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Research article

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The effectiveness of the combination of lemon aromatherapy and acupressure on xerostomic complaints

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ABSTRACT

Background

Xerostomia (dry mouth) is an oral manifestation that is often considered by patients with chronic kidney failure. The mechanism of action of the combination of lemon and acupressure can stimulate saliva which will deliver these stimuli into the autonomic nervous system and stimulate the parasympathetic nerves optimally to produce saliva which can be used by xerostomia needed by hemodialysis.

Objective

To analyze the effectiveness of the combination of lemon aromatherapy and acupressure on xerostomia complaints.

Method

This study uses Quasi Experiment Design by designing Pre Test and Post Test with Control Group Design. In this study there were 32 samples divided into 2 intervention groups (n = 16) and controls (n = 16). The combination of lemon and acupressure aromatherapy is given 3 times a week for 4 weeks. Measurement of xerostomia complaints using an S-XI questionnaire, measurements were made 3 times, before intervention (pre test), at week 2 and at week 4.

Results

Giving a combination of lemon aromatherapy and acupressure was more effective than acupressure with a Difference mean of the pre test-week 4 is -6,000 and SD 1,032 (p = 0,000) and the effect of using the results of 1,2 was significant (strong).

Conclusion

The combination of lemon aromatherapy and acupressure is more effective in reducing xerostomia complaints compared to lemon acupressure and aromatherapy effective in reducing xerostomia complaint.

Keywords: Lemon aromatherapy, Acupressure, Xerostomia, Hemodialysis

INTRODUCTION

Kidney failure is a global phenomenon of non-communicable diseases and must be controlled. The Global Burden Disease estimates that in 2015, 1.2 million people died from kidney failure and increased 32% since 2005 (Wang H,

2016). Kidney failure itself is a chronic disease caused by damage to the kidney which is characterized by reduced irreversible filtration rate in the glomerulus that requires invasive action in the form of kidney transplantation or hemodialysis (Suresh Goli, 2015; Yohana Gowara, 2014). In Indonesia in 2018 the

prevalence of chronic renal failure in people aged ≥ 15 years based on a doctor's diagnosis was 3.8% and the proportion had been or was undergoing hemodialysis in Indonesia in people aged ≥ 15 years who had been diagnosed with chronic renal failure ie 19.3% (Risksedas 2018, 2018).

All kidney disorders can describe oral manifestations and can affect the composition of saliva so that it can cause xerostomia and excessive thirst (Suresh Goli, 2015). Xerostomia (dry mouth) is an oral manifestation that is often faced by patients with chronic kidney failure. The results of the study on oral problems faced by kidney failure patients who underwent hemodialysis, in all patients in the study group, showed extra oral and intra oral changes, one of which was xerostomia with a presentation of 45% (Suresh Goli, 2015). In studies with characteristics of orofacial region soft tissue abnormalities in patients with terminal renal failure who were undergoing hemodialysis from 93 samples there were 77 samples (82.8%) experiencing xerostomia (Yohana Gowara, 2014).

In patients with chronic kidney failure who undergo HD, there will be excess fluid intake so that it can cause edema on parts of the body due to the inability of the kidneys to expel fluid (Anis Ardiyanti, 2015). Loss of kidney function can also cause sodium and water retention due to loss of nephron function, loss of tubular function can also cause urinary excretion to become runny so that it can cause dehydration (Anis Ardiyanti, 2015; O'callaghan, 2009). This dehydration will cause an increase in osmolality in cells so that it will cause a body reaction in the form of thirst and dry mouth sensation (xerostomia) (Anis Ardiyanti, 2015; Kowalak, 2011). Side effects of drugs, especially sedatives, such as the benzodiazepine group, this is because the drug can cause autonomic nerve depression, the autonomic nerve has a role in salivary gland secretion so that the effect of the drug can signal the brain to inhibit the autonomic nerve from regulating salivary secretions so that it can cause a decrease in the salivary flow rate (Belazelkowska A, 2013; Roganović, 2018; Rosa-María López-Pintor, 2017; Tatiana M. F, 2016).

