Effect of Lavender Oil Inhalation versus Acupressure on Anxiety Level of Geriatric Patients Undergoing Hemodialysis

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Abstract

Background: *Hemodialysis (HD) is a viable and widely prescribed therapeutic option for older adults with End Stage Renal Disease. Even though anxiety is one of the most common difficulties that HD patients face and frequently linked to depression, a lower perceived quality of life, and a lack of therapeutic adherence. As non-pharmacological therapies are safer to use in the management of geriatric patients' disorders, implementing of such approaches to reduce anxiety levels is a worthwhile goal for the gerontological nurse.* ***Aim****: This study aimed to determine the effect of lavender oil inhalation versus acupressure on anxiety level of geriatric patients undergoing hemodialysis.* ***Design****: A quasi-experimental research design was utilized.* ***Setting****: Hemodialysis Unit of Damanhur National Medical Institute, El-Beheira Governorate, Egypt.* ***Subjects:*** *Sixty-six geriatric patients were randomly assigned to three equal groups (n=22 in each group) lavender oil inhalation, acupressure, and control group.* ***Tools****: Four tools were used: Quick Smell Identification Test, Short Portable Mental Status Questionnaire, Geriatric Anxiety Scale (GAS), and Hemodialysis geriatric patients' Socio–Demographic and Clinical Data Structured Interview Schedule.* ***Results****: The mean geriatric anxiety scale scores were decreased post interventions in the lavender aromatherapy group (from 29.8± 5.0 to 19.7±5.3) as well as in the acupressure group (from 27.1 ±3.6 to 18.3± 6.4, with a highly statistically significant difference (p = 0.001).* ***Conclusion:*** *Both lavender aromatherapy and acupressure were effective in reducing anxiety in geriatric patients undergoing hemodialysis, with lavender aromatherapy having a relatively higher effect than acupressure.* ***Recommendations****: Encourage nurses to use lavender aromatherapy inhalation and acupressure as a non-pharmacological approach to reduce patient anxiety and improve the quality of nursing care*

Keywords: Lavender oil inhalation, Acupressure, Anxiety, Geriatric patients, Hemodialysis.

Introduction

Elderly patients with end stage renal disease (ESRD) are commonly affected by a multitude of clinical problems associated with hemodialysis (HD) such as anxiety, anemia, hypotension, depression, sleep problems and fatigue. Anxiety had been reported to be among the highest prevalent psychological problem experienced by patients receiving HD (Naderifar et al., 2018). Anxiety disorders are a significant clinical problem in HD geriatric patients that is under-recognized. In general, it can have a devastating effect on the health and well-being of older adults, and untreated anxiety can lead to irrational behavior, disobedience, conflict, difficult in performing daily activities,

and fear of death (Delgado-Domínguez et al., 2021).

Over 70% of HD patients who suffer from anxiety are unaware of their symptoms and do not recognize the need for proper management (Naderifar et al., 2018). The gerontological nurse has significant roles and responsibilities in the assessment and earlier identification of anxiety, as well as reducing existing stressors and creating a therapeutic environment for hemodialysis geriatric patients. Anxiety management in hemodialysis patients includes both pharmacological and non-pharmacological interventions (Gerogianni et al., 2019). Non-pharmacological interventions are safer to be used in the management of anxiety among HD geriatric patients. In this regard, among the most noteworthy non-pharmacological methods are complementary therapies, such as acupressure, aromatherapy, massage therapy, meditation, and guided visual imagery (Gerogianni et al., 2019).

Complementary approaches for reducing anxiety are inexpensive, simple to implement, non-invasive, non-pharmacological, and free of side effects. Aromatherapy is a popular approach in non-pharmacological interventions for anxiety relief. Acupressure has also been shown to effectively relieve anxiety with no complications by boosting brain reactions and hormone activity (Gung, 2021).

Aims of the Study

This study aims to investigate the effect of lavender oil inhalation versus acupressure on anxiety level of geriatric patients undergoing hemodialysis.

