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Effectiveness of thirst bundle on reduction of thirst intensity and dryness of mouth among postoperative patient's undergone abdominal surgery

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ABSTRACT

Purpose: Thirst during the perioperative phase can be distressing for patients. Routine assessment of patients for signs of thirst and dry mouth is often neglected by healthcare providers, contributing to complications as increased thirst intensity, breathlessness, and pain. The implementation of a simple nursing intervention called a "thirst bundle" has the potential to mitigate the intensity of thirst and dryness of mouth among patients recovering from surgery.

Design: This research adopted a quantitative approach with a quasi-experimental pre-test-post-test control group design.

Methods: The study involved 60 postoperative patients who met specific criteria after undergoing abdominal surgery. Participants were selected through purposive sampling technique. Thirst intensity and dryness of mouth were evaluated using a numeric rating scale and Challacombe scale for both experimental and control groups. Data analysis encompassed descriptive and inferential statistics.

Findings: Findings of study indicated that the implementation of the thirst bundle significantly lowered mean thirst intensity scores in the experimental group (mean=2.6) compared to the control group (mean=6.4), as confirmed by statistical analysis (t=23.7, df=58, p=0.05). Additionally, the mean dryness of mouth score was significantly reduced in the experimental group (mean=1.4) compared to the control group (mean=5.4) through the thirst bundle intervention (t=28.05, df=58, p=0.05). There was no association existed between pre-intervention of thirst intensity and dryness of mouth among postoperative patients in the experimental group, regarding baseline variables.

Conclusions: The findings emphasize that the implementation of the thirst bundle intervention by nurses effectively reduces both thirst intensity and dryness of mouth among postoperative patients. This research emphasizes the significance of utilizing the thirst bundle as a nursing intervention to alleviate thirst and dryness of mouth in patients recovering from surgery.

Keywords: Nil Per Oral (NPO), Thirst bundle intervention, Intensity of Thirst, Dryness of mouth, Abdominal surgery, Postoperative patients

Introduction:

Thirst, a fundamental distress signal, drives the need for water to maintain the body's fluid balance. This arises from deficiencies in either intracellular or extracellular fluid volumes.[1] This sensation is particularly prevalent and significant among patients undergoing operative

procedures who are placed on nil per oral (NPO) status. Similarly, dry mouth arises due to NPO status and the use of medications during and after surgeries, impacting saliva flow.[2]

The NPO status induces distressing symptoms such as thirst and dry mouth, often unrecorded by nurses postoperatively, exacerbating patient discomfort and increasing pain and dyspnoea intensity, potentially leading to severe complications.[3]

Abdominal surgery involves operative procedures on organs within the abdomen. Typically, patients undergoing abdominal surgery remain hospitalized for around 5 to 6 days post-surgery.[4] During the initial two days of the postoperative phase, patients experience increased thirst and dry mouth due to their NPO status based on medical requirements and surgeon's instructions. Furthermore, postoperative medications (such as analgesics, antibiotics, sedatives, and oxygen therapy) exacerbate sensations of thirst and dry mouth.[5] Blood loss also contributes to the intensity of thirst and dry mouth, as electrolyte loss during surgery affects overall body water levels.[6]

According to the WHO protocol on the safety of surgical patients and the implementation of strategic initiatives like "Safe Surgeries Save Lives," there has been a significant decrease in the incidence of perioperative complications.[7] As of now, no identified recommendations or protocols address the safety aspects of employing strategies for managing thirst and dry mouth. Healthcare team members responsible for postoperative care of NPO patients currently lack specific resolution measures for these issues, raising concerns about potential complications and increased risks.

