

## Nurses' Knowledge and Practices regarding Care of Neonates Undergoing Esophageal Atresia Surgery

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### Abstract

**Background:** Esophageal atresia is congenital anomalies of the esophagus. The manifestations of esophageal atresia include excessive oral secretions, vomiting and unexplained cyanosis after initial feeding. Complications of esophageal atresia are severe and can lead to poor prognosis and outcomes if left untreated. Nurses provide care for neonates before, during, and after surgical operation to prevent complications. **Aim:** This study aimed to assess nurses' knowledge and practices regarding care of neonates undergoing esophageal atresia surgery. **Research design:** A descriptive study design was used to conduct this study. **Settings:** This study was carried out at Neonatal Surgical Intensive Care Unit at Benha Specialized Pediatric Hospital that affiliated to ministry of health and population. **Subjects:** A convenient sample of all available nurses 60 nurses, A purposive sample of 60 neonate with undergoing esophageal atresia surgery. **Tools of data collection:** Two tools were used: **Tool I:** A structured interviewing questionnaire sheet consisted of 2 parts: **Part 1,** Characteristics of the studied nurses and neonates with esophageal atresia, medical data of studied neonates. **Part 2,** Nurses' knowledge regarding esophageal atresia and care of neonates undergoing esophageal atresia surgery. **Tool II:** An observational checklist: Nurses' practices regarding care of neonates undergoing esophageal atresia surgery. **Results:** More than half of them have poor total knowledge, slightly more than half of the studied nurses have incompetent practice after surgery and there is a highly significant positive relation between total scores of nurses' knowledge and practice regarding care of neonates undergoing esophageal atresia surgery. **Conclusion:** There was a positive statistical correlation between total level of nurses' knowledge and practices regarding care of neonates undergoing esophageal atresia surgery. **Recommendation:** Pediatric nurses should update their knowledge and practice through continuing training, educational programs and workshops concerning the care of neonates undergoing esophageal atresia surgery.

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**Keywords:** Esophageal Atresia, Nurses' Knowledge, Practices, Neonates, Surgery.

### Introduction

Esophageal atresia (EA) is a congenital anomalies or birth defect of the swallowing tube (esophagus) that connects the mouth to the stomach, it causes the esophagus to end in a blind-ended pouch rather than connecting normally to the stomach, it characterized anatomically by a congenital obstruction of the esophagus with interruption of the continuity of the esophageal wall, esophageal

atresia often occurs with tracheo-esophageal fistula, a birth defect in which part of the esophagus is connected to the trachea (Campos et al., 2020).

Esophageal atresia includes four types ; type A that occurs when the upper and lower parts of the esophagus do not connect and have closed ends, type B is very rare type in which the upper part of the esophagus is

attached to the trachea, but the lower part of the esophagus has a closed end also, type C is the most common type in which the lower esophageal pouch connects abnormally to the trachea and the upper esophageal pouch ends blindly and type D that considered the rarest and most severe form in which the upper and lower parts of the esophagus are not connected to each other, but each is connected separately to the trachea (**Campos et al., 2020**).

The causes of esophageal atresia in most neonates are unknown, for some instances of esophageal atresia may be caused by genetic disorders and nearly half of all neonates born with esophageal atresia have one or more additional birth defects, such as other problems with the digestive system, cardiac, renal, or spinal cord defect. Risk factors that increase the risk of having a neonate with esophageal atresia include old paternal age and assisted reproductive technology (ART) (**Drevin et al., 2021**).

The manifestations of EA include excessive oral secretions, vomiting and unexplained cyanosis after initial feeding. EA also causes coughing, choking and severe abdominal distension. Eventually, aspiration pneumonia and severe respiratory distress develop in the untreated child and death may occur without surgical intervention. Neonatal EA also manifested by failure to pass suction catheter, or nasogastric tube at birth moreover, neonates may present with other serious anomalies, such as congenital heart disease, imperforated anus, intestinal obstruction, and anal atresia (**Vergouwe et al., 2022**).

Complications of EA are severe and can lead to poor prognosis and outcomes if left untreated, complications include gastro-esophageal reflux, gastric metaplasia and Barrett esophagus, anastomotic strictures (AS), eosinophilic esophagitis (EOE), feeding disorders, dysphagia, esophageal dysmotility,

cyanosis, and tracheomalacia also, respiratory complications, hypoxia and aspiration pneumonia are frequent severe complications (**Khademi et al., 2022**).

Treatment of EA involves surgical operation to repair the defect. The procedure depends on several factors, the length of the gaps between the upper and lower esophagus as large gaps require much a more extensive surgical procedure and whether a fistula (TEF) is present or not. Before the operation, continuous suction via a nasogastric tube to prevent aspiration and aspiration pneumonia. Other treatment modalities before corrective surgery include placing the infant in a prone position with the head elevated, restriction of all oral feedings, inserting a gastrostomy tube when corrective surgery is delayed decompressing or remove contents of the stomach and lowering the risk that stomach contents reflux back into the trachea (**Sharma & Duerksen, 2022**).

