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Original Article

Effect of Head and Face Massage on Agitation in Elderly Alzheimer's Disease Patients

Saeid Keshavarz[1], Tayebeh Mirzaei[2]*, Ali Ravari[3]

Abstract
Background: Management of agitation in Alzheimer's patients with non-invasive treatment methods, such as massage therapy, is of paramount importance.
Aim: This study was conducted to determine the effects of head and face massage on agitation in elderly Alzheimer's patients living in nursing homes in Yazd, Iran.
Method: This randomized controlled clinical trial was conducted on two groups (n=35 in each group) from 26 September to 5 October 2016. For the patients in the intervention group, massage therapy was performed using the effleurage and compression techniques, and no intervention was implemented in the control group. The usual way to control the symptoms of agitation was physical restraint. The Cohen-Mansfield Agitation Inventory (CMAI) was used to measure the agitation level. The data were analyzed by performing Wilcoxon and Mann-Whitney tests in SPSS, version 18.
Results: The mean ages of the intervention and control groups were 82.2±10.6 and 81.5±9.6 years, respectively. The mean scores of agitation in the intervention and control groups decreased from 77.2±14.4 and 82.1±17.3 before the intervention to 49.7±6.0 and 80.8±18.3 after the intervention, respectively. The results showed a significant difference between the two groups after the intervention (P<0.001), while no significant difference was noted between the groups before the intervention (P=0.38).
Implications for Practice: The findings showed that head and face massage could reduce agitation in elderly Alzheimer's patients. Thus, this technique could be considered by nurses and caregivers to reduce agitation in this population.

Keywords: Alzheimer's disease, Massage, Nursing homes, Psychomotor agitation

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Introduction

Aging is a natural physiological process characterized by a dynamic irreversible decline in physiological function (1). Epidemiological studies show that 11% of the world's population is aged above 60 years; it has been estimated that more than 22% of the world's population will grow elderly by 2050. In this regard, it is estimated that the world's elderly population will rise from 600 million in 2000 to 2 billion in 2050 (2). Based on the census performed by the Statistical Center of Iran, the number of elderlies was 6,300,000 in 2011, which increased from 6.6% of the whole Iranian population in 1996 to 8.2% in 2011. According to a previous study, the population aged over 60 years old will constitute 10% and 20% of the whole Iranian population in the years 2021 and 2050, respectively (3).

Alzheimer's disease is the most common type of dementia, comprising 60-80% of dementia cases; this disease is clinically evident when there is a gradual loss of higher brain functions including behavioral and mood changes (4-8). The prevalence of Alzheimer's disease increases exponentially with age, increasing from 3% in the 65- to 74-year-old age bracket to 50% in the elderly of 85+. By 2013, 44.4 million people worldwide were diagnosed with Alzheimer's, which is estimated to exceed 76.6 million by the year 2030 (9). In a study conducted at the Johns Hopkins University, it was estimated that in 2050, one in every 85 people worldwide would suffer from Alzheimer's disease (10). In 2014, Alzheimer's disease was the sixth leading cause of death in the United States (11). More than 90% of the elderly with Alzheimer's have behavioral and psychological symptoms such as agitation, irritability, anxiety, and depression (12).

Among the behavioral symptoms, family members and nurses of Alzheimer's patients believe agitation is one of the most challenging behaviors among these patients (13). In this relation, agitation may be associated with symptoms such as wandering, physical aggression, repetitive motions, screams, and resistance to care (14). The disease complications and diminished cognitive function cause both individuals and their families to bear heavy mental and financial stress (15). The behavioral and psychological symptoms of Alzheimer's disease are traditionally managed by pharmacological intervention or physical restraint (16). When patients use antipsychotics to reduce symptoms, they may be at increased risk of potential adverse effects, including increased falls and mortality (17). The use of therapeutic approaches other than pharmacological therapies seems to be necessary due to their side effects. In addition, there are some ethical issues regarding the use of physical restraint (18).

Massage therapy has been used for thousands of years (19). Body massage studies are increasing and positive effects of massage on anxiety, stress, sleep, and pain have been reported. Non-pharmacological interventions, including massage therapy, may be particularly appealing to family members, and they would prefer to use massage to avoid experiencing side effects of medications. Massage is easily learned, low-risk, and readily available. Massage can also be cost-effective as it can be trained to volunteering caregivers (20). Today, massage therapy in many countries is a major part of the healthcare system, and specialized massage therapists are working along with physicians to treat patients. Massage therapy as a nursing intervention is considered in many clinical settings as a complementary therapy to reduce stress (21).

