

# Effect of Frozen Saline on Postoperative Thirst among Women Undergoing Gynecological surgery

<sup>1</sup>Hanan Awad Moawad Elmashad, <sup>2</sup>Ahlam Mohammed Ibrahim Gouda

<sup>1</sup>Woman's Health & Midwifery, Nursing Department, Faculty of Nursing-Mansoura University, Egypt

---

**Abstract:** postoperative thirst affects the quality of sleep and causes great distress and, therefore, leads to negative feelings such as anxiety and irritability, which affect the quality of life and, therefore, increases the concern of medical personnel

**Aim:** Evaluate the effect of frozen saline on postoperative thirst among women undergoing gynecological surgery.

**Method: Design:** Quasi- experimental research design.

**Setting:** The study was accompanied at the inpatient obstetric and gynecological departments in Mansoura University Hospital.

**Subjects:** purposive sampling was used to select study subjects (n=66) women who undergone Gynecological surgery, subjects were divided randomly into two equal groups.

**Tools:** Three tools were used for data collection, structured interviewing schedule, thirst intensity scale and thirst discomfort scale.

**Results:** The study findings revealed that there was a statistically significant difference between control and intervention groups where as the mean level of thirst was statically significant reducing in favor of the intervention group than the control group (<0.001). Also there was statistically significant difference between the pretest and posttest levels of thirst at different time of measurements among the intervention group ( $9.2 \pm 0.7$  &  $7.2 \pm 0.8$  &  $6.7 \pm 1.1$  &  $5.9 \pm 1.4$ ).

**Conclusion:** Postoperative woman who utilized frozen saline express less thirsty than those who don't utilize it.

**Recommendations:** Utilization of frozen saline as routine care for all obstetrics and gynecological operation.

**Keywords:** Frozen Saline, Gynecological surgery and Postoperative Thirst.

---

## 1. INTRODUCTION

Gynecological surgery refers to procedures that are carried out to treat a variety of conditions affecting the female reproductive organs. It covers a very disparate group of procedures ranging from simple excision of a vulval lesion or a vaginal repair to laparotomy for advanced abdomino-pelvic malignant lesions. In general it can be divided into minor procedures (dilatation and curettage, laparoscopy) and major procedures (hysterectomy, pelvic floor reconstruction). The successful outcome of gynecological surgery is based on careful pre operative preparation and attentive post operative care (Bieber et al., 2015 & Svensen et al., 2018).

The early postoperative period represents a major challenge for woman. The amount of discomfort after gynecological surgery depends on type of performed surgery. The types of discomfort include: nausea, vomiting, sore throat, surgical site pain and thirst. Thirst is a common stressful discomfort after gynecological operations like hysterectomy. It is perhaps due to the congestion of the peritoneum after secretions. So if the nurse can relieve only one of the symptoms that woman may have, in this particular case, the enormous discomfort caused by thirst will be a great thing (Ridolfi et al., 2006 & Baird, 20016 & Alkatout and Mettler, 2018).

Thirst is a kind of feeling craving for water and an important part of the regulatory mechanism of the balance of body fluids (Xiaolan et al., 2018). It negatively interferes with the post-anesthetic recovery. Surgical patients present conditions that promote and improve the appearance of thirst, including: preoperative fasting, medication in the anesthetic-surgical process, endotracheal intubation and intraoperative blood loss (Arai et al., 2013 & Arai et al., 2014). Thirst affects the quality of sleep and causes great distress and, therefore, leads to negative feelings such as anxiety and irritability, which affect the quality of life and, therefore, increases the concern of medical personnel (Anil et al., 2016 & Fox et al., 2015).

Thirst causes real suffering and as with pain, it is also subjective. It is necessary to stop simply ignoring it and moving on to consider it as an important factor of discomfort in the immediate post-operative (IPP), a point to be valued, measured and mitigated (Aroni et al., 2012). Management of thirst in immediate postoperative period is challenging. There is a contraindication to oral fluid intake due to the disturbed level of consciousness from both the anesthetic drugs and the presence of nausea and vomiting. Consequently, this might lead to development of pulmonary aspiration. Therefore, finding easy and safe ways to alleviate thirst among postoperative patients is a major challenge and crucial issue for health care professionals (Nascimento et al., 2014).

There are indications that the use of ice has greater efficacy in relieving thirst, because it stimulates oropharyngeal receptors called transient receptor potential melastatin 8 (TRPM8), which are sensitive to low temperatures (Cho et al., 2010 & Aroni et al., 2012). Studies have shown that the risk of bronchial aspiration is reduced in a gastric volume less than 50 mL, allowing, therefore, the use of ice and water up to this limit (Perlas et al., 2011).

