy on the elderly in Korea for the past 10 years to identify research trends and to explore the latest methods in use. The purpose of this study is to provide evidence in support of the development of an aromatherapy nursing intervention program

for the elderly in the future.

2. METHODS

2.1 Study design

This study is a literature review study to determine the current status and trends in research conducted on aromatherapy intervention programs for the elderly in Korea over the past 10 years.

2.2 Search strategy and inclusion criteria

Relevant academic journal papers were used to find studies on aromatherapy intervention programs for the elderly implemented in Korea from 2012 to 2022. The literature search was conducted using an online database (DB). Based on the COSI (core, standard, idea) model, the Research Information Sharing Service (RISS), Korean Studies Information Service System (KISS), Korean Citation Index (KCI), KOREAN SCHOLAR, DBpia, and NDSL were used and searches were conducted several times. The keywords used in the final search were elderly, aromatherapy, and intervention. For the search, “(Elderly) AND (Aromatherapy OR Aroma OR Fragrance OR Aromatherapy) AND (Intervention OR Treatment OR Activity)” was used. The final literature search date carried out on June 30, 2023. The selection criteria for target studies were as follows. 1) Studies that applied an aromatherapy intervention program were selected among papers published in domestic academic journals over the past 10 years from January 2012 to December 2022, and 2) aromatherapy intervention programs for the elderly were selected. The exclusion criteria included 1) review studies, 2) qualitative studies, 3) literature published in abstract only, and 4) dissertations.

2.3 Framework for data analysis

The analysis framework used in this study was modified and supplemented by the researcher to suit this study referring to previous analyzes and trend studies conducted in Korea[16-18]. The main contents of the analysis framework are publication year, mean age of participants, number of participants, case of participants, major field of study, study design, intervention of mode, total session, time of one session, place of session, implication methods, aroma essential oil, outcome variables that consisted of a total of 15 analysis criteria.

2.4 Data extraction and analysis

A total of 79 studies were searched: 23 from DBpia, 8 from KCI, 31 from RISS, and 17 from NDSL. A total of 49 studies excluding duplicates were selected by checking the titles and abstracts. 35 studies were selected at the title and abstract stage, and the final 14 studies were selected by excluding unrelated topics etc. The studies selection process was discussed by researchers and the selection was finalized. If there is a different of opinion, the decision was made after sufficient discussion (figure 1).

In order to reduce analysis errors and increase accuracy, several studies were randomly selected and the researcher analyzed and reviewed them using an analysis framework, and then analyzed a total of 14 studies. Data extracted according to the analysis framework were analyzed after reaching a consensus among researchers. The analysis framework divided of three parts: general characteristics, characteristics of intervention, characteristics of outcome variables. The general characteristics of the study consisted of publication year, mean age of participants, number of participants, and major, study design. The characteristics of the intervention programs were examined including type of intervention, total number of session, intervention time, intervention location, implication method, and type of oil applied. In the intervention effect analysis, the outcome measurement variables of the intervention program were assessed and were categorized with significant items. It divided into three domains: psychological-emotional effect, interpersonal relationship effect, physical-physiological effect. The analyzed data were presented as descriptive statistics of frequency

and percentage using Microsoft Excel program.

