

The effect of lavender aromatherapy and deep breathing exercise on anxiety level in hemodialysis patients

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ABSTRACT

Chronic kidney failure is a chronic disease that requires treatment and hemodialysis therapy. Hemodialysis therapy has physical and psychological impacts on patients, such as stress. Patients who experience stress require management techniques such as lavender aromatherapy and deep breathing relaxation. The purpose of the study was to compare the effects of lavender aromatherapy and deep breathing relaxation on patients receiving hemodialysis who were experiencing the stress of chronic kidney failure. The study's quasi-experimental design includes two groups for the pretest and posttest. The 32 patients with chronic renal failure receiving hemodialysis made up the research sample; 16 of them participated in the lavender aromatherapy intervention and 16 were part of the deep breathing relaxation group. The research instrument used is the perceived stress scale (PSS) questionnaire. With a p-value of 0.000, data analysis employing an independent t-test reveals a difference between the deep breathing relaxation and lavender aromatherapy interventions on the stress of chronic renal failure patients receiving hemodialysis. Lavender aromatherapy and breathing relaxation can reduce stress in chronic kidney failure patients undergoing hemodialysis. Lavender aromatherapy reduces stress in chronic kidney failure patients more effectively than deep breathing relaxation. Lavender aromatherapy can be an alternative therapy to reduce stress while undergoing hemodialysis.

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1. INTRODUCTION

Uremia (retention of urea and other nitrogenous wastes in the blood) can be caused by chronic renal disease, which is an irreversible kidney function impairment with impaired bodily ability to regulate metabolic, fluid, and electrolyte balance [1], [2]. According to the Global Burden of illness (GBD) Study 2015, renal illness is responsible for 5–10 million annual deaths [3]. The incidence rate of late-referral chronic kidney disease (CKD) was 45 between June 2021 and June 2022 at Lakipadada Hospital in Tana Toraja. More males than women were afflicted, with hypertension being the main cause, and the age range most typically impacted was 55–64 years old. These findings are consistent with Indonesian Renal Registry (IRR) data [4].

Hemodialysis is frequently needed as a kidney replacement therapy for diseases that cause chronic renal failure. Patients receiving hemodialysis treatment may experience side symptoms include hypotension,

hypertension, equilibrium syndrome, cramps, nausea, vomiting, headaches, chest discomfort, arrhythmias, itching [5], [6], fever responses, and hypoxemia [7]. Hemodialysis, which takes 12 to 15 hours of treatment time each week, is a lifelong requirement for patients with chronic renal failure. Hemodialysis therapy consists of pre-hemodialysis, hemodialysis, and post-hemodialysis. This situation causes psychological disturbances, discomfort, and freedom for the patient. This condition causes anxiety [8], stress, and even depression over time [9]. Chronic illnesses including chronic renal disease can lead to psychological conditions such as anxiety, stress, and depression [10]. Syahrizal *et al.* research, stated that most of the kidney failure respondents who underwent hemodialysis therapy experienced severe stress, as many as 27 people (57.5%) [11].

The most crucial component of treating stress in individuals with chronic renal failure is psychological therapies, such as relaxation techniques. The study used aromatherapy relaxation techniques and deep breathing relaxation. Aromatherapy has an effect that significantly affects human emotions because the sense of smell is a sense that is related to the limbic system, as the center of emotional control in the human brain [12]. Aromatherapy that is inhaled by the sense of smell in the nasal cavity is captured by the olfactory nerves in the olfactory neurons and then the impulses generated from aromatherapy are delivered to the brain center of the limbic system of the brain, causing a relaxing effect. The aromatherapy used in this research is lavender. Research on reducing stress in people with chronic kidney failure, such as studies showing that lavender aromatherapy has a positive effect on lowering stress levels in people with chronic kidney failure [13].

