

## Effect of Mothers' Telenursing Programme on Specific Postoperative Outcomes for their Infants with Esophageal Atresia

Marwa Abd ELkreem Ibrahim<sup>(1)</sup>, Samah Hamdy Abdel Hafez<sup>(2)</sup>

(1) Assistant Professor of Pediatric Nursing, Faculty of Nursing, Cairo University

(2) Lecturer of Pediatric Nursing, Faculty of Nursing, Cairo University

### Abstract

**Introduction:** Esophageal Atresia is marked by heavy oral secretions, vomiting, and failure to pass a suction catheter or nasogastric tube at birth, and unexplained cyanosis after initial feeding. Oral intake reaches the lungs or large quantities of air enter the stomach if there is a fistula between the esophagus and trachea. Here may be crucial abdominal distension, choking, cyanosis, frothy white bubbles in the mouth, and coughing. **Aim of the Study:** was to evaluate effect of mothers' telenursing program on specific postoperative outcomes for their infants with esophageal atresia. **Research Design:** In the present study, post and pre test quasi-experimental research design was applied. **Setting:** The suggested study was carried out at Cairo University Specialized Pediatric Hospital (CUSPH) in two separate locations. The first location was the SNICU (Surgical Neonatal Intensive Care Unit), and the second was the follow-up out-patient surgery clinic. **Sample:** Throughout the study, a purposeful sample of 60 women and their infants from past settings were selected. The study as well as control groups were split equally between the two categories. **Tools of data collection:** Mothers' Knowledge of EA, a Structured Interview Questionnaire, and a Follow-Up Phone Call for Selected Postoperative Outcomes Record Sheet for Infants are three Arabic-language data collection tools that were created by researchers. **Results:** The knowledge of mothers before and after the execution of the telenursing intervention programme showed highly statistically significant variations. **Conclusion:** The current study showed that, whenever telenursing was employed, it substantially enhanced mothers' knowledge in the study group compared with the control group. In addition, in comparison with women in the control group, infants with EA showed less postoperative difficulties for mothers who received the telenursing program. **Recommendations:** It is critical to use telenursing interventions in nursing care to make it simpler for mothers to reach in contact via nurses whenever they need to. For proof of how telenursing intervention may improve mothers' awareness of care following surgery over the course of a larger sample size, more study is needed.

**Keywords:** Telenursing, postoperative, mothers' knowledge, Esophageal Atresia

### Introduction:

One of the most pediatric surgical defects is Esophageal Atresia. Some believe that the infants' capacity to overcome this malformation, survival, and quality of life are indicators of the way care succeeded. The prognosis is primarily determined by the level of care offered to these infants when they are in the hospital and by any identified associated anomalies. Thus, it must be done to give such babies excellent nursing care to guarantee the greatest likelihood of survival and to enable pediatric nurses to supply the best nursing care for neonates with such congenital defects (Chen et al., 2017).

A birth circumstance called Esophageal Atresia (EA) happens when an area of the esophagus, which is the tube that connects the mouth to the stomach, fails to develop properly. One of the congenital gastrointestinal tract (GIT)

defects that requires surgical repair in infancy is the Tracheoesophageal Fistula (TEF), which could be present or absent (Susanti, Kardana, & Ariyanta, 2020). In the words of Maharjan, Kansakar, Samyukta, and Singh (2020), the hallmarks of EA are excessive salivation accompanied by choking, coughing, vomiting, and cyanosis at the initial phase of feeding.

The general incidence of EA/TEF varies from one in 3000 to 4 500 live births worldwide, with a slight 3:2 male preponderance. Most incidents occurred by chance, in rich countries, the survival rate ranges from 85 to 95%. In some areas of the world as Finland, the incidence may be as high as 1 in 2,440 live births. As well as, In Egypt based on informal report from Neonatal Surgical Intensive Care Unit (NSICU), the total number of infants admitted to the NSICU in 2018 was 40 infant who underwent EA surgery.

The indications of EA include vomiting, profuse oral secretions, inability to pass a suction catheter or nasogastric tube at birth, and unexplained cyanosis after the first feeding. Oral intake enters the lungs or substantial amounts of air enter the stomach when there is a fistula between the oesophagus and trachea. There can be significant abdominal distension, choking, cyanosis, frothy white bubbles in the mouth, and coughing. The newborn would eventually develop aspiration pneumonia and severe respiratory distress if left untreated, and without surgical intervention, death may result **(Abd-Elhamed, Osman & Mohammed, 2016)**.

After infants have been stabilised and investigated, the therapy of EA/TEF necessitates a rapid surgical correction. Because of this, TEF's surgical approach and operation time are crucial. Therefore, the timing of the procedure and the surgical strategy used in TEF are critical. Based on the newborns' size and health, make decisions. It is generally advised that newborns receive primary care. For severe respiratory distress syndrome, a phased repair many weeks after delivery is advised **(Sharma, 2018)**.

Preoperative nursing care ought to include keeping up the infant's respiratory status whereas maintaining a strategic distance from endotracheal intubation, proximal esophageal pocket depleting, and situating the kid semi-prone to decrease the hazard of gastroesophageal reflux illness. Observing of crucial signs, vascular get to ought to too be performed as prudent measures and a gastrostomy tube is set to play down gastroesophageal reflux, and a jejunostomy bolstering tube is put for wholesome purposes **(Hockenberry & Wilson, 2019)**. Aviation route administration, appropriate suction, appropriate situating, intravenous anti-microbials, torment administration, chest tube care, gastrostomy tube care, wound care, and gastrostomy feedings may be begun and proceeded until the esophageal anastomosis is mended, after which verbal bolstering may be continuously presented in case endured well to anticipate choking, are all postoperative nursing intercessions for neonates who experienced EA surgery. Newborn children are regularly not discharged until they are able to endure verbal nourishing successfully **(Hockenberry, Roger, & Wilson, 2019)**.

