

A study to assess the effectiveness of selected nursing strategies on level of thirst distress among patients undergoing hemodialysis at selected hospital Bangalore.

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Abstract:

Background: Patients with chronic kidney disease on hemodialysis therapy need to adhere to the fluid restrictions to prevent acute lung edema and congestive heart failure. Patients on dialysis experience intense thirst and xerostomia and it is important to identify effective interventions to manage thirst distress among hemodialysis patients and to enhance the quality of life of hemodialysis patients. **Objectives of the study:** Objectives of this study were to compare the level of thirst distress among hemodialysis patients in experimental and control group; determine the effectiveness of selected nursing strategies on thirst distress among hemodialysis patients in experimental group; association between thirst distress and selected demographic variables among hemodialysis patients in experimental and control group. **Material and Methods:** A randomized controlled design was utilized in the study. Sixty hemodialysis patients undergoing hemodialysis were selected based on the inclusion and exclusion criteria. The subjects were randomly assigned to experimental and control group and pretest was conducted. Specific nursing interventions to the subjects in experimental group and routine care was given to the subjects in control group. Post test measure was obtained on 2nd and 4th session of hemodialysis in both the groups. **Result:** The data collected was analyzed by using descriptive and inferential statistics. Results of the study revealed that the mean thirst distress scores were decreased from 23.23 ±2.59 on pretest to 15.77±2.28 on the 2nd post test after 4th cycle of hemodialysis in experimental group. But, in the control group mean thirst distress scores were almost similar on all the measurements with a slight increase on the second post test. There was statistically significant difference (P=0.000) in the thirst distress scores of subjects in experimental group. **Interpretation and conclusion:** Application of moist oral swabs and mouthwash was effective in reducing the level of thirst distress among patients undergoing hemodialysis and these interventions can be incorporated in the routine care of patients undergoing hemodialysis.

Keywords: Chronic kidney disease, selected nursing strategy, hemodialysis, thirst distress, oral moist swabs, mouthwashes.

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I. Introduction

Chronic kidney disease (CKD) is a progressive loss of kidney function over a period of months or years through five stages¹. It is one of the most common severe public health problems worldwide. In India, Screening and Early Evaluation of Kidney Disease (SEEK), a community based voluntary health screening program which was started in 2006, showed the overall prevalence of CKD in the SEEK India cohort to be 17.2%, with nearly 6% of patients having CKD stage 3–5². In 2013, as per Global Burden of Disease study, 956 200 people were estimated to have died from chronic kidney disease, a 134% increase from 1990, one of the largest rises among the top causes of death³. Based on different epidemiological data, chronic kidney disease affects on average 10% of the population around the world. This could be due to an increased proportion of aging population and increased prevalence of civilization diseases such as diabetes, hypertension or obesity⁴.

End stage renal disease (ESRD), for most patients, is the result of kidney function deterioration over a period of time that is secondary to another chronic medical condition such as diabetes or hypertension⁵. Treatments that are currently available for ESRD include renal transplantation and a number of forms of renal dialysis. Haemodialysis is a standard treatment of end stage renal disease or failure that has been practiced now for nearly quarter of a century. Thirst is a common problem for people on dialysis, and if the patient feels thirsty, it probably means he/she is trying to stay within the fluid limits⁶. Thirst can occur in two different ways, namely, primary or secondary. Although primary thirst is a physiological need and has a regulatory effect on body fluid homeostasis, the effect of secondary thirst is not a homeostatic regulation. Primary thirst is classified

into two categories according to origin: intracellular, which results from an increase in plasma osmotic pressure, and extracellular, which results from a decrease in plasma volume and blood pressure. Generally, these mechanisms take action together to develop thirst and stimulate both the thirst centers in the hypothalamus and the pituitary's release of antidiuretic hormone (vasopressin). Extracellular thirst also stimulates the renin–angiotensin–aldosterone system, causing reabsorption of water and sodium⁷. Dialysis patients often report their desire to drink more fluids, patients feel more distress and discomfort due to thirst intensity and restriction in fluid intake.

I.1. Significance of the study

Treatment for chronic kidney disease focuses on slowing the progression of the kidney damage, usually by controlling the underlying cause. Hemodialysis (HD) remains the most common Renal Replacement Therapy (RRT) modality for renal failure patients. Dialysis is a treatment for kidney failure that rids body of unwanted toxins, waste products and excess fluids by filtering blood. Patients with chronic kidney disease on dialytic therapy have more intense thirst and xerostomia (dry mouth), and also need to maintain a diet with fluid restrictions to prevent hypertension, acute lung edema and congestive heart failure⁸.