Nurses have a very significant role in caring of neonates undergoing esophageal atresia surgery as nurses have a variety of roles and functions associated with the neonate's surgical management, nurses provide care for neonates before, during, and after surgical operation. Pre-operative neonatal care includes stabilization of the neonate's respiratory status with avoidance of endotracheal intubation obstruction, suction tube drainage, caring for proximal esophageal pouch, putting the neonate in semi-prone positioning to minimize the risk of gastro-esophageal reflux and aspiration via the occult fistula of the distal trachea and monitoring of vital signs and vascular access should also be performed as precautionary measures. Giving neonate oxygen and IV infusion during esophageal atresia surgery (**Hamed et al., 2021**).

Post-operative nursing care of neonates includes maintenance of adequate thermoregulation and pain management. The

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nurse should also make sure that double-lumen nasogastric catheter is attached to low-suction and the gastrostomy tube is returned to gravity drainage until feedings are tolerated. If a thoracotomy is performed and a chest tube is inserted, the nurse should pay attention for the appropriate function of the closed drainage system (VanHoorn et al., 2023).

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

Esophageal atresia (EA) is one of the most common congenital malformations of the esophagus in neonates. EA is also associated with numerous long-term comorbidities that affect the esophagus and respiratory system. In Egypt, the incidence rate of esophageal atresia in neonates is (2.4%) at 2019, neonates undergoing surgical correction are at great risk of problems such as metabolic imbalance, respiratory disorders and growth retardation that can be associated with high rates of mortality and morbidity. A knowledgeable and qualified nurse can help such neonates by providing quality care (Hamed et al., 2023).

According to the statistical record office of Benha Specialized Pediatric Hospital, the incidence rate of esophageal atresia in neonates (68, 87, 96) respectively in (2018, 2019, 2020) years. So that, the current study will be carried out to assess nurses' knowledge and practices regarding care of neonates undergoing esophageal atresia surgery (Benha Specialized Pediatric hospital statistic report., 2022).

### **Aim of the study**

This study aimed to assess nurses' knowledge and practices regarding care of neonates undergoing esophageal atresia surgery.

### **Research Questions:**

- ✚ What is the level of nurses' knowledge regarding care of neonates undergoing esophageal atresia surgery?

- ✚ Do the nurses provide a competent care for neonates undergoing esophageal atresia surgery?
- ✚ Is there a relation between nurses' characteristics and their knowledge and practices regarding care of neonates undergoing esophageal atresia surgery?

### **Subjects and Method**

#### **Research design:**

A descriptive study design was used to conduct this study.

#### **Research setting:**

This study was carried out at Neonatal Surgical Intensive Care Unit (NSICU) at Benha Specialized Pediatric Hospital that affiliated to Egyptian Ministry of Health and Population. It is located in the second floor and composed of two rooms. One room contains 7 incubators, and another room contains 5 incubators

#### **Subjects:**

The subjects consisted of two types of samples:

**Type (1):** A convenient sample of all available nurses, 60 nurses who are working at the previously mentioned setting regardless their personal characteristics and their willing to participate in the study. The data will be gathered over six months period of time from beginning of the study.

**Type (2):** A purposive sample of 60 neonate undergoing esophageal atresia surgery admitted in NSICU of Benha Specialized Pediatric Hospital after fulfilling the following criteria.

#### **Criteria of neonates:**

- Neonates ' age from the first day after birth to the first month.
- Both sex (males and females).
- Neonates undergoing esophageal atresia surgery.
- Free from other congenital anomalies.

#### **Tools of data collection:**

Two tools were used for data collection:

**Tool (I): A structured interviewing questionnaire sheet:**

It was designed by a researcher in the light of current relevant studied and researches to assess personal medical data for the subjects (Nurse and neonates) and was written in an Arabic language. It was consisted of two parts:

**Part 1: Characteristics of the study subjects.** It consisted of (19) multiple choice questions and composed of three sections:

**Section 1: Personal characteristics of the studied nurses:** (age, gender, level of education, qualification, years of experience in (NSICU) and attendance of training courses related to caring of neonates undergoing esophageal atresia surgery). It consisted of (6) multiple choice questions.

**Section 2: Personal characteristics of the studied neonates with (EA):** (gestational age, current age, gender, birth weight, current weight, consanguinity, type of delivery). It consisted of (7) multiple choice questions.

**Section 3: Medical data of the studied neonates:** (diagnosis, symptoms or present complain, when symptoms appeared, family history of EA, length of hospital stay, previous hospitalization). It consisted of (6) multiple choice questions.

**Part 2: Nurses' knowledge regarding care of neonates undergoing esophageal atresia surgery,** It was developed by the researcher based on **Zaki, (2019)** to assess nurses' knowledge regarding care of neonates undergoing esophageal atresia surgery. It consisted of (35) multiple choice questions and composed of three sections:

**Scoring system of nurses' knowledge:**

The studied nurses' answers were compared with a model key answer, the scoring system was divided as: the complete correct answer scored (2), incomplete correct answer scored (1) and wrong /don't know was be scored (0). According to nurses' answers, their total level of knowledge was categorized

as (Good) if nurses scored  $\geq 80$  % which ranged from (56-70). (Average) if nurses scored 60- 80 % which ranged from (42-56). (Poor) if nurses scored  $< 60$  % which less than 42. The total number of multiple-choice questions that assessed knowledge was 68.