Telenursing is the hone of giving nursing care and ursing honing through innovation. Concurring to data on telenursing's utilize in nursing hone, it may be utilized for discussion, instruction, observing, and persistent assessment. The Skillet American Wellbeing Association (PAHO) (2019) characterizes telehealth as the utilize of data and communication innovation (ICT) to offer healthcare administrations when get to to physical areas postures a obstruction. It is pivotal for upgrading wellbeing frameworks in destitute countries since it increments benefit accessibility, disentangles determination and treatment, kills geographic boundaries, raises guidelines, and helps in proficient improvement **(Mozafari, Khorshidi and Lotfi, 2018)**.

Telenursing enables access to care and the export of nursing services through the use of technology. It is an effective tool for general Nursing is responsible for identifying EA as soon as the baby is born. The main concern for the infant exhibiting the typical EA signs and symptoms is opening a patent airway and avoiding additional respiratory compromise. Neonatal pre- and postoperative treatment follow standard practises for surgical baby care. The management of the infant with EA does, however, require specific nursing concerns **(Hockenberry & Wilson, 2018)**. The uniqueness of newborn children's social, mental, enthusiastic, and physical responses makes nursing treatments very difficult. The center nursing covers the need of taking a patient's history, evaluating the children after confirmation, observing critical signs, administering information to children and parents who are lacking, caring for intravenous fluids and oral liquids, and foreseeing wound disease. Additionally crucial are postoperative care, counselling, and wellness education. As a result of pediatric surgical problems, expert nursing care is regarded as a key tool for progress **(James, Nelson & Ashwill, 2017)**.

#### **Significance of the study:**

According to the World Health Organization (WHO) (2019), millions of newborn undergo multiple surgeries and experimental treatments every day. Care for babies taken after surgery is one aspect of child wellness that is occasionally disregarded but can be essential in preventing harm and passing. There aren't many considerations for telenursing in pediatric nursing

care in Egypt, but Abusaad and Sarhan (2016) looked at how telenursing affected the degrees of compassion and exhaustion in children with severe b-thalassemia. To make it easier for pediatric patients to get in touch with their doctors and medical staff whenever they got there, they suggested adopting telenursing interventions. However, more attention has to be given to the use of telenursing as a strategy.

As a clinical facilitator in the NSICU, I observed that moms of newborns with esophageal atresia needed knowledge about the condition itself and needed instructions on how to care for their children after surgery. In this way, mothers must get constant guidance and assistance. Few research on moms who were interested in telenursing programmes and had infants with EA have been extinguished in Egypt. The present thinking is to increase mothers' knowledge about EA and how to care for their newborn infants with EA in this way. Additionally, it offers recommendations and guidance that should be represented in the education of pediatric nurses and provides evidence-based data that can help nurses refine their skills and conduct research in the field of pediatrics.

The care of infants undergoing EA presents a number of problems for nurses working in SNICU, including the necessity for them to have strong clinical pre and post care practices that have an impact on postoperative outcomes and the continuously evolving surgical procedures. Delivering nursing care based on practices supported by evidence. Therefore, the current study's objective is to assess how mothers' participation in a telenursing programme has affected certain postoperative outcomes for their infants who have EA.

#### **Aim of the study:**

The present study aimed to evaluate effect of mothers' telenursing programme on specific postoperative outcomes for their infants with Esophageal Atresia.

#### **Operational definitions:**

For the purpose of the current study the following operational definitions addressed as the following:

#### **Specific Postoperative Outcomes for Infants:**

Infants' weight, indications of wound infection, fever, pain, and feeding quality are all mentioned in the current study.

#### **Mothers' telenursing programme:**

The following topics are discussed in the current study's reference to mothers' telenursing programmes: position following surgery, infant gastrostomy feeding, activity, care for vomiting, care for fever, care for cough, care for pain, administration of medication, bathing, wound care, care for the urinary system, infection prevention, and postoperative follow-up. It gave moms who had children with EA the tools they needed to care for their newborns safely and accurately. It will be created following a thorough assessment of the literature and backed by instructional materials like an illustrated Arabic booklet, instructional videos, demonstrations, and arguments.

#### **Subjects and Methods:**

##### **Research Hypotheses:**

1. It is projected that women taking part in the telenursing programme will perform better than mothers in the control group on the posttest and follow-up test in terms of general knowledge.
2. Infants whose mothers received the programme may display fewer postoperative issues than infants whose mothers did not.

##### **Research design:**

A quasi-experimental design seeks to show a correlation between an independent and dependent variable, much like a true experiment. A quasi-experiment does not rely on randomization, in contrast to an actual experiment. Instead, groupings of people are created using non-random criteria (Polit, Beck, & 2017).

##### **Setting:**

Two different instances of the proposed study were conducted at Cairo University Specialised Pediatric Hospital (CUSPH). The SNICU (Surgical Neonatal Intensive Care Unit) was the first location and the second was the follow-up out-patient surgery clinic.

##### **Sample:**

According to the following criteria, the following purposive test of 60 women and their

children undergoing EA surgery was included in the study: Newborn child getting ready for EA surgery. Mother (of any age, able to examine and type, with a smartphone that can access the web and Whatsapp. The only real exception to this rule is if the newborn infant has any chronic illness or any other innate defects. The first 30 mothers and their children acted as the control group and received standard medical care, while the second 30 mothers and their children received an experimental treatment. According to the International Fund for Agricultural Development's 2015 report, "Calculating the Sample Size," the sample size is based on type 1 error of 0.05 and test power of 95%.

### Tools of Data Collection:

After an assessment of the pertinent literature, the researchers created three Arabic-language data collection tools:

- 1- A structured interview questionnaire was the first tool. It had two parts (I and II)

#### Part I: included two dimensions (a, b) Mothers' characteristics and Infants' personal data

- a- The mother's age, place of residence, education level, marital status, health status, and number of children.
- b- A child's age, sex, rank, and whether other members of his or her household had EA.

