The Effect of Orange Inhalation Aromatherapy on Anxiety in Chronic Kidney Failure Patients Undergoing Hemodialysis

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Abstract

Chronic renal failure patients undergoing hemodialysis often experience anxiety. The patient's anxiety stems from the patient still not knowing how the hemodialysis procedure works and its side effects. The changes experienced by chronic renal failure patients are anxiety, which causes drastic changes in patients not only physically but also mentally. This study aims to determine the effect of orange inhalation aromatherapy on anxiety in patients with chronic renal failure undergoing hemodialysis. This study is a type of experimental research with a two-group pretest-posttest design conducted at Sebelas Maret University Hospital Surakarta in March 2024. The population in this study were 77 patients with chronic renal failure undergoing hemodialysis. The sampling technique of this study was purposive sampling, so the number of samples in this study was 30, consisting of 15 control groups and 15 treatment groups. Data collection on anxiety of chronic renal failure patients was carried out using the Hamilton Anxiety Rating Scale (HARS). Data analysis test in this study used independent samples t-test. The results showed that there were differences in the effect of anxiety in patients with chronic renal failure in the control group who were not given citrus inhalation aromatherapy and the treatment group given citrus inhalation aromatherapy at Sebelas Maret University Hospital with a p-value = 0.012. It is suggested that patients with chronic renal failure undergoing hemodialysis can apply it themselves when experiencing anxiety during hemodialysis because this inhalation aromatherapy is very easy to apply and very useful

Keywords: Aromatherapy, chronic kidney failure, hemodialysis, inhalation

INTRODUCTION

Chronic Kidney Disease is a global public health problem with a growing incidence of kidney failure, poor prognosis and high costs. In Indonesia, treatment of kidney disease is the second largest healthcare provider after heart disease in health insurance utilization during 2015, there were 30.554 patients undergoing active hemodialysis, most of which were caused by Chronic Kidney Disease (Kemenkes RI, 2020).

In Indonesia, according to the results of Basic Health Research Data (Riskesdas, 2018), the prevalence of Chronic Kidney Disease was 0.38% or 713.783 people. This prevalence figure has increased compared to Riskesdas data in 2013 with a prevalence of 0.2% (Kemenkes RI, 2018).

Chronic renal failure is kidney damage characterized by uremia (urea and other wastes circulating in the blood and its complications if dialysis or kidney transplantation is not performed) (Wahyuni et al., 2023). Chronic Kidney Disease is a clinical symptom due to chronic decline in kidney function, kidney failure also causes death if replacement therapy is

not carried out, due to failure of kidney function in maintaining metabolism and electrolytes (Harlimah, 2020).

Anxiety that occurs in patients on hemodialysis is usually caused by unfamiliar equipment and machines as well as discomfort assiciated with inserting the equipment so that anxiety, if not addressed, will affect the patient's physiological aspects such as increased pulse rate, shortness of breath, difficulty sleeping and getting tired easily (Faruq et al., 2020).

Chronic Kidney Disease patients undergoing hemodialysis often experience anxiety. The patient's anxiety stems from the patient still not knowing how the hemodialysis procedure works and its side effects. The changes experienced by Chronic Kidney Disease patients are anxiety that causes drastic changes in patients not only physically but also mentally. Anxiety is a normal reaction to a very stressful situation in a person's life, which does not last long, the hemodialysis process causes psychological stress or anxiety and physical disturbances to the nervous system, such as restlessness, confusion, trembling, decreased concentration (Damanik, 2020).

Anxiety in hemodialysis patients if left untreated will lead to various problems such as refusal of action which results in increased ureum and creatinine levels and then decreased kidney function and death. In addition, prolonged anxiety can affect the immune system. Anxiety triggers the production of the hormone cortisol which interferes with the function of T cells in fighting infections, thus increasing the risk of some easily-attacked diseases such as flu and other serious physical problems such as stroke and heart disease (Sari et al., 2021).