Massage consists of several mechanisms of action, including biomechanical (range of motion exercises), physical (blood pressure), neurological (reduced muscle spasm and pain), and psychosocial (relaxation) mechanisms (22). In the light of this, several studies have been performed in various domains including pain management (23, 24), palliative care, and care for individuals in nursing homes (25, 26).

However, studies have mostly focused on the massage of the neck and shoulders. Further research on massage therapy under special circumstances is required to ascertain the effects and benefits of massage therapy. Currently, an increasing shift is observed toward the use of non-pharmacological interventions, including music therapy (27), aromatherapy (28), and massage (29), to reduce the behavioral and psychological symptoms of dementia.

Wendy et al. (2013) in a randomized controlled trial in five long-term care centers in Australia investigated the effect of foot massage (every day for 10 minutes during three weeks) on agitation of 55 long-term care residents using Cohen-Mansfield Agitation Inventory (CMAI). The results showed that foot massage increases agitation in these subjects (30). Suzuki et al. (2010) investigated the physical and psychological effects of massage therapy (for six weeks and five days a week) on 20 elderlies with severe dementia. Their results presented that massage therapy had a

significant effect on the level of stress and aggressive behaviors in individuals suffering from severe dementia (29). In a study, Snyder et al. (1995) examined the impact of hand massage and therapeutic touch on agitation in dementia patients. The results demonstrated that hand massage and therapeutic touch did not influence agitation in Alzheimer's patients (31). Bahraini et al. (2014) determined the effect of head and face massage on the sinusitis-induced headache of 35 women residing in the dormitory of Khorasgan University. They found a statistically significant difference in pain intensity before and after massage in head and face areas with efflorescence and compression (32).

Although recent studies have presented evidence of the effectiveness of hand massage on short-term agitation behaviors, this is not sufficient in advocating the effectiveness of massage therapy (33). A small number of massage therapy studies have provided support for stress and agitation management in patients with dementia. Evidence of the effect of head and face massage on other disorders including delirium has been reported (34); however, the effect of head and face massage on reducing the agitation of Alzheimer's patients has not been manifested.

In recent years, interest has increased in the use of non-pharmacological interventions to treat Alzheimer's disease behavioral and psychological symptoms. These interventions are aimed at improving cognitive skills, morale, and quality of life (35).

The effleurage (stroking) therapy is the most common form of massage in the United States (19). Massage therapy is known as a simple and inexpensive intervention accessible in all cultures in any place and time (26). Although some studies have been carried out evaluating the effects of massage therapy on agitation, their results are contradictory and rather confusing. On the other hand, to the best of the author's knowledge, no study has been conducted regarding the impact of head and face massage using effleurage technique on the agitation of the elderlies with Alzheimer's disease.

Considering the aging population in Iran and the increasing rate of Alzheimer's disease in the elderly population, the prevalence of agitation is remarkably high in this group. Therefore, we aimed to investigate the effect of head and face massage on agitation in the elderly Alzheimer's disease patients residing in nursing homes in Yazd, Iran, 2016.

Methods

In this randomized clinical trial, with a control group and pretest-posttest design, 70 out of 142 elderly Alzheimer's patients from two similar nursing homes in Mehriz and Taft counties (Yazd Province, Iran) were enrolled.

The inclusion criteria were having definitive diagnosis of Alzheimer's disease and incidence of mild to moderate Alzheimer's disease as diagnosed by a neurologist and documented in the medical record, being aged 60 years and older, residing in the nursing homes of Mehriz and Taft counties, providing consent to participate in the study, not suffering from mental retardation, not having wound in the head and face, feeling agitated (using the observations of the last two weeks of the researcher and completing CMAI at the end of the second week), and not consuming medicines affecting agitation. Moreover, the exclusion criteria included going on short-term leave and discharge from the center.

From the research population, 70 participants were selected. For this purpose, after selecting the eligible samples from the 142 subjects, the patients were randomly assigned to intervention and control groups using Random Allocation software. Using this software, odd numbers from the intervention group and even numbers from the control group were selected. The sampling process was performed from 15 August to 15 September, and the intervention was conducted from 26 September to 5 October 2016.

According to the previous studies and based on the comparison of two independent means with a confidence level of 95%, power of 80%, and a standard deviation derived from Molye et al.'s study(30), the sample size in each group was calculated at 31, which was considered 35 in each group taking into account sample attrition.

