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# Nurses Clinical Knowledge Towards Patients with Tracheostomy at Al-Imam Al-Hussein Medical City in Holy Kerbala'a City

Ali S. Obeid[1]

Nursing Department, Al-Safwa University College[1]

**ABSTRACT**— Tracheostomy is a surgical procedure which consists of making an incision (cut) on the anterior (front) side of the neck and opening a direct airway through an incision into the trachea (windpipe). The resulting stoma (hole) can serve independently as an airway or as a site for a tracheal tube or tracheostomy tube to be inserted; this tube allows a person to breathe without the use of the nose or mouth [1]. The study aims to determine the level of clinical knowledge about tracheostomy care among nurses at intensive care unit at Al-Imam Al-Hussein Medical City in Holy Karbala'a City and to find out the relationship between socio- demographic characteristics which of age, gender, level of education, years of experience, years of experience in ICU and participation in a training course about tracheostomy care. A descriptive quantitative approach is conducted to assess the nurses' clinical knowledge toward patients with tracheostomy of nurses who work in Al-Imam Al-Hussein Medical City, in holy Kerbala'a City, Iraq. The study started in 3rd of May, 2020 and ended in 25th of May, 2021. The study instrument consisted of two parts; part one deals with the characteristics of the sample which of age, gender, level of education, year of experiences in nursing, year of experiences in intensive care units and specific training course. Part two deals with the nurses' clinical knowledge concerning tracheostomy installation and management which was 36 items. The validity of instrument was obtained from 11 experts in specialty. The reliability was =1.00. The data analysis was done by using SPSS program version 23. the statistical methods which used in present study is descriptive and inferential statistics. The findings of present study revealed that the nurses' responses about general knowledge toward patients with tracheostomy is as of 57.81%, M.S = 12.66. The nurses' responses about clinical knowledge toward patients with tracheostomy is as of 67.01%, M.S = 73.57. The study concluded that the nurses' knowledge about tracheostomy installation and management was good. The researcher recommends increasing the training courses and workshops related to the importance of tracheostomy procedure to avoid errors. And also introduce the subject of the present study in the curriculum of nursing colleges to improve the students' knowledge.

**KEYWORDS:** Nurses, Clinical, Knowledge, Tracheostomy, Intensive Care Unit

## 1. INTRODUCTION

Tracheostomy is one of the oldest operations known, with ancient Egyptian artifacts engraved with depictions of tracheostomy that date back to 3600BC. Written references to a surgical procedure of an incision in the tracheostomy also appeared in a Hindu text written circa 2000BC. Alexander the Great was reported to save a soldier's life from suffocation in circa 1000BC, by way of an incision of the tracheostomy using his sword tip. From the 16th century to the 19th century, a tracheostomy was generally regarded by surgeons as dangerous with a low chance of success, and, as a result, few surgeons were willing to perform the procedure. Tracheostomies were reserved as an option for emergency treatment for obstruction of the upper airways, although the success rate of the procedure was not favorable [2].

There are four main reasons why someone would receive a tracheotomy, Emergency airway access, airway access for prolonged mechanical ventilation functional or mechanical upper airway obstruction and decreased/incompetent clearance of tracheobronchial secretions [3].

The best position for a tracheotomy was and still is one that forces the neck into the biggest prominence. Usually, the patient is laid on their back on a table with a cushion placed under their shoulders to prop them up. The arms are restrained to ensure they would not get in the way later [4].

## 2. Methodology

### *2.1 Design of the Study*

A descriptive quantitative approach is conducted to assess the nurses' clinical knowledge toward patients with tracheostomy.

### *2.2 Ethical Consideration*

The researcher obtained the approval of the hospital administration, as well as the consent of the participants in the research.

### *2.3 Setting of the Study*

Al-Imam Al-Hussein Medical City, Holy Karbala, Iraq. The Sample of the Study: A non-probability, purposive sample of (40) nurses who work at the ICU were selected based on the study criteria and after obtaining a consent from them.

### *2.4 Instrument*

The instrument consists two part; part one deals the characteristics of the study sample which of 6 items, and part two consist of 36 items constructed according to review of literature. Validity of Instrument: the validity of instrument was obtained through 11 experts. Reliability of instrument: the reliability was estimated by using Cronbach's Alpha which equal 1.00

### *2.5 Statistical and Data Analysis*

The researchers are used Package of Social Sciences version 23, and used of Descriptive and Inferential Statistical for data analysis

## 3. RESULTS

The socio-demographic characteristics of the present study in table (1) revealed that the age of study sample was 45% at 18-24 years old. A high percent of nurses who participated in the present study was females which of about 63%.

