

The Effectiveness of Chewing Gum and Sucking Ice Cubes in Reducing Thirst in Chronic Kidney Failure Patients Undergoing Hemodialysis

Eva Latifah Nurhayati¹, Debi Novita Siregar², Abdul Gani³, Sunarti⁴, Karmila Br Kaban⁵, Patimah Sari Siregar⁶
^{1,2,3,4,5,6}Faculty of Nursing and Midwifery, Universitas Prima Indonesia Medan, Sumatera Utara, Indonesia

ABSTRACT

Patients with end-stage kidney disease undergoing hemodialysis often experience Thirsty and reduce thirst in patients undergoing hemodialysis, among others, by chewing low-sugar gum and sucking ice cubes. stone to decrease thirst in chronic renal failure patients undergoing hemodialysis. This type of research used a quasi-experimental design with a two-group pre-post design, with a total sample of 34 people divided into two groups of 17 people in the chewing gum group and 17 people in the ice cube group. The results of the study before chewing low-sugar gum felt thirsty were 14 people (82,4%) and 3 people (17,6%) who felt very thirsty, while before chewing ice cubes, 16 people felt thirsty (94,1%) and 1 person (5,9%). Giving low-sugar chewing gum decreased the thirsty of as many as 14 people (82,4%) and those who did not decrease thirsty as many as 3 people (17,6%), while after sucking ice cubes, the results showed a decrease in thirst by as much as 16 people (94,1%), and 1 person (5,9%). The results of the Mann-Whitney test showed that there was a difference in the effectiveness of chewing low sugar gum and sucking ice cubes in reducing Thirsty where sucking ice cubes was more effective than chewing low sugar gum with a p-value of 0,000. Sucking ice cubes is more effective in reducing Thirsty compared to chewing low-sugar gum. Can increase knowledge and insight for patients with chronic kidney failure in dealing with thirst.

KEYWORDS: Chronic kidney disease, Thirsty, chewing gum, sucking ice cubes

ARTICLE DETAILS

Published On:
19 July 2022

Available on:
<https://ijmscr.org/>

INTRODUCTION

Chronic kidney failure (CKD) is progressive and irreversible kidney damage that causes the kidneys to not function optimally in removing toxins and metabolic waste products which are characterized by the presence of protein in the urine and a decrease in the glomerular filtration rate (Smeltzer et al., 2010). A decrease in the glomerular filtration rate was detected by examining the creatinine clearance of 4-hour urine collection which showed a decrease in creatinine clearance and an increase in serum creatinine levels (Suharyanto & Majid, 2009).

Based on data from Basic Health Research (Riset Kesehatan Dasar) in 2013, the prevalence of chronic kidney failure based on the diagnosis of Indonesian doctors was 0,2%, the highest prevalence was in Central Sulawesi at 0,5%, followed by Aceh, Gorontalo, and North Sulawesi each with 0,4%, while East Nusa Tenggara, South Sulawesi, Lampung, West Java, Central Java, DI Yogyakarta, and East Java were 0.3% each. North Sumatra province by 0.2% (Badan Penelitian dan Pengembangan Kesehatan, 2013).

Based on data obtained from the Indonesian Renal Registry in 2018, the number of new patients and active patients undergoing chronic hemodialysis in 2016-2018 has increased (Indonesian Renal Registry, 2018). Based on a 2014 report from the Indonesia Renal Registry (IRR), the percentage of hemodialysis (HD) procedures in Indonesia in 2014 was 95% routine HD, 4% acute HD, and 1% extra HD. Dialyser users in Indonesia ranked first were Central Java with 73,385 patients, followed by West Java with 50,599 patients and in North Sumatra with 2,163 patients.

Hemodialysis is the process of cleaning the blood by the accumulation of waste. Hemodialysis is used for patients with end-stage renal failure or acutely ill patients who require short-term dialysis (Purwanto, 2016). The risk of kidney disease is also influenced by race, gender, place of residence, and lifestyle. Increasing economic and health inequality, migration, demographic changes, dangerous working conditions, environmental threats, natural disasters, and

The Effectiveness of Chewing Gum and Sucking Ice Cubes in Reducing Thirst in Chronic Kidney Failure Patients Undergoing Hemodialysis

pollution can frustrate attempts to reduce morbidity and mortality from kidney disease (Luyckx et al., 2018).