The approach to managing thirst, especially in NPO situations, presents specific challenges due to the restriction on consuming significant liquid volumes orally. This constraint is due to the risk of pulmonary aspiration resulting from reduced consciousness levels induced by anaesthetic drugs, coupled with the potential for nausea and vomiting.[8]

A quantitative study was conducted in Brazil to establish a safety protocol for managing thirst during the immediate postoperative period. The study revealed that patients recounted instances of near-debilitating thirst during the anaesthetic recovery phase following cardiac surgeries.[9] Thirst evaluation in various studies utilized a numeric analog scale (ranging from 1 to 10). Clinical signs of dehydration, including thirst, fatigue, and dry mucus membranes, were observed among patients.[10] Consequently, thirst stands out as a widespread, intense, and undertreated symptom among postoperative patients. From a patient's perspective,

thirst was a significant stressor during the postoperative period, ranking fifth among 34 identified stressors in cardiac surgery.[11]

Unfortunately, many healthcare professionals neglect routine assessments for thirst and dry mouth in patients, potentially resulting in significant complications such as pain and breathing difficulties.[3] Mitigating thirst perception can involve the intake of cold liquids, which can help alleviate the sensation. A thirst bundle nursing intervention to address this is a "thirst bundle," comprising a sterile oral gauze for moistening the lips and a sterile squirt bottle containing water to moisten the oropharynx and tongue, effectively reducing the intensity of thirst and dryness of mouth.

Materials and methods

In this study, a quantitative research approach was adopted, utilizing a quasi-experimental pre-test-post-test control group design. The research was conducted at a tertiary teaching hospital. The study focused on 60 postoperative patients who underwent abdominal surgery and met specific criteria. These participants were selected through a non-probability purposive sampling technique. The assessment of the effectiveness of the thirst bundle intervention was conducted using a standardized numeric rating scale and the Challacombe scale. These tools were employed by the investigator to evaluate the intensity of thirst and dryness of mouth among both experimental and control groups.[10] The tool's validity was established by the consensus of 10 experts, and its reliability was confirmed through the test-retest method, specifically using Karl Pearson’s correlation coefficient for internal consistency assessment. Data analysis encompassed descriptive and inferential statistics.

Inclusion criteria comprised adults, both male and female, aged between 21 and 45 years, conscious with a Glasgow Coma Scale (GCS) score of 15, registering a score of ≥ 3 on a numeric rating scale for intensity of thirst, receiving general or spinal anaesthesia during the postoperative recovery phase, expressing willingness to participate, and being available during the study.

Exclusion criteria involved individuals diagnosed with respiratory complications, encountering complications during surgery, and experiencing recovery-related issues following anaesthesia which includes bleeding, hypoglycaemia, nausea, vomiting, and fever.

Ethical Considerations:

Data collection was undertaken after acquiring ethical approval and formal approval from the Department Head of General Surgery. The research population comprised adults of both genders aged between 21 and 45 years. Selection criteria included individuals who were conscious with a GCS score of 15, reported a intensity of thirst of ≥ 3 on a numeric rating scale, and were undergoing post-operative recovery under either general or spinal anaesthesia. Additionally, participants needed to express willingness to participate and be available during the study period. The research protocol was introduced to them, and informed consent was secured. A total of 60 subjects (30 in each group) were randomly enrolled into the experimental and control groups by adhering to their inclusion and exclusion criteria through a non-probability purposive sampling technique.

The interventions were carried out in general surgical wards conjunction with the standard care procedures. For the experimental group, the researcher administered the "thirst bundle" twice, with a 30-minute interval. Each bundle comprised 9 moist wipes, with 18 sprays of water applied to the oropharynx and tongue using a squirt spray bottle over a 15-minute period. This procedure was repeated thrice at 5-minute intervals. In contrast, the control group only received standard care. For both groups, a post-test assessment of thirst intensity and dryness of the mouth was conducted 15 minutes after completing the intervention. The collected data were analysed using descriptive and inferential statistics based on the study's objectives.