**Tool (II): An observational checklist:**

It was be adopted from **Smith & Martin, (2020)** to assess nurses' practices regarding care of neonates undergoing esophageal atresia surgery. The total numbers of all procedures were 12 procedures, and the total steps of all procedures were 194 steps.

**It consisted of:-**

**A. Nurses' practices regarding care of neonates undergoing esophageal atresia surgery, Preoperative nursing care.** It included (107) steps divided under six procedures namely: hand washing (5 steps), vital signs (23 steps), insertion of the cannula (10 steps), collection of blood sampling (22 steps), suctioning (37 steps), care of the endotracheal tube (10 steps).

**B. Nurses' practices regarding care of neonates undergoing esophageal atresia surgery, immediate nursing care.** It included (19) steps divided under two procedures namely: oxygen therapy (7 steps), intravenous infusion (12 steps).

**C. Nurses' practices regarding care of neonates undergoing esophageal atresia surgery, Postoperative nursing care.** It included (68) steps divided under four procedures namely: ventilator care (19 steps), wound care (17 steps), feeding through a gastric tube (19 steps), chest tube care (13 steps).

**Scoring system of nurses' practices:**

The nurses' practices were calculated as: done correctly were be scored 1, not done correctly or incorrect done were be scored 0. According to the nurses' actual practices, the total score of the studied nurses' practices were be categorized as the following: competent if nurses scored 100% and be

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scored incompetent if nurses scored less than 100%.

### **Tool validity:**

The study tools were revised by a panel of three experts (professor and two assistant professor) in the field of Pediatric Nursing Faculty of Nursing Benha University who are selected to test content validity of the instruments and to judge its clarity, comprehensiveness, relevancy simplicity and accuracy. All of their remarks were taken into consideration. Some items were rephrased to arrive at all the final version of the tools. to determine the extent to which the items were be related to each other and its face and content validity.

### **Tool reliability:**

Reliability was be assessed using Cronbach's alpha test to measure the internal consistency of the tools.

- Knowledge reliability statistics  
Cronbach's alpha test = 0.857.
- Practice reliability statistics  
Cronbach's alpha test = 0.841.

### **Ethical considerations:**

The study was approved by the Ethics Committee at the Faculty of Nursing Benha University, The researcher explained the aim of the study to nurses and ensured that the study was be voluntary. Oral and written approval was a prerequisite to participate in the current study. All collected data was be confidential and was be used for research purpose only, oral and written consent was be obtained from nurses and all of them had the right to withdrawal from the study at any time. Confidentiality of the gathered data and results were secured.

### **Pilot Study:**

A pilot study involved 10% of sample size, 6 nurses and 6 neonates undergoing esophageal atresia surgery from determined study sample, to evaluate feasibility and applicability of the study tools and then the

necessary modifications were be done according to the results of the pilot study which no radical modifications were carried out in the study tools as revealed from pilot study. So that, nurses who were included in the pilot study were not excluded or excluded from the total study sample. This phase took one month from beginning to end August, 2022.

### **Field work:**

The process of data collection took three months from the beginning of September to the end of November 2022. The researcher was available at each study setting by rotation for three days weekly during morning and afternoon shifts to collect data by using the previously mentioned tools, these days were Sunday, Tuesday and Thursday. The researcher started by introducing herself to the studied nurses, give them a brief idea about the study and its expected outcomes. The purpose of the study was explained by the researcher to each studied nurse. A structured interviewing questionnaire was disturbed in order to collect the required data and each nurse was individually interviewed for 20-30 minutes, the researcher was available for more explanation whenever needed. The researcher checked the observational checklists while observing the nurses' actual practice on neonates pre, during, after esophageal atresia surgery that performed by the nurses was ranged from 2-4 hours.

### **Statistical analysis:**

The collected data was be organized, tabulated and statistically analyzed using Statistical Package for Social Science, SPSS version 21, running on electronic computer. Frequencies and percentages distribution were used for quantitative descriptive data and Chi-Square Coefficient was used for relation tests, while mean and standard deviation was used for quantitative data, Pearson Correlation

Coefficient was used for correlation analysis and degree of significance was identified.

The observation difference of statistically significance variable and associations were considered as the following: p-value

- Highly Statistically Significant Difference, HS  $p < 0.001$ .
- Statistically Significant Difference, S  $p < 0.05$ .
- No Statistically Significant Difference, NS  $p > 0.05$ .

### Results

**Table (1):** Shows that more than half (58.4%) of the studied nurses range in age from 30 < 35 years old with mean  $33.42 \pm 3.71$  years. In addition, all (100.0%) of them are females. As regard their Years of experience in neonatal surgery nursing, more than half (53.3%) of them have from 5 < 10 years with mean  $10.03 \pm 7.59$  years. Additionally, the majority (85%) of them not attended training courses and 55.6% of them attended two training courses. More than two thirds (70%) of the studied nurses had nursing diploma and less than one quarter (23.3%) of them have nursing technical institute. The majority (93.3%) of the studied nurses are staff nurses, but the minority (6.7%) are nursing supervisors.