Aromatherapy compounds through inhalation will directly affect the central nervous system and the balance of the cerebral cortex and nerves in the brain. Another mechanism is the inhibition of serotonin reuptake which will improve mood (Muchtaridi, 2015). Based on research Manalu (2019), states that there is an effect of inhalation aromatherapy on reducing anxiety scores in chronic renal failure patients undergoing hemodialysis, this is because inhalation aromatherapy can be used as an alternative therapy and complementary therapy to overcome anxiety experienced by chronic renal failure patients undergoing hemodialysis and minimize the side effects of pharmacological therapy.

Based on the above background, researchers are interested in conducting further research on the effect of citrus inhalation aromatherapy on anxiety in patients with chronic renal failure undergoing hemodialysis at Sebelas Maret University Hospital.

METHODS

This study uses an experimental research design with a pre-experiment design that uses the two group pretest-posttest design. This research will be conducted at the Hospital Universitas Sebelas Maret which was implemented in March 2024.

The population of this study were all chronic renal failure patients undergoing hemodialysis at Sebelas Maret Universitas Hospital. In a preliminary study conducted in October 2023 at Sebelas Maret Universitas Hospital, 77 patients with chronic renal failure underwent hemodialysis from January 2023 to October 2023. The sample in this study were 30 respondents with 15 who will be studied by being treated and 15 who will be studied without being treated.

The inclusion criteria for this research sample are chronic renal failure patients undergoing hemodialysis, not experiencing hearing loss, not experiencing olfactory disorders, willing to become respondents and able to communicate verbally. While the research exclusion criteria are respondents who do not fully participate in the study and resign during or in the study.

The instrument used in this study is the Hamilton Rating Scale for Anxiety questionnaire to measure anxiety levels. The independent variable in this study is the effect of orange inhalation aromatherapy, while the dependent variable in this study is the level of anxiety in patients with chronic renal failure undergoing hemodialysis.

Data analysis in this study with an independent sample test aimed at identifying the effect of giving citrus inhalation aromatherapy on anxiety levels in patients with chronic renal failure undergoing hemodialysis. This study has received approval from the Research Ethics Committee Faculty of Medicine Universitas Sebelas Maret the number 27/UN27.06.11/KEP/EC/2024.

RESULTS

Table 1 Characteristics of Respondents (n=30)

Characteristics	Control Group		Treatment Group	
	(f)	(%)	(f)	(%)
Gender				
Male	8	53.3	10	66.7
Female	7	46.7	5	33.3
Age				
15-64 years	8	53.3	12	80.0
≥ 65 years	7	46.7	3	20.0
Employment				
Not Working	5	33.3	1	6.7
Housewife	0	0.0	3	20.0
Self-employed	1	6.7	5	33.3
Employee	2	13.3	3	20.0
Labor	0	0.0	1	6.7
Civil servants	7	46.7	2	13.3
Education				
Elementary school	1	6.7	3	20.0
Middle school	1	6.7	4	26.7
high school	7	46.7	5	33.3
College	6	40.0	3	20.0
Duration of HD				
< 1 years	1	6.7	1	6.7
1-3 years	6	40.0	6	40.0
> 3 years	8	53.3	8	53.3

Based on the table above, it is known that the majority of respondents in the control group were male with a total of 8 people (53.3%). Based on age categories, it is known that the majority of control group respondents were of productive age (15-64 years) with a total of 8 respondents (53.3%). Based on job category, it is known that the majority of respondents in the control group work as civil servants/teachers/retirees with a total of 7 respondents (46.7%). Based on the education category, it is known that the majority of respondents had a high school education with a total of 7 (46.7%). Furthermore, based on the category of length of time suffering from chronic kidney failure, it is known that the majority of respondents in the control group had suffered from kidney failure for > 3 years with a total of 8 people (53.3%).

Based on the table above, it is known that most respondents in the treatment group were male with a total of 10 people (66.7%). Based on age categories, it is known that most respondents are of productive age (15-64 years) with 12 respondents (80.0%). Based on job category, it is known that most respondents work as entrepreneurs with a total of 5 respondents (33.3%). Based on the education category, it is known that most respondents had a high school education with a total of 5 (33.3%). Furthermore, based on the category of length of time suffering from chronic kidney failure, it is known that the majority of respondents in the treatment group had suffered from kidney failure for > 3 years with a total of 8 people (53.3%).