**Part II:** The child's medical history, covered the date of child's diagnosis, previous hospital stays, signs and symptoms, and current complaints. (3 inquiries)

- 2- Mothers' Knowledge of Postoperative Care for EA Questionnaire was the second tool. This questionnaire's goal was to determine how familiar mothers were in postoperative EA care. It had 45 questions total. It involved postoperative position (1 question), infant gastrostomy feeding (10 questions), care for vomiting (4 questions), activity (3 questions), care for fever (8 questions), care for cough (4 questions), care for pain (4 questions), medication administration (1 question), bathing (5 questions), wound care (5 questions), urinary system care (3 questions), and infection prevention (1 question).

### Scoring System of Mothers' Knowledge of Postoperative Care for EA Questionnaire:

The questionnaire had 45 multiple-choice questions (with correct and incorrect answers), for a total of 118 correct responses. Each properly chosen choice got one point, while the erroneous ones received zero. Three categories were created out of the total points (118): Unsatisfactory knowledge is defined as being below 60% (0 to less than 70 points), Satisfactory knowledge is defined as being between 60% and less than 75% (70 to less than 88 points), and Good knowledge is defined as being between 74 and 100% (88-118 points).

- 3- Call to Follow-up Regarding Record Sheet for Selected Postoperative Outcomes for Infants: Every phone call's date, time, length, selected postoperative outcomes addressed, and any instructions given to the mother were all recorded on it. The researcher also included information about the mother's progress and the follow-up of any issues or concerns that had been previously discussed in the form. It was designed to evaluate the postoperative EA outcomes for infants. It had 22 questions, which were broken down into the following categories: bleeding (1 item), feeding quality (10 items), feeding pattern, feeding reflexes, elimination, vomiting, cough, difficulty breathing, shocking, oligurea, temperature change (2 items), signs of wound infection (5 items), and pain (5 items).

### Telenursing programme:

After evaluating the literature and associated research, the researchers created a telenursing curriculum. The programme, which is a booklet in Arabic, is about postoperative care for infants who have had EA surgery.

### Booklet content:

Introduction to postoperative EA care for infants, including information on postoperative positioning, child gastrostomy feeding, activity, care for vomiting, care for fever, care for cough, care for pain, administration of medications, bathing, wound care, care for the urinary system, infection prevention, and postoperative follow-up.

### Content validity

To determine the extent to which the instruments measure what is intended to be measured, content validity was performed. A group of five professionals with expertise in pediatric surgery and pediatric nursing evaluated

the tools. The substance of the tools was generally agreed upon by all of them, and only small linguistic adjustments were made to the Arabic to make it more mother-friendly.

#### Reliability:

To determine how closely the tool's items assess the same notion and how closely they are correlated with one another, internal consistency was measured. According to Cronbach's Alpha, which was 0.77, internal consistency reliability was estimated.

#### Ethical consideration:

Cairo University Specialized Pediatric Hospital (CUSPH) granted approval, which was received. Mothers (in the control and study groups) were asked for their oral informed permission after being fully informed of the study's aims and methodology in order to seek their cooperation. They were made aware of the fact that their participation in the study was voluntary and that they had the opportunity to quit at any moment. Mothers were also given the assurance that all data collected would be kept private and used just for the investigation.

#### Procedure:

The managers of the surgical neonatal intensive care unit (SNICU), the outpatient surgery clinic, and the directors of Cairo University Specialized Pediatric University Hospital all granted authorization. The surgical out-patient clinic at Cairo University Specialized Pediatric Hospital (CUSPH), where they go for a diagnosis, is where researchers first encountered the moms in both groups. An informed permission was obtained from the moms who met the inclusion criteria after a brief explanation of the study's purpose to them. **A-For the control group (who left for the hospital routine care):**

- 1- The researchers filled the 1<sup>st</sup> tool (Structured Interview Questionnaire), and second one which called Mothers' Knowledge of Postoperative Care for EA Questionnaire for 1<sup>st</sup> time as (pretest) in the first setting. It took about 30-40 mins.
- 2- In the out-patient surgery clinic (second setting), Researchers met the participated mothers in control group to complete second tool for second time as (posttest). The researchers recorded calls using third tool. It

was call to follow-up regarding record sheet for selected postoperative outcomes for infants

- 3- After one month of operation researchers called mothers again to fill the third tool (follow up test). Each phone call took 20-30 minutes

#### For the study group:

##### Assessment phase:

In the first setting, the researchers completed the Mothers' Knowledge of Postoperative Care for EA Questionnaire for the first time as well as the Structured Interview Questionnaire. About 30 to 40 minutes passed. The programme booklet, which the researchers had created in Arabic, was then immediately given to the moms by the researchers. The mothers' phone details were obtained from the researchers, who also informed the moms that the films and programme guide would be given to them over WhatsApp. The sessions were scheduled based on the moms' availability after the researchers asked them to read the pamphlet.

##### Intervention phase:

After two days of meeting the moms in the surgical out-patient clinic, the researchers called them for the first time. Thereafter, sessions were scheduled according to the mothers' free time. The programme was delivered in three 45-minute sessions, one on each of the following days:

**The first session** covered an introduction to EA, recovery from surgery, feeding a newborn through a gastrostomy tube, treating vomiting, and activities.

**The second session** covered washing, wound care, drug delivery, fever, cough, and pain management.

**The third session** covered the following topics: urine output, infection prevention, infection symptoms, follow-up, and conclusion.

When the sessions were over, the researchers stayed reachable by phone in case the moms needed them to clarify any programme details that could have been unclear.

The researchers saw the mothers and children in the first setting on the day of the EA surgery and provided mothers with any clarifications they

wanted regarding the postoperative care for their children. After surgery, the researchers advised mothers to contact if their kids had any problems or if they needed assistance with child care.

All calls were recorded using a third instrument, a phone call record form, which included the date, time, and duration of each contact as well as discussions of a few postoperative outcomes and any instructions given to the mother. Data collection process took from May 2019 to August 2019.