**Table (1)** the distribution of the study sample according to their socio- demographic characteristics (No. = 40)

| Characteristics | | Freq. | % |
|---|---|---|---|
| **Age/years** | 18 – 24 | 18 | 45.0 |
| | 25 – 34 | 21 | 52.5 |
| | 35 – 44 | 1 | 2.5 |
| **Gender** | Male | 15 | 37.5 |
| | Female | 25 | 62.5 |

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| | | | |
|---|---|---|---|
| **Level of education** | College | 20 | 50.0 |
| | Institute | 12 | 30.0 |
| | Preparatory | 8 | 20.0 |
| **Years of experience in hospital** | 1 – 5 years | 29 | 72.5 |
| | 6 – 10 years | 5 | 12.5 |
| | 11 – 15 years | 6 | 15.0 |
| **Years of experience in ICU** | Less than 2 years | 27 | 67.5 |
| | More than 2 years | 10 | 25.0 |
| | More than 5 years | 3 | 7.5 |
| **Specific Training course** | No | 31 | 77.5 |
| | Yes | 9 | 22.5 |
| **Specific Training course inside Iraq** | No | 31 | 77.5 |
| | Yes | 9 | 22.5 |

No: Number, Freq.: Frequency, %: Percentage

A high percent of the study sample was graduated from nursing college which of 50%. A 73% of the study sample have 1-5 year of experiences in nursing. A high percent of study and control group have 1-3 year of experiences in critical care unit which of 67.5%. The majority of the nurses 77.5% respectively have not training course about tracheostomy care.

**Table (2)** Nurses' Knowledge about Tracheostomy for the Study Sample

| No. | Items | Correct | | Incorrect | |
|---|---|---|---|---|---|
| | | F. | % | F. | % |
| **1.** | Trachea means tube or windpipe | 39 | 97.5 | 1 | 2.5 |
| **2.** | Stoma means an opening or stomy | 15 | 37.5 | 25 | 62.5 |
| **3.** | The Shaft or the cannula is the main part of tracheostomy tube formation | 19 | 47.5 | 21 | 52.5 |
| **4.** | A Cuff piece is used to inflate the inner balloon of the tracheostomy tube | 22 | 55.0 | 18 | 45.0 |
| **5.** | Silicone tracheostomy could be sterilized | 28 | 70.0 | 12 | 30.0 |
| **6.** | Obturator ease the tracheostomy tube to go inside the trachea | 7 | 17.5 | 33 | 82.5 |
| **7.** | The plastic tracheostomy becomes more flexible when it exposes to the inner body temperature | 26 | 65.0 | 14 | 35.0 |
| **8.** | Decannulation means a patient weaning or extubation | 29 | 72.5 | 11 | 27.5 |
| | Total of correct and incorrect answers percentage | | 57.81% | | 42.18% |
| | M.S | 12.66 | | | |

No: Number, F.: frequency,%: percentage, M.S = Mean of score; G = Good level of knowledge (M.S ≥ 1.5); P=Poor level of knowledge (M.S<1.5), cut of point = 1.5

The table (2) presented the nurses general information about Tracheostomy for study sample which revealed that the correct answer was 57.81%, while the wrong answer was 42.18 %. Nurses' level of general knowledge about tracheostomy is good (M.S= 12.66).

**Table (3)** Nurses' Clinical Knowledge about Tracheostomy for the Study Sample

| No. | Items | | F. | % |
|---|---|---|---|---|
| **1.** | Donning gloves and mask before making a tracheostomy | Agree | 40 | 100.0 |
| **2.** | Before the procedure, ensure that resuscitation equipment and a spare tracheostomy tube are available beside the patient's bed | Not sure | 1 | 2.5 |
| | | Agree | 39 | 97.5 |