The confidence level of 95% is equal to 1.96. The 80% power factor is equal to 0.84. s is the estimation of standard deviation of the agitation score in each of the two groups.

• d is the least difference in the mean agitation score between the two groups, which indicates the difference to be significant and s is considered 0.5.

The data collection tools comprised a demographic form and the CMAI. This instrument identifies and prioritizes disturbing behaviors (aggressive, physically non-aggressive, verbally agitated, and hiding/hoarding behaviors). The CMAI is a 29-item scale, each rated based on a 7-point scale ranging from 1 (never) to 7 (several times per hour) and the observation of the last two weeks. The highest and lowest possible scores are 203 and 29, respectively. Also, the score 90 was considered as the entry score.

This scale consists of four subscales of aggressive (15 items), physically non-aggressive (8 items), verbally agitated (4 items), and hiding/hoarding (2 items) behaviors. Zare et al. evaluated the reliability of the scale with the test-retest method using Spearman-Brown correlation coefficient and reported the test-retest reliability coefficient for the whole scale to be 0.99 (P<0.01). The test-retest reliability coefficient for the subscales varied from 0.38 to 0.92, indicating the test-retest reliability of this scale and Cronbach's alpha index to be 0.82. The findings showed that the whole scale and all its four subscales had high internal consistency. These significant coefficients ranged from 0.43 to 0.90 (36). In this study, reliability was established by the Spearman-Brown Prediction Formula for 10 patients with Alzheimer's disease. The test-retest reliability was 0.98 for the entire questionnaire.

The demographic form included the patient's name, age, gender, economic status, educational level, wound in the head and face, mental retardation, and short-term leave from the center.

To perform massage, the patients were placed in supine position, and then the masseur stood next to their heads. Initially, the masseur used a thumb and a finger to massage the forehead, scalp, eyebrows, nose, inner corners of the eyes, and eyelids. Then, the masseur laid his/her palms on the cheeks and massaged the chin. Finally, s/he used fingertips, low pressure, skin, and muscle massaged (32).

All the elderlies with mild to moderate Alzheimer's disease with personal willingness and consent from nursing home authorities were included in the study after completing the demographic information form by the first researcher. To examine the effect of massage therapy using the effleurage (stroking) and compression techniques, all the participants were identified using the CMAI two weeks pre-intervention. After this period, the CMAI was immediately completed for the participants by the first trained nurse. Then, for the participants in the intervention group, massage therapy using the effleurage (stroking) and compression techniques was performed by the second trained nurse for 10 minutes a day for 10 days (31) in the evening, since it is suggested that agitation in people with dementia is intensified due to the sunset phenomenon (37). Although no intervention performed on the control group, if they wished so, the intervention was carried out on them after the study. After 10 sessions, the subjects were evaluated by the first trained nurse using the CMAI.

This study was conducted following obtaining the approval of the Research Ethics Committee of Rafsanjan University of Medical Sciences, Rafsanjan, Iran, and submitting the written letter of introduction by the Yazd Welfare Organization to the respective authorities in geriatric nursing homes. The patient information was kept completely confidential.

The data obtained in the study were analyzed using the descriptive and inferential statistics in SPSS, version 18. To determine normality of the data, Kolmogorov-Smirnov test was run and found that the data are not normally distributed. Thus, for pre- and post-intervention comparison of each group and comparing the two groups, the Wilcoxon and Mann-Whitney tests were applied, respectively. P-value less than 0.05 was considered statistically significant.

Results

The mean ages of the intervention and control groups were respectively 82.2±10.6 and 81.5±9.6 years. In terms of gender, 25 (71.4%) of the subjects in the intervention group and 20 (57.1%) in the control group were female. Also, 10 (28.6%) individuals in the intervention group and 15 (42.9%) in the control group were male. The findings showed that the mean age of the two groups was above 80 years and there was no significant difference in age between the two groups. In addition, most of the participants in both groups were illiterate (Table 1).