Breathing relaxation is a breathing technique on the abdomen with a slow and steady frequency that is rhythmic and comfortable by closing your eyes when you inhale [14]. Deep breathing exercises can reduce tension or stress by increasing blood oxygen levels and lung ventilation [15], [16]. According to preliminary research, stress is known to affect 60% of chronic renal failure patients receiving hemodialysis. This stress is characterized by heart palpitations, feelings of fear and worry, cold sweats, and restlessness. Nursing care that has been given to patients with chronic kidney failure undergoing hemodialysis is in the form of counselling about chronic kidney failure, the benefits, methods, side effects, and psychological complications of hemodialysis therapy. Through counselling, nurses help patients overcome psychological aspects while undergoing hemodialysis. This study sought to compare the effects of lavender aromatherapy and deep breathing relaxation on the stress levels of hemodialysis patients with chronic renal failure.

2. METHOD

The research design used two groups by measuring the pre-test and post-test to look at the changes that happened after the experiment. This was a two-group pre-test and post-test design. The population in this study was composed of 32 chronic kidney failure patients undergoing hemodialysis at Kajen Hospital, Pekalongan Regency, Indonesia. According to the inclusion criteria, which required that participants have chronic renal failure, be on hemodialysis for at least three months, and not have olfactory abnormalities, the sample method was used.

The lavender aromatherapy interventions (group I) were given to a total of 32 chronic kidney failure patients receiving hemodialysis, divided by 16 taking place on Mondays and Wednesdays, and the deep breathing relaxation interventions (group II) were given to 16 with hemodialyzes taking place on Tuesdays and Thursdays. For simple experimental investigations that use an experimental group and a control group, the sample size ranges from 10 to 20 people [17].

Measuring stress levels using the Perceived Stress Scale (PSS) questionnaire, by Cohen, Kamarck, & Mermelstein [18], which has been modified in Indonesian in his research and has been tested for validity by expert judgment with psychologists in clinical and educational psychology, The reliability results obtained had a Cronbach's alpha of 0.78, or were said to be reliable [19]. Data collection was carried out from February 22 to March 10, 2023. The study was carried out in the hemodialysis unit at Kajen Hospital in the Indonesian province of Central Java's Pekalongan Regency. Data analysis used univariate analysis in the form of distribution frequency and percentage of stress before and after the given intervention, both lavender aromatherapy and deep breathing relaxation. Bivariate analysis using an independent t-test Ethical test conducted at Widya Husada University Health Research Ethics Committee with Letter Number 22/EC-LPPM/UWHS/II-2023.

3. RESULTS AND DISCUSSION

3.1. Overview of respondents

The majority of respondents were adults, namely 26 people (81.3%); male responders made up the majority of the sample, 17, or 53.1%); the majority of respondents' education levels were junior high school graduates, 12 people (37.5%); and the majority of respondents, 23 people (71.9%), had undergone hemodialysis for 1–5 years as shown in Table 1.

Table 1. Characteristics of respondents and duration of hemodialysis

Respondents' characteristics	Frequency (f)	Percentage (%)
Age		
Adult (20-60 years)	26	81.25
Elderly (over 60 years)	6	18.75
Gender		
Man	17	53.1
Woman	15	46.9
Level of education		
College	7	21.9
Senior high school	10	31.2
Junior high school	12	37.5
Elementary school	3	9.4
Hemodialysis duration		
< 1 year	0	0
1-5 years	23	71.9
≥ 5 years	9	28.1
Total	32	100

3.2. Overview of stress levels before and after being given lavender aromatherapy

The mean stress levels before given lavender aromatherapy are 16.69 and after being given lavender aromatherapy 9.88 shown in Table 2. Patients with chronic kidney failure must receive lifelong hemodialysis therapy, which can have adverse effects that put their health at risk. These side effects can include hypotension, hypertension, equilibrium syndrome, cramps, nausea, vomiting, headaches, chest pain, arrhythmias, itching, fever reactions, hypoxemia, and discomfort. Stress can be brought on by hemodialysis therapy, which is time-consuming and has negative effects in people with chronic kidney failure. This is in line with the opinion that people with chronic renal failure must get hemodialysis treatment for the rest of their lives. This situation causes psychological disorders in the patient, discomfort, and freedom for the patient. This condition causes anxiety, stress, and even depression over time [1], [2], [8].