Dialysis prescriptions have evolved to take advantage of new technology and serve a burgeoning patient population. The high-sodium bicarbonate-based dialysate was first formulated in 1982 to enable short, safe, comfortable, high-efficiency hemodialysis (HD). Near-universal adaptation of these high-sodium formulas has virtually eliminated profound dialysis disequilibrium and greatly reduced dialysis discomfort, but has created a syndrome of dialysis salt loading with accentuated post-dialysis thirsty, interdialytic weight gain, and hypertension. Available technology will soon permit individuals to receive hyponatremic dialysis with dialysate customized to the patient's serum sodium activity. Then, rather than choosing between comfortable, safe, high-efficiency dialysis with salt loading; cramps, asthenia, and symptomatic hypotension using low-sodium, high-efficiency rapid HD to control blood pressure (BP) and weight gain; or comfortable, slow (Flanigan, 2004).

Most patients on hemodialysis (HD) have to maintain a fluid-restricted diet to prevent a high interdialytic weight gain (IWG). The prevalence of xerostomia (the feeling of a dry mouth) is higher in HD patients than in controls (Bots et al., 2005). Because oral dryness may contribute to experienced Thirsty, we investigated the possible relation between Thirsty, salivary flow rate, xerostomia, and IWG (Bots et al., 2004). Patients on hemodialysis (HD) are unable to eliminate excess fluid and must adhere to a regimen of dietary fluid restriction to prevent volume overload. Thirsty represents a major obstacle to the achievement of such a goal (Bellomo et al., 2015).

Chewing low-sugar gum has been shown to increase the amount of saliva to reduce Thirsty and dry mouth (xerostomia). Chewing gum is an alternative therapy that can be used to stimulate salivary glands in patients undergoing hemodialysis (Bots et al., 2005). Gum chewing has been known to be a part of adjunctive medical therapy for cancer-related xerostomia. Nonadherence to fluid restriction in hemodialysis (HD) patients brought about by unrestricted Thirsty and xerostomia leads to excessive interdialytic weight gain (IWG) (Jagodzińska et al., 2011).

Based on a survey conducted by the researcher interview done with the health workers at the RSU. Royal Prima Medan, said that currently there are 114 patients with chronic kidney failure undergoing hemodialysis, consisting of 62 men and 52 women. From a large number of patients with chronic kidney failure undergoing hemodialysis, many

of them complain that they often feel thirsty during hemodialysis because their fluid intake is limited.

METHODS

This type of research is a quasi-experimental study with a two-group pre-post design, namely the sample in this study was observed before being given treatment, then after being given intervention the sample was called re-observed. The location of research was carried out at the RSU. Royal Prima Medan in 2018, the reason that the availability of the required number of samples fulfills the requirements to conduct research and there is a permit from the institution where the research is conducted.

The population in this study were all patients with chronic kidney failure, as many as 114 people. The sampling technique in this study was purposive sampling, namely, the sampling was carried out in such a way that the representativeness was determined by the researcher. The sample in this study was 17 people in the chewing group. Chewing gum and 17 people in the group sucked ice cubes. Which is in accordance with the inclusion and exclusion criteria. The purpose of this study was to determine the effectiveness of chewing low-sugar gum and sucking ice cubes in reducing thirst in chronic kidney failure patients undergoing hemodialysis.

Aspects of measuring the effect of chewing low-sugar gum and collecting ice cubes on the decrease in thirst in chronic renal failure patients undergoing hemodialysis using the observation sheet of this instrument are used as an indicator in measuring thirst before and after hemodialysis. Form observation sheet with one question, namely a list containing statements and questions to be observed and respondents providing answers by providing checks (√). This study used primary and secondary data, namely data taken directly from respondents, and from hospital staff who worked in hemodialysis rooms.

Bivariate analysis was used to determine meaningful differences between the two data groups, namely dependent variables (decreased thirst) before and after chewing gum and chewing ice cubes. This study used a paired hypothesis test, then carried out on two variables that were suspected to have an effect, using the Wilcoxon test and the Mann Whitney test.

RESULT

The results of this study used the intensity before and after being given the intervention of chewing low-sugar gum and sucking ice cubes.