### Evaluation phase 1 (post-test):

The moms were met by the researchers one week after the operation in a second setting. The programme's impact on mothers' understanding of postoperative care for EA surgery was evaluated by the researchers using a second tool that was filled out as a posttest. To record the infants' chosen postoperative outcomes, the researchers looked over the third tool.

### Evaluation phase 2 (follow-up):

In order to assess the program's impact on mothers' understanding of postoperative care for EA infants and record the infants' chosen postoperative outcomes, the researchers contacted the mothers one month following surgery and had them complete a third tool over the phone. It takes roughly 20 to 30 minutes to complete the tool for each mother call. **Statistical analysis**

Statistical Package for Social Studies, version 21, was used to tabulate and summarize the obtained data. Data was computerized, and appropriate descriptive and inferential statistical tests were used for analyzing it. Frequency and percentage were used to express quantitative data. The parametric 2 test was used to compare two qualitative variables, and the parametric t test and f test was used to compare two quantitative variables. Using the Pearson correlation coefficient, variables were correlated with one another. P values under 0.05 were taken into consideration for statistical significance.

### Results:

According to Table 1, 40 % of the moms in both groups were between the ages of 25 and 30. In addition, 50% of the women in the study group were illiterate, compared to 36.7% of the moms in the control group who had only a basic education. Last but not least, it was discovered that the majority of mothers in both the study group

(87.7%) and control group (73.4%) worked outside the home. Figure 1 shows that in both groups, the majority of mothers (60% and 76.7%, respectively) reside in rural areas. Table (2) clarified that more than two-fifths (43.3%) of the children in the study and control groups were between the ages of 7 and 11 days. Furthermore, in the study group, more than half of the infants (53.3%) were male, and more than two-fifths (46.7%) were female, while the control group had the highest percentage of males (60%) and 40.0% of females.

According to Table 3, the mothers' understanding of each aspect of post-operative care was unsatisfactory in the study group, with percentages ranging from (86.7% to 100%) in the pre study group. While mothers' knowledge was satisfactory, it ranged from (93.3% to 100%) in the post-study and (40% to 100%) in the follow-up. But scores of mothers' knowledge about each aspect of after-operative care in the control group were inadequate, with percentages ranging from (86.3%-100%), 80%-96.7%, and 90%-100% before, post, and follow up, respectively.

Table (4) showed that prior to the programme, every mother in the study group had an unsatisfactory level of knowledge, whereas following the programme, 80% of the mothers in the study group had a satisfactory level of knowledge, and in the follow-up, 66.7 percent of them had a satisfactory knowledge score. The same table showed that the mothers in the study group's overall mean score for post-operative care knowledge before the programme was (28.53±11.01) while after the program and in the follow up had increased to (93.20±17.92 and 73.03±9.59) respectively after the programme and in the follow-up. However, every mother in the control group scored poorly on the pretest, but the percentage decreased to (97.7% and 93.3%) on the follow-up and posttests, respectively. While the total mean score of knowledge about post-operative care among mothers in the control group was (28.53±11.01, 31.003±3.62 and 30.03±1.59) in pre, post and follow up successfully.

Table 5 showed that, both before and after the programme, there were positive, highly statistically significant differences in the overall mean scores for mothers' knowledge between the control and study groups, with (P. = 0.000). The control and study groups' overall mean scores

prior to the exam were statistically identical ( $t = 1.370$ ;  $P = 0.176$ ). Between the research group's pre, post, and follow-up periods, there were substantial and favourable differences in the mothers' overall mean scores of knowledge of postoperative care ( $P = 0.000$ ).

The study group's mothers' ratings for each component of the post-operative care plan, including pre-, post-, and follow-up care, were displayed in Table (6). It is clear that the knowledge post-scores for each of the thirteen areas have risen.

In all 13 areas of care, there was a highly significant difference between the control and study groups' posttest levels of knowledge of postoperative care, as shown in Table (7), with  $p$  values ranging from (0.006 to 0.000).

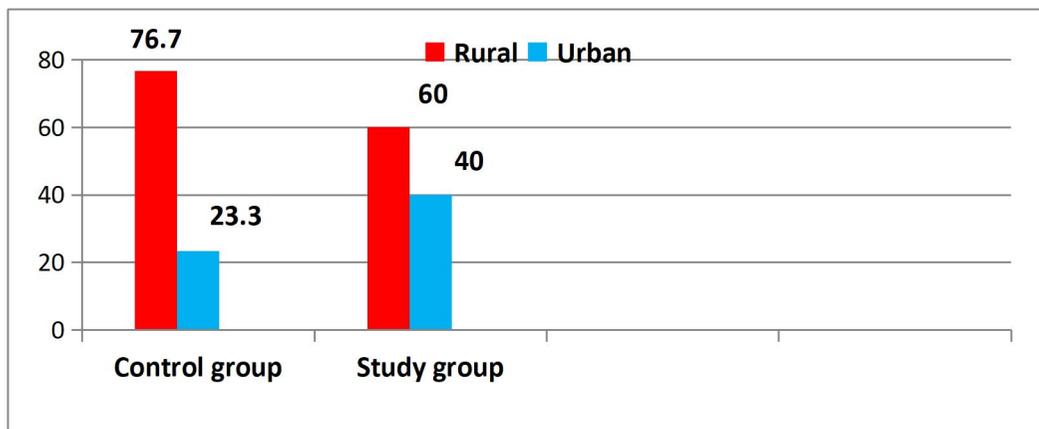
Table (8) demonstrated the existence of a highly significant difference between the follow-up level of knowledge about post-operative care in all 13 areas of care between the control and study groups, with  $p$  values ranging between (0.002 and 0.000).

According to Table (9) the most common complaints of children in the control group were fever, bleeding, and vomiting (43.3%, 26.6%, and 23.3% in that order), but in the study group it was respiratory issues and discomfort (26.6% and 23.3% respectively). Abscess formation and urinary tract infections were problems that affected 10% and 6.7% of the children in the control group, respectively.

