Effect of Implementing Nursing Measures on Thirst Perception among Patients in Chest Intensive Care Unit

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Abstract
Background: Thirst is one of the main stressors that reduce the comfort of critically ill patients connected with a noninvasive laryngeal mask. It can cause significant distress and stress, which can increase oxygen consumption and the metabolic burden of their organs, and may even induce delirium, thus affecting recovery. **Aim:** The current study aimed to evaluate the effect of implementing nursing measures on thirst perception among patients in chest intensive care units. **Design:** A quasi-experimental study design. **Setting:** This study was conducted at the Chest Intensive Care Unit in Tanta University Chest Hospital affiliated to Tanta University Hospitals. **Subjects**: A purposive sample of 60 adult patients admitted to the previously mentioned setting. **Tools:** three tools were used in order to obtain the necessary data for this study: **Tool I:** Patient's Interview Schedule, **tool II:** Subjective Thirst Perception Scale and **tool III:** Objective Thirst Assessment Sheet. **Results**: there was a statistical significant decrease in thirst perception in both control and study group on the third day in which p = 0.049* and 0.045* respectively. Additionally, there was statistical significant decrease in thirst perception in control versus study group on the third day in which p =0.043*. **Conclusion:** The results of the current study concluded that there was a significant decrease of thirst perception among critically ill patients after implementing nursing measures in ICU. **Recommendations:** It can be recommended that using nursing measures as a part of the daily care in managing patients' complains of thirst in ICU is   essential.
Key Words: Critically Ill Patient, Intensive care unit, Nursing measures& Thirst perception.

Introduction

Thirst is one of the main stressors that reduce the comfort of critically ill patients connected with a noninvasive laryngeal mask. It can cause significant distress and stress, which can increase oxygen consumption and the metabolic burden of their organs, and may even induce delirium, thus affecting recovery. (**Doi et al., 2021**)

According to an interesting study, in the intensive care unit (ICU), thirst is reported as the highest source of stress, with a prevalence in ICU patients of 70.8%. However, thirst is often undetected and remains untreated. Particularly in critically ill patients with a noninvasive laryngeal mask, it is difficult to detect patients' thirst perception because they cannot express thirst perception under sedation or intubation. (**Schittek et al., 2020& Kawahara et al., 2020**)

Thirst can be defined as a perception that provokes the urge to drink fluids and is a prevalent, intense, distressing, and underappreciated symptom in intensive care patients. Additionally, dry mouth refers to a condition in which the salivary glands in the mouth don't make enough saliva to keep the mouth wet. Thirst and dry mouth are common symptoms and may affect patients' experience in the intensive care unit. It usually occurs due to the adverse effect of some medications, oxygen therapy, and intubation**. (VonStein et al., 2019&Aoki et al., 2018)**

According to etiology, thirst can be osmotic or hypovolemic. Osmotic thirst derives from a slight increase of 1% to 2% in plasma osmolality, which can stimulate the release of the antidiuretic hormone. When the compensatory mechanism provided by the osmotic changes is not effective, thirst is activated, prompting the body to seek water. In turn, hypovolemic thirst is associated with the need for hydric ingestion to restore plasma volume, and its regulatory mechanism depends both on the renin-angiotensin-aldosterone system and the adrenergic action. On the other hand, a dry mouth is the result of inadequate saliva secretion, which may reflect hypovolemia. Although thirst perception and dry mouth may be associated, these relationships have not been investigated. (**Doi et al., 2021&Nascimento et al., 2018**)

The critically ill patients are exposed to a confluence of factors that lead to an increase in the thirst incidence and patient distress such as extended fasting times both preoperatively and postoperatively, intraoperative bleeding, anxiety, intubation, blood loss, electrolyte imbalance, and effect of anesthetic drugs and prolonged oxygen therapy. (**Nascimento et al., 2018**)

Management of thirst in critically ill patients on the non-invasive laryngeal mask is challenging; there is a great reduction in oral fluid intake due to the disturbing level of consciousness from both the anesthetic drugs and the presence of nausea and vomiting that might lead to the development of pulmonary aspiration. Therefore, finding easy and safe ways to alleviate thirst among patients postoperatively is a major challenge and crucial issue for health care professionals. (**Lee et al., 2020**)

Several nursing measures have been proposed to quench thirst including declining body temperature, use of menthol in association with cold

strategies, use chewing gums, applying acupressure, early fluid ingestion, substitute saliva, and the use of a thin straw (**Garcia et al., 2016**). The choice among such strategies is at least in part dependent on the type of critical care units. For example, declining body temperature seems suitable in the chest intensive care unit serving the dual purpose of limiting the ingested volume while stimulating cold-sensitive receptors. There is growing clinical interest in improving the ability to quench thirst for patient with non-invasive laryngeal mask and in optimizing thirst management. (**Lee et al., 2020. Garcia et al., 2016&Gulia et al.,2019**)