Saline solution is a solution that contains secretions of dissolved salt and has the effect of reducing bacteria and promoting the secretion of saliva (Cawley & Benson, 2005). Normal saline (0.9%) is a not irritant and is believed to help information of granulation tissue and to promote healing. It's safe, cost-effective and readily available mouthwash. It is not only a natural disinfectant but it also eliminates any swelling from the tissue (Wuketich et al., 2012 & Cheng, 2007). In particular, the saline will not cause damage to the mucous membrane of the mouth either anatomically or physiologically. It can be used without a prescription.

The efficacy of frozen gauze with a saline or wet gauze or natural snow was documented in a study performed by (Cho et al., 2010) among patients after laparoscopic cholecystectomy. The utilizing a saline solution for oral care can maintain the integrity of the mucous membranes of the mouth. The saline solution reported that it has no harmful effects on the mucous membrane of the mouth and improve the stability of the oral mucosa (Ozden et al., 2015). The statistical significant reduction in thirst among post-operative patients under gone abdominal surgery suggests that ice-cold saline is a safe and effective complementary method for thirst management, which can be safely added to many other measures used by nurses and physicians. Cold saline solution is clearly an effective therapeutic measure for the relief of thirst (Kaur, 2016).

#### Significance of the Study:

The prevalence of thirst is high in the immediate postoperative period, affecting 75% of adult patients (Aroni et al., 2012). Also another study revealed that 89.6% of patients (including 31.8% gynecological and obstetric patients) feeling thirsty and the mean of thirst intensity was 6.9-+2.4 (Pierotti et al., 2018). The patients considered thirst upsetting and traumatic and thus interfering in their recovery (Lisboa et al., 2012).

Additionally, the group patients classified thirst as the most significant stressor of 50 evaluated factors. The postoperative thirst disturbs sleep and emotion thus woman's recovery (Dessotte et al., 2016). Paradoxically, in comparison with other post-operative discomforts such as pain, nausea and hypothermia thirst receives less attention from medical team and remains sub-identified and sub-measured, and relief measures in clinical practice are no standardized (pavani et al., 2016 & Garcia et al., 2016). As a medical paradigm shift, nursing emphasizes a people-centered care philosophy that demands respect for women's feelings and comfort. So more attention is given to thirst after surgery

#### Aim of the Study:

The aim of the current study is to evaluate the effect of frozen saline on postoperative thirst among women undergoing gynecological surgery.

**Hypothesis:** postoperative woman who utilize frozen saline express less thirsty than those who don't utilize it.

### Operational definitions

**Thirst:** patient feels thirsty to drink water, in the current study, thirst is measured by the scores of visual analogue scale as patient reports.

**Frozen Saline:** An isotonic solution of sodium chloride and distilled water frozen at refrigerator and women in the intervention group asked to suck 30 ml of the frozen normal saline.

## 2. SUBJECTS AND METHOD

**Study Design:** A quasi-experimental design was used to accomplish the aim of this study.

**Study Setting:** This study was directed at the inpatient obstetric and gynecological departments in Mansoura University Hospital, Egypt.

**Sample Type:** A purposive sample was used in this study.

**Sample Criteria:** The study comprised of 66 postoperative women, the inclusion criteria included

1. Free from complications.
2. Good consciousness.
3. There are no swallowing problems.
4. Absence of nausea and vomiting.
5. Fasting prior to operation from 6-8 hours.
6. Undergo Gynecological surgery.

### Sample Size:

This is a controlled randomized trial proposes to assess the effectiveness of utilizing frozen saline on thirst relief among immediate postoperative patients undergoing abdominal surgery (**Al Sebaee & Elhadary 2017**). Based on data from literature, and considering level of significance of 5%, and power of study of 80%, the sample size can be calculated using the following formula:

$$n = [(Z\alpha/2 + Z\beta)^2 \times \{2(SD)^2\}] / (\text{mean difference between the two groups})^2$$

where

SD = standard deviation

$Z\alpha/2$ : This depends on level of significance, for 5% this is 1.96

$Z\beta$ : This depends on power, for 80% this is 0.84

Therefore,

$$n = [(1.96 + 0.84)^2 \times \{2(0.3)^2\}] / (0.21)^2$$

Based on the above formula, the sample size required per group is 33.

**Tools of data collection:** Three tools were used for data collection:

**Tool I: A structured Interviewing Schedule:** Based on reviewing the relevant literature, it was designed by researchers. It involved two parts: **Part 1:** This part enclosed the data related to general characteristics of women such as age, educational level, occupation and residence. **Part 2:** This part included data related to the surgery such as type of anesthesia, fasting hours and operation time.