Table 2 Description Anxiety control group (n=15)

Patient Anxiety Control Group	N	*Min*	*Max*	*Mean*	*Std. Deviation*
Pre test	15	15	27	17.0588	2.33106
Post tets	15	14	26	14.5294	2.91800

Based on the table above, it is known that the average anxiety score of control group chronic kidney failure patients in the pre-test data was 17.05 with Std. Deviation was 2.33106, the minimum score was 15, and the highest was 27. Then in the post-test data, the average anxiety value of the group of chronic kidney failure patients was 14.52 with Std. Deviation is 2.91800, the minimum score is 14, and the highest is 26.

Table 3 Normality test results

Group	Patient Anxiety	df	*Sig.*
Control	*Pre test*	15	0.389
	Post tets	15	0.165
Treatment	*Pre test*	15	0.217
	Post tets	15	0.115

Based on the results of the data normality test using the Shapiro-Wilk test, it is known that the significance value (sig.) for the control group in the pre-test data was 0.389 (>0.05) and in the post-test data was 0.165 (>0.05). Then in the treatment group, the significance value (sig.) in the pre-test data was 0.217 (>0.05) and in the post-test data was 0.115 (>0.05). This shows that the significance value (sig.) in the control and treatment groups for pre-test and post-test data is > 0.05. So it was concluded that the data was normally distributed and could be continued for independent samples testing.

Table 3 Description Anxiety Treatment Group (n=15)

Patient Anxiety Treatment Group	N	*Min*	*Max*	*Mean*	*Std. Deviation*
Pre test	15	14	23	17.2667	2.40436
Post tets	15	10	22	14.8000	2.95683

In the treatment group given intervention in the form of inhaled aromatherapy, the average anxiety score for chronic kidney failure patients in the pre-test data was 17.26 with Std. Deviation was 2.40436, the minimum score was 14, and the highest was 23. Then in the post-test data, the average anxiety value of the group of chronic kidney failure patients was 14.80 with Std. Deviation is 2.95683, the minimum score is 10, and the highest is 22.

Table 4 Normality test results

Group	Patient Anxiety	df	*Sig.*
Control	*Pre test*	15	0.389
	Post tets	15	0.165
Treatment	*Pre test*	15	0.217
	Post tets	15	0.115

Based on the results of the data normality test using the Shapiro-Wilk test, it is known that the significance value (sig.) for the control group in the pre-test data was 0.389 (>0.05) and in the post-test data was 0.165 (>0.05). Then in the treatment group, the significance value

(sig.) in the pre-test data was 0.217 (>0.05) and in the post-test data was 0.115 (>0.05). This shows that the significance value (sig.) in the control and treatment groups for pre-test and post-test data is > 0.05. So it was concluded that the data was normally distributed and could be continued for independent samples testing.

Table 5 independent samples test results

Group	*N*	*Mean*	*P-Value*
Control	15	17.8667	0.012
Treatment	15	14.8000	

Based on the results of the independent samples test, it is known that the p-value obtained was 0.012 (P<0.05). This shows that there is a difference in the influence of anxiety in patients with chronic kidney failure in the control group who were not given orange inhalation aromatherapy and the treatment group who were given orange inhalation aromatherapy at Sebelas Maret University Hospital.

DISCUSSION

Anxiety is a continuous feeling of anxiety, discomfort, worry and uncertainty accompanied by physical symptoms such as sweating, headache, restlessness and heart palpitations in response to an unpredictable threat (Simanjuntak et al., 2023). Anxiety experienced by chronic renal failure patients undergoing hemodialysis can be caused by various stressors, including the experience of pain in the fistula puncture area at the time of starting hemodialysis, dependence on others, difficulty in maintaining employment, financial, threat of death, changes in self-concept, role changes and changes in social interaction (Saragih et al., 2022).

Aromatherapy is a complementary medicine that uses essential oils as the main therapeutic agent. Essential oils are obtained from extracting flowers, leaves, stems, fruits, roots, and resins. Essential oils as aromatherapy are used through inhalation and or topical routes. When inhaled, essential oils act on the brain and nervous system through stimulus from the olfactory nerve. This response will stimulate the production of brain neurotransmitters related to recovering psychological conditions such as emotions, feelings, thoughts and desires (Agustina et al., 2019).