Table 1. Characteristics by Gender and Age

No.	Characteristics of Respondents	Frequency (f)	Percentage %
1	Gender		
	Male	23	67,6
	Woman	11	32,4

The Effectiveness of Chewing Gum and Sucking Ice Cubes in Reducing Thirst in Chronic Kidney Failure Patients Undergoing Hemodialysis

	Total	34	100,0
2	Age		
	Teenagers 17-25 years	8	23,5
	Early adulthood 26-35 years	10	29,4
	Late adulthood 36-45 years	10	29,4
	Elderly 46-55 years	6	17,6
	Total	34	100,0

Based on the table above, it is known that of 34 people the majority are male as many as 23 people (67,6%) and the minority are female as many as 11 people (32,4%). 34

respondents, the majority aged 26-35 years and 36-45 years were 10 people (29,4%), and the minority aged 46-55 years were 6 people (17,6%).

Table 2. Characteristics of Thirsty Before the Intervention of Chewing Low Sugar Chewing Gum

No	Chewing gum	Frequency (f)	Percentage %
1	Thirsty	14	82,4
2	Very Thirsty	3	17,6
	Total	17	100,0

Based on the table above, it can be assessed that before giving low-sugar chewing gum to 17 respondents, the majority felt

thirsty as many as 14 people (82,4%) while the minority was very thirsty as many as 3 people (17,6%).

Table 3. Characteristics of Thirsty after the Intervention of Chewing Low Sugar Chewing Gum

No	Chewing gum	Frequency (f)	Percentage %
1	Decrease	14	82,4
2	Not decreasing	3	17,6
	Total	17	100,0

Based on the table above, it can be seen that, after being given low-sugar chewing gum by 17 respondents, the majority

decreased their thirst by 14 people (82,4%) while the minority did not decrease their thirst by 3 people (17,6%).

Table 4. Characteristics of Thirsty before the Intervention is Given Ice Sucking Intervention

No	Sucking ice cubes	Frequency (f)	Percentage %
1	Thirsty	16	94,1
2	Very Thirsty	1	5,9
	Total	17	100,0

Based on the table above, it can be seen that before chewing ice cubes from 17 respondents, the majority of them felt

thirsty for as many as 16 people (94,2%) while the minority was very thirsty for as many as 1 people (5,9%).

Table 5. Characteristics of Thirsty after the Intervention is Given Ice Sucking Intervention

No	Sucking ice cubes	Frequency (f)	Percentage %
1	Decrease	16	94,1
2	Not decreasing	1	5,9
	Total	17	100,0

Based on the table above, it can be seen that, after giving ice cubes to 17 respondents, the majority decreased by 16 people

(94,1%) while the minority did not decrease by 1 people (5,9%).

The Effectiveness of Chewing Gum and Sucking Ice Cubes in Reducing Thirst in Chronic Kidney Failure Patients Undergoing Hemodialysis

Table 6. The Effectiveness of Chewing Low Sugar Gum on Reducing Thirsty in Patients with Chronic Kidney Failure Undergoing Hemodialysis

Treatment	Thirsty		Very Thirsty		Total		Z	P-value
	N	%	N	%	N	%		
Before	14	82,4	3	17,6	17	100	-2,668	0,008
After	14	82,4	3	17,6	17	100		

Based on the table above, it can be seen that the Wilcoxon test results obtained a value of $Z = -2,668$ with a p value of $0,008 < 0,05$ so the conclusion was H_0 was rejected, it is concluded

that there is an effect of chewing low sugar gum on reducing thirsty in patients with chronic kidney failure undergoing hemodialysis.

Table 7. The Effectiveness of Sucking Ice Cubes on Reducing Thirsty in Patients with Chronic Kidney Failure Undergoing Hemodialysis

Treatment	Thirsty		Very Thirsty		Total		Z	P-value
	N	%	N	%	N	%		
Before	16	94,1	1	5,9	17	100	-3,638	0,000
After	16	94,1	1	5,9	17	100		

Based on the table above the results of the Wilcoxon test at the time of the pre-test had a mean value of 1,06 and a median value of 1,00. At the time of the post-test, the mean value was 1,94 and the median was 2,00. Then the Z value = $-3,638$ with

a p value of $0,000 < 0,05$ so that the conclusion H_0 is rejected, it is concluded that there is an effect of sucking ice cubes on reducing Thirsty in chronic kidney failure patients undergoing hemodialysis.