The intervention that can be given to xerostomia patients is to increase the salivary

rate. Increasing the salivary rate can be done by stimulating the salivary gland itself because the salivary gland work is influenced by the autonomic nerve (Peter Celec, 2015; Tamaki Matsumoto, 2016).

The lemon aromatherapy combination that can be used to stimulate salivary incontinence, aromatherapy using essential oils can provide a variety of psychological and physical effects given in various ways, including through massage, bathing, and inhalation, the effect of inhaling essential oils is that olfactory receptor cells will be stimulated and impulses will delivering stimuli to the limbic system, centers of autonomic function and emotion, the nature of oil, their fragrances, and their effect on determining the level of stimulation, olfactory information is then transmitted to the primary olfactory region in the brain, which is largely a component or strongly connected to the limbic system (Tamaki Matsumoto, 2016) and acupressure carried out on stimulation of acupuncture points associated with salivary gland nerves can cause endogenous secretion morphine like substance called endorphins which works on opiate receptors and inhibits pain signal transmission, the emergence of this tenderness mechanism associated with gan network pathologic process is below the associated point and will have a regulatory effect on the salivary gland (Yang, 2010).

The purpose of this study was to analyze the "Effectiveness of Combination of Lemon Aromatherapy and Acupressure on Xerostomia Complaints".

METHODS

Study design

The design of this study is quasi experiment. The form of design used is "Pre and Post test with control group".

In this study the researchers divided the two groups, namely the intervention group received a combination treatment of lemon aromatherapy and acupressure, giving an aromatherapy intervention using lemon oil with a dose of 1 mL and a mixture of 10cc water which was given through inhalation using a humidifier when the steam came out with acupressure at acupoint Juliao ST 3, Dicang ST 4, Lianquan CV 23, Chengjiang CV 24 and Taixi KI 3) were given

acupressure using fingers for 3 minutes at each acupoint, and the control group received acupressure treatment at acupoint (Juliao ST 3, Dicang ST 4, Lianquan CV 23, Chengjiang CV 24 and Taixi KI 3) given pressure using fingers for 3 minutes at each acupoint. All interventions in each study group were given before patients underwent hemodialysis performed 3 times a week for 4 weeks (12 sessions) (H Miharja, 2017), measurement of xerostomia complaints was done 3 times, namely on the first day before treatment (pre test), after treatment at week 2 and after treatment at week 4. Measurement of xerostomia complaints using S-XI which has been proven to have good validity and reliability with a validity value of ≥ 0.70 and reliability value 0.93, so valid S-XI is used to measure

xerostomia (João Pedro de Almeida RatoAmaral, 2017; William Murray Thomson, 2011).

Sampel

The reference population in this study were all hemodialysis patients in Tidar General Hospital Magelang, the number of HD patients at Tidar Magelang General Hospital in April 2019 was 154 patients. In this study using a non probability sampling technique. The sample in this study consisted of 32 people divided into 16 intervention groups and 16 control groups.

Ethical considerations

Ethical approval was obtained from the ethics commission of the RSUD Dr. Moewardi with an ethical approval number is 733 / V / HREC / 2019.