Based on the results of the analysis, it is known that the average score of anxiety of chronic renal failure patients in the control group who are not given intervention in the form of inhalation aromatherapy is 17.86 with a Std. Deviation of 3.29213, a minimum score of 14, and the highest score of 26. Then in the treatment group given intervention in the form of inhalation aromatherapy, the average score of anxiety of chronic renal failure patients is 14.80

with a Std. Deviation of 2.95683, a minimum score of 10, and the highest score of 22. Furthermore, based on the results of the independent samples test, it is known that the p-value obtained is 0.012 (P <0.05). This shows that there is a difference in the effect of anxiety of chronic renal failure patients in the control group who are not given orange inhalation aromatherapy and the treatment group given orange inhalation aromatherapy at Sebelas Maret Universitas Hospital.

The time needed to undergo hemodialysis therapy is 12-15 hours for hemodialysis every week or at least 3-4 hours per therapy. This can trigger changes in body responses both physiological and psychological, where in general, the hemodialysis process in the hospital can cause physical physiological stress that disrupts the neurological system such as weakness, fatigue, decreased concentration, tremors, weakness in the arms, pain in the soles of the feet and changes in behavior while psychologically will experience anxiety (Puspitasari et al., 2021).

Aromatherapy is one of the therapies that can be used to reduce the anxiety of patients who will undergo hemodialysis therapy. Aromatherapy is a method of nursing therapy that uses volatile plant liquid materials or essential oils and other aromatic compounds from plants that aim to affect a person's mood or health (Rahmanti et al., 2023). According to Gong et al., (2020), inhaling aromatherapy can stimulate the central nervous system and influence the balance of the cerebral cortex and brain nerves to release neurotransmitters such as serotonin and dopamine.

Aromatherapy can be implemented through several ways, including inhalation, soaking, massage and compressing. Aromatherapy compounds through inhalation will directly affect the central nervous system and the balance of the cerebral cortex and nerves in the brain. Aromatherapy inhalation of damask rose and orange extract is effective to reduce anxiety in hemodialysis patients. In addition, lavender aromatherapy, rosemary flowers, peppermint oil, sunflower oil, chicory essence, tea tree oil, and jojoba oil effectively reduce anxiety in hemodialysis patients (Bouya et al., 2018).

The results of this study are in line with the results of the study Mutiara Dewi et al., (2021), which found that there was an effect of inhalation aromatherapy on reducing the anxiety level of chronic renal failure patients undergoing hemodialysis, where inhalation aromatherapy can be used as an alternative therapy and complementary therapy to treat anxiety in chronic renal failure patients undergoing hemodialysis and minimize the side effects of pharmacology. In addition, this aromatherapy is relatively affordable, safe, does not cause side effects, and is easy to apply.

Other research results conducted by Manalu (2019), also found an effect of aromatherapy inhalation on reducing the anxiety value of chronic kidney disease patients undergoing hemodialysis at Grandmed Lubuk Pakam Hospital in 2018. Based on research Simanjuntak et al., (2023), stated that before lavender aroma therapy was carried out on respondents, the data obtained were the majority of severe anxiety and the minority of mild anxiety. After giving lavender therapy to respondents, the majority of mild anxiety and the minority of severe anxiety were obtained. There is an effect of using lavender aroma therapy on reducing anxiety in patients with chronic renal failure before undergoing hemodialysis.

Aromatherapy stimulates the olfactory organ through scent. It is believed that aromas activate the olfactory nerve cells and thus stimulate the limbic system. Nerve cells produce various neurotransmitters such as enkephalins, endorphins, noradrenaline and serotonin. These neurotransmitters can reduce anxiety and its manifestations (Ningsih et al., 2024; Agustin et al., 2021).

In line with research Rambod et al., (2020), which states that aromatherapy can reduce anxiety levels and reduce systolic blood pressure. In the research Guo et al., (2020), also states that the provision of aromatherapy is effective for overcoming anxiety in adult patients in preoperative measures. This is by research Warjiman et al., (2017), which states that lavender aromatherapy has a sedative effect that serves to calm the central nervous system so that it can reduce anxiety.