In the control group, before the study, the overall mean agitation score was 82.1±17.3 that reached to

Table 1. Comparison of demographic characteristics of the subjects under study in the intervention and control groups

Variable	Control group Mean±standard deviation	Intervention group Mean±standard deviation	Test result
Age (year)	81.5±9.6	82.2±10.6	*P=0.77
Gender	Number (percentage)	Number (percentage)	
Male	15 (42.9)	10 (28.6)	*P=0.21
Female	20 (57.1)	25 (71.4)	
Level of education			
Literate	32(91.4)	8(22.9)	*P=0.10
Illiterate	3(8.6)	27(77.1)	

*P Mann-Whitney U Test

80.8±18.3 by the end of the study (P=0.11). Also, the mean score of aggressive behaviors was 39.1±9.6 before the study, which reduced to 38.6±10.1 after the study (P=0.54). In the physically non-aggressive behaviors subscale, the mean scores were 23.4±8.6 and 22.7±8.1 pre- and post-intervention, respectively (P=0.21). Further, the mean scores in the hiding/hoarding behaviors subscale were 5.2±3.6 and 5.2±2.4 pre- and post-intervention, respectively (P=0.83). Finally, in the verbally aggressive behaviors subscale, the mean scores were 14.4±2.5 and 14.2±2.3 pre- and post-intervention, respectively (P=0.61). Comparison of the agitation behaviors of the control group showed no significant difference in the agitation behaviors before and after the study; similarly, the Mann-Whitney U test did not show any significant differences (P>0.05; Table 2).

In the intervention group, the mean score of agitation before the study was 77.2±14.4, which diminished to 49.7±6.0 after the study (P<0.001). Moreover, in the aggressive behaviors subscale, the mean scores pre- and post-intervention were 37.7±9.8 and 23.0±4.4 (P<0.001), respectively. In the physically non-aggressive behaviors subscale, the mean scores before and after the intervention were 20.0±4.9 and 14.6±2.6 (P<0.001), respectively. In the hiding/hoarding behaviors subscale, the mean scores before and after the intervention were 4.1±2.0 and 3.4±1.3 (P<0.001), respectively. In addition, in the verbally aggressive behaviors subscale, the mean scores before and after the intervention were 15.2±2.6 and 8.5±1.6, respectively (P<0.001). Comparison of the agitation behaviors of the intervention group revealed a significant difference in all the agitation behaviors before and after the study. The Mann-Whitney U test reflected a significant difference in this regard (P<0.05; Table 2).

After the study, the overall mean agitation score was 49.7±6.0 in the intervention group, while it was

Table 2. Comparison of the mean scores and standard deviations of the agitation behaviors in the elderlies based on group

Behavior type	Study stage	Group		Between-group test results
		Intervention Mean±standard deviation	Control Mean±standard deviation	
Aggressive	Before	37.7±9.8	39.1±9.6	*P=0.75
	After	23.0±4.4	38.6±10.1	*P<0.001
	Intra-group test result	**P<0.001	**P=0.55	
Physically non-aggressive	Before	20.0±4.9	23.4±8.6	*P=0.08
	After	14.6±2.6	22.7±8.1	*P<0.001
	Intra-group test result	**P<0.001	**P=0.21	
Hiding/hoarding	Before	4.1±2.0	5.2±3.6	*P=0.33
	After	3.4±1.3	5.2±2.4	*P=0.001
	Intra-group test result	**P<0.001	**P=0.83	
Verbally aggressive	Before	15.2±2.6	14.4±2.5	*P=0.15
	After	8.5±1.6	14.2±2.3	*P<0.001
	Intra-group test result	**P<0.001	**P=0.61	
Overall agitation score	Before	77.2±14.4	82.1±17.3	*P=0.38
	After	49.7±6.0	80.8±18.3	*P<0.001
	Intra-group test result	**P<0.001	**P=0.11	

* Wilcoxon Test, ** Mann-Whitney U Test

80.8±18.3 in the control group (P<0.001). The mean score of aggressive behavior in the intervention group was 23.0±4.4, while it was 38.6±10.1 in the control group (P<0.001). In the non-aggressive

physical behavior subscale, the mean score in the intervention group was 14.6±2.6, while it was 22.7±8.1 in the control group (P<0.001). Besides, the mean score of the hidden behaviors subscale in the intervention group was 3.4±1.3, whereas in the control group, it was 5.2±2.4 (P<0.001). In terms of aggressive verbal behavior subscale, the mean scores in the intervention and control groups were 8.5±1.6 and 14.2±2.3 (P<0.001), respectively. The Wilcoxon test revealed a significant difference between the two groups after the intervention (P<0.001; Table 2).