Persistent renal failure Patients who feel stressed should seek medical attention since, if untreated, it can have an influence on their psychological and physical health and even lead to other disorders brought on by acute stress. Untreated stress can have a negative impact on a patient's compliance with receiving therapy and potentially result in death. This is in line with the belief that a diagnosis of chronic kidney failure can be stressful, accompanied by psychological difficulties such as intermittent acute stress on top of a chronic illness, a decreased quality of life, a need for medication throughout one's life, and emotions of grief, anxiety, and guilt. In addition to non-adherence to medical treatment, a decreased quality of life, and an increase in morbidity and death, patients may present with common stress-related disorders [20].

For individuals with chronic kidney failure, lavender aromatherapy has been shown to lower stress levels [13]. Aromatherapy is one of the non-pharmacological approaches that can be used to lessen stress. Lavender was used as the aromatherapy treatment in this trial, diffused for 15 minutes. Patients with chronic renal failure may benefit from aromatherapy therapy to balance their emotions and enhance their health. According to the perspective, which argues that aromatherapy is a complementary therapy employing essential oils in holistic healing to promote health and mental well-being and restore bodily balance [21], this is in line with the use of essential oils in aromatherapy.

Stress levels decreased in chronic renal failure patients who received lavender aromatherapy treatments. This demonstrates that lavender aromatherapy is calming, so it can reduce tension in individuals with chronic kidney failure. This is due to the calming effects of lavender flowers' aroma [22]. Inhaled lavender aromatherapy can have a calming and stress-reducing effect on the patient's spirit and emotions. Ester group chemicals, which are sedatives or relaxants and strengthen the nervous system, are present in the scent of lavender. The anxiety-related increase in brain activity is slowed down by lavender. Decreased brain activity causes people to relax and calm so that anxiety disappears [23], and there is an effect of lavender aromatherapy on reducing stress levels in patients with chronic kidney failure [24], and there is an effect of lavender aromatherapy on reducing stress and anxiety [25].

Table 2. Stress levels before and after being given lavender aromatherapy

Stress	Pre test	Post test
Mean	16.69	9.88

3.3. Overview of stress levels before and after being given deep breathing relaxation

The mean stress levels before deep breathing relaxation are 16.88 and after being given 13.69 shown in Table 3. Hemodialysis therapy is a lifelong requirement for patients with chronic kidney failure, and they need a lengthy session each week. Patients with chronic renal failure may endure a decline in quality of life if they do not receive hemodialysis treatment. This situation can increasingly affect the psychological aspects of the patient, such as stress. After receiving assistance in the form of deep breathing relaxation, stress among individuals with chronic kidney failure has decreased. Both before and after receiving a deep breathing relaxation intervention, this can be detected.

One of the non-pharmacological methods for reducing stress is deep breathing relaxation. Using breath management techniques, deep breathing relaxation therapies can be employed to establish pleasant and calm situations. This supports the notion that deep breathing relaxation is a self-management technique based on the activity of the sympathetic and parasympathetic nervous systems. Because carbon dioxide is emitted as a waste product of combustion when you exhale and you rebreathe the oxygen required to clean the incoming blood, energy can be produced when practicing deep breathing relaxation. Deep breathing relaxation is achieved by slowly filling the lungs with air while counting from 1 to 4, slowly releasing the air through the mouth, and feeling the muscles in the upper and lower limbs loosen up while counting from 5 to 8. The respondent is advised to breathe with a normal rhythm three times, then inhale again through the nose and exhale slowly through the mouth. The results of this study are in accordance with previous studies, which stated that before breathing relaxation therapy, the average stress score was 13.35, and after doing breathing relaxation techniques, the research results were obtained after being given breathing relaxation therapy interventions with an average score of 11.50, so there is a decrease in stress levels after being given deep breathing relaxation interventions [26], [27].

Deep breathing has the benefit of reducing stress. This technique generates energy when relaxing the breath through the inhaled oxygen, so it can clean the blood and cause a feeling of comfort. Deep breathing relaxation by inhaling air through the nose, holding it for a few seconds, and slowly exhaling through the mouth can widen lung ventilation and then increase oxygen in the blood so that it can reduce stress. This is in accordance with the opinion, which states that deep breathing relaxation can increase lung ventilation and increase blood oxygen, thereby reducing levels of anxiety or stress. Energy is produced when you do deep breathing relaxation because when you exhale, carbon dioxide is released as a waste product of combustion, and when it is inhaled again, oxygen that the body needs to cleanse the blood enters. The benefits of deep breathing relaxation are lower blood pressure and mental tension, a lower heart rate, increased confidence and peace of mind, and reduced worry and anxiety. According to the findings of earlier studies, hemodialysis patients with chronic renal failure who practice deep breathing can reduce their anxiety [28].