CONCLUSIONS

Based on the results of the study, there are differences in the effect of anxiety of chronic renal failure patients in the control group who are not given citrus inhalation aromatherapy and the treatment group given citrus inhalation aromatherapy at Sebelas Maret Universitas Hospital.

Health practitioners can use the results of this study as a non-pharmacological therapy to reduce the anxiety of chronic renal failure patients undergoing hemodialysis. Because this aromatherapy is relatively affordable, safe, does not cause side effects, and is easy to apply. And it is hoped that further research will add the number of respondents and use other variables related to the anxiety of chronic renal failure patients undergoing hemodialysis such as family support, movitation, economic status and patient religiosity and use different research instruments.

REFERENCE

Agustin, E., & Hudiyawati, D. (2021). Studi Literatur: Efektivitas Aromaterapi terhadap Penurunan Kecemasan pada Pasien Gagal Ginjal Kronik yang Menjalani Hemodialisa. *Jurnal Ilmu Keperawatan : Journal of Nursing Science*, *9*(2), 168–177.

Agustina, E. N., Meirita, D. N., & Fajria, S. H. (2019). Pengaruh Aromaterapi Peppermint Terhadap Perubahan Tingkat Nyeri Pada Pasien Post Operasi Sectio Caesarea di RSUD Leuwiliang Kabupaten Bogor. *Jurnal Ilmiah Wijaya*, *11*(2), 17–25. www.jurnalwijaya.com;

Bouya, S., Ahmadidarehsima, S., Badakhsh, M., Balouchi, A., & Koochakzai, M. (2018). Effect of aromatherapy interventions on hemodialysis complications: A systematic review. *Complementary Therapies in Clinical Practice*, *32*(7), 130–138. https://doi.org/10.1016/j.ctcp.2018.06.008

Damanik, H. (2020). Tingkat Kecemasan Pasien Gagal Ginjal Kronik Dalam Menjalani Hemodialisa Di Rumah Sakit Imelda Pekerja Indonesia. *Jurnal Ilmiah Keperawatan Imelda*, *6*(1), 80–85. https://doi.org/10.52943/jikeperawatan.v6i1.365

Faruq, M. H., Purwanti, O. S., & Purnama, A. P. (2020). Efek Relaksasi Benson Dalam Menurunkan Kecemasan Pasien Yang Menjalani Hemodialisa. *Jurnal Ilmiah Keperawatan Sai Betik*, *16*(1), 24–29. https://doi.org/10.26630/jkep.v16i1.1895

Gong, M., Dong, H., Tang, Y., Huang, W., & Lu, F. (2020). Effects of aromatherapy on anxiety: A meta-analysis of randomized controlled trials. *Journal of Affective Disorders*, *274*(September), 1028–1040. https://doi.org/10.1016/j.jad.2020.05.118

Guo, P., Li, P., Zhang, X., Liu, N., Wang, J., Yang, S., Yu, L., & Zhang, W. (2020). The effectiveness of aromatherapy on preoperative anxiety in adults: A systematic review and meta-analysis of randomized controlled trials. *International Journal of Nursing Studies*, *111*(November), 103747. https://doi.org/10.1016/j.ijnurstu.2020.103747

Harlimah. (2020). *Gangguan Sistem Perkemihan*. Yogyakarta: PT Pustaka Baru Press.

Kemenkes RI. (2018). *Laporan Nasional Riskesdas 2018*. Jakarta : Kementerian Kesehatan RI.

Kemenkes RI. (2020). *Profil Kesehatan Indonesia Tahun 2020*. Jakarta : Kementerian Kesehatan RI.

Manalu, T. A. (2019). Pengaruh Aromaterapi Inhalasi Terhadap Penurunan Nilai Kecemasan Pasien Gagal Ginjal Kronik Yang Menjalani Hemodialisa. *Jurnal Keperawatan Dan Fisioterapi (Jkf)*, *1*(2), 13–19. https://doi.org/10.35451/jkf.v1i2.149

Muchtaridi, M. (2015). *Aroma Terapi Tinjauan Aspek Kimia Medisinal*. Yogyakarta: Graha Ilmu.