**Tool II: Thirst Intensity Scale:** A numerical rating scale (NRS) was used to measure thirst intensity as it was adapted from (**Downie et al., 1978 & Jensen et al., 1986**). Women were requested to rate their thirst intensity on a 10 NRS, scoring system: 0 indicating no thirst at all, and 10 indicating the worst possible thirst that the woman had experienced.

## International Journal of Novel Research in Healthcare and Nursing

Vol. 5, Issue 3, pp: (180-189), Month: September - December 2018, Available at: [www.noveltyjournals.com](http://www.noveltyjournals.com)

**Tool III: Thirst discomfort scale:** It was adapted from (Martins et al 2017) to assess post-operative thirst discomfort after surgery. It included questions to ask women about dry mouth; dry lips; thick tongue; thick saliva; dry throat, bad taste and desire to drink water. Scoring system: not bothered (1), slightly bothered (2) and very bothered (3).

**Tool IV: Satisfaction questionnaire:** It was designed to assess the level of satisfaction among the intervention group regarding the utilization of frozen saline. It consisted of five statements. The women responded to each of the items using a five point Likert scale: very satisfied (5), satisfied (4), natural (3) unsatisfied (2) and very unsatisfied (1).

### Validity and reliability

Tools were reviewed by five specialized university professors. According to their comments, modifications were considered. While their reliability was tested giving Cronbach's alpha test for reliability= 0.881

### Ethical Considerations:

Ethical approval from the Nursing Faculty Ethics Committee was granted. Also, official authorizations were acquired from the pioneer of the Obstetrics and Gynecology Department. Informed consent was obtained from the cases after clarifying the aim and approach of this study. Privacy and confidentiality was protected. Cases were educated about their rights withdraw from study at any time.

### Pilot Study:

Pilot study phase was carried out for one week (April 2018) at Obstetrics and Gynecology Department of Mansoura University Hospital on 10% of the sample size (7 cases) to test the applicability, significance of the research tool and the clearness of the designed questionnaire and the required modification were made like changes of some questions and rephrase to others. The pilot sample was excluded from the study.

### Field work:

#### Phase 1: The preparatory phase

The researchers prepared the data collection tools based on the current literature and carried out the pilot study. The study was carried out from April to June 2018. The researchers obtained the official permissions and informed consent from women.

#### Phase2: The implementation phase

After two hours of gynecological surgery, the women were evaluated according to the following safety criteria: level of consciousness, presence of airway protection reflexes and absence of nausea and vomiting then assigned the women either control or intervention group by simple random sample assignment. The researchers collected data related to the general characteristics and surgery data then the intensity and distress of thirst was measured in both control and intervention groups.

After two hours of gynecological surgery, the researchers assessed the intensity and discomfort of post-operative thirst using the previous tools then the women in the intervention group asked to suck 30 ml of the frozen normal saline. Then, the researchers assessed the intensity and distress of post-operative thirst after one hour post intervention and repeated the intervention after two hours and then evaluated the intensity of the thirst again. Meanwhile, women in the control group followed the postoperative routine care.

At the end, the satisfaction of the woman regarding the care provided was evaluated in intervention group. The data collected were coded, analyzed and then the results were compared between the two groups.

### Statistical analysis:

All statistical analyses were performed using SPSS for windows version 20.0 (SPSS, Chicago, IL). Data were tested for normality of distribution prior to any calculations. All continuous data were normally distributed and were expressed in mean  $\pm$  standard deviation (SD). The comparisons were determined using Student's t test for two variables or one-way ANOVA test for comparison among than two variables with continuous data. Chi-square test was used for comparison of variables with categorical data. Statistical significance was set at  $p < 0.05$ .

### 3. RESULTS

**Table 1: Number and percent distribution of the study subjects according to their socio-demographic characteristics (n=66)**

Socio-demographic characteristics	Intervention group		Control group		Chi square test	
	n= (33)	%	n= (33)	%	X <sup>2</sup>	P
<b>Age (years)</b>						
30 – < 40	10		12	36.4	1.003	0.606
40 – < 49	16	48.5	12	36.4		
≥50	7	21.2	9	27.3		
<b>Mean ±SD</b>	44.5 ±7.6		42.9 ±9.3		0.740	0.462
<b>Educational level</b>						
Basic education	6	18.2	7	21.2	0.564	0.754
Secondary	15	45.5	12	36.4		
Higher	12	36.4	14	42.4		
<b>Occupation</b>						
Working	11	33.3	16	48.5	1.567	0.211
Housewife	22	66.7	17	51.5		
<b>Residence</b>						
Rural	15	45.5	20	60.6	1.521	0.218
Urban	18	54.5	13	39.4		