Once thirst is present, the organism can be satiated in a pre or post absorptive way. In the pre-absorptive way, the pressure and temperature receptors in the oropharynx monitor the impact of hydric ingestion even before the body absorbs the fluids, acting to regulate this act and interrupt the drinking. In other words, the parts of the brain responsible for thirst satiety are activated without the need for a large volume of water. Sensory physiology has discovered that every sense depends on the activation of the Transient Receptor Potential (TRP) and the cold feeling is stimulated specifically by the activation of the Transient Receptor Potential Melastatin 8 (TRPM8). Refreshing the oral cavity with cold can be considered pleasant, related with the pleasure produced by pre-absorptive satiety. The thermal perceptions occur particularly by means of the TRPM8 receptors are located on various cell structures, covering the whole oral cavity. With the reduction of the oral mucosa temperature by cold strategies, the TRPM8 is activated, and refreshment, satiety, and relief from discomfort without great fluid ingestion occurs⁸.

Thirst is a symptom that is present in clinical practice, but frequently undervalued, often unnoticed by the health team, although always recorded in the reports of individuals who experience it⁹. The investigator during the clinical practice had come across patients with hemodialysis experiencing difficulty to maintain the restricted fluid volume during hemodialysis sessions. The use of strategies that act in the pre-absorptive satiety are a viable alternative for patients who experience thirst in periods of fluid restriction. Realising that helping the client to cope with the therapeutic regimen especially the fluid restriction is one of the important nursing task, the investigator is motivated to test the effect of specific nursing strategies which include applying moist oral swab and mouthwash on thirst distress among patients with CKD subjected to hemodialysis.

II. Material and Method

The objectives of the current study is

- a. to compare the level of thirst distress among hemodialysis patients in experimental and control group.
- b. to determine the effectiveness of selected nursing strategies on thirst distress among hemodialysis patients in experimental group.
- c. to determine the association between thirst distress and selected demographic variables among hemodialysis patients in experimental and control group.

To fulfil the objectives of the current study following hypothesis were formulated

H₁: There will be statistically significant difference in the mean pre test and post test scores of thirst distress among hemodialysis patients in the experimental group

H₂: There will be statistically significant difference in the post test scores of thirst distress among hemodialysis patients in the experimental and control group.

H₃: There will be statistically significant association between thirst distress and selected demographic and clinical variables of hemodialysis patients in the experimental and control group.

Research design: A randomized controlled design.

Variables: Independent variable in this study was selected nursing strategies (moist oral swabs and mouthwash) which were administered repeatedly for 4 consecutive sessions and dependent variable refers to thirst distress among patients undergoing hemodialysis.

Setting of the study: The study was conducted in St Philomena's Hospital, Bangalore. It is a 400 bedded general hospital.

Population: The study population consisted of Patients with CKD in the age group of 30 to 70 years and receiving hemodialysis in selected hospital, Bangalore.

Sample size: The sample size of the study consisted of 60 hemodialysis patient selected from the hospital in which 30 subject each were assigned to the experimental group and control group randomly.

Sample size calculation: Sample size was calculated by using the formula,

$$n=2S_p^2 [Z_{1-\alpha/2}+Z_{1-\beta}]^2 / \mu_d^2$$
$$S_p^2 = S_1^2 + S_2^2 / 2$$

Where, S_1^2 = Standard deviation in the first group

S_2^2 = Standard deviation in the second group

μ_d^2 = Mean difference between the sample

α = Significance level

$1-\beta$ = Power

Sampling technique: A total of 81 patients receiving hemodialysis in the selected hospital were screen for eligibility from 14th January 2020 to 7th February 2020. Thirty random numbers were generated online and these numbers were assigned to the experimental group by flipping coin. The researcher prepared 60 sealed opaque envelopes which contain a card folded 4 times with a number ranging from 1-60 and the subjects were asked to handpick an envelope. The subjects who got the cards with the random number were allocated to the experimental group and the remaining subjects were allotted to the control group.