**Table (2):** Reveals that the majority (86.7%) of the studied neonates gestational aged - range from 36 - < 40 weeks with gestational aged mean  $37.32 \pm 1.24$  weeks. As well, more than half (46.7%) of them current age between 7 - <14 days with mean  $15.14 \pm 6.13$ gm. Regarding their birth weight, more than two thirds (68.3) of them range from 2000 - <2500 gm. with mean  $2574.61 \pm 413.23$ gm and more than three fifths (61.7%) of them current weight range from 2000 - <2500 gm. with mean  $2572.83 \pm 646.15$  and more than two thirds (70.0%) of them had no consanguinity between the parents. The majority (81.7%) of the studied neonates

delivered by cesarean section, while less than one fifth (18.3%) of them delivered by vaginal delivery.

**Figure (1):** Reveals that more than three quarters (76.7%) of the studied neonates were females, while less than one quarter (23.3%) of them were male.

**Table (3):** Portrays that less than half (45.0%) of the studied neonates was diagnosed as esophageal atresia type 1, isolated esophageal atresia without fistula. Also, three quarters (75.0%) of them suffered from vomiting, excessive oral secretions, and cyanosis after initial feeding. In addition, the majority (90.0%) of them had symptoms of esophageal atresia appeared through 24 hours after birth with mean  $24.13 \pm 7.26$ . As well, the majority (91.7%) of them stayed in hospital from 7 to less than 30 days ago with mean  $24.13 \pm 7.26$  days.

**Figure (2):** Shows that more than half (58.3%) of the studied nurses had poor knowledge. while less than one third (31.7%) of them had average total knowledge, and the minority (10.0%) of them had good total knowledge about care of neonate undergoing esophageal atresia surgery.

**Table (4):** Represents that more than half (51.7%) of the studied nurses had competent practice regarding care of neonates after surgery, while more than half (55.0%) of them had incompetent practice regarding care of neonates before surgery.

**Figure (3):** Illustrates that more than half (53.3%) of the studied nurses have competent practice while less than half (46.7%) of them had incompetent practice regarding care of neonates surgery of esophageal atresia.

**Table (5):** Highlights that there was a positive correlation between total scores of nurses' knowledge and practice regarding care of neonates undergoing of esophageal atresia surgery ( $p = 0.000$ ).

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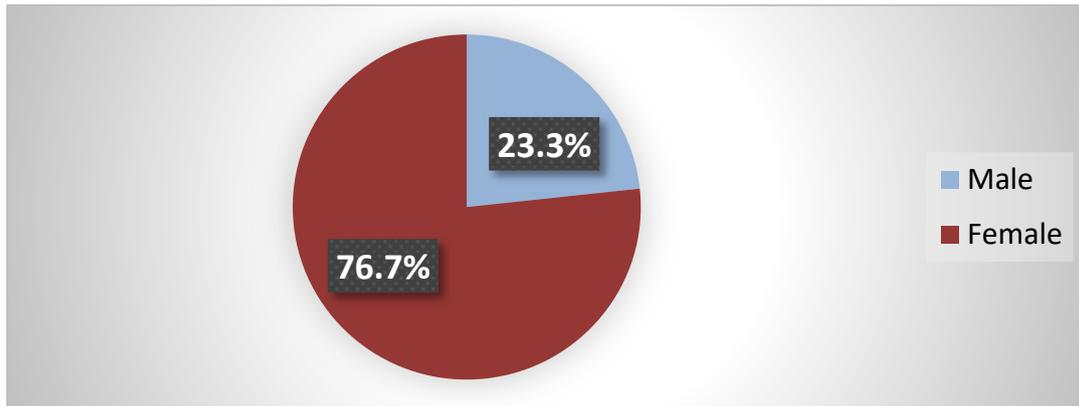
**Table (1): Distribution of the studied nurses according to their personal characteristics (n=60).**

Personal characteristics	(n=60)	
	No.	%
<b>Age (years):</b>		
25 < 30	11	18.3
30 < 35	35	<b>58.4</b>
35 < 40	9	15.0
≥ 40	5	8.3
<b>Mean ± SD</b>	33.42 ± 3.71	
<b>Gender :</b>		
Female	60	100.0
<b>Educational level :</b>		
Nursing diploma	42	<b>70.0</b>
Nursing Technical	14	23.3
Bachelor of nursing science	3	5.0
Post graduate studies in nursing	1	1.7
<b>Qualification :</b>		
Nurse	56	<b>93.3</b>
Nursing supervisor	4	6.7
<b>Years of experience in neonatal surgery nursing:</b>		
1 < 5	19	31.7
5 < 10	32	<b>53.3</b>
≥10	9	15.0
<b>Mean ± SD</b>	10.03 ± 7.59	
<b>Attending training courses regarding care of neonates undergoing esophageal atresia surgery</b>		
Yes	9	15.0
No	51	<b>85.0</b>
<b>Number of training courses:( n=9)</b>		
One	3	33.3
Two	5	<b>55.6</b>
Three	1	11.1

**Table (2): Distribution of the studied neonates with esophageal atresia according to their personal characteristics (n= 60).**