**Table (1):** Percentage Distribution of Mothers' Personal Data in both Groups

Mothers' Personal Data	Study (n=30)		Control (n=30)		X <sup>2</sup>	P
	N	%	N	%		
<b>Mothers' age/years:-</b>						
< 20	2	6.7	1	3.3	23.067	0.574
20 to less than 25	5	16.7	10	33.4		
25 to less than 30	12	40	12	40		
30 to less than 35	6	20	4	13.3		
35 to less than 40	4	13.3	2	6.7		
40 and more	1	3.3	1	3.3		
<b>Mother's level of education:-</b>						
Not read or write	15	50	7	23.4	33.579	0.117
Read and write	1	3.3	1	3.3		
Basic education	7	23.4	11	36.7		
Secondary school	4	13.3	7	23.4		
University education	3	10	4	13.3		
<b>Mothers' occupation:-</b>						
Working outside home	26	86.7	24	73.4	16.133	0.24
Housewife	4	13.3	6	26.6		

\* Significant at  $p < 0.05$

**Figure (1):** Mothers' Place of Residence in both Groups**Table (2)** Percentage Distribution of Children's Characteristics in both Groups.

Infant's characteristics	Study(n=30)		Control(n=30)		X <sup>2</sup>	P
	N	%	N	%		
<b>Child's age/days:-</b>						
3- < 7 days.	11	36.7	12	40.0	2.589	0.629
7- < 11 days.	13	43.3	13	43.3		
11- 16 days.	6	20.0	5	16.7		
Mean ±SD	7.1 ±0.61		6.91 ± 1.04			
<b>Gender:-</b>						
Male	16	53.3	18	60.0	0.089	0.765
Female	14	46.7	12	40.0		
<b>Child's rank in the family:-</b>						
First	12	40.0	12	40.0	14.694	0.100
Second	5	16.7	11	36.7		
Third	6	20.0	5	16.7		
More than third	7	23.3	2	6.6		

**Table (3):** Medical History and Current Health Status of Children and their Mothers in both Group.

Item	Study Group (n=30)		Control Group (n=30)		Chi-Square	P. Value
	No	%	No	%		
<b>Clinical Manifestations:</b>						
• Drooling	5	16.7	7	23.3	0.142	0.733
• Difficulty breathing	7	23.3	6	20		
• Vomiting	13	43.3	15	50		
• Coughing or choking during feeding	12	40	10	33.3		
• Cyanosis (skin that has a blue appearance) during feeding	7	23.3	11	36.3		
• Full, round abdomen (belly area)	7	23.3	13	43.3		
<b>-Mother medical status:</b>						
- No disease	27	90	28	93.3	0.218	0.640
- Had disease	3	10	2	6.7		

Table (4): Comparison of Level of Mothers' Knowledge about EA Care in both Groups.

Items	Study Group (n=30)						Control Group (n=30)						t. test	P. value
	Pre		Post		Follow Up		Pre		Post		Follow Up			
	No	%	No	%	No	%	No	%	No	%	No	%		
- Postoperative Position: - Unsatisfactory - Satisfactory	26 4	86.7 13.3	1 29	3.3 96.7	18 12	60 40	26 4	86.7 13.3	25 5	83.3 16.7	27 3	90 10	7.785	0.000
-Infant Gastrostomy Feeding: - Unsatisfactory - Satisfactory	30 00	100 00	2 28	6.7 93.3	1 29	3.3 96.7	30 00	100 00	29 1	96.7 3.3	30 00	100 00	11.883	0.000
-Care of Vomiting: - Unsatisfactory - Satisfactory	29 1	96.7 3.3	00 30	00 100	00 30	00 100	29 1	96.7 3.3	28 2	93.7 6.6	30 00	100 00	10.614	0.000
- Activities: - Unsatisfactory - Satisfactory	30 00	100 00	00 30	00 100	00 30	00 100	30 00	100 00	27 3	90 10	28 2	93.3 6.7	13.325	0.000
- Care of Fever: - Unsatisfactory - Satisfactory	30 00	100 00	00 30	00 100	00 30	00 100	30 00	100 00	29 1	96.7 3.3	30 00	100 00	11.202	0.000
- Cough Care: - Unsatisfactory - Satisfactory	30 00	100 00	00 30	00 100	00 30	00 100	30 00	100 00	27 3	90 10	28 2	93.3 6.7	9.642	0.000
- Care of Pain: - Unsatisfactory - Satisfactory	30 00	100 00	00 30	00 100	00 30	00 100	30 00	100 00	25 5	83.3 16.7	27 3	90 10	3.377	0.000
-Medication Administration: - Unsatisfactory - Satisfactory	30 00	100 00	00 30	00 100	00 30	00 100	30 00	100 00	28 2	93.3 6.7	28 2	93.3 6.6	11.646	0.000
- Bathing: - Unsatisfactory - Satisfactory	30 00	100 00	1 29	3.3 96.7	00 30	00 100	30 00	100 00	28 2	93.3 6.7	27 3	90 10	9.313	0.000
- Wound Care: - Unsatisfactory - Satisfactory	26 4	86.7 13.3	00 30	00 100	00 30	00 100	26 4	86.7 13.3	25 5	83.3 16.7	27 3	90 10	9.172	0.000
-Urinary System Care: - Unsatisfactory - Satisfactory	30 00	100 00	00 30	00 100	00 30	00 100	30 00	100 00	24 6	80 20	28 2	93.3 6.7	12.446	0.000
-Infection Prevention: - Unsatisfactory - Satisfactory	27 3	90 10	00 30	00 100	00 30	00 100	27 3	90 10	27 3	90 10	27 3	90 10	9.041	0.000
- Follow up: - Unsatisfactory - Satisfactory	30 00	100 00	00 30	00 100	00 30	00 100	30 00	100 00	27 3	90 10	30 00	100 00	2.795	0.006

Table (5): Level and Total Mean Scores of Mothers' Knowledge about EA Care (Pre, Post and Follow up) in both Groups.