Inclusion criteria: The criteria that specify the characteristics that people in the population must possess are referred to as inclusion criteria. In this study the inclusion criteria consisted of patients diagnosed with chronic kidney disease who are willing to participate in the study by giving written informed consent and who;

- a) were in the age group of 30 to 70 years
- b) were on hemodialysis for atleast 2 times/week.
- c) had the ability to communicate
- d) had moderate to severe thirst distress

Exclusion criteria: In this study exclusion criteria included patients diagnosed with chronic kidney disease who were not alert and not oriented to time, person and place.

Data collection instrument: The instrument used for the present study consists of two sections

Section 1: Baseline data to assess the sample characteristics.

Section 2: Thirst distress scale, assess thirst distress level among patient undergoing hemodialysis.

Content validity of the tool: Content validity of the tool was established by 10 experts in the field of nursing, 1 nephrologists and 1 statistician. All the items of the thirst distress scale received 100% agreement from the experts. But for demographic and clinical performa, required modification were done accordingly.

Reliability of the tool: The reliability of tool was established by administering the tool to 8 hemodialysis patients in Greenview Medical Center Multi-Speciality Hospital, Bengaluru,India. The reliability of Thirst Distress Scale was computed by split half method using Karl Pearson's coefficient of correlation formula. The reliability of the entire tool was calculated by using Spearman Brown Prophecy formula. The Thirst Distress Scale- Janet L Welch 2002 was found to be reliable.

Pilot study: After obtaining permission from the concerned authority, pilot study was conducted on hemodialysis patients in Greenview Medical Center Multi-Speciality Hospital, Bengaluru, India. The investigator introduced herself and the purpose of the study was explained to the subjects. Confidentiality was maintained and written consent was obtained from the subjects. The subjects were asked to give the baseline information after which, the assessment was done by using Thirst Distress Scale which took an average of 15 – 20 minutes for each subject. The study was found to be feasible, practicable and acceptable. The result revealed that the objective of the study could be fulfilled. The results were presented before the research committee on 8/11/2019. Based on this information the investigator was permitted by the guide to proceed with the actual data collection for the main study.

Data collection method: The researcher obtained prior permission from St Philomena Hospital, Bangalore to conduct the study. The research proposal was presented before institutional ethical committee on 19th march 2019 and ethical clearance was obtained. Formal written permission was obtained from St Philomenas Hospital. After securing written permission from the concerned authority of the hospital and dialysis unit, a total of 81 subjects were screened for eligibility and 21 subject were excluded from the study. The subject were selected based on inclusion and exclusion criteria and informed written consent were obtained from the subject after explaining the study. The subject were randomly assigned to experimental and control group by using sealed opaque envelope method. Baseline thirst distress and demographic variable were assessed by the researcher with the help of thirst distress scale and demographic performa respectively. Specific nursing interventions which included applying moist oral swabs (3 swabs) during dialysis and mouthwash with 100ml of water before and after dialysis and at an interval of 2 hour except during dialysis with maximum of 7 mouth washes per day was administered to the subjects in experimental group and was repeated for 4 consecutive sessions of hemodialysis.

Routine care was given to the subjects in control group and all the subject in both the group were instructed to adhere to the prescribed fluid restriction. Post test measure of thirst distress was obtained on 2nd and 4th session of hemodialysis from the subjects of both group. adhere to the prescribed fluid restriction. Post test measure of thirst distress was obtained on 2nd and 4th session of hemodialysis from the subjects of both group.