Research Hypothesis

Geriatric patients undergoing hemodialysis who receive lavender oil inhalation exhibit lower levels of anxiety than those who receive acupressure.

Materials and Method

Materials

Design: This study followed a quasi-experimental research design.

Settings: This study was conducted at the Damanhur National Medical Institute, El-Beheira Governorate, which is affiliated to the Egyptian Ministry of Health and Population.

Subjects: This study included 66 patients aged 60 and over who had been on hemodialysis for at least 6 months and up to 5 years, receiving hemodialysis three times a week for four hours each session, with no or mild cognitive impairment (based on the Short Portable Mental Status Questionnaire), with normal olfactory function (based on the Quick Smell Identification Test), and had anxiety (based on the Geriatric Anxiety Scale). Additionally, those patients had no history of herbal allergies or acute respiratory diseases, were not receiving oncology treatment, had no amputations at the site of acupressure, were not taking tranquillizers and anxiolytics, not expressed stressful events in the previous 6 months, and willing to participate in the study.

Geriatric patients who fulfilled the inclusion criteria were randomly divided into three equal groups (22 geriatric patients for each group). The study group A consisted of geriatric patients assigned to receive lavender oil to inhale, the study group B included geriatric patients receiving acupressure technique, and the control group C where geriatric patients received hemodialysis unit routine care of the unit.

Tools: Four tools were used to collect data of the study:

Tool One: Quick Smell Identification Test (Q-SIT):

This is a reliable screening test (r = 0.87) was developed by Jackman & Doty, 2005 to enable preliminary diagnosis of anosmia and for olfactory impairments using three odors (cloves, coffee, and rose). The score of the Q-Sticks test ranged from 0 (no odor identified) -3(all odors identified); zero means anosmia and 3 means normal olfactory function

Tool Two: Short Portable Mental Status Questionnaire (SPMSQ):

This tool was developed by Pfeiffer (1975) and it was translated into Arabic by Abd Elsalam, (2012). In the current study, this Arabic version was used to exclude older adults with moderate and severe cognitive impairment. Items were scored and classified as follows: 0-2

errors: normal mental functioning, 3-4 errors: mild cognitive impairment, 5-7errors: moderate cognitive impairment, 8 or more errors: severe cognitive impairment.

Tool Three: Geriatric Anxiety Scale (GAS):

The GAS is a 30-item self-report rating scale designed to measure anxiety symptoms with older adults and developed by Segal et al. (2010) which are intended to holistically measure several components of anxiety: somatic (9 items), affective (8 items), and cognitive symptoms (8 items). It is a Likert-type scale that ranges from 0 (not at all) to 3 (all of the time). Total Score = sum of items 1 through 25; Possible total scores range from 0 to 75. The score 0 to less than 24 indicates mild anxiety, from 25 to less than 50 indicate moderate anxiety and more than 50 indicate sever anxiety.

Tool Four: Hemodialysis geriatric patients' Socio–Demographic and Clinical Data Structured Interview Schedule:

This tool was developed by the researcher and included two parts: **part I:** Socio-demographic data such as age, sex, marital status, level of education, residence, monthly income, and occupation before retirement. **Part II:** The clinical data of the studied geriatric patients such as history of ESRD, its onset, start of hemodialysis.

Method

1) Preparation phase:

During this phase, the researcher obtained study approval from the responsible authorities, as well as a certificate indicating the safety of lavender oil inhalation from the medicinal plants department, Faculty of Science, Alexandria University. The researcher also attended a training course on the basic concepts and techniques of acupressure at physical fitness unit, Faculty of Sport education, Alexandria University. The study tools for gathering the necessary data were prepared and tested for validity and reliability, a pilot study was conducted, and the proposed program was designed (covered simple instructions and illustrations for each step in lavender aromatherapy and acupressure technique).

2) Implementation phase

-Before starting the intervention, the researcher ensures that the environment is quiet, well ventilated, and free from any distraction.