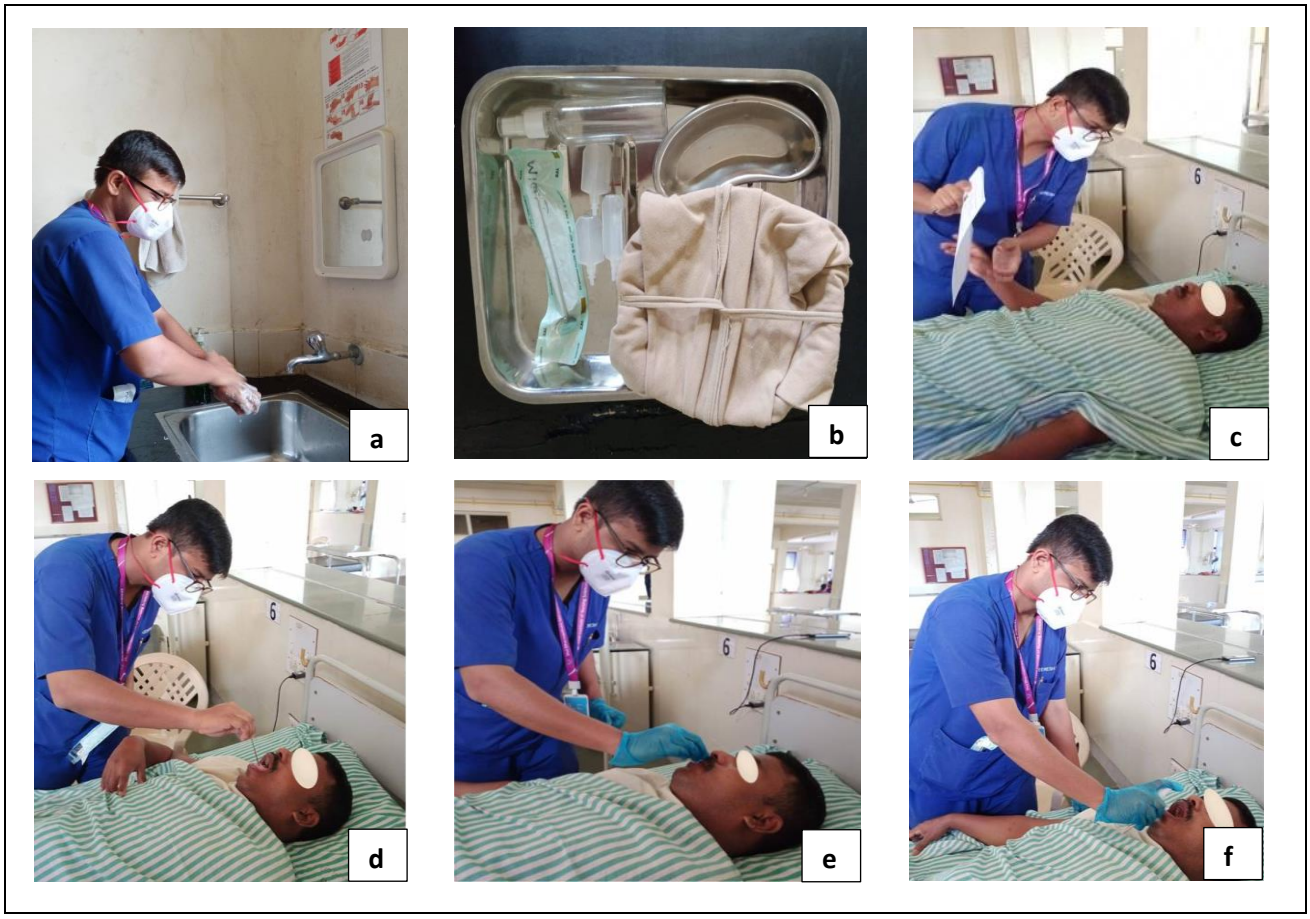

Figure 1. Thirst bundle intervention**. (a)** Handwashing protocol prior to thirst bundle administration. **(b)** Key articles supporting thirst bundle interventions in clinical practice **(c)** Pre-intervention assessment of thirst intensity using the numeric rating scale **(d)** Pre-intervention assessment of dryness of mouth using the Challacombe scale. **(e)** Application of moist wipes. **(f)** Application of spray.

Results:

Data analysis utilized descriptive and inferential statistics to examine thirst intensity and dryness of mouth levels, employing frequency and percentage distribution. Paired and unpaired 't' tests assessed the thirst bundle's effectiveness and compared experimental and control groups, respectively. The Chi-square test explored associations with baseline variables, with hypotheses tested at a 5% significance level, deeming p-values <0.05 as significant.