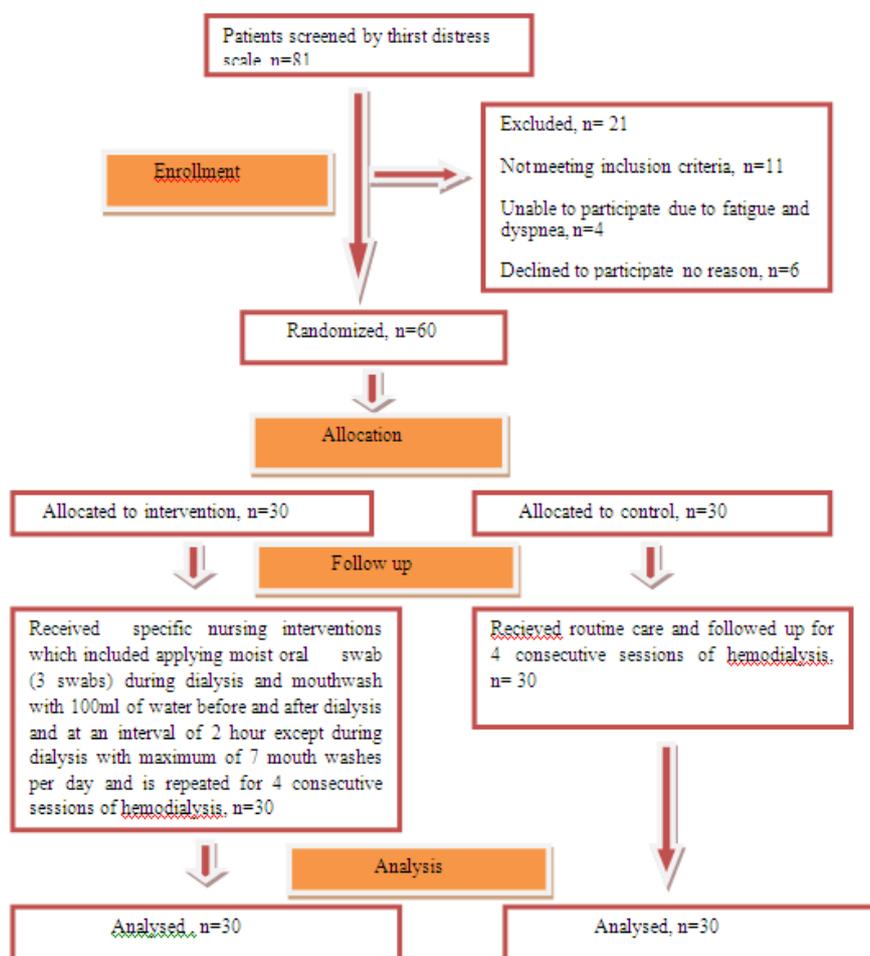


Fig.1 Consolidated Standards of Reporting Trials (CONSORT) - style flow diagram of Screening, Recruitment and Randomization.

Statistical analysis:

Analysis is the process of categorizing, ordering, manipulating and summarizing of the data to obtain an answer to the research question. It involves the translation of the information collected during the course of a research project into an interpretable and manageable form. The data would be analyzed using descriptive and inferential statistics according to the objectives of the study and organised under the following sections:

- Section 1:** Distribution of demographic and clinical profile of the subject.
- Section 2:** Level of baseline thirst distress among hemodialysis patients in experimental and control group.
- Section 3:** The comparision of pre test and post test thirst distress among hemodialysis patient in the experimental and control group.
- Section 4:** The effectiveness of applying moist swab and mouthwash on thirst distress among patients undergoing hemodialysis in experimental group.
- Section 5:** Association between the demographic variable and thirst distress among patient undergoing hemodialysis.

III. Results

Results deals with the description of the subjects characteristics, analysis and interpretation of the data collected from 60 patients with chronic kidney disease patients in a selected hospital Bangalore. The data were processed and analyzed on the basis of the objectives and hypothesis formulated for the purpose of the study.

Section 1: Distribution of demographic and clinical profile of the subject.

The highest percentage of subjects in experimental group(40%) and control group(46.7%) were in the age group of 61 to 70 years. Data also depicts that majority of the subjects in experimental (63.3%) and in control group(60%) were males and were married. Data shows that 30% of the subject in experimental and 13.3% in control group were vegetarian where as 70% of the subject in the experimental group and 86.7% in control group consumed a mixed diet. The highest percentage of the subjects in experimental group (43.3%) and in control group (63.3%) were having a fluid restriction of 751 to 1000 ml. Data also shows that 50 % of subjects in experimental and majority of subjects 73.3% in control group were following a low sodium intake. Diabetes and hypertension were the common comorbid diseases presented by the subjects in both experimental and control group.

The majority of the subjects in experimental group (90%) and control group(76.6%) were on antihypertensive drugs. Data also depicts that majority of the subjects in experimental(40%) and control group(36.7%) were suffering from CKD for a duration of 1 to 3 years. Majority of the subject in experimental (56.7%) and control group (60%) were on dialysis for 3 times/week. The data also reveals that highest percentage of subject in experimental group (46.6%) have body weight above 70kg and in control(46.6%) have body weight between 50 to 60kg.