Table 8. Comparison of the Effectiveness of Chewing Low-Sugar Gum and Sucking Ice Cubes in Patients with Chronic Kidney Failure Undergoing Hemodialysis

Variable	frequency	Mean rank	Sum of rank	P Value
Group Low-sugar gum chewing	17	9,41	160,00	0,000
Group sucking ice cubes	17	25,59	435,00	

Based on the table, it can be seen that the results of the Mann Whitney test showed that the mean rank in the low-sugar chewing gum group was 9,41 and in the ice cube chewing group it was 25,59. There is a significant difference between the difference in the average decrease in the intensity of thirst in the low-sugar chewing gum group and sucking ice cubes, where the difference in the average decrease in Thirsty in the ice cube group is greater than in the low-sugar chewing gum group. The results of the Mann-Whitney test also showed a p value of $0,000 < 0,05$, it can be concluded that there is a difference in the effectiveness of chewing low-sugar gum and sucking ice cubes in reducing thirst in patients with chronic kidney failure.

DISCUSSION

Based on the results of the research before being conducted in the group giving low-sugar chewing gum, the majority 82,4% felt thirsty and the minority 17,6% felt very thirsty. In the group sucking ice cubes, 94,2% felt thirsty and 5,9% felt very thirsty. Chewing gum is an alternative therapy that can be used to stimulate the salivary glands in hemodialysis

patients. Chewing gum can reduce thirst by 60% compared to 15% saliva replacement therapy.

After giving it to the low-sugar chewing gum group, 82,4% stated that their thirst had decreased and 17,6% said their thirst had not decreased. In the group sucking ice cubes, 94,1% stated that their thirst had decreased and 5,9% said their thirst had not decreased. The water content in ice cubes is also very helpful in providing a cool and refreshing effect and is able to overcome Thirsty in patients undergoing hemodialysis. The use of ice cubes by means of sucking is also effective for oral care and overcoming dry mouth (xerostomia). Sucking ice cubes is considered effective to reduce the Thirsty experienced by patients undergoing hemodialysis (Pierce A. Grace & Neil R. Borley, 2014). While the study of patients with chronic kidney disease undergoing hemodialysis, there is no difference between smoking chewing gum and rape ice cubes (Dewi et al., 2016).

The study was conducted to compare the effectiveness of chewing low sugar gum and sucking ice cubes on reducing thirst, it was found that before being given the treatment, chewing low sugar gum often felt thirsty 82,4%, and those who felt very thirsty 17,6%. After being

The Effectiveness of Chewing Gum and Sucking Ice Cubes in Reducing Thirst in Chronic Kidney Failure Patients Undergoing Hemodialysis

given treatment, he said that his thirst decreased by 82,4% and his thirst did not decrease by 17,6%. Given the treatment of sucking ice cubes often felt thirsty 94,1% and those who felt very thirsty 5,9%. After being given the treatment, the thirst decreased by 94,1%, the thirst did not decrease by 5,9%. Thirsty is a physiological response in the human body in the form of a conscious desire to meet the needs of fluids in the body. The phenomenon of the emergence of Thirsty is equally important for regulating the concentration of sodium and water in the body (Guyton, 2012).

The study using the Mann-Whitney test showed that the mean rank in the low-sugar chewing gum group was 9,41 and in the ice cube chewing group it was 25,59. there is a significant difference between the average difference in the decrease in the intensity of thirst in the group chewing low-sugar gum and sucking ice cubes. The value shows a p-value of 0.001 <0.05, it can be concluded that there is a difference in the effectiveness of chewing low sugar gum and sucking ice cubes in reducing thirst in patients with chronic kidney failure.

The effectiveness of gum chewing in reducing thirst in HD patients has recently been evaluated by only a single study with a short 2-week intervention period (Jagodzińska et al., 2011). Chewing low-sugar gum for 5 minutes in chronic kidney disease patients undergoing hemodialysis increased saliva secretion this indirectly will also decrease thirst in respondents after being given the intervention of chewing low sugar gum for five minutes respondents said the saliva that came out was more and there was a mint flavor that made the mouth fresh so that the feeling of thirst felt reduced.

CONCLUSION

The results showed that there was a difference in the effectiveness between chewing low-sugar gum and swallowing ice cubes to reduce thirst, sucking ice cubes is more effective than chewing low-sugar gum to reduce thirst in chronic kidney failure patients undergoing hemodialysis at RSU Royal Prima Medan.