Table 1: Demographic and Clinical Information

n=60

Sl. No	Baseline Variables		Experimental Group		Control Group	
			f	%	f	%
1.	**Age in years**	21-25	02	6.66	03	10

		26-30	06	20	03	10
		31-35	05	16.66	11	36.66
		36-40	07	23.34	06	20
		41-45	10	33.34	07	23.34
2.	**Gender**	Male	15	50	17	56.66
		Female	15	50	13	43.34
3.	**History of various habits**	Smoking	03	10	0	0
		Tobacco chewing	03	10	03	10
		Consuming alcohol	01	3.33	03	10
		No unhealthy habits	23	76.67	24	80
4.	**Educational status**	Non formal education	02	6.66	03	10
		Primary education	11	36.66	10	33.34
		Secondary education	10	33.34	15	50
		Graduate & above	07	23.34	02	6.66
5.	**Occupation**	Professional	01	3.33	0	0
		Arithmetic skill jobs	0	0	02	6.66
		Skilled worker	11	36.66	09	30
		Unskilled worker	15	50	15	50
		Unemployed	03	10	04	13.34
6.	**Type of surgery**	Appendectomy	09	30	12	40
		Cholecystectomy	06	20	07	23.34
		Hernia repair	11	36.66	09	30
		Hysterectomy	04	13.34	02	6.66
7.	**Type of Anaesthesia**	General	20	66.66	17	56.66
		Spinal	10	33.34	13	43.34
8.	**History of any co-morbid illness**	Yes	05	16.66	02	6.66
		No	25	83.34	28	93.34
9.	**Duration of NPO (hours)**	08-11	17	56.66	15	50
		12-15	13	43.34	15	50
10.	**Drugs prescribed**	Yes	05	16.66	02	6.66
		No	25	83.34	28	93.34

Demographic and Clinical Information

Baseline variables revealed the following distribution: the majority (36.66%) of participants were aged 31-35 years, with males constituting 56.66%. Regarding unhealthy habits, 80% had none. Educational status showed 50% with secondary education, and occupational status had

50% as unskilled workers. Appendectomy was the most common surgery (40%), while 66.66% underwent general anaesthesia. The majority (93.34%) had no history of co-morbid illness. In terms of NPO duration, 56.66% had 8-11 hours, and 93.34% had no prescribed drugs. (Table 1).

Table 2a: Demographic and Clinical Information of pre-test level of thirst intensity.

n=60

Sr. no	Thirst intensity	Experimental Group		Control Group	
		Pre-test		Pre-test	
		f	%	f	%
1.	Mild	0	0	0	0
2.	Moderate	25	83.33	30	100
3.	Severe	5	16.67	0	0

Table 2b: Demographic and Clinical Information of pre-test level of dryness of mouth.

n=60

Sr. no	Level of dryness of mouth	Experimental Group		Control Group	
		Pre-test		Pre-test	
		f	%	f	%
1.	Mild	0	0	6	20
2.	Moderate	30	100	24	80
3.	Severe	0	0	0	0

Assessment of pre-interventional level of Thirst Intensity and Dryness of mouth

The research study found that both the experimental and control groups had a majority of subjects with moderate intensity of thirst and moderate dryness of mouth. (Table 2a and Table 2b).

Table 3a: Comparison of pre & post test scores of thirst intensity in experimental group.

n=30

Sr. no	Test	Mean	SD	Mean difference	df	P value	Calculated paired 't' value	Table 't' value
1.	Pretest	5.6	1.03	3	29	<0.05	t = 25.5 **S** P<0.05	2.05
2.	PostTest	2.6	0.81					

S – Level of statistical significance.

Table 3b: Comparison of pre & post test scores of dryness of mouth in experimental

group.

n=30

Sr. no	Test	Mean	SD	Mean difference	Df	P value	Calculated paired 't' value	Table 't' value
1.	**Pretest**	4.6	0.48	3.2	29	<0.05	t = 23.1 **S** P<0.05	2.05
2.	**Post-test**	1.4	0.81					

S – Level of statistical significance.