Table no 1: Frequency, percentage distribution and chi square value of demographic and clinical variables among patients undergoing hemodialysis in experimental and control group.(n=60)

variables	experimental group		control group		χ^2 value	p value
	frequency	percentage	frequency	percentage		
Age in year						
30 to 40	3	10%	3	10%	1.487	0.685
41 to 50	5	16.7%	7	23.3%		
51 to 60	10	33.3%	6	20%		
61 to 70	12	40%	14	46.7%		
Gender						
Male	19	63.3%	18	60%	0.071	0.791
Female	11	36.7%	12	40%		
Marital status						
unmarried	2	7%	0		3.01	0.221
married	28	93.3%	29	96.7%		
widowed	0		1	3%		
divorced/seperated	0		0			
Quantity of fluid permitted in ml per day						
500 to 750ml	12	40%	9	30%	0.83	0.242
751 to 1000ml	13	43.30%	19	63.30%		
1000ml to 1500ml	5	16.70%	2	6.70%		
Daily sodium intake						
low intake,<1 spoon per day	15	50%	22	73.30%	3.45	0.063
moderate, 1 to 2 spoon per day	15	50%	8	26.70%		
History of comorbid illness						
diabetes mellitus	3	10%	5	16.70%	3.39	0.335
hypertension	11	36.70%	16	53.30%		
anemia	2	6.60%	1	3.30%		
both (diabetes and hypertension)	14	46.70%	8	26.70%		
Duration of CKD						
Below 1 years	7	23.30%	6	20%	1.663	0.645

1 to 3 years	12	40%	11	36.70%		
3.1 to 5 years	6	20%	4	13.30%		
Above 5 years	5	16.70%	9	30%		
Frequency of hemodialysis						
2 times/weeks	12	40%	10	33.30%	0.544	0.762
3 times/week	17	56.70%	18	60%		
4 times/week	1	3.30%	2	6.70%		
Body weight						
below 50 kg	1	3.30%	3	10%	3.964	0.265
50 to 60kg	9	30%	14	46.60%		
61 to 70kg	7	23.30%	6	20%		
above 70 kg	14	46.60%	7	23.30%		

Section 2: Level of baseline thirst distress among hemodialysis patients in experimental and control group.

Thirst Distress Scale - Janet L Welch 2002 was used to assess the thirst distress level of hemodialysis patients and level of thirst was graded to mild, moderate, severe.

Table 2: Frequency and percentage distribution of hemodialysis patiented based on the baseline level of thirst distress.

		n ₁ =30, n ₂ =30			
		Experimental		Control	
		pre test		pre test	
variable	Score	frequency	%	frequency	%
Mild	<15				
moderate	16-22	12	40%	14	46.70%
severe	23 – 30	18	60%	16	53.30%

Table 2 shows that majority of the subject in experimental (60%) and control group (53.3%) had severe thirst distress.

Section 3: The comparison of pre test and post test mean thirst distress score of subject among hemodialysis patient in the experimental and control group.

Normal distribution of the thirst distress scores was checked by Shapiro Wilk Test and the data was found to be normally distributed. Hence to compare the thirst distress score between experimental and control group independent t test was computed and following null hypothesis was formulated

H₀: There is no significant difference between the mean thirst distress score of subjects in the experimental and control groups

Table 3: Comparison of pre test, 1st post test and 2nd post test mean scores of thirst distress scale in experimental and control groups .

n ₁ =30, n ₂ =30						
variable	Experimental group		Control group		t value	p value
	Mean	S.D	mean	S.D		
Pre test	23.3	2.59	21.97	2.6	1.88	0.064
1st post test	17.97	2.47	21.97	2.6	6.101	0.000
2nd post test	15.77	2.28	22	2.6	9.865	0.000

d_f=58, t=2.22

The data from the table 3 shows that the mean pre test thirst distress score for experimental and control group was 23.3±2.59 and 21.97±2.6 respectively. Since the obtained p value was greater than 0.05, null hypothesis was accepted. It is inferred that there was no significant difference between the baseline mean thirst distress scores of subjects in experimental and control group. The data also reveals that on 1st and 2nd post test the obtained p values were less than 0.05, and the null hypotheses were rejected. It is inferred that there is

significant difference in mean thirst distress scores of subjects in experimental and control group on 1st and 2nd post test.

Section 4: The effectiveness of applying moist swab and mouthwash on thirst distress among patients undergoing hemodialysis in experimental group.