RESULT

Table 1 Respondent characteristics based on age, gender, long time undergoing HD and number of respondents (n = 32)

Characteristics	Intervention		Control		P*
	N	%	N	%	
Age					
20-29 year	2	12,5	1	6,3	0,422
30-39 year	4	25	2	12,5	
40-49 year	4	25	4	25	
50-59 year	3	18,8	7	43,8	
60-69 year	3	18,8	2	12,5	
Total	16	100	16	100	
Gender					
Female	10	62,5	9	56,3	0,510
Male	6	37,5	7	43,8	
Total	16	100	16	100	
Long time undergoing HD					
3-19 month	6	37,5	8	50	0,309
20-49 month	9	56,3	6	37,5	
50-79 month	1	6,3	2	12,5	
Total	16	100	16	100	

(p*= levene test)

In Table 1 shows the highest age in the intervention group, namely 30-39 years as many as 4 people (25%) and 40-49 years as many as 4 people (25%) while in the control group ie 50-59 years as many as 7 people (43.8%), obtained homogeneity test results ($p = 0.422$) which means there is no difference between the age of the intervention group and the control group. The highest sex was women, where in the intervention group as many as 10 people (62.5%) and in the control group as many as 9 people

(56.3%), homogeneity test results were obtained ($p = 0.510$) which means there is no difference between sexes intervention group and control group. The highest duration of HD in the intervention group was 20-49 months as many as 9 people (56.3%) and in the control group 3-19 months there were 8 people (50%) obtained homogeneity test results ($p = 0.309$) which means there is no difference between old HD intervention group and control group.

Table 2 Distribution of differences in xerostomia complaints before and after treatment in the intervention and control groups

Xerostomia complaint	Intervention			Control		
	Mean Difference	SD	P value	Mean Difference	SD	P value
Week 4-Pre test	-6,000	1,032	0,000	-3,812	1,424	0,000
Week 2-Pre test	-2,625	0,806	0,005	-1,687	1,014	0,000
Week 4-week 2	-3,375	1,024	0,000	-2,125	0,806	0,000

*paired t test (analysis within group)

In table 2 shows the results of the assessment of xerostomia complaints before and after treatment. In the intervention group the results of the difference in the decrease in xerostomia complaints from the pre-test to the second week were -2,625 or a decrease of 19.5% ($p = 0,000$) in the control group also decreased xerostomia complaints in the second week with a difference of -1,687 or a decrease of 13,2% ($p = 0,000$),

then in the intervention group there was a decline again in the pre-test until the 4th week with a difference of -6,000 or a decrease of up to 44,6% ($p = 0,000$) in the control group. 4th week with a difference of -3,812 or a 29.9% decrease ($p = 0,000$). This shows that the intervention group experienced a greater decline than the control group.

Table 3 Distribution of the effectiveness of the combination of lemon and acupressure aromatherapy against xerostomia complaints

Variabel	Intervention		Control		P value
	Mean	SD	Mean	SD	
Pre Test	13,437	0,963	12,750	1,000	0,057
Week 2	10,812	1,276	11,062	1,181	0,570
Week 2-Pre Test	-2,625	0,806	-1,687	1,014	0,007
Week -4	7,437	1,209	8,937	1,289	0,002
Week 4-week 2	-3,375	1,024	-2,125	0,806	0,001
Week 4-Pre Test	-6,000	1,032	-3,812	1,424	0,000

*Independent t test (analysis between group)

From the decrease in xerostomia complaints in the intervention group and the control group where there was no difference in the pre test between the intervention and control groups with a value of $p = 0.057$, in the fourth week the intervention group experienced a significant decrease compared to the control group.

The analysis showed that the control group that received acupressure could reduce xerostomia complaints at week 4 by 8.937, in the intervention group who received a combination of lemon and acupressure aromatherapy had been able to reduce xerostomia complaints on an average in almost the same range at week 3, in the week 4th has succeeded in reducing the average complaints of xerostomia by 7.437 where the score is 5 (not xerostomia) and score 15 (xerostomia) which means the average decrease in the intervention group is in the low range with a value of $p = 0.000$.

The results of the analysis show that the hypothesis of this study is accepted, namely the combination of lemon and acupressure aromatherapy is more effective than acupressure alone. Where acupressure is given in the intervention and control groups is carried out at the same dose, at the same point and the same enumerator, so it can be said that the effectiveness of the intervention group who received a combination of lemon and acupressure aromatherapy is a role of lemon aromatherapy so that it can reduce complaints xerostomia is better than the group that gets acupressure.

