The Effect of Aromatherapy on Elderly Persons With Dry Skin

A Randomized Controlled Trial

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Dry skin, which is one of the most frequent dermatological problems seen in the elderly population, is an important problem that increases with aging. This study was conducted as a randomized controlled experimental trial to determine the effect of aromatherapy, applied to elderly persons residing in a nursing home in a city center, on dry skin. Elderly persons were grouped into a control group (20 elderly persons), an olive oil group (20 elderly persons), and an aromatherapy group (20 elderly persons). When examining between-measurements differences of the groups in the study, skin moisture levels of the elderly individuals in the aromatherapy group increased in all zones, arm, leg, back, and chest, at measurements of the second and fourth weeks compared with the first measurements. This improvement was determined to be higher after the second week. Skin moisture levels of elderly persons in the olive oil group were determined to significantly increase at the arm zone in the fourth week and at the back zone in the second and fourth weeks compared with the first measurements. Skin moisture levels of elderly persons in the control group, on the contrary, did not change in the second and fourth weeks compared with the first measurements and their dry skin continued at the same level. The intervention performed in this manner in the present study can be used in the clinical practice as an effective nursing intervention to reducing dry skin among elderly persons. **KEY WORDS:** *aromatherapy*, *elderly*, *nursing*, *skin dryness* *Holist Nurs Pract* 2021;35(1):34–39

As the world population gradually ages, the number of physiological problems associated with age is gradually increasing.[1,2] Today, the vast majority of people 70 years and older suffer from at least one dermatological problem, whereas approximately 10% have 3 to 4 dermatological problems.[1]

Thinning, dryness, roughness, wrinkles, and either benign or malignant tumors are primary changes seen on the aging skin. In addition to being an esthetic organ, the skin regulates body temperature, ensures protection of body fluids, and protects the other organs against harmful external factors. As we age, the skin normally becomes subjected to attrition and this process either increases or accelerates the process of skin aging and thus leads to dry skin due to the effect of environmental factors.[3,4] Therefore, it is crucial that elderly persons protect and take care of their skin.

Being one of the most common dermatological problems in the elderly population, dry skin is an important problem that increases as people age and affects 30% to 75% of individuals older than 65 years. Moreover, the decrease in the activity of sebaceous glands and sudoriferous glands is one of the most important causes of dry skin. Conditions such as diabetes mellitus, liver diseases, renal failure, and hypothyroidism, as well as low environmental moisture, central heating, frequent bathing, and some medications (diuretics, antilipidemics, etc), exacerbate dry skin.[5] Keratinocyte maturation and accumulation also impair the skin and thus the whole skin can have a dry, rough, and furfuraceous look primarily in the legs, hands, and arms.

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Dry skin also causes elderly persons to contact pruritus, which, in turn, leads to the formation of lesions, opens the way for eczematous changes and skin infections,[3,4] and leaves the skin with a dry, furfuraceous, and cracked appearance.

Although dermatological problems occurring in old age are generally non–life-threatening, the impaired outer layer of skin has the potential to influence social relationships, psychological conditions, and business relationships between individuals. In turn, it becomes gradually more important to take the necessary precautions for preventing dry skin and aging and to diagnose and treat physiological skin changes and diseases.[4,5]

The most important steps in the treatment of dry skin in elderly persons are to prevent moisture loss from the stratum corneum layer of dermis, replace decreased moisture, and increase oxygen carriage to cells.[5] Therefore, the use of soap products containing moisturizer as well as moisturizers and essential aromatherapeutic oils increasing skin moisture within the first 5 minutes after bathing may enhance quality of life of elderly people. Aromatherapy, which has sedative, analgesic, refreshing, and therapeutic characteristics, refers the application of some essential oils to the body using compression, steam, or massage for the sake of health and beauty. Performing massage with them in particular carries the potential to decrease dry skin and skin lesions. Lavender and chamomile oils, for example, are used for this exact purpose.[6-12]

This study was conducted to examine the effects of applying aromatherapy with a mixture of lavender and chamomile oils on dry skin in elderly individuals.

METHODS

This study was conducted as a randomized controlled experimental trial to determine the effect of aromatherapy on dry skin of elderly persons residing in a nursing home located in a city center.

Participants

The population of the study consisted of all the elderly individuals (n = 96) residing in a nursing home located in a city. All participants were given a questionnaire to fill out at the onset of study in order to evaluate each individual suffering from dry skin.

