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The Effect of Gargling with Peppermint Water on Thirsty in patients Undergoing Hemodialysis

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Abstract

Background: Chronic kidney disease is a condition in which the body is unable to maintain balance in metabolism, fluids, and electrolytes due to irreparable damage to kidney function. One of the problems that can occur in hemodialysis patients is thirst. Therefore, it is important to treat patient's thirst. Gargling with peppermint water is one way to quench thirst and overcome it.

Objective: The purpose of this study was to measure the effectiveness of gargling with peppermint in reducing thirst in kidney failure patients undergoing hemodialysis.

Method: This study used quasi-experimental methods involving i36 patients undergoing hemodialysis at a private hospital in Bengkulu City. A purposive sampling technique was used in this study. In addition, visual analog scale instruments for assessing thirst were used as questionnaires to assess thirst.

Result: The study showed that there was a difference in average thirst sensation between the intervention groups and the control group. For the Mann-Whitney statistical test for thirst, the p-value was 0.026 (p-value ≤ α 0.05). This suggested that gargling with peppermint water affected thirst in hemodialysis patients.

Conclusion: Hence peppermint water gargle therapy may be recommended as a non-drug treatment to control taste thirst in renal failure patients undergoing hemodialysis.

Keywords: gargling; hemodialysis; kidney failure; peppermint; thirst

INTRODUCTION

In recent years, the number of cases of non-communicable diseases (NCDs) seems to be increasing both in the country and around the world. This disease contributes greatly to morbidity and mortality from non-communicable diseases and to meeting the UN sustainable development target to reduce premature deaths from non-communicable diseases by 2030 (Bikbov et al., 2020). Long-term failure of kidney function leads to kidney performance that cannot be gradually corrected. It causes uremia and azotemia as the body cannot maintain metabolic, fluid, and electrolyte balance (Inayati et al., 2021). The glomerular filtration rate (GFR) decreased below 60 ml/min/1.73m2 for three months, both with and without kidney damage. Chronic renal failure (CRF) is expected to be the most rapid and fifth most common cause of death by 2040 (Guerrero-Hue et al., 2021).

The Centers for Disease Control And Prevention (CDC) (2021) stated that 15% of adults in the US, or around 37 million people, are predicted to suffer from chronic kidney failure. According to Miranville (2020), there are 680,842 patients undergoing renal replacement therapy in Europe. According to the Indonesia Renal Registry (2018), there are 198.575 patients with chronic kidney failure. This figure has increased compared to previous years. According to data from Kemenkes RI (2022), 1.417.104 cases of chronic kidney failure occurred that year. According to Riskesdas Bengkulu (2018), the prevalence of chronic kidney failure is 0.43% or 12.322 cases, which was in 13th place.

Hemodialysis is a method of replacing kidney function. Hemodialysis is usually performed 2-3 times a week for 10-12 hours in total, with each session lasting 3-5 hours, in order to achieve adequate efficiency. In Indonesia, kidney failure patients do not undergo hemodialysis every day, so between two dialysis sessions, they face the problem of fluid accumulation in the body (Armiyati et al., 2019).

Problems that arise due to excess fluid are edema, heart problems, and weight gain between two hemodialysis times (Smeltzer & Bare, 2015). In order to avoid excess fluid, patients should limit fluid consumption on days when they do not do hemodialysis (Armiyati et al., 2019). Restriction of fluid intake must be done so that patients suffering from chronic kidney failure receive comfort before, during, and after hemodialysis therapy (Anita & Novitasari, 2017). Restriction of 3 important fluids is applied to hemodialysis patients even though patients will feel complaints of thirst (Guyton & Hall, 2017). Patients undergoing hemodialysis with fluid restriction often experience thirst problems. Increased thirst often results in increased fluid consumption through beverages. However, kidney failure patients cannot respond to thirst normally (Daryani et al. 2021).

Salivary secretion can be affected by the stimuli that the salivary glands receive. Such stimulation can occur through mechanical stimuli such as chewing and gargling and chemical stimuli such as sour, sweet, salty, bitter, and spicy tastes (Ria, 2018). Mechanical stimulation occurs during rinsing due to the process of movement of the cheek muscles. The gargling movement will stimulate the autonomic nerves to increase salivary secretion (Anggraini et al., 2018). Mint leaves have a cold sensation that can provide a sense of comfort, making the breath fresher (Sofidiana et al., 2022). Peppermint leaves are useful as an antibacterial agent to improve the health of oral organs and teeth and stimulate saliva production. In addition, mint leaves cope with respiratory problems and inflammation, improve the work of the digestive system, prevent heartburn, relieve nausea and bloating, and relax the work of smooth muscles in the stomach so as to avoid muscle cramps.