Significance of study:

Oral fluid intake may be restricted in ICU due to intubation and fasting which might lead to increased mouth dryness and thirst intensity. Nurses and physicians usually carry the perception that nothing can be done to overcome thirst and dry mouth. Also, it remains undocumented and neglected in critical care units. As far as now, no permanent assessment strategies are being carried out to assess thirst and dry mouth. This highlights the fact that there is a lack of database interventions in hospitals to reduce the intensity and distress of thirst and dry mouth. (**Aoki et al., 2018**) Thus, the study aims to evaluate the effect of implementing nursing measures on thirst perception among critically ill patients.

The aim of the study was to:

Evaluate the effect of implementing nursing measures on thirst perception among patients in chest intensive care units.

Research hypothesis:

Patients in the study group who will receive mouth care, ice water swabs, and acupressure exhibit relieving thirst and dry mouth compared to the control group.

Subjects and Method

Research design:

A quasi-experimental research design was utilized in this study.

Setting:

The study was conducted at the Chest Intensive Care Unit in Tanta University Chest Hospital. This unit is prepared and equipped with 4 words (the first ward equipped with 10 beds, the second word equipped with 3beds, the third word equipped with 2beds, and the reception word equipped with 2 beds). The total number of beds is 17.

Subjects:

A purposive sample of 60 adult patients was collected from the previously mentioned settings.

Inclusion criteria:

The subjects were selected according to the following criteria:

- Adult patients in the Intensive Care Unit (21 to 60 years).
- Both sexes.
- Patient still 72 hours in the intensive care unit.
- Ability to communicate.
- Patients were connected with a non-invasive laryngeal mask on Continuous Positive Airway Pressure (CPAP) or Bi-level Positive Airway Pressure (BI PAP) modes.

Tools of the study: -

Three tools were used to collect data for this study as follows:

Tool (I): Patient's Interview Schedule:

This tool was developed by the researcher after reviewing the related literature (**Kathleen, 2016. Zengin et al,**

2020), and it was consisted of the following two parts:

Part (1): Patients' Sociodemographic Data: This part included the patients' age, sex, patients' code, marital status, educational level, and occupation.

Part (2): Patients' Medical History Data:

This part included the following:

- Patients' current diagnosis, length of hospital stay
- Past medical, surgical, and family history
- Present history which included current medication such as opioids and diuretics. Additionally, causes of thirst such as extended fasting times, anxiety, previous intubation, blood loss, electrolyte imbalance, and the effect of anesthetic drugs and prolonged oxygen therapy. **(Adams et al,2020. Zengin et al ,2020)**

Tool (II): Subjective Thirst Perception Scale

This tool was developed by **Millard-Stafford et al. (2012)** to assess thirst in critically ill patients. This scale consisted two subscales as follows:

- Visual analog scale; which consisted of a 3-point Likert scale ranged from not thirsty to very thirsty.
- Categorical scale; which contained a 7-point Likert scale ranged from not thirsty at all to very, very thirsty.

Scoring system:

It was a single 10-point numeric rating scale during this scale patients feeling of thirst were assessed via the communication board and documented by the researcher on a 3-point visual analogue scale (top) and 7-point categorical scale (bottom).

Tool (III): Objective Thirst Assessment Sheet

Part (1): Physiological Parameters: such as vital signs, central venous pressure.

Part (2): Indicators of Thirst Assessment; such as dry mouth, decreased urine output, reduced sweating, tear production, muscle cramps, weakness, lightheadedness, pain, nausea, vomiting, hypoxia, tremors, and respiratory depression. **(Adams et al., 2020& Leemhuis et al., 2019)**

Scoring system: The total point of thirst indicators was 13, each point was observed, categorized, and scored into either present =1 or not present= 0 on all items of the checklist. The lowest value of the total point within the first 24 hours after admission to the ICU was selected as an index of the severity of thirst.

Part (3): Patients' Oral Assessment Guide (OAG) Scale:

This tool was developed by **(Aoki et al, 2018)** and adapted by the researchers to assess the oral condition as regards lips, tongue, mucosa, and saliva. The OAG scale consists of eight assessment categories: voice, swallowing, lips, tongue, saliva, mucous membrane, gingiva, and teeth/dentures. Each category was expressed in three stages.

Scoring system:

The OAG score was the sum of the scores for each category; each category was scored from 1 to 3-point Likert scale as the following:

- Score (1) for normal findings (pink and moist) = no thirst and healthy oral mucosa.
- Score (2) for moderate abnormality without compromise of either mucosal integrity or loss of function (dry, reddened or crackled) = moderate thirst.
- Score (3) for severe abnormality of mucosa= severe thirst.