To evaluate the effectiveness of application of moist swabs and mouthwash on thirst distress among hemodialysis patient in experimental group the thirst distress scale scores was recorded at three different time point namely pre-test, 1st post test (2nd cycle) and 2nd post test (4th cycle) which forms repeated observation on every subject and the repeated measures of analysis of variances were computed. Following null hypothesis was formulated

H₀ : There is no significant relationship between application of moist swabs and mouthwash and thirst distress among patients undergoing hemodialysis.

Table 4: Comparison of pre test and post test thirst distress scores of the subject in the experimental group.

n ₁ =30, n ₂ =30					
Thirst score	Type III sum of square	df	Mean square	F value	p value
pre test	414.408	1	414.408	48.6	0.000
1st post test					
2nd post test					

The data in the table 4 reveals that the obtained p value was lesser than 0.05 and hence the null hypothesis was rejected. It was inferred that there was statistically significant difference in the thirst distress scores of subjects in experimental group indicating the effectiveness of selected nursing strategies on thirst distress among hemodialysis patient.

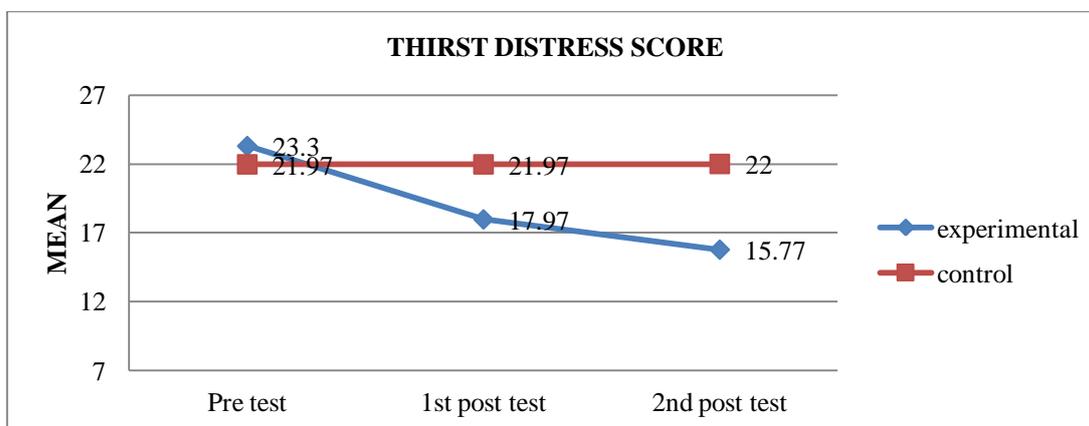


Fig 2: Line graph indicating the mean thirst distress score among the subjects in experimental and control group.

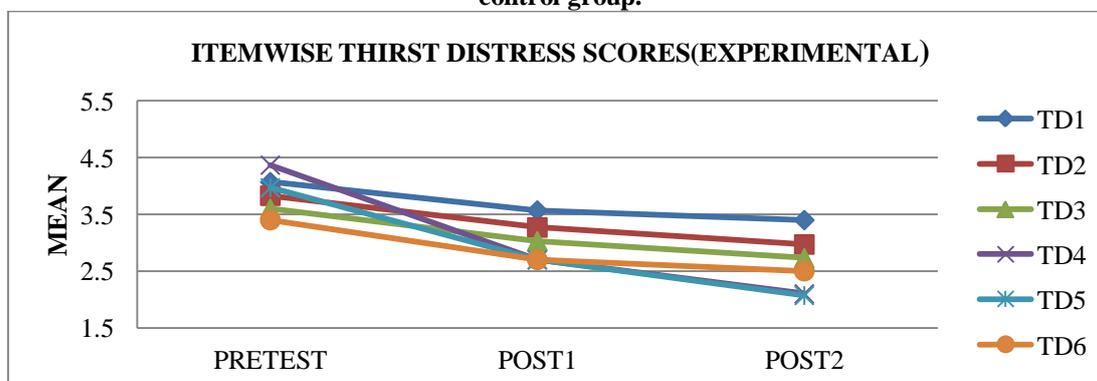


Fig 3 : Itemwise comparison of mean thirst distress score in experimental group.