SUGGESTION

Based on the conclusions above, the authors provide several suggestions, including. For health services, it is hoped that the results of this study can be used as a basis for the preparation of Standard Operating Procedures (SOPs) for thirsty management with the intervention of sucking ice cubes and chewing low-sugar gum in patients with chronic kidney failure undergoing hemodialysis. For respondents, the results of this study can be used as tangible evidence and the effect of therapy on managing thirst so that it can be used as a nursing intervention to reduce thirst experienced by chronic kidney failure patients undergoing hemodialysis. For further researchers, they can conduct further research by modifying the interventions given to reduce thirst in chronic kidney

failure patients undergoing hemodialysis, such as frozen grapes, mouthwash, or others.

REFERENCES

- I. Badan Penelitian dan Pengembangan Kesehatan. (2013). *Riset Kesehatan Dasar 2013*.
- II. Bellomo, G., Cocchetta, P., Pasticci, F., Rossi, D., & Selvi, A. (2015). The effect of psychological intervention on thirst and interdialytic weight gain in patients on chronic hemodialysis: A randomized controlled trial. *Journal of Renal Nutrition*, 25(5). <https://doi.org/10.1053/j.jrn.2015.04.005>
- III. Bots, C. P., Brand, H. S., Veerman, E. C. I., Korevaar, J. C., Valentijn-Benz, M., Bezemer, P. D., Valentijn, R. M., Vos, P. F., Bijlsma, J. A., ter Wee, P. M., van Amerongen, B. M., & Nieuw Amerongen, A. v. (2005). Chewing gum and a saliva substitute alleviate thirst and xerostomia in patients on hemodialysis. *Nephrology Dialysis Transplantation*, 20(3). <https://doi.org/10.1093/ndt/gfh675>
- IV. Bots, C. P., Brand, H. S., Veerman, E. C. I., Valentijn-Benz, M., van Amerongen, B. M., Valentijn, R. M., Vos, P. F., Bijlsma, J. A., Bezemer, P. D., ter Wee, P. M., & Nieuw Amerongen, A. v. (2004). Interdialytic weight gain in patients on hemodialysis is associated with dry mouth and thirst. *Kidney International*, 66(4). <https://doi.org/10.1111/j.1523-1755.2004.00933.x>
- V. Dewi, A., Nurchayati, S., & Jumaini. (2016). Perbedaan efektifitas mengunyah permen karet rendah gula dan mengulum grape ice cube terhadap rasa haus pada pasien gagal ginjal kronis yang menjalani hemodialisis. *Keperawatan*, 5.
- VI. Flanigan, M. (2004). Dialysate composition and hemodialysis hypertension. In *Seminars in Dialysis* (Vol. 17, Issue 4). <https://doi.org/10.1111/j.0894-0959.2004.17327.x>
- VII. Guyton, A. C. (2012). *Fisiologi manusia dan mekanisme penyakit*. EGC.
- VIII. Indonesian Renal Registry. (2018). 11th Report of Indonesian Renal Registry 2018. *IRR*.
- IX. Jagodzińska, M., Zimmer-Nowicka, J., & Nowicki, M. (2011). Three Months of Regular Gum Chewing Neither Alleviates Xerostomia nor Reduces Overhydration in Chronic Hemodialysis Patients. *Journal of Renal Nutrition*, 21(5). <https://doi.org/10.1053/j.jrn.2010.08.002>
- X. Luyckx, V. A., Tonelli, M., & Stanifer, J. W. (2018). The global burden of kidney disease and the sustainable development goals. *Bulletin of the World Health Organization*, 96(6). <https://doi.org/10.2471/BLT.17.206441>
- XI. Pierce A. Grace and Neil R. Borley. (2014). At a Glance Ilmu Bedah. In *Ilmu Bedah*.

The Effectiveness of Chewing Gum and Sucking Ice Cubes in Reducing Thirst in Chronic Kidney Failure Patients Undergoing Hemodialysis

- XII. Purwanto, H. (2016). Asuhan keperawatan pasien dengan gangguan sistem perkemihan. In *Pusdik SDM Kesehatan Kemenkes*.
- XIII. Smeltzer, S. C., Bare, B. G., Hinkle, J. L., & Cheever, K. H. (2010). Brunner & Sudarth's textbook of medical-surgical nursing. In *Wolter Kluwer Health/ Lippincott Williams & Wilkins*.
- XIV. Suharyanto, T., & Majid, A. (2009). *Asuhan keperawatan pada klien dengan gangguan sistem perkemihan*. Trans Info Media.