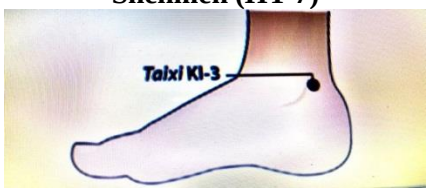
- Geriatric patients in the three groups were assessed individually using tool four to collect baseline data on their socio-demographic characteristics and health profile, and they were assessed using tool three for the first time to assess their anxiety level (pretest).

-For the study group A (lavender aroma therapy group), each of the geriatric patients is given the lavender oil to inhale, after one hour from starting the hemodialysis session through the application of two drops of lavender essential oil on a piece of 2 x 2 cm gauze attached to the geriatric patient's pillow approximately 10 cm close to his nose. The patient is then asked to take a deep breath and exhale it slowly during the hemodialysis session in order to inhale the oil properly. This process is applied for 20 minutes (using stopwatch), 3 times a week on Saturday, Monday and Wednesday during the morning and evening shifts for one month.

-For the study group B (acupressure technique group), Pressure was applied to three selected acupoints **(Figure 1)** of each geriatric patient (GV 29 at the midway between the medial ends of the eyebrow, HT 7 on the non-fistula hand, and KI 3 on the left and right legs). For each acupoint the researcher performed a one-minute warm-up to each acupoint in an outward and semi-circular motion, applying consistent fingertip or thumb pressure on each acupoint in circular motion in clockwise and counterclockwise for 1 minute, cooling down for each acupoint for one minute by moving the thumb in one direction up for several consecutive times. Each session lasted 15 minutes and performed on Sunday, Tuesday, and Thursday (during the morning and evening shifts) for three sessions a week for one month.

Yin Tang (GV 29)

Shenmen (HT 7)



Taixi (KI 3)

Figure 1: The selected acupoints

-For the study group C (control group), patients received the routine care of the hemodialysis unit (monitoring vital signs, close observation of patients' response to treatment and give reassurance). No instructions or illustrations were given to those patients .

Data collection began in early May to the end of July 2021.

3) Evaluation phase:

At the end of the 4th week, each patient in the three groups was re-assessed for the effectiveness of the interventions using tool three (Geriatric Anxiety Scale) (Post-test).

Ethical considerations:

An informed written consent was obtained from each study subject after explanation of the study purpose. Anonymity and privacy of the study subjects, confidentiality of the collected data, and the subject's right to withdraw at any time were maintained.

Statistical Analysis

Data was analyzed with statistical package for social science (SPSS) version 22. The level of significance was ≤ 0.05.

Results

The socio-demographic characteristics of hemodialysis patients are depicted in **Table 1**. Geriatric patients age ranged from 60 to 85 years old, with a mean of 69.4 ± 9.8 years. Males constituted 56.1 %, while females 43.9 %. In terms of social status, 68.2 % of elders were married, and 31.8 % were widows. Of the studied geriatric patients, 92.4% had comorbidities, with hypertension accounting for the majority (95.1%), diabetes mellitus 37.7%, and cardiovascular diseases 18%. Iron supplements was the most widely consumed medication by the studied geriatric patients undergoing HD (89.4 %), followed by calcium 80.3%, antihypertensives 69.7%, and hypoglycemic agents 25.8%.

The distribution of the studied geriatric patients depending on their hemodialysis-related data is shown in **Table 2**. Regarding the duration of ESRD, 51.5% were diagnosed with ESRD since 3 to 4 years and the majority (81.8%) began hemodialysis from 3 to less than 5 years, the majority in the three groups (93.9 %) used arteriovenous fistulas as a vascular access. With regard to the reported HD side effects, 98.5% of them claimed mood disturbances, 78.8% muscle tension, 69.7% skin itching, 51.5% insomnia, and 50% had numbness.

Figure 2 shows the initial evaluation of anxiety level of the studied geriatric patients undergoing HD. In the initial evaluation phase, 86.4% of lavender aromatherapy group demonstrated moderate level of anxiety while 13.6% had mild anxiety. On the other hand, 72.7% of acupressure group had moderate anxiety while 27.3% had mild anxiety. For control group, 59.1% had moderate anxiety and 40.9% had mild anxiety.