Table (1) shows that there was no statistical significant difference between both group regarding their socio-demographic characteristics. The mean age of the intervention and control groups nearly the same (44.5 ±7.6 & 42.9 ±9.3 respectively). Concerning level of education, it was obvious that 45.5% of the intervention group had secondary educational level and 42.4% of the control group had universal educational level. Additionally, (66.7% & 51.7% respectively) of intervention and control group were house wives. Also more than one half (54.5%) of intervention group from urban area and more than half of control group (60.6%) from rural area

**Table 2: Distribution of the characteristics of the current surgery among the studied groups**

Variables	Intervention group		Control group		Chi square test	
	n= (33)	%	n= (33)	n= (33)	X <sup>2</sup>	P
<b>Type of operation</b>						
Hysterectomy	13	39.4	16	48.5	2.833	0.418
Hysteroscopy	8	24.2	3	9.1		
Oophorectomy	5	15.2	5	15.2		
Salpingectomy	7	21.2	9	27.3		
<b>Pervious operation</b>						
No	26	78.8	26	78.8	0	1.000
Yes	7	21.2	7	21.2		
<b>Fasting hours</b>						
8 – 9	15	45.5	10	30.3	1.610	0.205
10 – 12	18	54.5	23	69.7		
<b>Mean ±SD</b>	9.3 ±1.1		9.8 ±1.3		1.659	0.102
<b>Type of anesthesia</b>						
General	3	9.1	4	12.1	0.160	0.689
Spinal	30	90.9	29	87.9		

Table (2) demonstrates that hysterectomy is the most common operation in both intervention and control group (48.5% & 39.4% respectively). In addition, regarding fasting hours, it was clear that Mean ±SD of both groups nearly the same (9.3 ±1.1 & 9.8 ±1.3 respectively). Majority of study group (90.9% & 87.9%) had spinal anesthesia.

**Table 3: Comparison of the thirst intensity between the studied groups**

Time	Intervention group	Control group	Student's t test	
	Mean ±SD	Mean ±SD	T	P
Before intervention (baseline measurement)	9.2 ±0.7	8.8 ±1.2	1.529	0.131
After 1 hour of giving frozen saline	7.2 ±0.8	8.8 ±1.0	7.075	<0.001
Before giving 2 <sup>nd</sup> frozen saline	6.7 ±1.1	9.2 ±0.8	10.032	<0.001
After 1 hour of giving second frozen saline	5.9 ±1.4	9.4 ±0.7	13.253	<0.001
ANOVA test				
F	60.679	3.328		
P	<0.001	0.022		

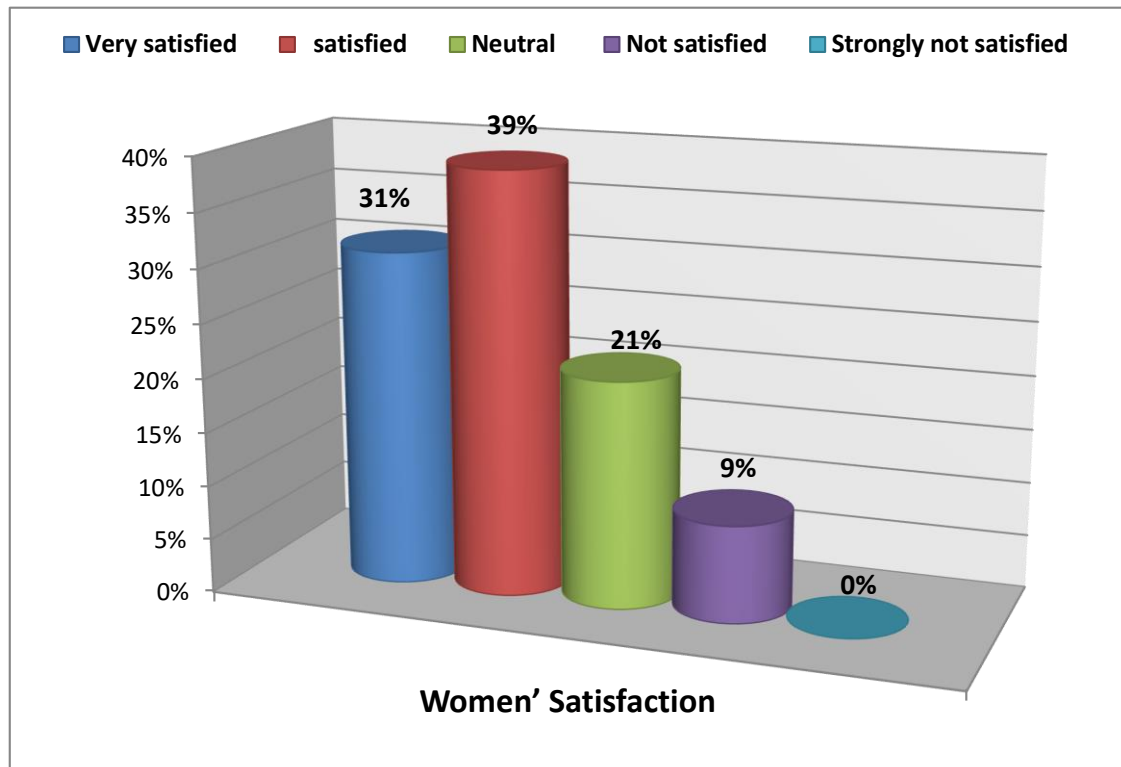
Table (3) reveals that there was statistically significant difference of thirst intensity among the intervention and control group in favor of the intervention group. At baseline measurement (before intervention) the two groups were nearly the same (9.2 ±0.7 versus 8.5 ±1.1%) but after one hour of giving frozen saline thirst intensity in intervention group were decreased (7.2 ±0.8% versus 8.8 ±1.0%) respectively. After 1 hour of giving second frozen saline, the huge difference between two groups were observed (5.9 ±1.4% versus 9.4 ±0.7%).