Neonates characteristics	(n=60)	
	No.	%
<b>Gestational age (weeks):</b>		
32 < 36	3	5.0
36 < 40	52	<b>86.7</b>
≤ 40	5	8.3
<b>Mean ± SD</b>	37.32 ± 1.24	
<b>Current age (days):</b>		
7 < 14	28	<b>46.7</b>
14 < 21	20	33.3
21 ≤ 28	12	20.0
<b>Mean ± SD</b>	15.14 ± 6.13	
<b>Birth weight (gm):</b>		
2000 < 2500	41	<b>68.3</b>
≥ 2500	19	31.7
<b>Mean ± SD</b>	2574.61 ± 413.23	
<b>Current weight (gm):</b>		
2000 < 2500	37	<b>61.7</b>
≥ 2500	23	38.3
<b>Mean ± SD</b>	2782.83 ± 646.15	
<b>Consanguinity between parents:</b>		
Yes	18	30.0
No	42	<b>70.0</b>
<b>Mode of delivery:</b>		
Normal vaginal delivery	11	18.3
Cesarean section	49	<b>81.7</b>

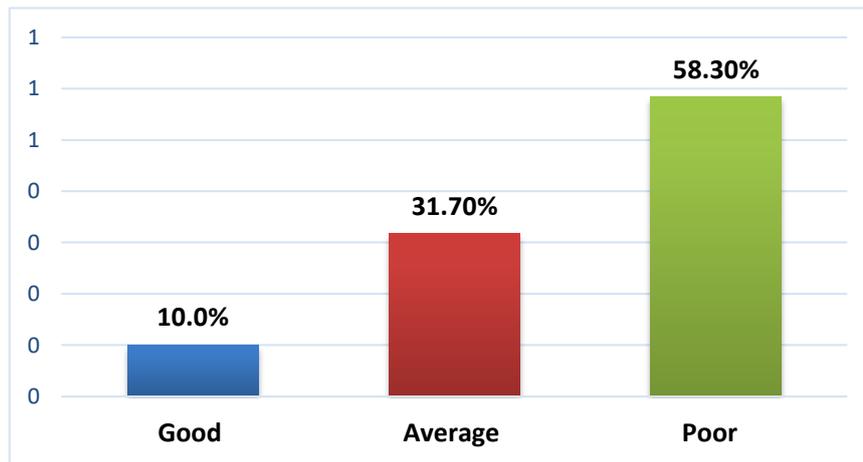
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**Figure (1): Distribution of the studied neonates with esophageal atresia according to their gender (n= 60).**

**Table (3): Distribution of the studied neonates with esophageal atresia according to their medical data (n= 60).**

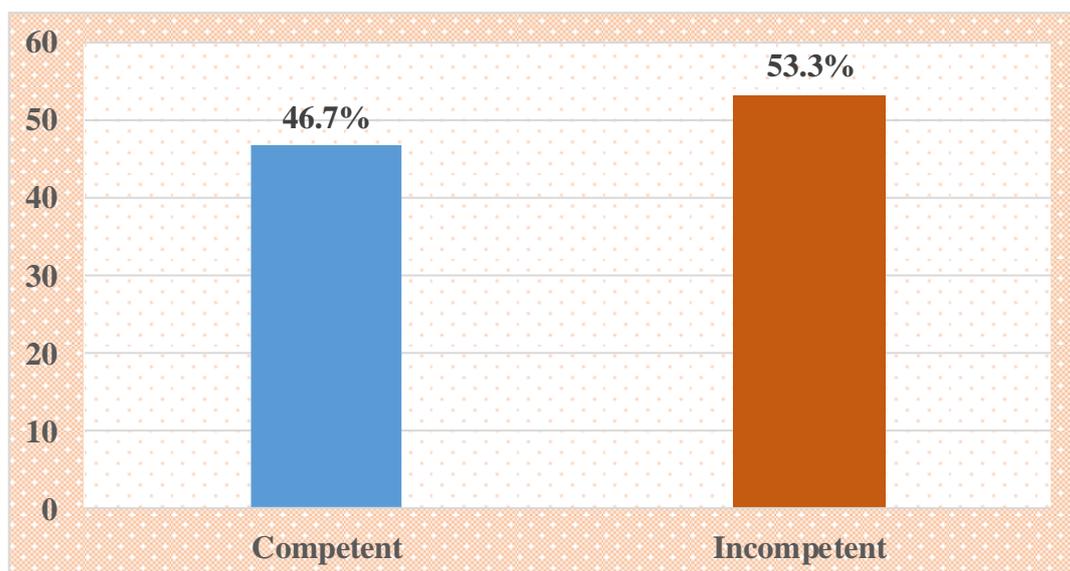
Items	(n=60)	
	No.	%
<b>Diagnosis:</b>		
Esophageal atresia (type 1) isolated esophageal atresia without fistula.	27	<b>45.0</b>
Esophageal atresia (type 2) esophageal atresia with proximal fistula.	24	40.0
Esophageal atresia (type 3) esophageal atresia with distal tracheoesophageal fistula.	6	10.0
Esophageal atresia (type 4) esophageal atresia with proximal and distal tracheoesophageal fistula.	3	5.0
<b>Present complain :</b>		
Vomiting, Excessive oral secretions, and Cyanosis after initial feeding.	45	<b>75.0</b>
Coughing, Chocking and Severe abdominal distension.	15	25.0
<b>Symptoms of esophageal atresia appear (hours) :</b>		
Through 24 hours after birth.	54	<b>90.0</b>
Trough 48 hours after birth.	6	10.0
<b>Mean ± SD</b>	24.13 ± 7.26	
<b>Family history of esophageal atresia :</b>		
No	60	<b>100.0</b>
<b>Previous hospitalization:</b>		
No	60	<b>100.0</b>
<b>Length of hospital stay (days):</b>		
1 < 7	5	8.3
7 < 30	55	<b>91.7</b>
<b>Mean ± SD</b>	24.13 ± 7.26	