The best possible score of 8 points was indicated of good oral health; the worst

possible score of 24 points was indicated of poor oral health.

Part (4): Thirst Biochemical Parameters: which included blood volume that affect thirst including plasma osmolality, sodium (normal/low/high), potassium (normal/low), glucose (normal/high), partial pressure of carbon dioxide (normal/low/high) and partial pressure of oxygen (normal/low/high) was recorded.

Method

1- **An official permission** was obtained from the responsible authorities at the Faculty of Nursing, Tanta University to the director of the Chest Care Unit in Tanta University Chest Hospital.

2- **Ethical and Legal Consideration:**

a. Ethical committee approval was obtained from the faculty of nursing Code No (66/5/2022).

b. Every participant was informed about the purpose, nature, and benefits of the study at beginning of the research and asked to share in the study willingly.

c. Written informed consent obtained from each patient.

d. Confidentiality and anonymity maintained by the use of code number instead of name and the right of withdrawal is reserved.

e. The privacy of the studied patients maintained.

f. The study not caused any harm to the patients.

3. The study tool I and tool III parts one, two, and four was developed by the researcher based on the literature review. Tool II was developed by **Millard-Stafford et al. (2012)** and Tool III part three was developed by **Aoki et al. (2018)** and adapted by the researcher.

4. Validity of the developed tool tested for clarity and applicability by seven experts in Critical Care Nursing and Biostatistics to ensure their validity and modifications would be done.

5. The reliability all tools of the study tested for reliability and Cronbach alpha test would be used.

- Cronbach's Alpha for tool I is 0.802 for 12 items applied on 6 adult patients.
- Cronbach's Alpha for tool II is 0.951 for 2 items applied on 6 adult patients.
- Cronbach's Alpha for tool III is 0.881 for 34 items applied on 6 adult patients.
- Cronbach's Alpha for the studied sheet in total is 0.827 for 6 adult patients.

6. A pilot study carried out on 10% (6) patients to assess the feasibility and applicability of the tools and the needed modifications would be done.

7. Sixty critically ill patients selected according to inclusion criteria and exclusion criteria and was divided into two equally groups 30 of patients in each group.

8. Data was collected within 6 months.

9. The researcher started with the control group first then the study group.

10. Data collection: The present study was conducted through four phases assessment, planning, implementation, and evaluation phase as follow:

I-Assessment phase:

Assessment done by the researcher for all patients in both groups. This phase was started immediately before implementing nursing measures as a baseline data to assess the baseline data. The researcher assessed each patient individually during morning, evening and night shifts. The assessment done before and 15 minutes after implementing nursing measures for three consecutive days as the following:

- Assessment of patient socio-demographic, and medical history data was obtained by the researcher using Tool I.

- Objective assessment of patients' thirst physiological related parameters, thirst indicators and biochemical parameters using tool III parts one, two, and four.
- Assessment of patients' subjective thirst perception and changes of oral condition as regards lips, tongue, mucosa, and saliva using tool II and tool III part three.

II- Planning phase:

This phase was based on data of the assessment phase and expected outcomes criteria that prescribed when planning patient care which include:

1. Reducing dry mouth for patients with a non-invasive laryngeal mask.
2. Decreasing the feeling of thirst.

III- Implementation phase:

Patients assigned into two groups; control and study groups.

- Patients in the control group received the routine care of the unit as implemented by the nursing staff which includes mouth care.
- Patients in the study group received mouth care, oral ice water swabs, and acupressure technique by the researchers.

Implementing mouth care and ice water swab:

- Hand washing.
- Put on clean gloves and explain the procedure to the patient.
- Disconnect the patient from Bi PAP.
- Attach him with nasal cannula.
- Place a towel across the patient's chest to keep them dry and prop the patient's head up to a 45-degree angle or greater.
- provide mouthwash in a cup. Instruct the patient to rinse his mouth and spit.
- Place a dime-sized amount of toothpaste on a toothbrush and brush all surfaces of the teeth.
- Provide more mouthwash and have the patient rinse and spit.
- Have the patient rinse and spit one more time.
- Asked the patient to open his mouth and

lift his tongue.
- Put ice water swab on patient's tongue, left cheek and right cheek.
- Instruct the patient to close his mouth for several seconds then remove the swab.
- Attach the patient with Bi PAP.