**Table 4: Comparison of the thirst distress scale between the studied groups**

	Intervention	Control	T test	
	Mean ±SD	Mean ±SD	t	P
<b>Baseline</b>				
My mouth is dry	2.85 ±0.4	2.76 ±0.6	0.691	0.492
My lips are dry	2.88 ±0.3	2.85 ±0.4	0.354	0.725
My tongue is thick	2.85 ±0.5	2.88 ±0.4	0.265	0.791
My saliva is thick	2.97 ±0.2	2.94 ±0.2	0.583	0.562
My throat is dry	2.82 ±0.5	2.79 ±0.5	0.229	0.819
My mouth had bad taste	2.88 ±0.6	2.72 ±0.7	0.386	0.701
I want to drink water	2.42 ±0.8	2.73 ±0.7	1.628	0.109
Total	19.6 ±2.3	19.7 ±3.3	0.131	0.896
<b>Post intervention</b>				
My mouth is dry	2.06 ±0.8	2.79 ±0.5	4.218	<0.001
My lips are dry	2.30 ±0.8	2.85 ±0.5	3.280	0.002
My tongue is thick	2.45 ±0.6	2.91 ±0.4	3.592	<0.001
My saliva is thick	2.33 ±0.8	2.97 ±0.2	4.379	<0.001
My throat is dry	2.42 ±0.8	2.89 ±0.4	2.921	0.005
My mouth had bad taste	2.12 ±0.9	2.86 ±0.6	3.467	<0.001
I want to drink water	2.21 ±0.9	2.73 ±0.7	2.645	0.010
Total	15.9 ±4.9	19.9 ±2.9	4.007	<0.001

Table (4) illustrates that there was no statistically significant difference regarding all items of thirst discomfort among the intervention and control group at baseline measurements. While there was statistically significant difference regarding all items of thirst discomfort among the intervention and control group post intervention.

**Figure (1): Frequency Distribution of Women’ Satisfaction Regarding Effectiveness of (Frozen Saline) on Postoperative Thirst Relief**



**Figure (1) The level of satisfaction regarding utilizing frozen saline among intervention group.**

Figure one illustrated that one third of women were either very satisfied or satisfied regarding utilizing frozen saline to alleviate the postoperative thirst intensity.

#### 4. DISCUSSION

The present study aimed to evaluate the effect of frozen saline on postoperative thirst among women undergoing gynecological surgery. The study findings shown that there was a statistically significant difference between control and intervention groups whereas the mean level of thirst was statically significant reducing in favor of the intervention group than the control group at different time of measurements. These study findings are supported the research hypothesis that postoperative woman who utilized frozen saline expressed less thirsty than those who didn't utilize it.

The findings of this study revealed that there was no statistically significant difference among both groups as regard to their general characteristics and currant surgery data; age group, educational level, occupation and residence; likewise there was no statistically significant difference between the two groups regarding their fasting hours, intensity and distress of thirst, this means that good matching existed between both groups.