The figure 3 reveals that among subjects in the experimental group, Item no.4, mouth feels like sticky and dry was the item with the highest mean score (4.37 ± 0.61) on pretest and had a greater reduction on second posttest (2.1 ± 0.30). The figure 4 also reveals that all the items had a greater reduction in their mean scores on second posttest indicating the clinical significance of selected nursing interventions on thirst distress among hemodialysis patients.

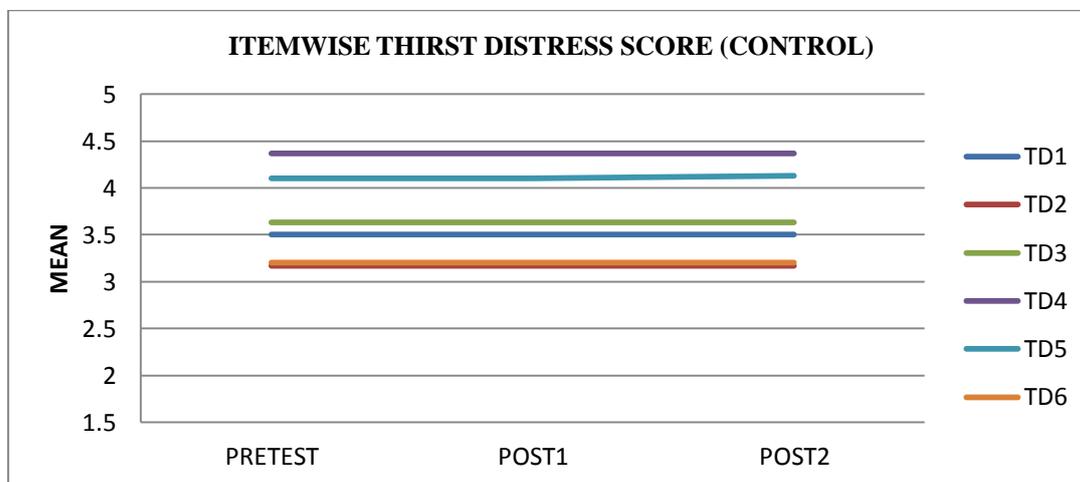


Fig 4 : Itemwise comparison of mean thirst distress score in control group.

Among the subjects in the control group, item no.4, mouth feels like sticky and dry was the item with the highest mean score (4.37 ± 0.66) on pretest and the graph also reveals that there was no reduction in the mean scores of all the items on posttest one and two.

Section 5: Association between the demographic variable and thirst distress among patient undergoing hemodialysis in experimental and control group.

In order to determine the association of thirst distress with selected demographic variable, linear regression was computed for experimental and control group. reveals that there was no significant association between the pre test thirst distress scores and selected demographic and clinical variables of hemodialysis patients such as age, gender, marital status, education, dietary pattern, quantity of fluid permitted, daily sodium intake, duration of CKD, frequency of HD per week and body weight. The data also depicts that there was a statistically significant association between presence of co morbid diseases and thirst distress ($p= 0.005$) and can be inferred that presence of co morbid disease has a significant impact on thirst distress among hemodialysis patients.

IV. DISCUSSION

The findings of the study revealed that highest percentage of subjects in experimental group (40%) and control group (46.7%) were in the age group of 61 to 70 years. The finding differs from United States Renal Data System (USRDS) 2018 which reports a decreasing prevalence of ESRD among older adults due to a greater mortality among them. In the present study majority of the subjects were males in experimental (63.3%) and control group (60%). The findings collaborate with the theoretical literature which reports ESRD as a disease more frequent in males.

The present study findings identified that diabetes and hypertension were the common comorbid diseases presented by the subjects in both experimental and control group. A similar study conducted in Chennai revealed that majority of the patients (80%) in the study group and the control group had diabetes mellitus. In patients with diabetes mellitus, the excess glucose combines with free amino acids on circulating or tissue proteins and generate Advanced Glycation End Products (AGEs). These products may cause renal and microvascular complications through accumulation in tissues and cross linking with collagen leading to an increased risk for CKD. A study conducted in Indonesia showed that 48.86% of respondents in the intervention group and 50% in the control suffered from renal impairment caused by hypertensive disease. Increased prevalence of CKD among hypertensive patients could be due to increased intra glomerular capillary pressure resulting in glomerulosclerosis and decreased kidney function.