Item	Control Group (n=30)						Study Group (n=30)					
	Pre		Post		Follow up		Pre		Post		Follow up	
	No	%	No	%	No	%	No	%	No	%	No	%
Level: Unsatisfactory Satisfactory	30 00	100 00	6 24	20 80	10 20	33.3 66.7	30 00	100 00	28 2	93.3 6.7	29 1	96.7 3.3
Mean±S.D.	30.03±1.5		93.20±17.9		73.03±9.5		28.53±11.0		31.03±3.6		30.03±1.5	

**Table (6):** Comparison of Total Mean Scores of Mothers' Knowledge about EA Care in both Groups.

Item	Mean $\pm$ S.D	t. test	P. value
<b>Pretest:</b> Control group. Study group.	28.53 $\pm$ 11.0 28.53 $\pm$ 11.1	1.370	0.176
<b>Posttest:</b> Control group. Study group.	31.003 $\pm$ 3.6 93.20 $\pm$ 17.9	16. 843	<b>0.000</b>
<b>Follow up:</b> Control group Study group.	30.03 $\pm$ 1.5 73.03 $\pm$ 9.5	13.165	<b>0.000</b>
<b>Study group:</b> Pretest. Posttest.	28.53 $\pm$ 11.1 93.20 $\pm$ 17.9	18.348	<b>0.000</b>
<b>Study group:</b> Pretest. Follow up.	28.53 $\pm$ 11.1 73.03 $\pm$ 9.5	14. 343	<b>0.000</b>
<b>Study group:</b> Posttest. Follow up.	93.20 $\pm$ 17.9 73.03 $\pm$ 9.5	13.965	<b>0.000</b>

**P $\leq$ 0.000****Table (7):** Comparison of Mean Scores of Total Mothers' Knowledge about EA Care in the Study Group n= 30 (Pre, Post and Follow up the Intervention).

Items	Mean $\pm$ S.D.			f. test	P. Value
	Pre	Post	Follow Up		
- Postoperative Position	0.13 $\pm$ 0.34	0.3 $\pm$ 0.15	0.40 $\pm$ 0.49	8.0600	<b>0.001</b>
-Infant Gastrostomy Feeding	0.70 $\pm$ 0.79	1.53 $\pm$ 0.88	2.0 $\pm$ 0.84	92.358	<b>0.000</b>
-Care of Vomiting	3.33 $\pm$ 2.02	11.6 $\pm$ 3.73	6.8 $\pm$ 1.36	36.452	<b>0.000</b>
- Activities	0.66 $\pm$ 0.77	1.8 $\pm$ 0.48	1.83 $\pm$ 0.79	57.628	<b>0.000</b>
- Care of Fever	2.66 $\pm$ 1.21	7.1 $\pm$ 1.79	5.67 $\pm$ 1.54	108.47	<b>0.000</b>
- Cough Care	2.0 $\pm$ 1.36	8.76 $\pm$ 2.44	6.47 $\pm$ 1.76	69.732	<b>0.000</b>
- Care of Pain	3.5 $\pm$ 1.19	7.3 $\pm$ 1.85	5.1 $\pm$ 1.98	---	---
-Medication Administration	3.0 $\pm$ 0.0	3.50 $\pm$ 0.0	3.0 $\pm$ 0.00	5.786	<b>0.000</b>
- Bathing	1.6 $\pm$ 1.7	2.3 $\pm$ 0.96	2.67 $\pm$ 0.87	124.52	<b>0.000</b>
- Wound Care	5.3 $\pm$ 2.1	17.93 $\pm$ 4.5	10.7 $\pm$ 1.96	126.49	<b>0.000</b>
-Urinary System Care	1.36 $\pm$ 1.57	6.3 $\pm$ 1.83	4.7 $\pm$ 1.48	136.478	<b>0.000</b>
-Infection Prevention	4.9 $\pm$ 4.18	23.3 $\pm$ 5.46	13.73 $\pm$ 2.69	10.545	<b>0.000</b>
- Follow up	0.73 $\pm$ 0.47	1.0 $\pm$ 0.00	1.0 $\pm$ 0.00	8.0600	<b>0.001</b>