These results were in agreement with **Hee et al, (2015)** who studied effects of saline cold water gauze and general cold water gauze on postoperative thirst who found that there was no statistically significant difference between the experimental group and the control group in terms of age, educational level, In addition, there was no significant difference between two groups in thirst and oral status. In agreement with, **Al Sebaee & Elhadary (2017)** study about a care bundle (an ice cold normal saline with menthol) on postoperative thirst relief and oral condition among patients undergoing abdominal surgeries who reported that there was no statistically significant difference between the study groups regarding level of thirst and oral condition at base line measurements.

Concerning to the intensity of thirst among intervention (frozen saline) group, the current study findings revealed that there was reduction in the intensity of thirst after one hour of sucking frozen saline at 1<sup>st</sup> and 2<sup>nd</sup> intervention. This finding powers the physiological action of saline to decrease thirst as it may be occurred due to cold temperature: being detected in the oral cavity, it produces feelings of pleasure, agreeableness and reward, also called the hedonic process or aliesthesia, moisturizing the oropharyngeal region (**Eccles et al., 2013**).

Similarly, **Cho et al., (2010)** who examined the effects of using gauze with a cold saline solution or ice to release thirst and oral condition in patients undergoing laparoscopic cholecystectomy and reported that thirst score changes along the study; however, the difference was significantly higher in the experimental group who received frozen gauze with saline solution than the control group who received, ice or wet sponge. Additionally, **Al Sebaee & Elhadary (2017)** study about a care bundle (an ice cold normal saline with menthol) on postoperative thirst relief, concluded that using ice cold normal saline with menthol (care bundle) was significantly relief thirst intensity among immediate postoperative patients who undergone abdominal surgeries. Also, a gradual decrement in the mean values of thirst intensity of study group with a highly significant statistical difference between both groups.

Similarity, the study findings about effectiveness of oral care with ice cold saline versus room temperature saline on thirst and oral condition among post-operative patients undergone abdominal surgeries discovered that the mean score of the thirst levels of the subjects in the ice cold saline group experienced less thirst after the intervention, as based on the subjective thirst assessment, after the intervention the mean thirst score was reduced from  $5.17 \pm 0.70$  to  $2.30 \pm 0.53$  after 15min and The paired t-test value of thirst assessment at 15min and 4 hours after intervention was found to be statistically significant at .000 level (**Kaur, 2016**).

In agreement with another study conducted in Korea by **Moon et al., (2016)** on 56 participants as the experimental group received wet gauze with cold normal saline and control group received wet gauze with cold water and results revealed that thirst for the experimental group improved more than for the control group study. So the results indicated that nurses can apply wet gauze with cold normal saline to reduce thirst and saliva acidity and to improve the oral cavity condition for postoperative patients.

In relation to the thirst discomfort among the study groups, the results reported that the thirst causes much discomfort among both group and majority of them were very bothered from it and there was no significant difference at baseline measurements. While after intervention there was a significant difference between both groups in favor of reduce the mean of the thirst discomfort among the intervention group. In agreement with the current study findings **Araiet al., (2013)** in their research entitled "The effects of oral care with normal saline on oral state of patients in intensive care unit" found a significant difference in the oral cavity state between the experimental group that had used normal saline and the control group that had used tantum solution.

The current study findings stated that about two third of the intervention group either satisfied or very satisfied with the provided care to reduce the intensity of thirst. In same line **Cho et al., (2010)** revealed that the group that received wet gauze with normal saline were satisfied or very satisfied with the intervention (40.5% & 54.6).

## 5. CONCLUSIONS

The study results concluded that using of frozen saline was significantly relief thirst intensity among immediate postoperative woman undergone gynecological surgery than the woman who received routine care.

## 6. RECOMMENDATIONS

- Replication of the study on larger sample, undergoing different types of surgeries in different settings is recommended before generalization of the study findings.
- Utilization of frozen saline as routine care for all obstetrics and gynecological operation.
- Further studies on the management of a discomfort as common and intense as thirst in the immediate postoperative period.

## ACKNOWLEDGMENT

We offer our appreciation and thankfulness to postoperative women, doctors and nurses at Obstetrical and Gynecological Department of Mansoura University Hospital for their help and cooperation.