Based on the phenomenon described above, the author would like to conduct a scientific study on "the effect of gargling with peppermint water on thirst in kidney failure patients undergoing hemodialysis at Harapan and Doa Hospital in Bengkulu City."

METHOD

This study was a quasi-experimental plan utilizing pre and post-test plans with the control group. The respondents was divided two groups. The intervention group was further treated by gurgling with peppermint water. Meanwhile, the control group was given swishing treatment with boiled water as a comparison.. The sample in this study consisted of chronic kidney failure patients who were undergoing hemodialysis and experienced thirst in the HD room of Harapan and Doa Hospital in Bengkulu City. Sampling was carried out by purposive sampling, which considered inclusion and exclusion criteria. The use of peppermint water for gargling was the independent variable of this study, and the perception of thirst was the dependent variable. The peppermint water used was made in-house by researchers using real peppermint leaves. Peppermint leaves of 350 gr were cooked with water as much as 350 ml on the fire using a pot for 10 minutes. After cooking, the stove was turned off and let sit until it became a normal temperature, then strain and peppermint water was ready to use. Thirst estimations were taken 1 hour sometime recently and after the intercession. The treatment was conducted on one day with a recurrence of three gargling treatments conducted at 10.00 WIB, 12.00 WIB, and 14.00 WIB. The consideration was conducted by giving educated assent, and then thirst was examined during the pre-test, thirst, and post-test, while treatment was carried out within the mediation and control bunches.

Data were processed using SPSS 21 using non-parametric tests of Mann Whitney and *Wilcoxon*. Meanwhile, the media used were the *Visual Analogy Scale* (VAS) *For Thirsty Assessment* instruments with *Cronbach's alpha coefficient* of 0.96, Standard Operational Procedures for gargling with peppermint water and gargling with boiled water.

RESULT

Table 1. Characteristics of Respondents include Age, Gender, Long Hemodialysis (N = 36)

Variable	Group		P value
	Intervention (N=19)	Control (N=19)	
Gender			
Male	5 (27.8%)	8 (44.4%)	0.488*
Female	13 (72.2%)	10 (55.6)	
Age			
Mean	50.39	46.44	
Min	24	22	
Max	63	62	0.516**
SD	9.720	13.635	
CI 95%	45.56 ; 55.22	39.66 ; 53.22	
Duration of Hemodialysis			
Mean	3.33	2.22	
Min	1	1	0.052**
Max	7	5	
SD	1.782	1.263	
CI95%	2.45 ; 4.22	1.59 ; 2.85	

** Chi-Square Test ** Whitney Mann Test*

According to the results, most of the respondents who participated were female. The number of female respondents in the intervention group was 13 individuals (72.2%), while in the control group was ten individuals (55.6%). According to Ardiyanti's research (2015), most hemodialysis patients are indeed women (56.2%). Other research findings also found that the majority of hemodialysis patients are women (60.0%) (Wijayanti et al. 2017). Furhermore, research conducted by Dasuki and Basok (2019) showed that more than half of the hemodialysis patients involved in their research are women (58.8%). In this case, gender will affect a person's fluid and weight, whereas women have proportionally less body water because it contains more fat than men. Fat does not contain water, so obese clients have a smaller proportion of water than thin ones (Fajri et al., 2020).

Furthermore, current research also found that the mean age of the treatment group respondents is 50.39 years old, while the mean age of the control group is 46.44 years old. The youngest age was 22 years old, while the oldest one was 63 years old. Therefore, it can be summed up that the age of respondents was categorized as pre-elderly. According to Smeltzer et al. (2008), chronic kidney disease tends to increase in adulthood due to the chronic and progressive course of the disease. As you get older simultaneously, renal and urinary tract functions and tubule function, including reabsorption ability, will decrease. It is supported by Aisara's statement (2018) that Dynamic diminish in Glomerular Filtration Rate (GFR) and Renal Blood Stream (RBF) changes as human gets older. In addition, as age increases, the elderly actually encounters a decrease in physiological and cognitive capacities so that they are defenseless to different wellbeing issues (Sutriyanti et al., 2022).