Tabel 3. Stress levels before and after being given deep breathing relaxation

Stress	Frequency (f)	Percentage (%)
Mean	16.88	13.69

3.4. Overview of the differences between lavender aromatherapy intervention and deep breathing relaxation

The mean differences between lavender aromatherapy intervention and deep breathing relaxation are 6.81 and 3.19 for patients with chronic renal failure undergoing hemodialysis with stress shown in Table 4. Based on the difference in the average stress score of chronic kidney failure patients who were given lavender aromatherapy intervention and deep breathing relaxation intervention, it was known that the stress reduction in chronic kidney failure patients who were given lavender aromatherapy was greater, namely 6.81, compared to the stress reduction value of chronic kidney failure patients who were given deep breathing relaxation intervention, which is equal to 3.19. Conclusions drawn from this study's findings indicate that lavender aromatherapy is more successful at lowering stress in people with chronic renal disease who are receiving hemodialysis. Lavender aromatherapy has ingredients that cause a relaxing effect, so it can reduce stress, anxiety, or pain.

Table 4. Differences between lavender aromatherapy intervention and deep breathing relaxation

Variable	Group	n	Mean	Std. Deviation
Stress patients with chronic renal failure	Intervention I (aromaterapy)	16	6.81	2.007
	Intervention II (deep breathing)	16	3.19	1.682

Because lavender aromatherapy includes linalool, which soothes the nervous system, it is used in this study to lessen stress in patients with chronic renal failure. Lavender oil has a calming effect and can help with stress reduction [29]. Because lavender aromatherapy is inhaled by patients through their sense of smell and through the impulses generated by lavender aromatherapy, which are then carried to the center of the brain and cause a relaxing effect, lavender aromatherapy is more effective at reducing stress [30] in patients with chronic kidney failure. Lavender aromatherapy, which was employed in this study, has a relaxing impact since it contains calming compounds. Linalool, one of these chemical components, is helpful for soothing. This is in line with the belief that the aroma of lavender contains sedative or relaxing esters that support the nervous system [31].

Despite being less effective than lavender aromatherapy at reducing stress in people with chronic kidney failure, deep breathing relaxation has the benefit of being simple to grasp and put into practice because it doesn't require any additional tools. This supports the idea that deep breathing relaxation techniques can be easily learned and applied. In addition, deep breathing relaxation therapy has the advantage of requiring less time and money to complete than other relaxation approaches [32].

Patients receiving hemodialysis for chronic renal failure are taught deep breathing relaxation techniques to lower stress. It is hoped that patients will be able to use this therapy on their own at home in an effort to lessen stress because it has a number of benefits, including being simple to implement. This is consistent with the idea that complete relaxation lessens stress of all kinds, including mental and physical stress. Patients on maintenance hemodialysis can feel less fatigued by engaging in deep breathing exercises for 20 minutes twice daily [33]. Patients receiving hemodialysis for kidney failure can benefit from deep breathing exercises to lessen fatigue [34]. Psychological counseling is the most important part of addressing stress in patients with chronic renal failure. The impact of self-healing on hemodialysis patients' stress levels the client's spiritual requirements must also be taken into consideration by the nurse when providing nursing care in order to lower the client's level of stress while receiving medical treatment in the hospital [35].

4. CONCLUSION

The mean stress levels before being given lavender aromatherapy were 16.69 and after being given lavender aromatherapy were 9.88. The mean stress levels before deep breathing relaxation are 16.88 and after being given 13.69. There is a difference in the stress experienced by chronic renal failure patients receiving hemodialysis at Kajen Hospital in the Pekalongan Regency and lavender aromatherapy intervention with deep breathing relaxation. Lavender aromatherapy can be an alternative therapy to reduce stress while undergoing hemodialysis.




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