### REFERENCES

- [1] Bieber, E.J.; Sanfilippo, J.S.; Horowitz, I.R. and Mahmood I. Shafi.(2015): Clinical Gynecology. Second edition, ed. Eric Published by Cambridge University Press.© Cambridge University Press 2015.pp281-300.
- [2] Svensen, C.H.; Prough, D.S.; Feldman, L. and Gan, T.J. (2018): Fluid Therapy for the Surgical Patient. CRC Press, Taylor & Francis Group, LLC.pp180.
- [3] Baird, M.S. (2016): Manual of Critical Care Nursing: Nursing Interventions and Collaborative Management. Copyright Elsevier Health Sciences, USA. Pp390-450.
- [4] Ridolfi, R.C.; Poli, M. and Boninsegna, C. (2006): Protocol Systematic Review How time of fast from liquids can affect on discomfort caused by thirst on adult surgical patients during the early post operative period after elective surgery: a systematic review. Master in Evidence-Based Practice e Metodologia della Ricerca Clinico-assistenziale; Lavoro finale Joanna Briggs Institute (2006 -2008). Available from: [http://www.evidencebasednursing.it/nuovo/Formazione/masterebp\\_vecchi/protocolli\\_SR/RS\\_Ridolfi\\_Poli\\_Boninsegna.pdf](http://www.evidencebasednursing.it/nuovo/Formazione/masterebp_vecchi/protocolli_SR/RS_Ridolfi_Poli_Boninsegna.pdf).
- [5] Xiaolan, W.; Cuiqing, L.; Yulan, Z. and Lu, H. (2018): The Effect of Nursing Intervention of Postoperative Thirst in Patients after Laparoscopic Cholecystectomy. American Journal of Nursing Science. Vol. 7, No. 3, 2018, pp. 106-108. doi: 10.11648/j.ajns.20180703.14.
- [6] Arai SR, Butzlaff A, Stotts NA, Puntillo KA. (2014): Quench the thirst: lessons from clinical thirst trials. Biol Res Nurs [Internet]. 2014 [cited 2015 nov. 19];16(4):456-66. Available from: Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3989478/> [ Links ].
- [7] Arai S, Stotts N, Puntillo K. (2013): Thirst in critically ill patients: from physiology to sensation. Am J Crit Care [Internet]. 2013 [cited 2013 Aug 10];22(4):328-35. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/23817822>.
- [8] Anil, S., Vellappally, S., Hashem, M., Preethanath, R. S., Patil,S., &Samaranayake, L. P. (2016). Xerostomia in geriatric patients: a burgeoning global concern. Journal of Investigative & Clinical Dentistry, 7 (1), 5-12.
- [9] Fox, N. F., Xiao, C., Sood, A. J., Lovelace, T. L., Nguyen, S. A., & Sharma, A., et al. (2015): Hyperbaric oxygen therapy for the treatment of radiation-induced xerostomia: a systematic review. Oral Surgery Oral Medicine Oral Pathology & Oral Radiology, 120 (1), 22-28.
- [10] Aroni, P.; do Nascimento, L.A. and Fonseca, F.F. (2012): Assessment strategies for the management of thirst in the post-anesthetic recovery room. Acta paul. enferm. vol.25 no.4 São Paulo 2012. Available from: <http://dx.doi.org/10.1590/S0103-21002012000400008>.
- [11] Nascimento LA, Fonseca LF, Rossetto EG, Santos CB. (2014): Development of a Safety Protocol for Thirst Management in the Immediate postoperative period. Rev Esc Enferm USP [Internet]. 48(5):834-43. Available from: [http://www.scielo.br/scielo.php?script=sci\\_ar\\_ttext & pid=S0080-62342014000500834&Ing](http://www.scielo.br/scielo.php?script=sci_ar_ttext & pid=S0080-62342014000500834&Ing).
- [12] Cho E.A, Kim K.H, & Park J.Y.(2010): Effects of frozen gauze with normal saline and ice on thirst and oral condition of laparoscopic cholecystectomy patients: Pilot study. Journal of Korean Academy of Nursing.; 40 (5): 714-723. DOI: 10.4040/jkan.2010.40.5.714.
- [13] Perlas A, Davis L, Khan M, Mitsakakis N, Chan VW.(2011): Gastric sonography in the fasted surgical patient: A prospective descriptive study. Anesth Analg. 2011;113:93-97. doi: 10.1213/ANE.0b013e31821b98c0. Epub 2011 May 19.
- [14] Wuketich S, Hienz SA, Marosi C (2012): Prevalence of clinically relevant oral mucositis in outpatients receiving myelosuppressive chemotherapy for solid tumors. Support Care Cancer. 2012 Jan;20(1):175-83. doi: 10.1007/s00520-011-1107-y. Epub 2011 Feb 18.
- [15] Cheng KK (2007): Oral mucositis and quality of life of Hong Kong Chinese patients with cancer therapy. Eur J OncolNurs 11: 36-42.