**Figure (2): Distribution of total scores level of nurses' knowledge about care of neonate undergoing esophageal atresia surgery (n=60).**

**Table (4): Distribution of the studied nurses according to subtotal practices regarding care of neonates undergoing esophageal atresia surgery (n=60).**

Items	Competent		Incompetent	
	(n=60)			
	No.	%	No.	%
Care of neonates before surgery	27	45.0	33	<b>55.0</b>
Care of neonates during surgery	29	48.3	31	51.7
Care of neonates after surgery	31	<b>51.7</b>	29	48.3



**Figure (3): Distribution of total scores level of nurses' practices regarding care of neonates surgery of esophageal atresia (n=60)**

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**Table (5): Correlation between total scores of nurses' knowledge and practice regarding care of neonates undergoing esophageal atresia surgery (n=60).**

Variable	Total knowledge score	
	(n=60)	
	r	P value
Total practice score	0.615	0.000**

**Discussion**

Regarding personal characteristics of the studied nurses, the current study revealed that, more than half of them ranged in age from 30 < 35 years old with mean  $33.42 \pm 3.71$  years. From the researcher's point of view, this could be due to the fact that this age range lies within the productive age in the workforce in the hospital.

This result was similar with **Mohammed, et al., (2020)**, who conducted a study entitled "Improve Nurses' Competency Level Regarding Care of Children Undergoing Intestinal Obstruction Surgery" and found that, the mean age of the studied nurses was  $30.72 \pm 5.77$  years, On the other hand, these results disagreed with **Ike, et al., (2022)** in a study which entitled "Effect of an Educational Intervention on Nurses' Competency in the Neonatal Unit of a Teaching Hospital in Nigeria" who stated that, the mean age of the studied nurses was 41.9 (11.6) years. This discrepancy may be due to difference between the studied nurses' characteristics and different settings.

As regard to nurses' gender, the present study results showed that, all of the studied nurses are females. According to the researcher interpretation, this may be due to decreased numbers of male

students who admitted to the field of nursing. This result was in the same line with **Gomaa, et al., (2022)**, who conducted a study entitled "Nurses' Knowledge & Practices toward Enteral Feeding and its effect on selected High-Risk Neonates' Outcomes", who reported that, the studied participants mostly were females.

Concerning to years of experiencing in surgical neonatal intensive care unit, the current study findings indicated that, more than half of them had from 5 < 10 years with mean  $10.03 \pm 7.59$  years. According to the researcher interpretation, this may be related to hospital regulations that require nurses to have experience in critical areas as surgical neonatal intensive care unit. These results agree with **Bahnasawy, et al., (2021)**, whose study entitled "Nurses Attitude and Practice Regarding Patient Undergoing Abdominal Surgery", who found that, more than half of the studied nurses had less than 10 years of experience with mean  $9.6 \pm 5.5$  years.

Concerning attendance of training courses, the current study results reflected that, more than four fifths (majority) of them didn't attended any training courses. This result was in agreement with **Salman Abo Zeed, et al., (2019)**, who carried out a study

entitled "Assessment of Nursing knowledge and Practices in Caring of Neonatal Intestinal Obstruction", and found that, the largest proportion of the studied nurses were not attending programs or courses in this field. According to the researcher interpretation this may be attributed to hospital policies and the work overload at these areas.

Concerning the educational level of the studied nurses, the current study results declared that, less than three quarters of them had nursing diploma. This finding disagree with **Abuejheisheh, et al., (2020)**, who carried out a study entitled "Predictors of intensive care unit nurses' practice of evidence-based practice guidelines" and mentioned that, most of the studied nurses had bachelor degree in nursing. According to the researcher interpretation, this discrepancy may be related to hospital regulations that require nurses to had higher qualifications.

Regarding the qualification of the studied nurses, the present study results showed that, most of the studied nurses were staff nurses, but the minority of them was supervisors. This result was in accordance with **Ahmed, et al., (2018)**, who carried out a study to assess "Effect of educational nursing guidelines regarding enteral feeding on nurses' knowledge and practices at critical care units", who found that, most of the studied nurses were staff nurses. From the researcher point of view, this could be linked to the fact that, nursing diploma provided the hospitals with large number of graduated diploma nurses than other agencies such as faculties of nursing and technical nursing institute.

Regarding characteristics of the studied neonates with esophageal atresia, the present study clarified that most of

them ranged from 36 - <40 weeks of gestational age with mean  $37.32 \pm 1.24$  weeks. As well, nearly half of them their current age ranged from 7 to less than 14 days with mean  $15.14 \pm 6.13$ . These findings matched with a study by **Hendy, et al., (2020)**, who conducted "Nursing Competency for Caring of High-Risk Neonates at Neonatal Intensive Care Unit" who demonstrated that, the mean age of neonates was  $37.40 \pm 1.29$  weeks and most of them were more than 7days old with mean  $14.65 \pm 5.88$ .