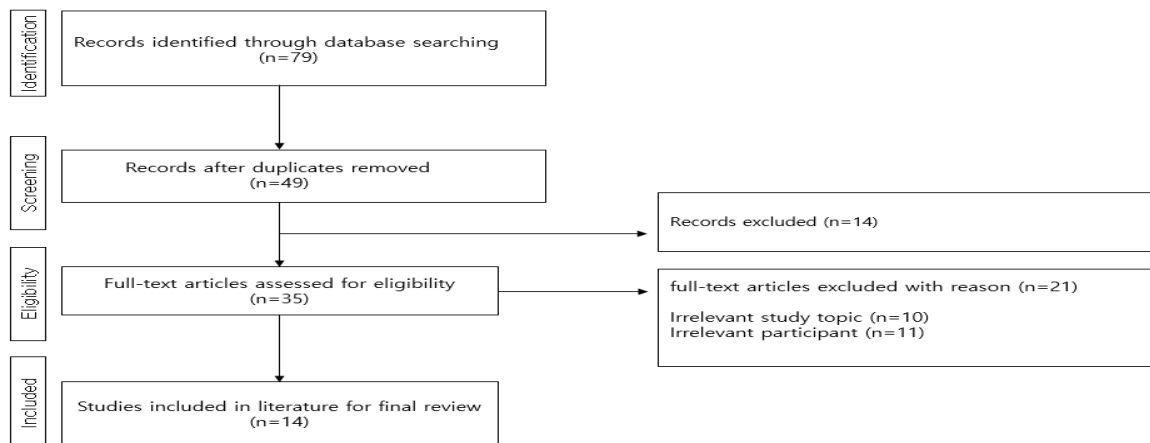


Figure 1. Study flow diagram

3. RESULTS

3.1 General characteristics of study

A total of 14 articles were selected based on the data selection criteria for this study, with 12 articles (85.7%) from 2012 to 2017 and 2 articles (14.3%) from 2018 to 2022. The average age of the subjects who participated in the study was 70 to 79 years old in 13 articles (92.9%), and 80 to 89 years old in 1 article (7.1%). The number of subjects who participated in the study was 20 to 39 people in 2 articles (14.3%), 40 to 59 people in 7 articles (50.0%), and over 60 people in 5 articles (35.7%). Among the characteristics of the participating subjects, 7 articles (50.0%) dealt with general elderly people, and 7 articles (50.0%) focused on the elderly living with dementia, stroke, hypertension, etc. Most of the published field is nursing with having study design of non-equivalent control group pre-post test (Table 1).

Table 1. General Characteristics

(N=14)

Characteristics	Categories	N(%)
Publication year	2012~2017	12(85.7)
	2018~2022	2(14.3)
Mean age of participants	70~79	13(92.9)
	80~89	1(7.1)
Number of participants	20~39	2(14.3)
	40~59	7(50.0)
	≥60	5(35.7)
	Case of participants	General
Major	Special	7(50.0)
	Nursing	12(85.7)
	Non-nursing	2(14.3)
Study design	One-group pre-post test	1(7.1)
	Nonequivalent control group pre-post test	13(92.9)

3.2 Characteristics of aromatherapy intervention programs

Most aromatherapy intervention programs for the elderly were conducted individually (92.9%) rather than in group (7.1%). The total number of interventions was 7 articles (50.0%) with 6 sessions or less, 4 articles

(28.6%) with 7 to 12 sessions, and 2 articles (14.3%) for 13 or more sessions. In terms of the duration of each session, 4 articles (28.6%) were less than 20 minutes, 2 articles (14.3%) were 20 to 40 minutes, and 2 articles (14.3%) were over 40 minutes, and 6 articles (42.8%) were not described. Most intervention programs were conducted in hospitals (64.3%), while others were conducted in community health centers (28.6%) or at home (7.1%). The application of aromatic essential oils included massage (50.0%), inhalation (35.7%), and topical application (14.3%). The types of aromatic essential oils appeared in the following order: lavender (23.3%), marjoram (16.3%), and sweet orange (9.3%), etc(Table 2).

Table 2. Characteristics of intervention**(N=14)**

Characteristics	Categories	N(%)
Mode	Individual	13(92.9)
	Group	1(7.1)
Total session	1~6	7(50.0)
	7~12	4(28.6)
	≥13	2(14.3)
	Not described	1(7.1)
Time of one session	<20minutes	4(28.6)
	20~40minutes	2(14.3)
	>40minutes	2(14.3)
	Not described	6(42.8)
Place of session	Home	1(7.1)
	Hospital	9(64.3)
	Community center	4(28.6)
Implication methods	Massage	7(50.0)
	Topical application	2(14.3)
Aroma essential oil*	Inhalation	5(37.7)
	Lavender	10(23.3)
	Majoram	7(16.3)
	Sweet orange	4(9.3)
	Tea tree	2(4.7)
	Ylang ylang	2(4.7)
	Bergamot	2(4.7)
	Frankincense	2(4.7)
	Lemon	2(4.7)
	Chamomile roman	2(4.7)
	Sandalwood	1(2.3)
	Rosewood	1(2.3)
	Myrrh	1(2.3)
	Geranium	1(2.3)
Palmarosa	1(2.3)	
Clary sage	1(2.3)	
Rosemary	1(2.3)	
Black pepper	1(2.3)	