Discussion

Since the incidence of Alzheimer's disease in the elderly is on the rise and the management of behavioral symptoms poses a big challenge for the health community, the present study investigated the effect of head and face massage on agitation in the elderly Alzheimer's patients residing in nursing homes. The results showed that the mean scores of agitation and its subscales in the intervention group were significantly reduced compared to the control group.

The findings ascertained the positive effect of massage in Alzheimer's patients. In a similar study, Suzuki et al. (2010) examined the effect of massage therapy (30 minutes a day, five days a week, for six weeks) on stress and aggressive behavior on 20 elderly patients with severe dementia. These researchers found that massage therapy reduced the level of stress and aggressive behavior in patients with severe dementia (29). Their results were in agreement with our findings, suggesting the positive effects of massage therapy. However, the number of massage therapy sessions in the study by Suzuki et al. was higher than the number of sessions held in the present investigation. As such, the 30-day massage therapy could reduce the level of stress and aggressive behavior in the study by Suzuki et al., while massage therapy 10 minutes a day for 10 days in the present study resulted in less reduction in the mean score of agitation behavior.

A study was conducted by Bahraini et al. (2014) to determine the effect of head and face massage on sinusitis-induced headache in 35 women residing in the Khorasgan University dormitory, the severity of pain was significantly different before and after massage therapy in the head and face regions using the effleurage (stroking) and compression techniques (32). This finding was consistent with those of Bahraini et al., indicating the positive effect of massage therapy. The numbers of the massage therapy sessions and samples in the study by Bahraini et al. were less than those in the present study; they showed that the 15-minute massage therapy could mitigate pain severity.

Snyder et al. (1995) investigated the effects of massage and therapeutic touch in an experimental crossover study compared to the presence of a researcher without intervention on 17 Alzheimer patients. Hand massage and therapeutic touch were performed once a day (evening) for 10 days, while the researcher presented to the hospital for five days. Their results indicated that the non-aligned hand massage and touch therapy did not reduce agitation in patients with Alzheimer's disease (31). In that study, the type of massage and the number of cases were different from those of the present study, and this difference in results could be attributed to differences in the type of massage and the number of research samples.

In another study, Molly et al. (2010) examined the effect of foot massage on agitation in 55 elderly patients with Alzheimer's disease in a clinical trial performed in five long-term care centers in Australia. In that study, the patients in the intervention group received 10 minutes of foot massage for one week (from 1:00 pm to 5:00 pm, due to increased agitation of the patients in the evening). Inconsistent with the present results, they showed that restlessness increased in both groups, but this increase was more pronounced in the control group (30). This discrepancy in results might be due to differences in the number of care centers, the type of massage, and the number of massage sessions.

Among the limitations of this study was the presence of caregivers as intrusive agents. According to the inclusion criteria, the generalization of the results to all Alzheimer's patients is limited due to the mentioned criteria. Considering that agitation is not the same for all individuals, a pretest-posttest design was used in this study to determine the changes in agitation in each individual.

Implications for Practice

The findings of this study showed that head and face massage could effectively decrease agitation in the elderly with Alzheimer's disease. According to the results of this study, the use of head and face massage as an effective nursing intervention can diminish agitation in elderly Alzheimer's patients. Considering the simple application of this method, it can be used as a complementary intervention

with pharmacological treatment in these patients.

Head and face massage is a safe, simple, low-cost, non-pharmacologic, and tolerable intervention in agitation management. Regarding the effectiveness of massage therapy in agitation management in elderly Alzheimer's patients, nurses and caregivers are recommended to use this method to reduce agitation in these patients.

Applying complementary therapies, including massage, is part of the professional goals of nurses. Due to the prevalence of agitation and anxiety in elderly Alzheimer's patients, the challenge it poses to caregivers and family members, and the increased burden and costs it imposes on societies, massage can be deemed as a safe non-pharmacological treatment method. This easy, safe, non-invasive, and relatively inexpensive practice can be utilized along with medical treatment. Therefore, this intervention can be carried out by nurses and caregivers in nursing care centers. It can also be trained to patients' family members as an effective treatment.

Considering the positive effects of massage therapy, which can greatly reduce stress and pain and prevent the occurrence of restlessness, and scarcity of similar studies on the effect of massage on frailty in Alzheimer's disease, performing further studies is recommended. The researcher suggests applying this treatment method for the elderly and patients suffering from anxiety and pain. Finally, we recommend the use of other forms massage therapy for restlessness.

Acknowledgments

Conflicts of Interest

The authors declare no conflicts of interest.

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