When viewed from the results of this study the combination of lemon and acupressure aromatherapy is more effective in reducing xerostomia complaints. The results of the calculation effect are obtained by the results of 1.2, which means the strong effect. In the previous study, the results of the calculation effect were obtained with the results of 0.32

(modest effect) (Yang, 2010), this proves that this study of the combination of lemon and acupressure aromatherapy is more effective in reducing complaints of xerostomia compared to acupressure alone.

DISCUSSION

Limonena's content in lemon aromatherapy can activate the parasympathetic nervous system in the autonomic nervous system thereby increasing salivary production which shows that salivary secretion is produced not only through the action of the autonomic nervous system but also through reflexes conditioned based on olfactory experience stimulation (Michihiro Nakayama, 2016; Tamaki Matsumoto, 2016)

Acupressure is carried out at the Juliao ST 3 point where there are facial nerves and intermedius so that at this acupuncture point can stimulate the salivary glands (Suh, 2016), at Dicangacupoints ST 4 there are also facial nerves which are branches of zygomatic, based on consultation with experts in the field acupuncture also recommends these two points to affect the salivary gland then the Lianquan CV23 acupuncture point is located in the submandibular gland and labial points can be used to treat xerostomia (Yang, 2010), Chengjiang CV 24 acupoints are branches of the inferior labial artery and vein and the branch of facial nerve at this point has additional indications of relieving thirst (Andrew Ellis, 2004), at the Chengjiang CV24 point it can be used to treat dry mouth (xerostomia) (Val Hopwood, 2010) and Taixi point KI 3 is a source of large blood vessel points and Shu meridian kidney point, the junction of 3 Yin meridians i foot is used to treat Yin and get rid of secretion of body fluids (Sun, 2007).

In this mechanism of action the combination of lemon and acupressure aromatherapy in the study can stimulate the salivary glands that will deliver these stimuli to the autonomic nervous system. Lemon aromatherapy delivers stimuli through the olfactory system produced from essential oil molecules that will be related to olfactory receptors from cilia in the nasal cavity

and sensory information transmitted along the olfactory conduction pathway through the hippocampus which then reaches the autonomic nervous system while in acupressure at the point Juliao ST 3 According to ST 4, Lianquan CV23, Chengjiang CV 24 which contained facial nerves and intermedius connected to the salivary gland so that this acupoint stimulates the salivary gland to produce saliva and reduce xerostomia caused by a decrease in salivary production. The results of the statistical test of this study in the intervention group who received a combination of lemon and acupressure aromatherapy were $p = 0,000$.

In the study of the effects of acupressure on thirst and xerostomia in hemodialysis patients, in the intervention group, acupressure was applied by hand at 2 acupoints (CV23 on the anterior midline of the neck and Yifeng TE17 on the posterior second ear lobe). the average pre-intervention salivary rate is 0.09 mL / minute and the average post-intervention salivary rate results are 0.12 mL / minute ($p = 0.04$) with a cohen's effect size of 0.32 (modest effect) (Yang, 2010).

The study of auricular acupressure therapy against xerostomia in hemodialysis patients performed has good effectiveness in this study experiencing a decrease in S-XI scores on the average S-XI score of 10.08 in the pre test to 9.04 at week 4 with a percentage drop in scores. S-XI is 10.3% (Guowen Yang, 2017). Whereas in this study adding lemon aromatherapy treatment in the intervention group showed a decrease of 44.6%.

CONCLUSION

The combination of lemon and acupressure aromatherapy is more effective in reducing xerostomia complaints in week 4 with a mean of 7.437 ($p = 0.002$).

This combination of lemon and acupressure aromatherapy can be used for nursing interventions in nursing care in patients experiencing xerostomia not only in hemodialysis patients, but also in cancer patients, the elderly, and other systemic diseases.

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