Because there was no similar study, the power analysis was performed after 20 elderly persons were included in each group (total 60) and thus the sample size was determined to be sufficient. The elderly individuals were divided into 3 groups: a control group (20 people), an olive oil group (20 people), and an aromatherapy group (20 people), according to a computerized randomization table.

Inclusion criteria of the study

Those who were elderly, suffering from dry skin (≤35% rate), had no neuropathy, skin disease, allergies, or psychiatric disorders, and were open to communication and cooperation were included in the study.

Exclusion criteria of the study

The elderly persons who had amputated limbs, had a history of cancer, and declined to participate in the study were not included in the study.

Data collection forms

Elderly information form

The questionnaire prepared on the basis the literature review[6,8,12] consisted of 20 questions about descriptive characteristics and dry skin–related characteristics of the elderly individuals.

Data collection

Arm, leg, back, and chest areas of elderly persons were measured using a device to determine skin moisture rate. All data (skin moisture and skin pH) were then assessed 1 day prior to the application, during the second week of application, and after the application. The participants were requested not to use soap, detergent, and cosmetics 1 day before measurement, given that it affects skin moisture and pH. Skin moisture and skin pH measurements were taken from areas containing little body hair.

Skin moisture analyzing device

A skin moister analyzer (DMM skin moisture analyzer) was used to measure the moisture at any point of the body. Developed for precise measurement, this device shows the amount of moisture only via contact without damaging any part of the skin. It measures skin moisture between 0% and 99.9% and has a readable digital screen. During the measurement, the skin should not be dirty, wet, or overly hairy.

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Assessment of dry skin is as follows:

- Dry (0%-35%)
- Normal (35%-55%)
- High (≥55%)

Skin pH meter

The skin-pH meter PH 905 is a fast, easy, and economical tool used for measuring the pH level of either skin or the scalp. The measurement reading is determined using a high-quality combined electrode, in which both glass H^+ ion–sensitive electrode and an additional reference electrode are placed in one housing. The device then is connected to a probe handle pH electrode containing the measurement electronics. Modern and high-quality electronics of the probe allow for a quick (1 second) and reliable measurement while avoiding the effects of occlusion. The probe head serves as an optimal measurement of the planar skin surface. Single and continuous measurement is possible. pH is expressed up to 1 decimal point. The user can perform regular calibration. Given that skin is normally acidic, pH values vary according to certain parts of body, whereupon its normal limits range between 4 and 9.[13]

Application

In this study, the researcher who received aromatherapy education and an aromatherapy application certificate prepared aromatherapy oils and applied them to the skin using the effleurage method. The application protocol was decided in accordance with the literature.[6,10,14] Lavender (*Lavandula angustifolia*) and chamomile oil were prepared in a 1:2 ratio. Olive oil being eligible for the skin was used as the base oil and prepared by dilution at a rate of 3% (2 mL of chamomile oil and 1 mL of lavender oil into 97 mL of olive oil).

Lavender oil was chosen because of its analgesic and relaxing properties. Chamomile, likewise, contains numerous vitamins and minerals that are needed by skin. Hence, both revitalize and freshen one's skin and also slow down the effects of aging. Olive oil was chosen as the base because it is useful for sore and dry skin. To date, no human death caused by lavender oil or chamomile oil has been reported in the literature. Moreover, their adverse effects include skin irritation and allergy-based dermatitis.[15,16]

Prior to application, the researcher ensured and told all of the participants in the aromatherapy group that their privacy would be protected. Verbal communication was maintained throughout the procedure in order to relax the individual. A 10 mL of aromatherapy oil was applied to the whole body of elderly persons for 10 to 15 minutes using the effleurage massage technique, 5 minutes after bathing, twice per week over a period of 4 weeks. No existing medications used by the individuals appeared to interfere.

Those in the olive oil group were rubbed with 10 mL of olive oil across their body for 10 to 15 minutes via the effleurage massage technique, 5 minutes after bathing, twice per week over a period of 4 weeks

No application was made to those in the control group. As in the intervention group, their dry skin was measured before application and during the second and fourth weeks of the application.

Statistical analysis

All data were assessed via IBM SPSS 22.0 (IBM Corp, Armonk, New York) in the computer environment. Descriptive statistics (mean, percentage), in addition to the Shapiro-Wilk, Kruskal-Wallis, and Friedman tests, were used to analyze the data. The value of $P < .05$ was accepted as statistically significant.

Ethical considerations

Ethics Committee Approval from Clinical Trials Ethics Committee at Erciyes University in addition to written institutional permission from the nursing home where the study would be conducted was obtained prior to the study. The individuals included in the study were informed about the aim of the study, upon which their written and verbal consent was taken and they signed the informed consent form.