Comparison between the groups in relation to the level of anxiety pre and post the intervention is illustrated in **Table 3.** Prior to intervention, the large percentage of geriatric patients across the three groups reported moderate levels of anxiety (86.4% of the patients in group A, 72.7% for those in group B, and 59.1% in group C), while post-intervention, most of the geriatric patients in groups A, B reported the same percent (81.8%), and group C (72.7 %) encountered mild anxiety. Furthermore, the table shows that the differences in anxiety levels between the lavender aromatherapy and acupressure groups were highly statistically significant (p= 0.001). Conversely, no statistically significant differences were observed in the anxiety level pre and post evaluation in the control group (p=0.054).

Comparison between group A and group B according to the mean score of GAS overall and by each domain pre and post the intervention was illustrated in **Table 4**. The mean geriatric anxiety scale scores were decreased post interventions in the lavender aroma therapy group (from 29.8± 5.0 to 19.7±5.3) as well as the acupressure group (from 27.1 ±3.6 to 18.3± 6.4). with a highly statistically significant difference (p=0.001), with a relative higher effect of lavender aromatherapy on reducing anxiety than that of acupressure.

Discussion

Anxiety has a negative effect on patients' quality of life. In the Geriatric patients undergoing HD, anxiety has been associated with increased mortality, suicidal ideation, decreased adherence to treatment, hospitalization, dependence, and somatization of symptoms such as pain and fatigue. Optimal management of anxiety in geriatric patients undergoing HD remains a challenge and a holistic approach that includes pharmacologic and non-pharmacological methods is critically required. Several non-pharmacologic approaches can be utilized to improve symptoms of anxiety in HD patients (Gerogianni et al., 2019). Aromatherapy and acupressure are among the main approaches adopted as non-pharmacological interventions to treat psychological problems with no reported complications (Dehghanmehr et al., 2020). Therefore, this study aims to determine the effect of lavender aromatherapy versus acupressure on reducing anxiety levels among elderly patients undergoing hemodialysis.

In the initial assessment of the present study, high percentages of the studied geriatric patients undergoing HD suffer from moderate anxiety. This finding might be related to the fact that, geriatric patients on hemodialysis face many physical, financial and psychosocial stressors which can trigger anxiety (Alfikrie et al., 2020). As shown in the current study findings, the elderly patients had comorbidities for which they consume multiple medications, require long-term care, depend on others, as well as insufficient financial resources, all of which can generate anxiety. Finding of the present study is in agreement with other multiple studies done in Egypt by Elsayed et al. (2019) and in Canada by Collister et al. (2019) which concluded that anxiety is more prevalent among patients undergoing hemodialysis. However, the prevalence of anxiety in geriatric patients undergoing hemodialysis reported in the current study was greater than the incidence of anxiety among HD patients reported in Saud Arabia by Turkistani et al. (2014) and at community-based dialysis centers in Singapore (Griva et al., 2014). These reported differences in prevalence are likely attributable to different measurement tools that are used in the different studies as well as different cultures and socioeconomic backgrounds.

Notably, reduction in the mean scores for all GAS domains and overall GAS scores within the lavender aromatherapy group was observed after the intervention compared to its level before implementing the lavender aromatherapy and when compared with the control group, this indicates positive effect of lavender aromatherapy on reducing the anxiety levels of geriatric patients undergoing HD. These results could be attributed to the fact that inhaling lavender oil has sedative, calming, and carminative (smooth muscle relaxation) effects, in addition to its anxiolytic, antidepressant and stress-reducing properties. Lavender is thought to inhibit the activity of the hypothalamus-hypophysis-adrenal by affecting the nervous system, lowering cortisol excretion and increasing serotonin secretion (Tayebi et al., 2015).