Concerning the birth weight of the studied neonates, the current study findings stated that, more than two thirds of the studied neonates their birth weight ranged from 2000 to less than 2500 gm. with mean  $2574.61 \pm 413.23$  gm, while less than two thirds of them their current weight ranged from 2000 to less than 2500 gm. with mean  $2572.83 \pm 646.15$ . This result was in accordance with **Mohammed & Helmy., (2020)**, who carried out a study entitled "Nursing intervention guidelines regarding Care for Neonates with Necrotizing Enterocolitis: its effect on Nurses' Knowledge and Performance", who stated that, two thirds of studied neonates were weighted at the time of study  $2000 \geq 2500$  gm with mean  $2498.93 \pm 652.11$ .

Concerning consanguinity, the present study results indicated that, one third of the studied neonates had positive consanguinity between parents. This result was consistent with **Ogundoyin, et al., (2019)**, who conducted a study entitled "Outcome of management of neonatal intestinal obstruction at a tertiary center in Nigeria", and they reported that less than one thirds of studied neonates' parents were relatives.

Concerning gender of the studied neonates, the current study results

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declared that, more than three quarters of them were females. This result disagrees with **Nessa, et al., (2018)**, whose study entitled "Neonatal Intestinal Obstruction Management: Ten Years' Experience in Combined Military Hospital, Dhaka" they found that, most of the studied neonates were males.

The current study results represented that, most of the studied neonates were delivered by Cesarean section. These results disagree with, **Mekonnen, et al., (2021)**, who studied "The prevalence of necrotizing enterocolitis and associated factors among enteral fed preterm and low birth weight neonates admitted in selected public hospitals in Addis Ababa", who mentioned that, most of the studied neonates were delivered normally.

### **Regarding the studied neonates with esophageal atresia according to medical data**

The present study clarified that, nearly half of the studied neonates was diagnosed as EA (type 1). Also, three quarters of them had vomiting, excessive oral secretions, and cyanosis after initial feeding. This result was congruent with **Besendörfer, et al., (2021)**, who studied "Association of clinical factors with postoperative complications of esophageal atresia", who found that, most of the studied neonates had cyanosis and vomiting with feeding. On the other hand, this result disagree with **François, et al., (2019)**, who studied "Predictors of the performance of early anti-reflux surgery in esophageal atresia" who reported that, the largest proportion of the studied neonates diagnosed as type III.

The current study results reflected that, symptoms of esophageal atresia

appeared through 24 hours after birth among most of the studied neonates with mean  $24.13 \pm 7.26$ . As well, most of them stayed in hospital from 7 - <30 days ago with mean  $24.13 \pm 7.26$  days. This result was in harmony with **Courbette, et al., (2020)** in a study entitled "Characterization of esophageal motility in children with operated esophageal atresia using high-resolution impedance manometry and pressure flow analysis", and found that, most of the studied neonates had symptoms within 24 hours after birth and hospitalized more than week ago.

### **Concerning the studied nurses' knowledge about care of neonates undergoing esophageal atresia surgery**

In relation to the studied nurses' total scores of knowledge, the present study displayed that, less than one quarter of the studied nurses had good knowledge as regard discharge health instructions given after esophageal atresia surgery. Also, half of them had average knowledge as regard discharge health instructions given after esophageal atresia surgery, while less than two thirds of them had poor knowledge regarding esophageal atresia. This finding was paralleled with **Ahmed ,et al., (2022)** who carried out a study entitled "Effect of Educational Program for Nurses regarding Neonatal Hormonal Changes and Metabolic Stress Response after Surgery" and found that, the largest proportion of the studied nurses had poor level of total knowledge about esophageal atresia surgery and health instructions given after surgery before the program.

Additionally, the current study results represented that, one tenth of the studied nurses had good total knowledge

about esophageal atresia surgery. As well as, nearly one third of them had average total knowledge, while more than half of them had poor total knowledge. It might be due to several reasons; lack of training programs for nurses, absence of continuous supervision and evaluation, and low level of education.

This finding was supported by, **Dosokey, et al., (2021)** who carried out a study to assess "Effect of an Educational Program on Nurses' Performance regarding Nursing Intervention for Infants Undergoing Inguinal Hernia Repair" who showed that, most of the studied nurses had poor level of knowledge before the program. Conversely, **Mohamed, et al., (2021)**, they carried out a study entitled "Assessment of Nursing Performance toward Enteral Feeding at Pediatric Critical Care Units" and it was clear that, about three fifths of the studied nurses had satisfactory level of knowledge. This discrepancy may be due to attending training courses and ongoing education among those nurses.

#### **Concerning the studied Nurses' practices regarding care of neonates undergoing surgery of esophageal atresia;**

The present study results added that, slightly more than half of the studied nurses had satisfactory practice as regard care of neonates after surgery, while more than half of them had incompetent practice as regard care of neonates before and during surgery. These findings agree with **Zaki, et al., (2019)**, in a study entitled "Assessment of nurses' performance regarding care for neonates with necrotizing enterocolitis at intensive care units" and noticed that, two thirds of the studied nurses had unsatisfactory practice regarding

perioperative care of neonates. Likewise, **Ullrich, et al., (2021)**, who studied "Implementation of contextually appropriate pediatric emergency surgical care course in Uganda" and reported that, most of nurses had insufficient practices regarding pediatric emergency surgical care before intervention.