Implementing acupressure:

- **Two acupoints used to increase salivary flow rate:**
- Lianquan (CV23) on the anterior midline of the neck, this is called conceptual vessel 23 located at the upper border of hyoid bone, it's about a finger width above laryngeal prominence (Adam's Apple).
- Yifeng (TE17) Triple Energizer meridian located posterior to both ear lobes, in the depression between the mastoid process and the angle of the mandible.
- Used hands as a tool to press acupoints on the skin.
- Pressure was usually applied for a minimum of 15 s (**Yang et al ,2010**).
- Perform gentile pressure on circular motion for between 30 s and 5 min.
- The nursing measures implemented during morning, evening and night shifts before implementing each nursing measures and after 15 minutes' post implementing nursing measure for 3 consecutive days.
- During subjective thirst perception assessment, the patients respond to the researcher question through a communication board, the researcher records this response.
- The nursing staff trained during the morning shift before the beginning of data collection to help the researcher implementing nursing measures.

IV. Evaluation phase:

In this phase, the researcher observed each patient before implementing each nursing measures and after 15 minutes' post implementing nursing measure for 3 consecutive days to evaluate thirst

perception thirst intensity level, and oral condition using tool II and III.

Results

Table (1) represents the percent distribution of the studied patients according to their sociodemographic characteristics. In relation to age, it was reported that, more than half (60.00 % and 67.67 %) of the studied patients in both control and study groups were in the age group (50-60) years respectively, with mean age of (**51.17±7.096**) in control group and (**51.87±6.021**) in study group. **In relation to sex**, the majority (80.00%) of the studied patients in control group were male and more than two- thirds (73.33%) of the studied patients in study group were male. **Additionally**, more than two- thirds (70.00%) of the studied patients in control group employee and the majority (80.00%) of the studied patients in study group employee. **As regards to their marital status,** the majority (86.67% and 83.33%) of the studied patients in both control and study groups were married respectively.

Table (2) Represents the percentage distribution of the studied patients of both groups according to their clinical data. **Regarding current diagnosis**. It was noticed that the vast majority (90.00% and 96.67%) of the studied patients in both control and study groups were diagnosed as respiratory disorders respectively. **Additionally,** the most common (43.33% and 50.00%) comorbid disease among the control and study groups respectively was respiratory disease while, the least one (13.33%) was gastrointestinal disease. **Concerning current medication**, It was observed that more than half (53.33% and 56.67%) of the studied patients in

control and study groups were received opioids medication and near half (46.67% and 43.33%) of the patients in control and study groups received diuretics respectively.

Figure 1: Illustrates Distribution of the studied patients of both groups regarding the causes of thirst. It showed that more than two- thirds (70%) of the studied patients in control group and the vast majority (90.67%)of the patients in study group were suffered from thirst related to prolonged oxygen therapy. While more than half (66.67%and 63.33%) of the studied patients in control and study groups were suffered from thirst related to previous intubation respectively

Table (3): Shows the distribution of the studied patients according to subjective thirst perception. This table represents that near half (40.00%) of the studied patients in control group on the first day after nursing measures were at level 5 (thirst) on thirst categorical scale while more than half (60.00%) were at level 5 (thirst) on the third day. **on the other hand**, near one quarter (23.33%)of the studied patients in study group on the first day were at level 6 (very thirst) after nursing measures while more than one third (33.33%) were at level 3(not very thirsty) on thirst categorical scale.

Also it was observed that, there was statistical significant decrease in thirst perception in both control and study group on the third day in which p = **0.049*** **and** **0.045*** respectively. **Additional**ly, there was statistical significant decrease in thirst perception in control versus study group on the third day in which p =**0.043***.

Table (4): Illustrates the distribution of the studied patients at Chest

Intensive Care Unit regarding indicators of thirst assessment. It was found that more than two- thirds (73.33%) of the studied patients in the control group has dry mouth on the third day after implementing nursing measures. Compared to only minority (13.33%) of patients in the study group. It was observed that there were statistical significant improvement among the studied patients in the study group during the first and the second days of intervention P<0.05.

Additionally, it was found that there were statistical significant improvement among the studied patients of the study group during the 3rd day regarding light headedness, pain and vomiting P<0.05.

Table (5): Illustrates distribution of the studied patients of both groups regarding total level of oral assessment guide (OAG). This table reported that there was significance increase good oral health among patients in control group on third day in which p= **0.049*. On the other hand**, there was significance increase good oral health among patients in study group on first day in which p=**0.032***

Also, there was significance increase oral health status between control and study group on first and third day after nursing measures in which p= **0.027*** and p=**0.025*** respectively.

Table (1): Distribution of the studied patients according to their socio-demographic characteristics.