In the literature, there are many researchers studied the use of lavender aromatherapy via inhalation on different groups including the elderly which are in line with the results of the current study. For example, the study by Şentürk and Tekinsoy Kartın (2018) in Turkey, which examined the effect of inhaling lavender oil for a week on anxiety levels in HD patients including older patient, revealed that, in comparison to the control group, anxiety levels in the intervention group decreased significantly at the last follow-up (P <0.001). Similarly, other studies focused on geriatric patient undergoing hemodialysis Ilali et al. (2021) showed a significant reduction of anxiety levels after

lavender oil inhalation. Furthermore, the results of the current study come in line with the findings from the randomized controlled trial of Ebrahimi et al. (2021), who found that inhaling lavender and chamomile essential oils for 30 days reduces anxiety in elderly people living in the community both immediately after the intervention and one month later. Additionally, similar findings were obtained by Xiong et al. (2018) in China and Bouya et al. (2018) in Iran.

On the other hand, conflicting results were reached by Bagheri-Nesami et al. (2017) in Iran who revealed that lavender aromatherapy produced no significant effect on anxiety levels after the intervention. Likewise, Tayebi et al. (2015) in Iran reported in their study the significant effect of aromatherapy with lavender extract in reducing stress and depression, however, the effect of aromatherapy was not statistically significant in reducing anxiety. Moreover results of the current study contradict those of Seifi et al. (2014), whose study of patients who underwent coronary bypass surgery indicated that aromatherapy with lavender extract was not effective in reducing patients' anxiety. Another study done in the USA by Muzzarelli et al. (2006) who examined the effect of inhaling 10% diluted lavender essential oil for 5 minutes on anxiety prior to a scheduled colonoscopy and found that aromatherapy had no effect on the level of anxiety in those patients. Possible reasons for the difference between the results could be the difference in anxiety scales, the duration of each aromatherapy session, and the concentration of lavender oil.

In the same context, the current study indicated an important effect of acupressure intervention on anxiety levels in geriatric patients undergoing hemodialysis. It was found that all subscale and total scores of the intervention group on the GAS decreased significantly after the intervention than before and when compared with the control group. These positive results might be owed to the regulation of neurotransmitters and hormone functions by manual stimulation of acupressure points (Lane, 2009). Regulating nervous and hormonal functions through constant fingertip pressure on acupressure points may improve sleep and overall health, contributing to a reduction in psychological symptoms including anxiety. Therefore, acupressure can be suggested as an adjunct treatment for psychological illnesses. The present findings are similar with those of the study conducted in Iran by Beikmoradi et al. (2015) where they found significant reduction in anxiety mean scores after the demonstration of acupressure . In addition, the results of the current study are consistent with those of a randomized controlled trial in Malaysia by Hmwe et al. (2015) who found that four weeks of acupressure three times a week reduced depression, anxiety, stress, and general psychological distress significantly in hemodialysis patients.

Furthermore, an integrative review of acupressure interventions for older adults concluded that the use of specific pressure points, with standardized acupressure protocols, may improve the psychological well-being of older adults (Hmwe et al., 2019). Consistent results were also achieved by other studies conducted in Iran by Ebrahimi et al. (2021), Dehghanmehr et al. (2020) and in Europe by Mącznik et al. (2017). Acupressure has also been found to reduce anxiety and vital signs in women with coronary artery disease (Rahmani Vasokolaei et al., 2019). However, a single group study in elderly people with Alzheimer's disease did not show any significant positive effect of acupressure on anxiety (Simoncini et al., 2015). The choice of acupressure points, the method applied, and the dose of acupressure (frequency and duration) may change the effect of the treatment and lead to different study results.

The current study found a relative higher effect of lavender aromatherapy on reducing anxiety than that of acupressure. This finding is likely related to the acceptance and cooperation of the lavender aromatherapy group due to the simple technique of lavender inhalation compared to acupressure which goes through many steps from identifying pressure points to the cooling process, in addition, diffusion of the aroma may lead to a faster mood improvement. A review study in Iran by Ebrahimi et al. (2021) investigated the role of complementary therapy on anxiety in patients before and after surgery

found that lavender aromatherapy is more effective than acupressure technique in reducing anxiety.