Effectiveness of a thirst bundle in reducing thirst intensity and dryness of mouth in experimental group.

The pre-test and post-test mean values for thirst intensity were 5.6 and 2.6, respectively, while for dryness of mouth, the pre-test mean was 4.6 and the post-test mean was 1.4. Paired 't' test values for both sensations exceeded the critical table values of 2.05, affirming the effectiveness of the thirst bundle intervention in reducing these sensations among postoperative patients in the experimental group (Table 3a and Table 3b).

Table 4a: Comparison of post-test scores of thirst intensity in the experimental & control group.

n=60

Sr. no	Group	Mean	SD	Mean diff	Standard diff	Df	Calculated Unpaired 't' value	Table value
1	**Experimental group**	2.6	0.81	3.8	0.33	58	23.7 **S** P<0.05	2.00
2	**Control group**	6.4	0.48					

S – Level of statistical significance.

Table 4b: Comparison of post-test scores of dryness of mouth in the experimental & control group.

n=60

Sr. no	Group	Mean	SD	Mean diff	Standard diff	df	Calculated Unpaired 't' value	Table value
1	**Experimental group**	1.4	0.81	4	0.33	58	28.5 **S** P<0.05	2.00
2	**Control group**	5.4	0.48					

S – Level of statistical significance.

Comparison of post-intervention scores between experimental and control groups.

The research study found that the experimental group had significantly lower post-test mean values for both intensity of thirst and dryness of mouth compared to the control group. Unpaired 't' test values exceeded the table value of 2.00, indicating a significant difference between the experimental and control groups in terms of post-test scores for both sensations (Table 4a and Table 4b).

Table 5a: Association of the pre-interventional level of thirst intensity among postoperative patients with selected baseline variables in the experimental group.

n=30

Sr. no	Baseline variables	Chi-Square value	df	P value	Inference
1.	**Age in years**				
	21-25	3.56	4	9.49	**NS**
	26-30				
	31-35				
	36-40				
	41-45				
2.	**Gender**				
	Male	0	1	3.84	**NS**
	Female				
3.	**History of various habits**				
	Smoking	5.53	3	7.82	**NS**
	Tobacco chewing				
	Consuming alcohol				
	No personal bad habits				
4.	**Educational status**				
	Nonformal education	4.6	3	7.82	**NS**
	Primary education				
	Secondary education				
	Graduate & above				
5.	**Occupation**				
	Professional	2.51	4	9.49	**NS**
	Arithmetic skill jobs				
	Skilled worker				
	Unskilled worker				
	Unemployed				
6.	**Type of surgery**				
	Appendectomy	9.15	3	7.82	**NS**
	Cholecystectomy				
	Hernia repair				
	Hysterectomy				
7.	**Type of Anesthesia**				
	General	0.86	1	3.84	**NS**

	Spinal				
8.	**History of any co-morbid illness**				
	Yes	1.45	1	3.84	**NS**
	No				
9.	**Duration of NPO (hours)**				
	08-11	0.3	1	3.84	**NS**
	12-15				
10.	**Drugs prescribed**				
	Yes	1.45	1	3.84	**NS**
	No				

NS – Non significant (p<0.05%)

Table 5b: Association of pre-interventional level of dryness of mouth among postoperative patients with selected baseline variables in the experimental group.

n=30

Sr. no	Baseline variables	Chi-Square value	df	P value	Inference
1.	**Age in years**				
	21-25	0	4	9.49	**NS**
	26-30				
	31-35				
	36-40				
	41-45				
2.	**Gender**				
	Male	0	1	3.84	**NS**
	Female				
3.	**History of various habits**				
	Smoking	0	3	7.82	**NS**
	Tobacco chewing				
	Consuming alcohol				
	No personal bad habits				
4.	**Educational status**				
	Non formal education	0	3	7.82	**NS**
	Primary education				
	Secondary education				
	Graduate & above				
5.	**Occupation**				
	Professional	0	4	9.49	**NS**
	Arithmetic skill jobs				
	Skilled worker				
	Unskilled worker				
	Unemployed				