RESULTS

Upon examining the descriptive characteristics of elderly persons in the sample group, it was found that the majority (in all 3 groups) were between the ages of 71 and 80 years, female, single, illiterate or primary school graduate, and suffering from chronic disease. Those in the aromatherapy and olive oil groups in particular consumed between 1000 and 1500 mL of fluids per day, whereas most of those in the control group consumed around 1000 mL of fluid (Table 1).

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TABLE 1. Characteristics of Elderly Persons

Characteristics of the Elderly	Aromatherapy Group (n = 20)	Olive Oil Group (n = 20)	Control Group (n = 20)	*P*
Age, mean ± SD, y	73.75 ± 6.89	78.60 ± 7.89	79.65 ± 8.08	
Age groups				
60-70 y	7 (35.0)	4 (35.0)	4 (20.0)	
71-80 y	9 (45.0)	8 (45.0)	8 (40.0)	.586[a]
≥81 y	4 (20.0)	8 (20.0)	8 (40.0)	
Gender				
Female	13 (65.0)	11 (55.0)	13 (65.0)	
Male	7 (35.0)	9 (45.0)	7 (35.0)	.738[a]
Marital status				
Married	2 (10.0)	3 (15.0)	4 (20.0)	
Single	18 (90.0)	17 (85.0)	16 (80.0)	.900[a]
Educational level				
Illiterate/elementary education	7 (35.0)	14 (70.0)	15 (75.0)	.029[a]
Primary school/high school	13 (65.0)	6 (30.0)	5 (25.0)	
Presence of chronic disease				
Yes	14 (70.0)	12 (60.0)	16 (80.0)	.442[a]
No	6 (30.0)	8 (40.0)	4 (20.0)	
Daily fluid intake				
1000 mL	6 (30.0)	9 (45.0)	15 (75.0)	
1000-1500 mL	10 (50.0)	9 (45.0)	4 (20.0)	.059[a]
≥1500 mL	4 (20.0)	2 (10.0)	1 (5.0)	

[a]Chi-square exact test was used.

The skin pH levels of the participants were found to fall within the normal range (pH between 4 and 9 is accepted as normal) (Table 2).

When pre- and postapplication skin moisture levels of the participants were examined, it was found that the skin moisture levels of those in the aromatherapy group statistically significantly increased compared with those in the other groups ($P < .05$) (Table 3). When examining the between-measurement differences of the groups, it was determined that the skin moisture levels of those in the aromatherapy group increased in all areas, including the arm, leg, back, and chest during the second and fourth weeks compared with the first measurements. This improvement was higher after the second week ($P < .001$). Skin moisture levels of those in the olive oil group increased significantly in the arm region during the fourth week, and at the back region in the second

TABLE 2. Mean Skin pH Level of Elderly Persons

Measurements	Aromatherapy Group Mean ± SD	Olive Oil Group Mean ± SD	Control Group Mean ± SD
pH arm 1	5.23 ± 0.99	5.31 ± 0.53	5.31 ± 0.54
pH arm 2	5.14 ± 0.75	5.23 ± 0.43	5.40 ± 0.51
pH arm 3	4.79 ± 0.34	4.83 ± 0.21	5.17 ± 0.31
pH leg 1	5.16 ± 0.77	5.46 ± 0.49	5.80 ± 0.56
pH leg 2	5.27 ± 0.65	5.50 ± 0.53	5.37 ± 0.63
pH leg 3	5.14 ± 0.54	5.48 ± 0.49	5.50 ± 0.55
pH back 1	4.91 ± 0.61	5.27 ± 0.50	5.58 ± 0.58
pH back 2	5.17 ± 0.61	5.40 ± 0.54	5.26 ± 0.40
pH back 3	5.10 ± 0.45	4.96 ± 0.35	5.27 ± 0.46
pH chest 1	4.93 ± 0.70	5.17 ± 0.50	5.67 ± 0.60
pH chest 2	4.99 ± 0.59	5.31 ± 0.58	5.16 ± 0.58
pH chest 3	5.13 ± 0.61	5.28 ± 0.53	5.26 ± 0.51

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TABLE 3. Skin Moisture Levels of Elderly Persons by Zones in the Second and Fourth Weeks Before the Application