**International Journal of Novel Research in Healthcare and Nursing**

 Vol. 5, Issue 3, pp: (180-189), Month: September - December 2018, Available at: [www.noveltyjournals.com](http://www.noveltyjournals.com)

- [16] Kaur, R. (2016): A quasi experimental study to see the effectiveness of oral care with icecold saline versus room temperature saline on thirst and oral condition among post-operative patients undergone abdominal surgeries at GGS hospital, Faridkot, Punjab. *Innovational Journal of Nursing and Healthcare (IJNH)* 2 (1), 197-204, 2016.
- [17] Ozden, D., Turk, G., Duger, C., Elem K Guler, E.K., Fatma Tok, K. & Gulsoy, Z. (2015): Effects of oral care solutions on mucous membrane integrity and bacterial colonization. Available from: <https://www.researchgate.net/publication/259393232>.
- [18] Cawley M.M, Benson L.M. (2005): Current trends in managing oral mucositis. *Clinical Journal of Oncology Nursing*. 9 (5): 584- 592. <http://dx.doi.org/10.1188/05.CJON.584-592>.
- [19] Pierotti I, Fracarolli IL, Fonseca LF, Aroni P. (2018): Evaluation of the intensity and discomfort of perioperative thirst. *Escola Anna Nery* 22(3).
- [20] Lisboa Gois FC, Aguillar OM, Santos V, Llapa Rodríguez OE. (2012): Fatores estressantes para o paciente submetido à cirurgia cardíaca. *Invest Educ Enferm*. 2012;30(3):312-9.
- [21] Dessotte CAM, Rodrigues HF, Furuya RK, Rossi LA, Dantas RAS. (2016): Estressores percebidos por pacientes no pós-operatório imediato de cirurgia cardíaca. *Rev Bras Enferm [Internet]*. 2016; [cited 2018 Apr 27]; 69(4):694-703. Available from: <http://www.scielo.br/pdf/reben/v69n4/0034-7167-reben-69-04-0741.pdf>.
- [22] Pavani MM, Fonseca LF, Conchon MF. (2016): Thirst In Surgical Patients: Perceptions Of The Nursing Team In Inpatient Units. *J Nurs UFPE on line., Recife*, 10(9):3352-60.
- [23] Garcia AKA, Fonseca LF, Aroni P, Galvao CM. (2016): Strategies for thirst relief: integrative literature review. *Rev Bras Enferm [Internet]*. 2016;69(6):1148-55. DOI: <http://dx.doi.org/10.1590/0034-7167-2016-0317>
- [24] Al Sebaee, H.A. and Elhadary, S.M. (2017): Effectiveness of A Care Bundle on Postoperative Thirst Relief and Oral Condition among Patients Undergoing Abdominal Surgeries . *IOSR Journal of Nursing and Health Science (IOSR-JNHS)* , vol. 6, no. 5, 2017, pp. 82–90.
- [25] Downie WW, Leatham PA, Rhind VM, et al. (1978): Studies with pain rating scales. *Ann Rheum Dis* 1978; 37:378e381.
- [26] Jensen MP, Karoly P, Braver S. (1986): The measurement of clinical pain intensity: a comparison of six methods. *Pain* 1986;27:117e126.
- [27] Martins PR, Fonseca LF, Rossetto EG, Mai LD. (2017): Developing and validating the Perioperative Thirst Discomfort Scale. *Rev Esc Enferm USP*. 2017;51
- [28] Hee, M.; Hee, L.Y. and In Sook, J.(2015): Comparison of effects of saline cold water gauze and general cold water gauze on postoperative thirst, oral condition and saliva acidity. *J Korean Acad Fundam Nurs* 2015; 22 (4): 398-405.
- [29] Eccles, R.; Du-Plessis, L.; Dommets, Y. and Wilkinson, J.E. (2013): Cold Pleasure. Why we like ice drinks, ice-lollies and ice cream: *Appetite*; 71:357-360. doi: 10.1016/j.appet.2013.09.011. Epub 2013 Sep 21.
- [30] Moon YH, Lee YH, Jeong IS. (2016): A comparison of effect between wet gauze with cold normal saline and wet gauze with cold water on postoperative thirst, oral cavity 1155 *Rev Bras Enferm [Internet]*. 2016 nov-dec;69 (6):1148-55.condition, and saliva pH. *J Korean Acad Fundam Nurs [Internet]*. 2015[cited 2016 Apr 12];22(4):398-405. Available from: <http://j.kafn.or.kr/upload/pdf/jkafn-22-4-398.pdf>
- [31] Alkatout, I. and Mettler, L. (2018): *Hysterectomy: A Comprehensive Surgical Approach*. Springer International Publishing Switzerland. DOI: 10.1007/978-3-319-22497-8.pp775-800.