6.	**Type of surgery**				
	Appendectomy Cholecystectomy Hernia repair Hysterectomy	0	3	7.82	**NS**
7.	**Type of Anesthesia**				
	General Spinal	0	1	3.84	**NS**
8.	**History of any co-morbid illness**				
	Yes No	0	1	3.84	**NS**
9.	**Duration of NPO (hours)**				
	08-11 12-15	0	1	3.84	**NS**
10.	**Drugs prescribed**				
	Yes No	0	1	3.84	**NS**

NS – Non significant (p<0.05%)

Association of Pre-Interventional Levels with Selected Baseline Variables

The research findings showed no significant correlation between pre-intervention levels of thirst intensity and dryness of mouth with the selected baseline variables in the experimental group. (Table 5a and Table 5b).

Discussion:

Thirst and dry mouth are common complaints among postoperative patients, particularly those who undergo abdominal surgery and are placed on nil per oral (NPO) status. The discomfort associated with these sensations can lead to increased pain, dyspnoea, and overall dissatisfaction with care. Despite the prevalence of these symptoms, routine assessment and management of thirst and dry mouth by healthcare providers are often neglected, leading to potential complications and patient distress.

In this study, the thirst bundle intervention, which included moistening the lips with sterile oral gauze and administering water to the oropharynx and tongue using a squirt spray bottle, proved to be effective in reducing both thirst intensity and dryness of mouth.

This study's findings are consistent with prior research, such as a study conducted in Punjab that investigated the effectiveness of a thirst bundle in alleviating thirst intensity and dryness of mouth among ICU patients. Evaluation employed categorical thirst intensity and Challacombe scales. Results indicated that prior to intervention, the majority of patients experienced moderate thirst intensity (70%)

and dryness of mouth (65%). Thus, the study suggests healthcare workers utilize this effective intervention to alleviate discomfort associated with thirst and dry mouth. [12]

The study was reinforced by research in Egypt comparing the effectiveness of a care bundle versus routine care in alleviating thirst and enhancing oral condition among patients undergoing abdominal surgery. The experimental group received the care bundle, while the control group received routine care. Results showed that the care bundle significantly reduced thirst intensity (p=0.001), and improved tongue (p=0.05) and saliva (p=0.04) compared to routine care. Consequently, the study concluded that the care bundle effectively alleviated thirst intensity and improved tongue and saliva among immediate postoperative patients who underwent abdominal surgeries.[4]

Furthermore, the study found no significant association between pre-intervention levels of thirst intensity and dryness of mouth with selected baseline variables in the experimental group. This suggests that factors such as age, fasting duration, and the use of opioids and anticholinergic agents did not significantly influence the effectiveness of the thirst bundle intervention in reducing thirst and dry mouth among postoperative patients.

The results were corroborated by research from Brazil, which assessed perioperative thirst intensity, discomfort, and associated factors during anaesthesia recovery in 203 participants. This study determined that age, fasting duration, and the administration of opioids and anticholinergic agents did not significantly correlate with thirst intensity, dryness of mouth, or discomfort levels.[13]

The findings align with previous research, such as studies conducted in Punjab, Egypt and Brazil, which also demonstrated the effectiveness of similar care bundles in alleviating thirst and improving oral condition among postoperative patients.

These findings underscore the importance of implementing nursing interventions, including the thirst bundle, to address common postoperative symptoms: thirst and dry mouth. By providing simple yet effective interventions, healthcare providers can significantly improve patient comfort and satisfaction during the recovery phase following abdominal surgery.

Limitation:
The sample size was relatively small, which may limit the generalizability of the findings. Additionally, the study only assessed short-term outcomes immediately following the implementation of the thirst bundle intervention.

Conclusion:

The objective of this study was to assess the effectiveness of a thirst bundle intervention in alleviating thirst intensity and dryness of mouth among postoperative patients after abdominal

surgery. The study's results demonstrated that the thirst bundle intervention effectively reduced thirst intensity and dryness of mouth in these patients. Therefore, implementing the thirst bundle intervention could be recommended for postoperative patients to enhance the quality of care by alleviating thirst intensity.

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