Characteristics	The studied patients (n=60)				χ^2 P
	Control group (n=30)		Study group (n=30)		
	N	%	N	%	
Age (in years)					
▪ (30-<40)	2	6.67	0	0.00	0.642
▪ (40-<50)	10	33.33	10	33.33	0.914
▪ (50-60)	18	60.00	20	67.67	
Range	**(39-60)**		**(39-59)**		t=0.765
Mean ± SD	**51.17±7.096**		**51.87±6.021**		P=0.447
Gender					
▪ Male	24	80.00	22	73.33	FE
▪ Female	6	20.00	8	26.67	1.00
Marital status					
▪ Single	0	0.00	2	6.67	1.096
▪ Married	26	86.67	25	83.33	0.778
▪ Widow	4	13.33	3	10.00	
Educational level					
▪ Illiteracy	10	33.33	3	10.00	
▪ Read and write	11	36.67	12	40.00	**10.411**
▪ Secondary education	8	26.67	11	36.67	**0.022***
▪ High education	1	3.33	4	13.33	
Occupation					
▪ Employed	21	70.00	24	80.00	FE
▪ Unemployed	9	30.00	6	20.00	1.00

FE: Fisher' Exact test

* Significant at level P<0.05

Table (2): Distribution of the studied patients of both groups regarding their clinical data.

Clinical data	The studied patients (n=60)				χ^2 P
	Control group (n=30)		Study group (n=30)		
	N	%	N	%	
# Current diagnosis					
▪ Respiratory disorders	27	90.00	29	96.67	
▪ Neurological disorders	14	46.67	18	60.00	2.131
▪ Autoimmune disorders	7	23.33	5	16.67	0.144
▪ Hepatic disorders	16	53.33	15	50.00	
Length of hospital stay					
▪ <5	8	26.67	10	33.33	FE
▪ ≥5	22	73.33	20	66.67	0.779
Range **Mean ± SD**	**(4-8)** **5.97±1.542**		**(4-8)** **5.43±1.251**		t=1.471 P=0.147
# Past medical history					
▪ Renal disease	12	40.00	7	23.33	
▪ Gastrointestinal disease	4	13.33	4	13.33	
▪ Cardiac disease	5	16.67	4	13.33	0.071
▪ Endocrine disease	10	33.33	7	23.33	0.791
▪ Respiratory disease	13	43.33	15	50.00	
# Surgical history					
▪ Neurologic surgery	3	10.00	2	6.67	
▪ Cardiac surgery	2	6.67	2	6.67	
▪ Genitourinary surgery	8	26.67	7	23.33	2.588
▪ Endocrine surgery	4	13.33	5	16.67	0.108
▪ Renal surgery	1	3.33	3	10.00	
▪ Gastro intestinal	6	20.00	1	3.33	
# Family history					
▪ Hypertension	12	40.00	7	23.33	
▪ Diabetic mellitus	7	23.33	11	36.67	1.943
▪ Asthma	14	46.67	14	46.67	0.163
Current medication					
▪ Opioids	16	53.33	17	56.67	FE
▪ Diuretics	14	46.67	13	43.33	0.966