Mutiara Dewi, I. A., & Masfuri, M. (2021). Inhalasi Aromaterapi Lavender terhadap Komplikasi Hemodialisis pada Pasien Gagal Ginjal Kronis. *Jurnal Keperawatan Silampari*, *5*(1), 348–362. https://doi.org/10.31539/jks.v5i1.2956

Ningsih, A. S., Inayati, A., & Hasanah, U. (2024). Penerapan Aromaterapi Inhalasi Terhadap Kecemasan Pada Pasien Gagal Ginjal Kronik Yang Menjalani Hemodialisa Di Ruang HD RSUD Jendral Ahmad Yani Kota Metro. *Jurnal Cendikia Muda*, *4*(1), 43–52.

Puspitasari, D., Mursudarinah, M., & Hermawati, H. (2021). Pengaruh Relaksasi Napas Dalam terhadap Penurunan Kecemasan Pasien Hemodialisis di Klinik Hemodialisis PMI Surakarta. *ASJN (Aisyiyah Surakarta Journal of Nursing)*, *2*(1), 1–5. https://doi.org/10.30787/asjn.v2i1.828

Rahmanti, A., & Haksara, E. (2023). Penerapan Aromatherapy Lavender Untuk Mengurangi Kecemasan Pada Pasien yang Menjalani Hemodialisa di RUMKIKT TK II dr. Soedjono Magelang. *Jurnal Fisioterapi Dan Ilmu Kesehatan Sisthana*, *5*(1), 34–44. https://doi.org/10.55606/jufdikes.v5i1.203

Rambod, M., Rakhshan, M., Tohidinik, S., & Nikoo, M. H. (2020). The effect of lemon inhalation aromatherapy on blood pressure, electrocardiogram changes, and anxiety in

acute myocardial infarction patients: A clinical, multi-centered, assessor-blinded trial design. *Complementary Therapies in Clinical Practice*, *39*(May), 101155. https://doi.org/10.1016/j.ctcp.2020.101155

Saragih, N. P., Sianipar, T. I., Naibaho, R. W., & Halawa, S. D. (2022). Hubungan Antara Tingkat Kecemasan Dengan Lamanya Hemodialisis Pada Pasien Gagal Ginjal Kronik (GGK) Yang Menjalani HD. *Jurnal Penelitian Perawat Profesional*, *4*(3), 891–898. https://doi.org/10.37287/jppp.v4i3.1040

Sari, Y. K., Dewi, O. C. P., Wibisono, W., & Wulandari, N. A. (2021). Penggunaan Cytrus Orange sebagai Alternatif Menurunkan Kecemasan Pasien Hemodialisis. *Jurnal Keperawatan Silampari*, *4*(2), 537–543. https://doi.org/10.31539/jks.v4i2.1864

Simanjuntak, E., Sarumaha, P., Waruwu, Y., Hareva, N. P. T., Hulu, F., & Nababan, T. (2023). Pengaruh Aroma Terapi Lavender terhadap Penurunan Tingkat Kecemasan pada Pasien Gagal Ginjal Kronik Sebelum Menjalani Hemodialisa di RS Royal Prima. *MAHESA : Malahayati Health Student Journal*, *3*(3), 691–699. https://doi.org/10.33024/mahesa.v3i3.9927

Wahyuni, S., Yunita, R., & Suhartini, T. (2023). Pengaruh Teknik Hipnotis Lima Jari dan Aromaterapi Mint Terhadap Kecemasan Pasien Dengan Gagal Ginjal Kronik di Ruang Hemodialisa RSUD DR. Haryoto Lumajang. *Jurnal Ilmiah Ilmu Keperawatan*, *14*(2), 323–331. https://doi.org/10.36089/nu.v14i2.1251

Warjiman, Ivana, T., & Triatoni, Y. (2017). Efektivitas Aromaterapi Inhalasi Lavender Dalam Mengurangi Tingkat Kecemasan Pasien Hemodialisa Di Blud Rsud Dr. Doris. *Journal Stikes Suaka Insan*, *2*(2), 1–7. http://journal.stikessuakainsan.ac.id/index.php/jksi/article/view/74