Results of the current study added new evidence to support the potential application of lavender aromatherapy inhalation and acupressure in ESRD patients as an alternative non-pharmacological treatment for anxiety relief. It would also reduce the renal burden and additional risks of administering pharmacological agents to patients with impaired renal function. Due to its ease of application, lavender aromatherapy inhalation and acupressure are also versatile enough to be applied not only by medical staff but also by a patient's family or caregiver with proper training. Finally, the researcher did not notice, and the participants did not show any side effects related to either lavender aromatherapy inhalation or acupressure.

Conclusion

According to the findings of the present study, implementation of either lavender aromatherapy or acupressure was effective in reducing anxiety level in the geriatric patients undergoing hemodialysis. While the use of both lavender aromatherapy and acupressure was effective in reducing anxiety, the effect of lavender aromatherapy is relatively higher than that of acupressure.

Recommendations

In line with the findings of the study, the following recommendations are made:

- Assessing the psychological status of each geriatric patient should be an integral part of a multidisciplinary geriatric assessment using valid and reliable tools for early identification of those at risk for psychological problems including anxiety.
- In-service training Programs to be planned by Gerontological Nursing Department members and offered on a regular basis to nurses at various hemodialysis units. The program should include definition, different types and importance of CAM therapies particularly lavender aromatherapy and acupressure technique in order to encourage nurses to use these interventions to improve the quality of nursing care and decrease patients' anxiety.
- The use of aromatherapy and/or acupressure is to be incorporated into the undergraduate and graduate nursing curricula.

Limitations of the study:

- Some geriatric patients missed one or more hemodialysis sessions during the data collection process. They were excluded from the study, and other patients were assigned to participate instead.

Table 1: Distribution of the studied geriatric patients undergoing hemodialysis (HD) according to their socio-demographic characteristics and clinical data

Socio-demographic data		Groups						Total		P-value
		Group A**		Group B***		Group C****				
		No=22	%	No=22	%	No=22	%	No=66	%	
Age in years	60 -	4	18.2	5	22.7	8	36.4	17	33.3	.155
	65 -	7	31.8	4	18.2	10	45.4	21	37.8	
	70 -	9	40.9	11	50.0	4	18.2	24	22.7	
	75 -	2	9.1	1	4.5	0	0.0	3	4.5	
	80 ≤ 85	0	0.0	1	4.5	0	0.0	1	1.5	
Mean age		66.2 ± 8.9		72.5 ± 10.6		64.7 ± 7.8		69.4 ± 9.8		
Sex	Male	12	54.5	12	54.5	13	59.1	37	56.1	.940
	Female	10	45.5	10	45.5	9	40.9	29	43.9	
Social status	Married	17	77.3	14	63.6	14	63.6	45	68.2	.533
	Widow	5	22.7	8	36.4	8	36.4	21	31.8	
Educational level	Illiterate	6	27.3	9	40.9	7	31.8	22	33.3	.435
	Read and write	7	31.8	7	31.8	9	40.9	23	34.8	
	Basic education	0	0.0	1	4.5	0	0.0	1	1.5	
	Secondary	4	18.2	2	9.1	0	0.0	6	9.1	
	University	5	22.7	3	13.6	6	27.3	14	21.2	
Living condition	With family	21	95.5	21	95.5	21	95.5	63	95.5	.514
	Alone	1	4.5	1	4.5	1	4.5	3	4.5	
Presence of comorbidities #	-no	1	4.5	3	13.6	1	4.5	5	7.6	.764
	- Hypertension	20	95.2	18	94.7	20	95.2	58	95.1	
	- Diabetes mellitus	8	38.1	8	42.1	7	33.3	23	37.7	
	- Cardiovascular system diseases	6	28.6	4	21.1	1	4.8	11	18.0	
	- Gastrointestinal and liver diseases	0	0.0	1	5.3	2	9.5	3	4.9	
	- Hypothyroidism	1	4.8	1	5.3	1	4.8	3	4.9	
Type of medication consumed #	- Iron	21	95.5	22	100.0	16	72.7	59	89.4	.029*
	- Calcium	17	77.3	18	81.8	18	81.8	53	80.3	
	- Antihypertensive	18	81.8	12	54.5	16	72.7	46	69.7	
	- Hypoglycemic	6	27.3	5	22.7	6	27.3	17	25.8	
	- Anticoagulants	3	13.6	2	9.1	10	45.5	15	22.7	
	- Vitamins and minerals	4	18.2	3	13.6	7	31.8	14	21.2	
	- Cardiovascular drugs	6	27.3	6	27.3	3	13.6	15	22.7	
	- Gastrointestinal and hepatobiliary medications	2	9.1	1	4.5	2	9.1	5	7.6	