More than one answer was chosen

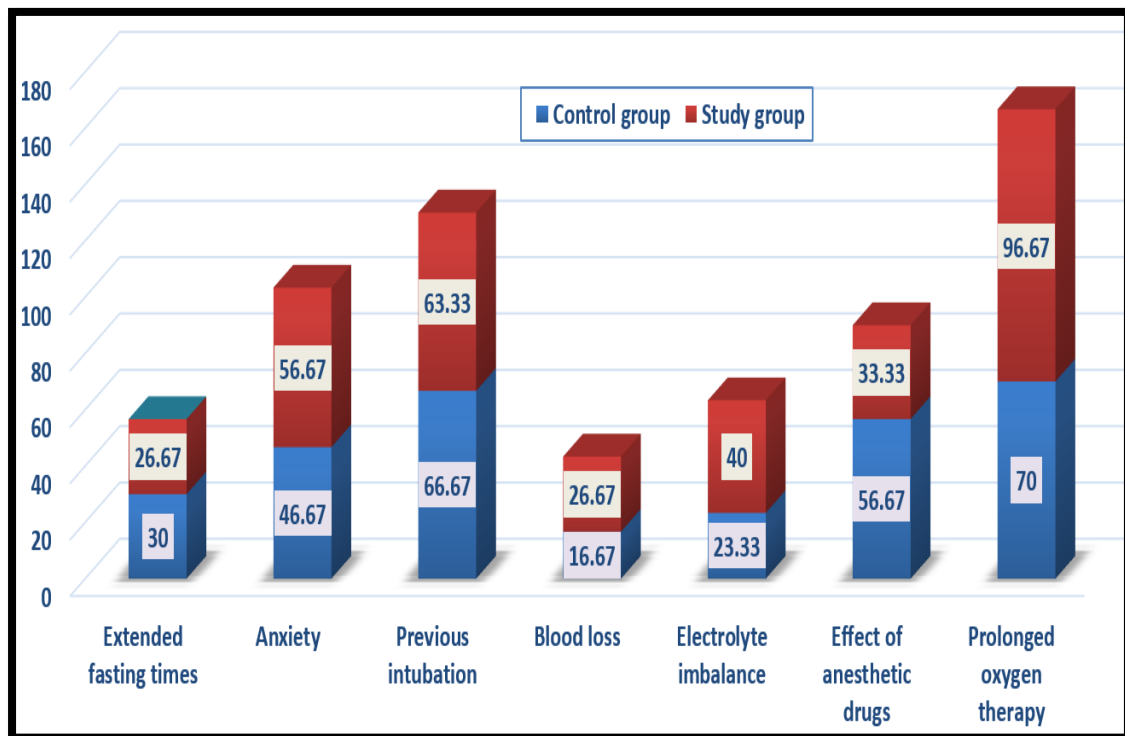* Significant at level P<0.05

Figure 1: Distribution of the studied patients of both groups regarding the causes of thirst.

Table (3): Distribution of the studied patients of both groups according to subjective thirst perception.

Thirst categorical scale	The studied patients (n=60)															
	Control group (n=30)								Study group (n=30)							
	1st day				3rd day				1st day				3rd day			
	Before		After 15 min		Before		After 15 min		Before		After 15 min		Before		After 15 min	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
▪ Not thirsty at all	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	3.33	0	0.00	1	3.33
▪ Not thirsty	1	3.33	0	0.00	8	26.67	0	0.00	0	0.00	5	16.67	1	3.33	3	10.00
▪ Not very thirsty	1	3.33	2	6.67	7	23.33	2	6.67	0	0.00	6	20.00	3	10.00	10	33.33
▪ Acutral	6	20.00	3	10.00	5	16.67	5	16.67	3	10.00	4	13.33	5	16.67	10	33.33
▪ Thirsty	10	33.33	12	40.00	8	26.67	18	60.00	8	26.67	5	16.67	6	20.00	5	16.67
▪ Very thirsty	8	26.67	5	16.67	2	6.67	2	6.67	10	33.33	7	23.33	10	33.33	1	3.33
▪ Very very thirsty	4	13.33	5	16.67	0	0.00	3	10.00	9	30.00	2	6.67	5	16.67	0	0.00
χ^2 , P	10.764 , 0.048*				10.537 , 0.049*				4.324 , 0.981				11.196 , 0.045*			
Control Vs Study χ^2 P	6.275 0.393						11.473 0.043*									

* Significant at level P<0.05

Table (4): Distribution of the studied patients of both groups regarding indicators of thirst assessment.

Indicators of Thirst assessment	The studied patients (n=60)														
	Control group (n=30)								Study group (n=30)						
	1st day				3rd day				1st day				3rd day		
	Before		After 15 min		Before		After 15 min		Before		After 15 min		Before	After 15 min	
	N	%	N	%	N	%	N	%	N	%	N	%	%	N	%
1.Dry mouth	17	56.67	19	63.33	21	70.00	22	73.33	23	76.67	15	50.00	23.33	4	13.33
χ^2 , P	FE , 0.792				FE , 1.00				**FE , 0.038***				FE , 0.751		
2.Decreased urine output	22	73.33	24	80.00	22	73.33	22	73.33	22	73.33	18	60.00	66.67	18	60.00
χ^2 , P	FE , 0.761				FE , 1.00				FE , 0.412				FE , 0.562		
3.Reduced sweating	18	60.00	20	66.67	17	56.67	19	63.33	19	63.33	17	56.67	53.33	14	46.67
χ^2 , P	FE , 0.789				FE , 0.792				FE , 0.792				FE , 0.797		
4. Tear production	23	76.67	24	80.00	23	76.67	26	86.67	25	83.33	21	70.00	73.33	20	66.67
χ^2 , P	FE , 1.00				FE , 0.506				FE , 0.360				FE , 0.779		
5. Muscle cramps	18	60.00	19	63.33	17	56.67	18	60.00	18	60.00	16	53.33	63.33	17	56.67
χ^2 , P	FE , 1.00				FE , 1.00				FE , 0.795				FE , 0.792		
6. Weakness	22	73.33	24	80.00	20	66.67	22	73.33	24	80.00	21	70.00	76.67	20	66.67
χ^2 , P	FE , 0.761				FE , 0.779				FE , 0.552				FE , 0.567		
7.Light headedness	20	66.67	21	70.00	18	60.00	18	60.00	19	63.33	19	63.33	53.33	13	43.33
χ^2 , P	FE , 1.00				FE , 1.00				FE , 1.00				**FE , 0.011***		
8.Vomiting	25	83.33	28	93.33	24	80.00	25	83.33	24	80.00	24	80.00	33.33	5	16.67
χ^2 , P	FE , 0.424				FE , 1.00				FE , 1.00				**FE , 0.045***		
9.Respiratory depression	26	86.67	28	93.33	21	70.00	22	73.33	14	46.67	13	43.33	66.67	17	56.67
χ^2 , P	FE , 0.671				FE , 1.00				FE , 1.00				FE , 0.596		

* Significant at level P<0.05   FE: Fisher' Exact test

Table (5): Distribution of the studied patients of both groups regarding total level of oral assessment guide (OAG).