In this study, it was found that the time respondents spent undergoing hemodialysis in the intervention group and control group ranged from 1 to 7 years, with an average of 3 years. There is a factually

noteworthy relationship between the length of hemodialysis and thirst. In this case, the length of time experiencing hemodialysis is related to the patient's capacity to adjust. The longer the patient experiences hemodialysis, the more patients are anticipated to adjust to the condition of the infection (Najikhah & Warsono, 2020).

Table 2. Average distribution of thirst before intervention in Intervention and control groups

Variable	thirst value		P Value
	mean±SD	min-max	
Group			
Intervention	4.00±0.767	3-5	
Control	4.17±1.249	3-7	
			0.960**

***Uji Mann Whitney*

Table 2 shows that the average thirst value of the intervention group respondents was 4.00 with an SD of 0.767, and it is believed that 95% of the average thirst value before the intervention was in the range of 3.62 to 4.38. The average thirst value of control group respondents was 4.17 with SD 1,249, and it is believed that 95% of the average thirst value before the intervention was in the range of 3.55 to 4.79.

Table 3. Average distribution of thirst after intervention in Intervention and control groups

Variable	thirst value		P Value
	mean±SD	min-max	
Group			
Intervention	2.17±0.857	1-3	
Control	2.89±1.132	1-5	
			0.00**

***Uji Mann Whitney*

Based on the table above, it is seen that the normal thirst level of respondents in the intervention group is 2.17, with a standard deviation of 0.875. In expansion, it can be accepted that 95% of the normal thirst level after the intervention increased from 1.74 to 2.59. Meanwhile, the thirst level of the respondents in the control group is 2.89, with a standard deviation of 1.132. It is further believed that 95% of the normal thirst level after the intervention increased from 2.33 to 3.45. The decrease in thirst value in this study was due to respondents who were willing to refrain from consuming excessive fluids by applying the act of gargling with peppermint water, which had been taught. Respondents stated that after gargling, the mouth became noticeably dry, the lips become moist, and bad breath muffles. In accordance with a study conducted by Arfany (2014), gargling movement activates the Musculus Masseter, which then stimulates the parotid gland to produce saliva or saliva. Consequently, saliva production increases so that thirst can be reduced.

Table 4. Differences in Average Thirst Before and After The Treatment in the intervention group

	N	Median (Min-Max)	Z	P-value
Thirst Value				
Before intervention	18	4.00 (3-5)	-4.001	0.000***
After intervention	18	2.17 (1-3)		

****Wilcoxon Test*

The result of the Wilcoxon Marked Rank Test factual test contained in Table 4 appears that the p value is 0.000 ≤ α 0.05. It appeared that there was a noteworthy distinction between the normal thirst values sometime recently and after the intercession within the intercession bunch.

Table 5. Differences in Average Thirst Before and After The Treatment in the control group

	N	Median (Min-Max)	Z	P-value
Thirst Value				
Before intervention	18	4.00 (3-7)	-3.416	0.001***
After intervention	18	3.00 (1-5)		

****Wilcoxon Test*

The results of the Wilcoxon Marked Rank Test factual test in Table 5 showed a noteworthy distinction between the normal thirst values before and after the intervention in the control group, with a p-value of 0.00, lower than the significance of 0.05. Chronic kidney disease patients experienced hemodialysis to overcome thirst with different sorts of treatment, one of which is gargling. There are several ways to reduce thirst felt by kidney failure patients undergoing hemodialysis, one of which is gargling with mint-flavored mouthwash, which is considered effective against thirst (Ardiyanti, 2015).

Based on the previous research conducted by Suryono (2016), gargling can also be done using 25 ml boiled water at room temperature (±25ºC), by gargling for 30 seconds and then disposing of the gargling water in the measuring cup provided. This method is also effective in reducing thirst in kidney failure patients. Furthermore, research conducted by (Sacrias, 2015) revealed that it is recommended to gargle using mouthwash 3-4 times per day with a maximum limit of water use of 100ml.