Jasmin	1(2.3)
Mandarin	1(2.3)

*N=19(total number of aroma of essential oil)

3.3 Outcome variables and effects of aromatherapy intervention programs

The measurement indicators of the aromatherapy intervention programs in each study were categorized into significant domains. To summarize, it was divided into psychological-emotional, interpersonal relationship, and physical-physiological domains. The psychological-emotional consisted of 4 measurement indicators: depression, stress, mood, and anxiety, with most showing significant results. For the interpersonal relationship area, problem behavior measurement indicators were used. In the physical-physiological area, there were a total of 17 measurement indicators including sleep, constipation, pruritus, skin and meatal status, blood pressure, pulse rate, brain waves, and serotonin, and cortisol etc. Most of the results showed significant results(Table 3).

Table 3. Characteristics of outcome variables

Domain	Variables	Number of variables	Significant variables N(%)
Psychological-emotional effect	Anxiety	3	3(100.0)
	Stress	3	3(100.0)
	Depression	4	4(100.0)
	Mood	1	1(100.0)
Interpersonal relationship effect	Problem behavior	1	1(100.0)
Physical-Physiological effect	Sleep status	5	4(80.0)
	Pain	4	3(75.0)
	Constipation	1	1(100.0)
	Pruritus	1	1(100.0)
	Skin status	1	1(100.0)
	Meatal status	1	1(100.0)
	Oral status	1	1(100.0)
	Blood pressure	4	3(75.0)
	Heart rate	4	3(75.0)
	Respiratory rate	1	0(0.0)
	Brain waves	1	1(100.0)
	Blood serotonin	1	1(100.0)
	Blood cortisol	1	1(100.0)
	Lipid in blood	1	0(0.0)
	Saliva cortisol	1	1(100.0)
	Grip strength	1	1(100.0)
	Stress	1	1(100.0)

4. DISCUSSION

This study reviewed the results of a total of 14 experimental studies to determine the characteristics and effects of aromatherapy intervention programs on elderly in Korea. This study was conducted with the aim of

providing evidence in support of developing aromatherapy intervention programs that nurses can perform for the elderly in Korea.

A total of 14 studies that looked at aromatherapy intervention programs conducted for the elderly in Korea over the past 10 years were selected. Although most nursing fields are carrying out aromatherapy intervention programs as a complementary and alternative therapy, its prevalence in recently published research appears to be decreasing. Toward a nursing theoretical framework for clinical application of aromatherapy the following theory can be applied: Florence Nightingale's rest and comfort as part of the environmental aspect, Myra Estrin Levine's stress prevention in holistic nursing, and Hildegard Peplau's interpersonal support [19]. The characteristics of the subjects in this study showed an equal frequency of general elderly and elderly with special conditions, among which subjects with special conditions included osteoarthritis, stroke, and dementia. In the early 2000s, research was mainly conducted on general elderly people, and after the mid-2000s, studies were attempted on subjects with special needs [15]. The fact that research was conducted with equal frequency confirms that research is being attempted to reflect the characteristics of various research subjects.

Aromatherapy intervention programs for the elderly showed a higher rate of research efforts conducted individually rather than as a group. It is believed that individual intervention methods were selected to maintain privacy when applying essential oils as a massage method. Looking at the location where sessions were conducted, the rate of individual intervention approaches in hospitals was higher than that of individual intervention approaches at home, so it is believed that the characteristics of the session location also affected the research results. Aromatherapy intervention programs were frequently applied in 6 sessions or less and for less than 20 minutes. The high frequency of less than 20 minutes confirms that the time required for inhalation and massage application is not large. However, when group intervention is applied to healthy elderly people for health promotion, the role of social support can play a role [20], which can lead to positive results. Therefore, an aromatherapy intervention program centered on group meetings consisting of 6 sessions can also be applied in the future.