OAG Level	The studied patients (n=60)															
	Control group (n=30)								Study group (n=30)							
	1st day				3rd day				1st day				3rd day			
	Before		After 15 min		Before		After 15 min		Before		After 15 min		Before		After 15 min	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
▪ Good oral health	6	20.00	8	26.67	6	20.00	10	33.33	6	20.00	20	66.67	27	90.00	29	96.67
▪ Poor oral health	24	80.00	22	73.33	24	80.00	20	66.67	24	80.00	10	33.33	3	10.00	1	3.33
χ^2 , P	FE , 0.98				**FE , 0.049***				**FE , 0.032***				FE , 0.542			
Range Mean ± SD	(13-23) 17.50±2.32		(13-23) 17.87±2.43		(14-21) 17.53±1.83		(14-22) 18.00±2.15		(13-20) 17.20±1.83		(12-20) 16.57±1.98		(11-21) 17.20±2.54		(9-21) 16.57±2.65	
t , P	0.358 , 0.552				0.819 , 0.369				1.660 , 0.203				0.894 , 0.348			
Control Vs Study t P	0.557 0.580		**2.272** **0.027***		0.583 0.562		**2.302** **0.025***									

* Significant at level P<0.05   <50% Good oral health

≥50% Poor oral health

Discussion

Thirst is one of the most intense symptoms reported by intensive care unit patients. (**Negro et al., 2021**). There are several methods to manage thirst in ICU

generally, include cold water sprays or swabs, menthol lip moisturizer and use of humidification. However, a review of these interventions concluded low quality of evidence due to insufficient studies (**Clark & Archer, 2022**). There for the main aim of this study was to evaluate the effect of implementing nursing measures on thirst perception among patients at chest intensive care units.

Part (1): Assessment of socio-demographic characteristics and medical data of the studied patients.

Regarding age of the studied patients, the current study reported that, more than half of the studied patients in both control and study groups were in the age group (50-60) years, with mean age of (51.17±7.096) in control group and (51.87±6.021) in study group. This may be attributed to that increase in age associated with chronic diseases, long term malnutrition, lowering their immune function and making them more vulnerable to ICU admission than young individuals.

This finding was in agreement with, **AlNoah et al., 2024** who showed that the most common age among both groups was in age between 51-60 years old of patient admitted to ICU.

Concerning sex and marital status, the present study reported that the majority of the studied patients in control group were male and more than two- thirds of the studied patients in study group were male this may be interpreted that male was admitted to the Intensive Care Unit due to the nature of their work and massive accident**. Additionally,** the majority of the studied patients in both control and study groups were married. From the researcher

point of view, this might because most of the studied patients ranged between 50-60 years old.

This finding was matched with **Vincent et al., 2020** who revealed that the patients admitted to ICU were mostly males. Also, **Doi et al., 2021** who showed that the majority of patients admitted to ICU were males However, **AlNoah et al., 2024** who showed that more than two-thirds of the intervention group and more than half of the control group were females of patient admitted to ICU.

Regarding medical diagnosis, it was noticed that the vast majority of the studied patients in both control and study groups were diagnosed as respiratory disorders. This finding was in agreement with, **Celik & Eser, 2017** who showed that respiratory disorders were the most common cause of ICU admission among about 95% of patients. Also, **Madkour et al., 2022** who showed that respiratory infections are known to be the most common cause of ICU admission in almost all the healthcare facilities all over the world.

Regarding comorbidities, the most common comorbid disease among the control and study groups was respiratory disease while, the least one was gastrointestinal disease. The incidence and proportion of respiratory disease in the community has been increasing in recent years because of the increasing aging population, excessive body weight due to westernization, increased morbidity of chronic pulmonary disorders, and long-term air pollution exposure

The current study was in line with, **Simpson et al., 2021** who showed that nearly half of patients admitted to intensive care unit had at least one comorbidity, moreover the presence of comorbidities was associated with worse prognosis.

Concerning the current medication, It was observed that more than half of the studied patients in control and study groups were received opioids medication and near half of the patients in control and study groups received diuretics. This result clarified the explanation for used opioid in critical care for sedation and pain management. there are numerous sources of pain such as surgery, endotracheal intubation, placement of invasive catheters, or other painful conditions.

The current study was in agreement with, **Lin et al., 2023** and **Stotts et al., 2015** who revealed that diuretics and opioids were the most commonly used medications among patients admitted to ICU, they also showed that the use of certain medications, such as opioids and diuretics, were predictors of thirst in ICU patients.