P: Exact probability test ** P < 0.05 (significant)*

***Group A: lavender aromatherapy group* ****Group B: acupressure group* *****Group C: control group*

 # More than one answer

Table 2. Distribution of the studied geriatric patients undergoing hemodialysis (HD) according to their hemodialysis related data

Hemodialysis history		Group						Total		P-value
		Group A*		Group B**		Group C***				
		No=22	%	No=22	%	No=22	%	No=66	%	
Duration of End Stage Renal Disease (ESRD)	< 3 years	5	22.7	3	13.6	4	18.2	12	18.2	.916
	3-4 years	11	50	11	50	12	54.5	34	51.5	
	5-6 years	6	27.3	8	36.4	6	27.3	20	30.3	
Duration of hemodialysis	6months < year	0	0	1	4.5	2	9.1	3	4.5	.311
	1year - < 3years	2	9.1	2	9.1	5	22.7	9	13.6	
	3years - < 5 years	20	90.9	19	86.4	15	68.2	54	81.8	
Type of vascular access	- Arteriovenous fistula	20	90.9	21	95.5	21	95.5	62	93.9	.766
	- Immediate catheter	2	9.1	1	4.5	1	4.5	4	6.1	
HD side effects #	- Mood disturbances	22	100	22	100	21	95.5	65	98.5	.430
	- Muscle tension	15	68.2	19	86.4	18	81.8	52	78.8	
	- Skin itching	15	68.2	15	68.2	16	72.7	46	69.7	
	- Dyspnea	7	31.8	11	50	9	40.9	27	40.9	
	- Insomnia	10	45.5	11	50	13	59.1	34	51.5	
	- Numbness in the extremities	12	54.5	11	50	10	45.5	33	50	
	- Hypotension	12	54.5	9	40.9	10	45.5	31	47	
	- Fatigue	12	54.5	8	36.4	11	50	31	47	
	- Nausea and vomiting	8	36.4	13	59.1	9	40.9	30	45.5	
	- Muscle pain	2	9.1	6	27.3	6	27.3	14	21.2	
	- Anorexia	3	13.6	6	27.3	2	9.1	11	16.7	
	- Dizziness and fainting	2	9.1	2	9.1	5	22.7	9	13.6	
	- Restless legs	0	0	3	13.6	0	0	3	4.5	
	- Weakness in sexual activity	1	4.5	2	9.1	0	0	3	4.5	
	- Problems in vascular access	0	0	1	4.5	0	0	1	1.5	
Satisfaction with management of HD side effects	No	22	100	21	95.5	19	86.4	62	93.9	.155
	Yes	0	0	1	4.5	3	13.6	4	6.1	