Methods of applying aromatherapy essential oils include transdermal application (massage, bathing, compression, topical application), inhalation. Massage is used to improve circulation, help alleviate digestive problems, issues with fluid retention, headaches, insomnia, musculoskeletal disorders, and nervous tension, and inhalation helps not only with mental symptoms such as stress, depression, and fatigue, but also with respiratory symptoms [2]. In this study, massage, inhalation, and topical application appeared across various sessions. No study was found comparing the differences between massage therapy and inhalation therapy, but looking at previous studies, the results of comparing the differences between inhalation therapy and massage therapy for dialysis patients showed that those who received massage therapy had lower levels of fatigue [21]. Massage therapy was also effective in studies conducted on cancer patients [22]. Meanwhile, there are also research results showing that the two therapies are equally effective in reducing anxiety before surgery [23]. In the future, a method of applying essential oils that takes into account the characteristics of the subjects and application location is needed.

Lavender was found to be the most used essence oil, followed by marjoram and sweet orange. Lavender essential oil is effective for burns, pain, soothing, anti-inflammatory, depression, anxiety, etc [2, 24], and its safety for the human body has been verified, for these reasons it may be the most popular oil used in practice. It is considered suitable for application. Marjoram is generally used for spasms, coughing, anti-inflammation, and wound healing [25], while sweet orange is effective in improving mood and anxiety [26]. This is similar to the research results that showed that lavender and chamomile were widely used in previous studies [15].

This study found that as a result of aromatherapy intervention, anxiety, depression, and stress were reduced in the psychological-emotional areas. These results were consistent with the results of a study conducted on

elderly people[27], which showed similar results as in the study[28] which found that the effect size for depression and anxiety was above average, it can be confirmed that aromatherapy is effective in reducing anxiety and depression in the elderly.

When applying essential oils, the nervous system responds, and along with this, physical-physiological indicators such as heart rate, blood pressure, electrodermal activity, brain waves, eye blinks, and pupil function can be monitored[29]. While previous research had very limited studies using physiological indicators[15], this study looked at objective subjects' responses using physical-physiological indicators such as blood pressure, pulse, serotonin and cortisol in blood, and cortisol in saliva. These objective indicators can be used as evidence to guide future evidence-based practice, suggesting that it is important to use outcome indicators that can secure objective data.

Mild cognitive impairment and dementia among the elderly continue to increase. However, in this study, there was no aromatherapy intervention program to improve cognitive ability in subjects with mild cognitive impairment or dementia. In a previous study, the more elderly people reported subjective discomfort with vision, hearing, and oral function, the higher the risk of cognitive function decline[30], and as a result of a meta-analysis study related to Alzheimer's and olfactory function, all Alzheimer's patient groups showed a decline in olfactory cognitive function compared to the control group[31], and as shown in a study showing a significant relationship between cognitive function and olfactory function [32], an aromatherapy intervention program is necessary to improve cognitive function and prevent dementia.

Since 43-62% of COVID-19 patients showed symptoms of reduced sense of smell, interest in olfactory treatment and rehabilitation has increased. If an elderly person's olfactory function has decreased due to COVID-19 infection, this situation requires further olfactory rehabilitation. Aromatherapy essential oils were developed based on research results showing that function was regained through aromatherapy after COVID-19[33] and that good results can be expected when olfactory function training is continuously implemented using familiar scents[34]. These programs can be conducted operated with a focus on prevention and health promotion if they are operated not only for elderly people in need but also for healthy elderly people.

4. CONCLUSION

This study analyzed research studies applying an aromatherapy intervention program for the elderly in Korea. Aromatherapy was effective in improving psychological-emotional, physical-physiological, and interpersonal relationship aspects. Mild cognitive impairment or dementia among the elderly has continuously increased, but this study had limited research of cognitive-related intervention programs and cognitive-related outcome variables. In the future, continued research on aromatherapy application programs to improve health not only for elderly people with special needs but also for healthy elderly people is needed. In addition, securing objective result indicators must be continuously carried out, and a systematic protocol such as the application method or application period of essential oils appears to be necessary. In the future, we propose to study the difference in effects depending on the method of applying essential oils and to develop an aromatherapy intervention program according to the health priorities of elderly subjects.

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Appendix

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