Measurements	Aromatherapy Group Median (Min-Max)	Olive Oil Group Median (Min-Max)	Control Group Median (Min-Max)	P^*
Arm zone				
First week	21.70 (18.30-34.00)^{Aa}	22.40 (18.70-31.60)^{Aa}	19.90 (18.10-23.00)^{Aa}	.506
Second week	24.50 (20.20-34.10)^{Ab}	23.15 (18.60-33.50)^{Aa}	20.20 (18.10-22.10)^{Ba}	<.001
Fourth week	26.40 (20.20-33.60)^{Ab}	25.50 (19.60-33.60)^{Ab}	20.60 (18.60-22.80)^{Ba}	<.001
P	<.001	.002	.490	
Leg zone				
First week	20.90 (18.20-26.40)^{Aa}	21.70 (18.10-35.70)^{Aa}	19.10 (18.30-29.90)^{Aa}	.058
Second week	25.10 (20.00-35.60)^{Ab}	22.70 (18.50-35.90)^{Aa}	19.45 (17.90-25.40)^{Ba}	<.001
Fourth week	28.25 (22.60-34.20)^{Ab}	24.30 (17.60-28.60)^{Aa}	19.70 (17.20-28.40)^{Ba}	<.001
P	<.001	.350	.915	
Back zone				
First week	20.80 (18.20-26.30)^{Aa}	20.20 (18.10-24.60)^{Aa}	21.10 (18.80-23.40)^{Aa}	.517
Second week	24.35 (20.0-38.90)^{Ab}	23.65 (18.40-31.70)^{Ab}	20.20 (18.20-24.20)^{Ba}	<.001
Fourth week	27.50 (22.40-30.80)^{Ab}	24.95 (20.50-28.60)^{Ab}	20.80 (17.60-25.20)^{Ba}	<.001
P	<.001	<.001	.074	
Chest zone				
First week	21.00 (18.20-32.40)^{Aa}	21.05 (18.80-39.10)^{Aa}	22.30 (19.00-33.50)^{Aa}	.298
Second week	24.10 (21.10-38.20)^{Ab}	22.30 (18.30-36.20)^{Ba}	21.00 (18.20-30.20)^{Ba}	<.001
Fourth week	27.00 (20.80-36.40)^{Ab}	22.10 (18.80-34.50)^{Ba}	20.80 (19.80-29.60)^{Ba}	<.001
P	<.001	.387	.142	

Abbreviations: A,B, between-groups; a,b, within-group measurements; *P**, between-groups; *P*, between-measurements.

and fourth weeks compared with the first measurements ($P < .05$). Skin moisture levels of those in the control group, on the contrary, did not change during the second and fourth weeks compared with the first measurements, which meant that dry skin remained at the same level ($P > .05$) (Table 3).

DISCUSSION

There are several studies indicating that aromatherapy, which is the therapeutic use of essential oils that are extracted from herbal sources and concentrated, has beneficial effects for numerous dermatological problems such as dryness, pruritus, psoriasis, eczema, head lice, hair loss, and burns. Lavender oil is one of such products often used for this purpose. Lavender oil is one such product natural antibiotic, antiseptic, antidepressant, and sedative properties according to the literature and is also used to eliminate various dermal problems such as eczema, dermatitis, burns, bruises, incisions, scales, and acnes.[17]

Chamomile oil, another essential oil, contains many vitamins and minerals required by the skin and it is known to revitalize and freshen the skin, slow down the effects of aging, and treat acne and other forms of skin inflammation.[17,18] The mixture of lavender oil and chamomile oil was found to be more effective in the fourth week on dry skin by increasing the skin moisture rate starting from the second week. Although there is no related study in the literature, aromatherapeutic massage was effective in treating dry skin and pruritus according to a study by Roh and Kim.[6]

Patients suffering from dry skin are often encouraged to use cosmetic or dermocosmetic products. However, these products sold in the market and used topically may cause a number of reactions such as contact urticaria, eczematous dermatitis, erythema, and erythema multiforme on the application area and also have a negative impact on individual's budget in terms of cost.[19]

Skin aging is an irreversible process. No method of treatment can completely eliminate this phenomenon, given that it is one of the most natural processes of life. However, some problems associated with this process can be kept under control using appropriate interventions.[19] While dry skin is not a dangerous symptom, it should not be ignored, due to the fact that that it can lead to pruritus, skin inflammation, and an impaired life quality for the individual.[20]

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CONCLUSIONS

The number of studies examining the effects of complementary therapies, especially aromatherapy, on skin problems is limited. We think that it is essential to make interventions for complementary treatment methods such as aromatherapy, which is easy to supply and cost-effective, to be utilized within standard nursing practices and to extend the use of aromatherapy.

The intervention we performed in this context in the present study can be used in clinical practice as an effective nursing intervention in order to reduce dry skin among elderly persons.

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