 # More than one answer *P: Exact probability test* *P < 0.05 (significant)*

**Group A: lavender aromatherapy group* ***Group B: acupressure group* ****Group C: control group*

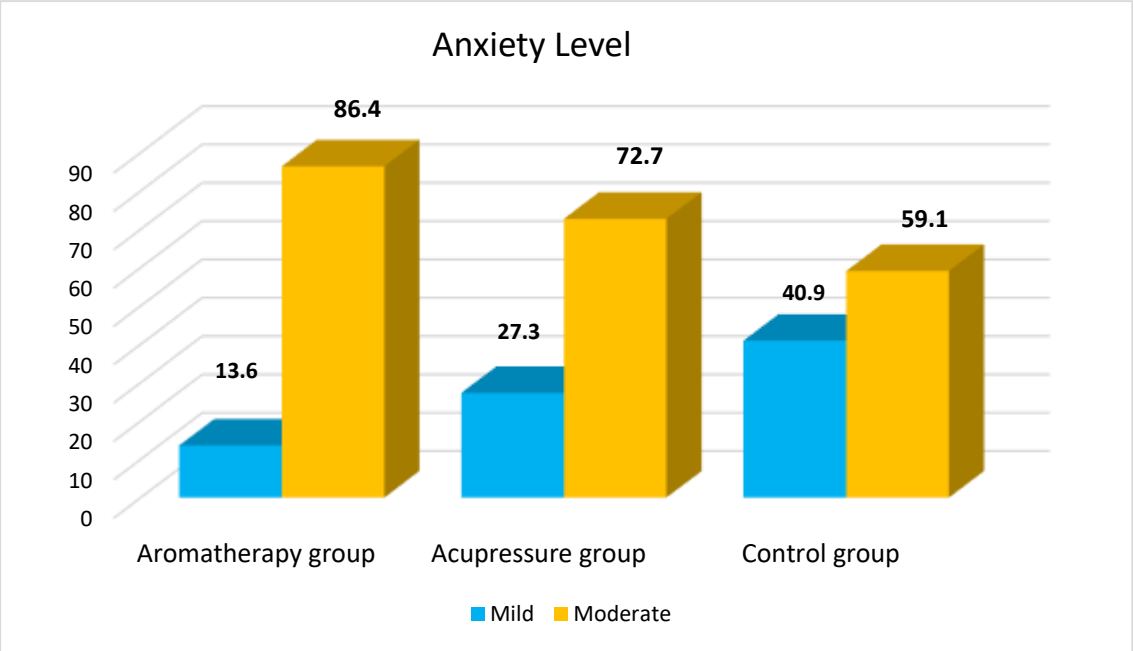


Figure 2: Initial evaluation of the studied Geriatric patients' anxiety according to Geriatric Anxiety Scale levels

Table 3: Comparison between the groups in relation to the level of anxiety pre and post intervention

Group	Pre				Post				p-value
	Anxiety level				Anxiety level				
	Mild		Moderate		Mild		Moderate		
	No	%	No	%	No	%	No	%	
Aromatherapy group	3	13.6	19	86.4	18	81.8	4	18.2	.001*
Acupressure group	6	27.3	16	72.7	18	81.8	4	18.2	.001*
Control group	9	40.9	13	59.1	16	72.7	6	27.3	.054

P: Mc-Nemar test ** P < 0.05 (significant)*

Table 4: Comparison between group A and group B according to the mean score of Geriatric Anxiety Scale in each domain and overall pre and post intervention

Geriatric Anxiety Scale	group A**				group B***			
	Pre		Post		Pre		Post	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Somatic	11.82	3.9	8.5	3.79	13.05	3.06	7.5	3.41
t (P)	2.9 (.007) *				5.4 (.001) *			
Cognitive	10.14	1.17	8	0.93	9.5	0.8	7.77	1.9
t (P)	6.9 (.001) *				3.3 (.001) *			
Affective	7.82	2.08	3.23	1.31	4.59	2.11	3.05	2.26
t (P)	8.4 (.001) *				2.4 (.024) *			
Overall	**29.77**	**4.96**	**19.73**	**5.34**	**27.14**	**3.59**	**18.32**	**6.42**
t (P)	**6.8 (.001) ***				**5.2 (.001) ***			

t: Paired t-test ** P < 0.05 (significant)* ***Group A: lavender aromatherapy group* ****Group B: acupressure group*

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