**Table (8):** Comparison of Infants' Selected Postoperative Outcomes in both Groups.

Items	Study (n=30)				Control(n=30)				X <sup>2</sup>	P
	Infants' Selected Postoperative Outcomes Follow up.									
	Clinic Visit		Phone		Clinic Visit		Phone			
N	%	N	%	N	%	N	%			
<b>Bleeding:</b>										
Present	1	3.3	5	16.7	7	23.3	11	36.7	0.207	0.001*
Not present	29	96.7	25	83.3	23	76.6	19	63.3		
<b>Feeding Quality:</b>										
Pattern:										
Breast Feeding	5	16.7	9	30.0	3	10.0	3	10.0	1.429	0.02*
Bottle Feeding	6	20.0	3	10.0	14	46.6	16	53.3		
Both of them	19	63.3	18	60.0	13	43.3	11	36.7		
• Feeding Reflexes:										
Not present	0	0.0	0	0.0	0	0.0	0	0.0	0.062	0.001*
Weak	3	10.0	3	10.0	5	16.7	5	16.7		
Strong	27	90.0	27	90.0	25	83.3	25	83.3		
• Elimination:										
Presence of Constipation	3	10.0	2	6.6	5	16.7	3	10.0	0.089	0.000*
Presence of Diarrhea	4	13.3	3	10.0	5	16.7	6	20.0		
Normal	23	76.7	25	83.3	20	66.6	21	70.0		
• Vomiting:										
Present	3	10.0	3	10.0	6	20.0	7	23.3	0.207	0.001*
Not present	27	90.0	27	90.0	24	80.0	23	76.7		
• Cough and Shocking:										
Present	2	6.6	1	3.3	4	13.3	6	20.0	0.207	0.001*
Not present	28	93.4	29	96.7	26	86.7	24	80.0		
• Difficulty Breathing										
Present	1	3.3	0	0.0	6	20.0	6	20.0	1.429	0.02*
Not present	29	96.7	30	100.0	24	80.0	24	80.0		
• Oligurea:										
Present	3	10.0	3	10.0	10	33.3	10	33.3	0.321	0.00*
Not present	27	90.0	27	90.0	20	66.7	20	66.7		
Infants' Weight Means± S.D.	2.7±1.3				2.3±1.0					
<b>Hyperthermia:</b>										
Present	2	6.7	2	6.6	18	60.0	20	66.7	0.207	0.001*
Not present	28	93.3	28	93.4	12	40.0	10	33.3		
<b>Hypothermia:</b>										
Present	2	6.7	0	0.0	5	16.7	3	10.0	1.429	0.02*
Not present	28	93.3	30	100.0	25	83.3	27	90.0		
<b>Signs of Wound Infection :</b>										
Presence of hematoma	1	3.3	2	6.6	9	30.0	10	33.3	0.089	0.000*
Presence of Pus	0	0.0	0	0.0	10	33.3	9	30.0		
Redness	2	6.6	1	3.3	7	23.3	6	20.0		
Swelling	1	3.3	0	0.0	15	50.0	11	36.7		
None of the above	26	86.7	27	90.0	2	6.6	2	6.6		
<b>Presence of pain:</b>										
Present	9	30.0	7	23.3	18	60.0	16	53.3	0.062	0.001*
Absent	21	70.0	23	76.7	12	40.0	14	46.7		

\* Statistical significant at P &lt; 0.05

**Discussion:**

To overcome time and space barriers and deliver better nursing care, telenursing encompasses all forms of nursing care and services that will be offered from a distance. It also involves a wide range of communication technologies, including phone, fax, email, and the internet (Forouzi, 2017). The American Telehealth Association (2018) states that telenursing may be a method for providing nursing care remotely in order to increase efficiency and the quality of healthcare for

patients. Nurses can keep track of a patient's oxygen levels, pulse, respiration, blood sugar, and other vital signs wherever they provide care (Mataxen & Webb, 2019) Therefore, the current study's objective is to assess the effects of the mothers' telenursing programme on particular postoperative results for their infants who have esophageal atresia.

The results showed that there was no statistically significant difference between the study and control group's children and mothers' socio-demographic data, and that there was also

no significant difference between the two groups' diagnoses, which is consistent with the homogeneity of the study sample. Knowledge level, the findings showed that, prior to the programme, all mothers in the control and study groups had unsatisfactory knowledge levels. However, there was no statistically significant difference between the two groups' total mean knowledge scores for post-operative care. In a prospective study by Gerceker, Muslu, and Yardimci (2016), who assessed children's postoperative symptoms at home following outpatient surgery through nurse-led telephone counselling, they noted that it is crucial to provide the mothers with sufficient information about wound healing, changing the dressings, and other related topics before discharge. It is important to give the mothers adequate information about wound healing, changing the dressings, care of fever and the signs of infection. Postoperatively, there may be changes in the child's body weight, body temperature and, nausea, vomiting, changes in appetite, and, possibly caused by anesthetic agents.

The goal of the study's randomised clinical trials (Paquette et al., 2013) was to determine whether a nurse telephone follow-up might take the place of clinic visits and lessen postoperative complications and pain intensity. In terms of follow-up, there were significant statistical differences between the study and control groups in the level of knowledge that mothers had on postoperative care across all 13 domains of care. 863 kids were randomly assigned to receive either a clinic visit after release or 1 to 14 days of telephone follow-up after discharge in a prospective study by Xin, et al. (2019). The efficiency of telephone follow-up in children who underwent tonsillectomy with day surgery was investigated in this study. Children receiving telephone follow-up have lower pain levels early after surgery and better dietary intake than those receiving clinical visits. Telephone follow-up also encourages analgesic use and fluid consumption, which decreases the need for medical attention.

The findings of the current study showed that there were substantial positive differences in the overall mean scores of mothers' knowledge before, after, and one month after the intervention. Regarding these findings, it was clear that the current study's findings supported the first research hypothesis because the intervention

group's total mean knowledge scores were higher than before compared to the control group's in the post-implementation and follow-up phases of the telenursing program's implementation, with a highly statistically significant difference. These results are supported by Randomized control study Yang, et al (2016) who studied The Effects of Tonsillectomy Education Using Smartphone Text Message for Mothers and Children Undergoing Tonsillectomy A sample of 61 pediatric patients and their mothers was recruited. Participants were randomly assigned into either the experimental group (n=27) or the control group (n=34). It was found that statistical significant differences increasing of mothers' knowledge pre, post education compare to control group.

The current study's findings showed that there were positive, highly statistically significant differences between post-operative outcomes for infants in the study group and the control group, with clinic visit and phone call coming in second and third, respectively. It was clear from the results of the current study that two children whose mothers will receive telenursing programming will exhibit fewer postoperative complications than those children whose mothers will not receive the programme, with a highly statistically significant difference, supported the research hypotheses. Numerous research in the same area support these findings. Using 36 infants with esophageal atresia as an example, Ghorbani et al. (2016) conducted a randomized, controlled clinical trial to examine the effects of early feeding support on postoperative weight gain status of infants with esophageal atresia. The results revealed that daily weight gain before and after feeding was significantly higher in the intervention group compared to the control group. Al Afik, and Pandin (2020) conducted a review to pinpoint the crucial part that telenursing plays in enhancing patient care. A survey of 10 studies produced the finding that telenursing might demonstrate long-distance service, time efficiency, and budget allocation.