Moreover, the current study declared that, more than half of the studied nurses had incompetent total practice regarding care of neonates surgery of esophageal atresia, but less than half of them had competent total practice. This result was in accordance with **Nada, (2021)**, who carried out a study to evaluate "Effect of Implementing Evidence Based Nursing Guideline on Nurses' Performance Related to Care Providing for Children at Pediatric Intensive Care Unit" and stated that, more than half of nurses had incompetent level of practice before the program.

Correspondingly, **Yang & Oh, (2021)**, who conducted a study entitled "Effectiveness of Debriefing for Meaningful Learning-based simulation training on high-risk neonatal care" and mentioned that, a largest proportion of the studied nurses had incompetent level of practice pre intervention. From the research investigator point of view, this may be related to lack of training sessions, and absence of continuous supervision and evaluation. Also, this result indicates that there is a gap between theory and nurses practice. Other reasons might be work overload and lack of nurses incentives to improve and update their practice especially whom working in Intensive Care Units for several years.

#### **Related to correlation between studied nurses' total knowledge and**

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### practices regarding care of neonates undergoing surgery of esophageal atresia

The present study highlighted that, there was a highly significant positive correlation between the studied nurses' total knowledge and total practice. This result was supported by **Mohamed, (2018)**, who mentioned that, there was a positive correlation between knowledge and practice scores of the study nurses significantly ( $P=0.000$ ).

In the same context, a study conducted by **Mohammed & Helmy, (2020)**, who mentioned that, there was a statistically significant positive correlation between total nurses' knowledge and practice. Likewise, a study carried out by **Dosokey, et al., (2021)**, who found that, there was a significant positive correlation between total knowledge and practice of the studied nurses. From the researcher's point of view, nurses' knowledge is significant factor that influence increasing the correct done practices.

### Conclusion

- More than half of the studied nurses have poor total knowledge, and had incompetent practice regarding care of neonates undergoing esophageal atresia surgery.
- In addition, the current study revealed that, there was a positive statistical correlation between total level of nurses' knowledge and practices regarding care of neonates undergoing esophageal atresia surgery.

### Recommendations

- Developing periodic training programs for nurses regarding care of neonates undergoing esophageal atresia surgery to improve their knowledge and practice.
- Periodic continuous evaluation for nurses' practice during care of neonates

undergoing esophageal atresia surgery to ensure competent care and quality of care.

- Designing Arabic booklets for nurses who are working in neonatal surgical units for enhancing their knowledge and practice regarding care of neonates undergoing EA surgery

- Further researches: the study should be replicated on a larger random sample in a different settings for the generalization of the obtained results

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## معلومات وممارسات الممرضين تجاه رعاية حديثي الولادة الخاضعين لجراحة انسداد المريء الخلقي شيرين جمال عبدالفتاح - باسمة ربيع عبدالصادق- سهام محمد عبدالعزيز

إنسداد المريء الخلقي هو عيب خلقي في المريء وهو الجزء الذي يربط الفم بالمعدة حيث يؤدي إنسداد المريء الخلقي الى عدم اتصال المريء بشكل طبيعي بالمعدة ، وغالبا ما يصاحب إنسداد المريء الخلقي ناسور المريء والذي يعد عيب خلقي يرتبط فيه جزء من المريء بالقصبة الهوائية. لذلك هدفت هذه الدراسة الى تقييم معلومات وممارسات الممرضين تجاه رعاية حديثي الولادة الخاضعين لجراحة انسداد المريء الخلقي. تم اجراء هذه الدراسة في وحدة الرعاية المركزة لجراحة حديثي الولادة في مستشفى الأطفال التخصصي في مدينة بنها التابعة لوزارة الصحة والاسكان على عينة ملائمة من جميع الممرضين المتاحين (٦٠ ممرضة / ممرض) الذين يعملون في المكان المذكور سابقا و عينة ملائمة من حديثي الولادة (٦٠ طفل) الخاضعين لجراحة إنسداد المريء الخلقي . وأظهرت نتائج هذه الدراسة أن أقل من ثلثي الممرضين لديهم معلومات ضعيفة ونصفهم لديهم معلومات متوسطة بينما أقل من ربعهم لديهم معلومات جيدة فيما يتعلق رعاية حديثي الولادة الخاضعين لجراحة انسداد المريء الخلقي. كما أن أكثر من نصف الممرضين لديهم ممارسة غير كفاء وأن أقل من نصفهم لديهم ممارسة غير كفاء فيما يتعلق رعاية حديثي الولادة الخاضعين لجراحة انسداد المريء الخلقي. وهناك ارتباط ايجابي بين معلومات الممرضين الكلية وممارساتهم تجاه رعاية حديثي الولادة الخاضعين لجراحة انسداد المريء الخلقي. وقد أوصت الدراسة بتنفيذ برامج تدريبية للممرضين العاملين في وحدات العناية المركزة لجراحة حديثي الولادة لتحسين وتعزيز معلوماتهم وممارستهم تجاه رعاية حديثي الولادة الخاضعين لجراحة انسداد المريء الخلقي.