Table 6. The Effect of Gargling with Peppermint Water on Thirsty in Kidney Failure Patients Undergoing Hemodialysis at Harapan dan Doa Hospital Bengkulu City

Variable	N	Median (min-max)	U	*P value*
Thirsty Intervention	18	2.00 (1-2)	103.500	0.026**
Thirsty Control	18	1.50 (0-2)		

***Whitney Mann Test*

Based on the result above, it can be concluded that gargling utilizing peppermint water has a more significant effect on reducing thirst. It may be seen from the normal contrast within the diminished thirst sensation that's more prominent than gargling using conventional water. As a result, the null hypothesis (H0) is rejected, and the alternative hypothesis (Ha) is accepted. Therefore, it can be concluded that the thirst of kidney disease patients undergoing hemodialysis at Harapan dan Doa Hospital in Bengkulu City is influenced by gargling with peppermint water.

DISCUSSION

The results of this study found that chronic kidney patients undergoing hemodialysis at Harapan dan Doa Hospital had different thirst averages after being given treatment, with p-values of 0.026 < 0.05. Therefore, with a p-value significance level of 0.026 (p-value < 0.05), it can be concluded that thirst can be minimized by gargling peppermint water.

The results are in accordance with the previous research carried out by Ardiyanti, 2015, showing that gargling with mint-flavored mouthwash affects thirst with a p-value of 0.001. Gargling with

peppermint water can affect thirst due to the peppermint content and gargling movements that can increase salivary secretion. One of the chemical ingredients of mint is menthol, which has a cold and refreshing sensation in the mouth. When the salivary glands fail to provide enough fluid to moisturize the mouth, it results in thirst. The effect of thirst alters oral sensations. Normal thirst will soon disappear by drinking; thirst can also be overcome just by wetting the mouth without swallowing any water. Moistening the mouth by gargling can reduce thirst (Ardiyanti, 2015).

Based on research by Suryono (2016), it was stated that gargling can also be done with 25 ml boiled water at room temperature (±25ºc), gargling for 30 seconds, and then disposing of the gargle water in the measuring cup provided. This method is also effective in reducing thirst in kidney failure patients. According to research conducted by Sacrias, (2015), it is recommended to gargle using mouthwash 3-4 times per day with a maximum limit of water use of 100ml.

Ganong (2008) further stated that mechanical, neuronal, and chemical stimuli can increase salivary secretion, especially in the parotid gland, as gargling movements activate masticatory muscles. A simple saliva reflex can be produced through gargling movements. It occurs when chemoreceptors and compressive receptors inside the oral cavity respond. Then, the impulses of afferent fibers reach the salivary center in the brainstem medulla, which is also the center that controls digestion and digestive activity. The salivary center then sends impulses to the salivary gland through extrinsic autonomic nerves, which reduces thirst.

The decrease in thirst value in this study was due to respondents who were willing to refrain from consuming excessive fluids by applying the act of gargling with peppermint water, which had been taught. Respondents stated that after gargling, the mouth becomes noticeably less dry, the lips become more moist, and bad breath muffles. In accordance with a study conducted by Arfany (2014), gargling movement activates the Musculus Masseter, which then stimulates the parotid gland to produce saliva or saliva. Consequently, saliva production increases so that thirst can be reduced.

The limitations of this study are that the research was only carried out one day. To receive maximum results, the study was supposed to be carried out more than one day. The sample used was only 36 people, so it could not be generalized to all CKD populations with thirst, and the use of gargling water should be checked first using a thermometer to equalize the water temperature.

CONCLUSION

Based on the results of the analysis and discussion of the results of the research that has been done, it can be implied that the average level of thirst before being given treatment in the intervention group was 4.00, while after being given treatment became 2.17. Meanwhile, in the control group, the average level of thirst before treatment was 3.83, and after treatment, it was 2.33. Therefore, there was a difference in the effectiveness of gargling with peppermint water and gargling with boiled water to reduce thirst. Gargling with peppermint water is more effective than gargling with boiled water to reduce thirst in chronic kidney disease patients undergoing hemodialysis at Harapan and Doa Hospital Bengkulu City. Therefore, there was a noteworthy distinction between thirst levels before and after treatment in both groups. Furthermore, the difference in both the intervention group (p = 0.000) and the control group (p = 0.001) was significant. In this case, gargling with peppermint water had a critical impact on thirst (p= 0.026).

Researchers can then increase the number of samples to strengthen the data to be normally distributed, and they can use parametric tests to make research more standard. The possibility of the consequences of this study is very small considering the ingredients used are natural ingredients, namely peppermint leaves, but do not deny the effects such as allergies and canker sores caused from peppermint leaves.

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