## Conclusion

The present research found that, compared to the control group, the study group's mothers' knowledge had improved after the implementation of the telenursing programme. Additionally, compared to women in the control

group, babies with EA showed less postoperative problems for mothers who received the telenursing programme.

### Recommendations

- Using telenursing intervention in nursing care to make it simpler for mothers to contact nurses whenever they need to is vital. However, additional study is required to highlight how telenursing intervention can improve mothers' knowledge of post-operative care over the course of a longer sample size .

### References

- Al Afik G and Pandin M. Telenursing as a new nursing paradigm in the 21 century: A literature review. Preprints (www.preprints.org). 10.20944/pre-prints.202103.0704.v1. [Accessed on October 2020].
- Abdelhamed, A. G., Osman, M. A., & Mohammed, F. Z. (2016). Nurses knowledge and practices regarding neonates with tracheoesophageal Fistula at Assuit university children hospital. *Assuit Scientific Nursing Journal*; 4(9): 43-50.
- Chaupis H. Artículo especial prospective applicability of e-health services: An overview of advantages of telemedicine and telenursing. *Health Care & Global Health*, 2017; 1(1): 55- 59.
- Chen L, Huang LH, Xing MY, Feng ZX, Shao LW, Zhang MY, Shao RY (2017) Using the Delphi method to develop nursing-sensitive quality indicators for the NICU *Journal Clin Nurs*.;26 (3-4):502-513. doi: 10.1111/ jocn. 1347.
- Forouzi M, Mirzaei R, Dehghan M, & Heidar A. (2017): Evaluation of clinical skills of nursing students in Original Article *Egyptian Journal of Health Care*, 2021 EJH vol. 12 no. 1 890 intensive care units. *Journal of Nursing Education*. 6 (6): 58 -64.
- Ghorbani, M, Rezaeian, A, Khademi, G, Shojaeian, R, Jafari, A, S. (2016) Effects of Early Feeding Support on the Postoperative Weight Gain Status of Infants with Esophageal Atresia. *Evidence Based Care Journal*, 6 (2): 67-74. Online ISSN: 2008-370X
- Hockenberry, M. J., & Wilson, D. (2019). *Wong's nursing care of infants and children: The child with gastrointestinal dysfunction* (11th ed., pp234- 235): London.Elsevier, Health Sciences.
- James, S. R., Nelson, K., & Ashwill, J. (2017). *Nursing care of children-E-book principles and practice: The child with a gastrointestinal alteration* (4th ed. pp 406-408): London Elsevier Health Sciences.
- Kassmann, B. P., Docherty, S. L., Rice, H. E., Bailey, D. E., & Schweitzer, M. (2012). Telephone follow-up for pediatric ambulatory surgery: Parent and provider satisfaction. *Journal of Pediatric Nursing*, 27(6), 715– 724.
- Maharjan, A., Sharma, A. K., Kansakar, P., Samyukta, K. C., & Singh, Y. (2020). Congenital tracheoesophageal fistula in Very Low Birth Weight Preterm Neonate with an Oligohydramnios as a Rare Presentation: A Case Report. *JNMA: Journal of the Nepal Medical Association*; 58(232):1075.
- Mozafari S, Khorshidi A and Lotfi. (2018) Comparing the effects of face-to-face and telenursing education on the quality of family caregivers caring in patients with cancer. *Journal of Family Medicine and Primary Care*, 7(6): 1209- 1215. <https://doi.org/>
- Mataxen P, Webb L. (2019): *Telehealth Nursing: More than just a phone call*. 49 (4): 11-13.
- Nagdeve, N, Sukhdeve M, Thakre T, Morey S. Esophageal Atresia Tracheoesophageal Fistula Presenting Beyond 7 Days. *J Neonatal Surg*. 10;6 (3):57.
- Pan American Health Organization. Framework for the Implementation of Telemedicine Service 2019, [https://www3.paho.org/hq/index.php?option=com\\_content&view=article&id=15138:nursing-staff-are-vital-for-making-progress-towards-universal-health&Itemid=1926&lang=en\[available 2019\]](https://www3.paho.org/hq/index.php?option=com_content&view=article&id=15138:nursing-staff-are-vital-for-making-progress-towards-universal-health&Itemid=1926&lang=en[available 2019])
- Parolini, F., Bulotta, A. L., Battaglia, S., & Alberti, D. (2017). Preoperative management of children with esophageal atresia: current perspectives. *Journal of Pediatric health, medicine and therapeutics*; (8) 1.

- Pepito J, Loscin R. (2019) Can nurses remain relevant in a technologically advanced future? *International Journal of Nursing Sciences*, ; 6: 106-110.
- Paquette, S. Le May, J. Lachance Fiola, E. Villeneuve, A. Lapointe, P. Bourga ult (2013) A randomized clinical trial of a nurse telephone follow-up on paediatric tonsillectomy pain management and complications *J. Adv. Nurs.*, 69 (9) (2013), pp. 2054-2065
- Sharma, S., & Duerksen, D. (2018). Tracheoesophageal fistula. Online Cited Jan . Available from URL: <http://emedicine.Medscape.com/article/186735-overview>.
- Susanti, P. T., Kardana, I. M., & Ariyanta, K. D. (2020). Tracheoesophageal fistula newborn presentation and outcome: *American Journal of Pediatrics*; 6(3): 259-267.
- Yeon, Ji Yeon Yang, J.Y., Lee, H., Zhang, Y., Lee, Y., J Hee, J and Eun, K (2016) The Effects of Tonsillectomy Education Using Smartphone Text Message for Mothers and Children Undergoing Tonsillectomy A Randomized Controlled Trial: *Telemedicine and e-Health*, 22(11):921-928. /doi. org/ 10.1089/ tmj. 2016. 0019.
- Xin Y, Li X, Du J, Cheng J, Yi C, Mao H. Efficacy of telephone follow- up in children) tonsillectomy with day surgery. *Indian J. Pediatr.*, 2019; 86(3):263- 266.