The present study revealed that majority of the subjects in experimental (60%) and control group (53.3%) had severe thirst distress. Similar findings were reported by a study conducted among 40 hemodialysis patients which 60% of the experimental group had moderate thirst distress and 55% of the control group had severe thirst distress. The findings are collaborated by the findings of a study conducted on 88 hemodialysis patients to assess the influence of low-sodium diet management on thirst response in end stage renal disease patients with hemodialysis which reported that 56.82% of respondents in the intervention group experienced

moderate thirst and 43.18% had severe thirst. In the control group, 43.18% of respondent experienced moderate thirst and 45.45% of the subjects had severe thirst.

The current study observed that there was a greater reduction in mean thirst distress scores of subjects in the experimental group on first (17.97 ± 2.47) and second (15.77 ± 2.28) post test measurement (after 4th cycle of hemodialysis). In the control group, the mean thirst distress scores were almost similar on all the measurements with a slight increase on the second post test. These observations are similar to the findings of a study which reported that the mean thirst distress scores were decreased from 2.30 ± 0.57 on pretest to 1.20 ± 0.14 on posttest in experimental group and in the control group mean thirst distress scores were almost similar on all the measurements.

The present study observed that there was a greater reduction in the post test scores of thirst distress of the subjects in experimental group on first and second post test measurement (after 4th cycle of hemodialysis) which was statistically significant ($F= 48.6, p=0.000$). Indicating the effectiveness of application of moist swabs and mouthwash in reducing the level of thirst distress among patients undergoing hemodialysis in experimental group. A similar study conducted in Chennai among 40 subjects reported that there was a greater reduction in the level of thirst distress after the administration of sucking ice cubes and mouthwash in experimental group ($p=0.004$). These findings are also supported by the findings of a quasi-experimental study conducted among 56 post operative patients. ($F=4.29, p=.009$). These findings suggest that application of moist swabs and mouthwash could be an effective nursing intervention to improve the condition of oral cavity and to reduce thirst distress and can be incorporated in the routine care of hemodialysis patients.

The study observed a statistically significant association between presence of co morbid diseases and thirst distress ($p= 0.005$) and can be inferred that presence of co morbid disease has a significant impact on thirst distress among hemodialysis patients. This finding is contradictory to the findings of a cross-sectional study conducted to evaluate thirst distress and its determinants in a sample of 203 hemodialysis patients in Turkey which reported no significant association between co morbid illness and thirst distress.

V. Conclusion

Application of moist oral swabs and mouthwash was effective in reducing the level of thirst distress among patients undergoing hemodialysis and these interventions can be incorporated in the routine care of patients undergoing hemodialysis.

Limitation

The study was conducted in a single setting. Thirst distress was measured according to the verbal response of the subjects. Followed up only for 4 cycles, long term assessment could not be done.

Implication and Recommendations

The nurses working in hemodialysis unit can draw inspiration from the evidence provided by the present study and can implement the selected nursing strategies to reduce fluid overload and inter dialytic weight gain which decrease the risk of cardiovascular morbidity & mortality and improve quality of life.

The study findings indicate that thirst and associated distress is important to be monitored and hence the nursing students to be guided in the thirst assessment of patients with restricted oral fluid intake. Nursing students should be skilled enough to identify thirst distress and to apply the strategies among patients on NPO status or with restricted intake in different settings.

In collaboration with Education Department nursing administrator can arrange the periodic in service education programme for the staff nurses regarding: Assessment of thirst distress in hemodialysis patients and the patients with restricted fluid intake, factors causing thirst distress in hemodialysis patients, and formulation of policies regarding the application of evidence based practice.

Further research can be carried out in this particular area to check the effectiveness of this strategies on large sample for generalization. Research can be conducted to identify long term effects of application of selected nursing strategies among patients who are nil per oral or with restricted fluid intake.

On the basis of the findings of the study the following recommendation have been made for the further study:

1. The study can be replicated on larger sample in different setting thereby improving the chances for generalization of findings.
2. Comparative study could be conducted with other non pharmacological measures.
3. A similar study could be conducted between thirst distress and other complimentary therapies.
4. A descriptive study can be conducted on the awareness of ESRD patients about various non-pharmacological therapies that can be adopted during hemodialysis to reduce thirst distress.
5. A similar study could be conducted for a longer duration.
6. Testing the effectiveness of application of moist oral swabs and mouthwashes among patients who are nil per oral or with restricted fluid intake.

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