Regarding the causes of thirst among the studied groups, It showed that more than two- thirds of the studied patients in control group and the vast majority of the studied patients in study group were suffered from thirst related to prolonged oxygen therapy. While more than half of the studied patients in control and study groups were suffered from thirst related to previous intubation. This due to Oxygen therapy has also been reported as one of the causes of thirst in ICU patients. Patients who receive conventional oxygen therapy frequently complain of dry mouth due to dry or under-humidified oxygen.

The current study was in line with **(Garcia et al., 2016 & Carey et al., 2015).** Who reported that the patients who receive prolonged oxygen therapy have high prevalence of thirst. Also, **Sato et al., 2022** who revealed that prolonged oxygen therapy was significantly associated with high thirst intensity among ICU patients. Additionally, **Negro et al., 2022** stated that thirst was associated with xerostomia,

endotracheal tubes, tracheostomies, oxygen therapy, solid and liquid fasting, electrolyte alterations, and hypovolemia.

Regarding Subjective thirst perception, the current study showed that near half of the studied patients in control group on the first day after nursing measures were at level 5 (thirst) on thirst categorical scale while more than half were at level 5 (thirst) on the third day. **on the other hand**, near one quarter of the studied patients in study group on the first day were at level 6 (very thirst) after nursing measures while more than one third were at level 3(not very thirsty) on thirst categorical scale.

Also, it was observed that there was statistical significant decrease in thirst perception in both control and study group on the third day. **Additionally**, there was statistical significant decrease in thirst perception in control versus study group on the third day.

The current study suggested that the thirst intervention has positive effect on Subjective thirst perception, effective in improving salivary flow rates and decrease thirst among patients admitted to ICU.

The current study was accordance with, **AlNoah et al., 2024, Doi et al., 2021 & VonStein et al., 2019** who revealed that total average thirst score was statistically significantly lower in the intervention group compared to the control group and concluded that implementing the thirst bundle is an effective technique to prevent thirst and mouth dryness.

Also, in line with the current study **Yang et al., 2010** who assessed the effect of acupressure on thirst in 28 hemodialysis patients, and revealed that the true acupressure program was associated with significantly increased salivary flow rate and significant reduction in thirst intensity.

Moreover, **Gulia et al., 2019** in a systematic review assessed the effectiveness of an

intervention bundle on thirst intensity and dry mouth among patients admitted in ICU and concluded that intervention bundle consisting of more than one intervention is significantly effective in reducing thirst and dry among patients admitted in ICU.

Regarding indicators of thirst assessment, the current study revealed that more than two- thirds of the studied patients in the control group have dry mouth on the third day after implementing nursing measures. Compared to only minority of patients in the study group. It was observed that there were statistical significant improvement among the studied patients in the study group during the first day of intervention. **Additionally,** it was found that there were statistical significant improvement among the studied patients of the study group during the 3rd day regarding light headedness, pain and vomiting.

The current study showed that the nursing measures resulted in significant decrease in dry mouth related to increase the salivary flow rate, sense of light headiness, pain and vomiting among ICU patients.

This comes in agreement with **VonStein et al., 2019** who revealed that scheduled use of ice water oral swabs and lip moisturizer with menthol resulted in significant reduction dry mouth (P= .008) in critical care patients.

Similarly, a randomized controlled trial by **Zhang et al., 2022** concluded that interventional bundle including vitamin C sprays, peppermint water mouthwash, and a lip moisturizer was shown to be a promising approach that can relieve thirst intensity and dry mouth, which are pervasively distressful to critically ill patients. The study also revealed that the intervention bundle significantly reduced thirst intensity by 1.27 points and there was a reduction of around two points in the pain intensity NRS score.

Regarding total OAG scale, the current study showed that there was significance

increase good oral health among patients in control group on third day**. on the other hand**, there was significance increase good oral health among patients in study group on first day. Also**,** there was significance increase good oral health status between control and study group on first and third day after nursing measures.

The current study in agreement with **Doi et al., 2021** who revealed that the oral care intervention resulted in significant improvement in oral health assessed by oral assessment guide score. Also, **Al Sebaee & Elhadary, 2017** who showed that effective oral care reduces oral health issues and alleviates thirst and dry mouth in ICU patients.

Conclusion

The results of the current study concluded that there was a significant decrease of thirst perception among critically ill patients after implementing nursing measures in ICU.

Recommendations

It can be recommended that using nursing measures as a part of the daily care in managing patients' complains of thirst in ICU is essential.

Limitation of the study

This study had some limitations as follows:
- The current study is a single center study.
- Relatively small sample size.
- Additional statistics are required to assess the factors affected thirst.
- Limited numbers of references are available.

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