| | | | | |
|---|---|---|---|---|
| **3.** | Before the procedure, increase ventilation is needed via the ventilator | Disagree | 1 | 2.5 |
| | | Not sure | 6 | 15.0 |
| | | Agree | 33 | 82. 5 |
| **4.** | Total time of the procedure is 10 seconds | Disagree | 14 | 35.0 |
| | | Not sure | 15 | 37.5 |
| | | Agree | 11 | 27.5 |
| **5.** | Air pressure volume that applied from the ventilator leading to the patient during secretions suctioning within 120-200 mmHg limit | Disagree | 1 | 2.5 |
| | | Not sure | 28 | 70.0 |
| | | Agree | 11 | 27.5 |
| **6.** | Over ventilation pressure leads to bronchial rupture | Disagree | 1 | 2.5 |
| | | Not sure | 10 | 25.0 |
| | | Agree | 29 | 72.5 |
| **7.** | After the procedure, wound around the stoma should be sutured | Disagree | 8 | 20.0 |
| | | Not sure | 3 | 7.5 |
| | | Agree | 29 | 72.5 |
| **8.** | Stiches are removed after 7 days of the procedure | Disagree | 3 | 7.5 |
| | | Not sure | 20 | 50.0 |
| | | Agree | 17 | 42.5 |
| **9.** | Check the tube in case of tear or leak | Not sure | 5 | 12.5 |
| | | Agree | 35 | 13.9 |
| **10.** | Check the stoma in case of bleeding in the wound around | Disagree | 2 | 5.0 |
| | | Not sure | 9 | 22.5 |
| | | Agree | 29 | 72.5 |
| **11.** | Put the patient in a semi-fowler's position | Disagree | 9 | 22.5 |
| | | Not sure | 9 | 22.5 |
| | | Agree | 22 | 55.0 |
| **12.** | Suctioning procedure is before meals | Disagree | 4 | 10.0 |
| | | Not sure | 7 | 17.5 |
| | | Agree | 29 | 72. 5 |
| **13.** | Suctioning is done twice hourly and increasing that if needed | Disagree | 5 | 12.5 |
| | | Not sure | 12 | 30.0 |
| | | Agree | 23 | 57.5 |
| **14** | Observe quantity, color, smell and consistency of secretions across the vacuum tube, then call a physician in case of differences | Not sure | 3 | 7.5 |
| | | Agree | 37 | 92.5 |
| **15.** | Suctioning procedure lasts about 10-15 minutes | Disagree | 4 | 10.0 |
| | | Not sure | 19 | 47.5 |
| | | Agree | 17 | 42.5 |
| **16.** | The purpose of warm humidification is to move static mucous particles to ease the suctioning process | Disagree | 2 | 5.0 |
| | | Not sure | 4 | 10.0 |
| | | Agree | 34 | 85.0 |
| **17.** | Suction the patient's mouth secretions after tracheal suctioning | Disagree | 2 | 5.0 |
| | | Not sure | 5 | 12.5 |
| | | Agree | 33 | 82.5 |
| **18.** | Necessity of observing the tube that there is no bleeding , pain, infection and/or hypoventilation | Not sure | 4 | 10.0 |
| | | Agree | 36 | 90.0 |
| **19.** | Tracheostomy tube is usually replaced during residency every 1-4 weeks | Disagree | 3 | 7.5 |
| | | Not sure | 23 | 57.5 |
| | | Agree | 14 | 35.0 |
| **20.** | Before tracheostomy tube replacement, be sure the patient didn't take any soluble foods through the nasogastric tube at least before one hour | Not sure | 12 | 30.0 |
| | | Agree | 28 | 70.0 |
| **21.** | Tracheostomy tie fixing is changed after 24 hours after the first fixation | Disagree | 2 | 5.0 |
| | | Not sure | 9 | 22.5 |
| | | Agree | 27 | 67.5 |
| **22.** | Stoma wound dress pad should be kept dry and continuously changed | Disagree | 1 | 2.5 |
| | | Not sure | 5 | 12.5 |
| | | Agree | 34 | 85.0 |
| **23.** | After the patient discharge, the tube is usually replaced every 3 months | Disagree | 1 | 2.5 |

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|---|---|---|---|---|
| | | Not sure | 21 | 52.5 |
| | | Agree | 18 | 45.0 |
| **24.** | Stoma is cleaned using wet and sterile gauze and sodium chloride (normal saline) | Disagree | 2 | 5.0 |
| | | Not sure | 8 | 20.0 |
| | | Agree | 30 | 75.0 |
| **25.** | Before weaning, re-assess the patient in case of aspiration before extubation | Disagree | 1 | 2.5 |
| | | Not sure | 12 | 30.0 |
| | | Agree | 27 | 67.5 |
| **26.** | After weaning, the patient should educate about stoma support with gentle pressing when coughing or speaking to protect sutures and prevent wound rupture | Disagree | 2 | 5.0 |
| | | Not sure | 7 | 17.5 |
| | | Agree | 31 | 77.5 |
| **27.** | Put facilitators instruments beside the patient's bed to ease patient-care provider communication such as pen, paper and sound recorder to make an order | Disagree | 2 | 5.0 |
| | | Not sure | 3 | 7.5 |
| | | Agree | 35 | 87.5 |
| **28.** | Re-evaluate the patient's condition every 2 hours | Disagree | 3 | 7.5 |
| | | Not sure | 5 | 12.5 |
| | | Agree | 32 | 80.0 |
| | Total | Agree | | 67.01% |
| | Total | Disagree and not sure | | 30.17% |
| | M.S | 73.57 | | |

No: Number, F.: frequency, %: percentage, M.S = Mean of score; G = Good level of knowledge (M.S ≥ 2); P=Poor level of knowledge (M.S < 2), cut of point = 2

Table (3) presented the nurses' clinical knowledge of the study sample towards tracheostomy procedure and care. It was 67.01% of agree answers, while disagree and not sure both answers was 30.17%. Nurses' level of clinical knowledge about tracheostomy is very good (M.S= 73.57).

**Table (4)** Association between Nurses' Clinical Knowledge about Tracheostomy and Their Gender

| | Study sample (N=40) | | | | | |
|---|---|---|---|---|---|---|
| Gender | **Sources of Variance** | **Sum of Square** | **df** | **Mean Square** | **F** | P ≤ 0.05 |
| Knowledge about tracheostomy | **Between Group**<br>**Within Group**<br>**Total** | **6.071**<br>**3.304**<br>**9.375** | **16**<br>**23**<br>**39** | **0.379**<br>**0.144** | **0.642** | **0.017**<br>**S.** |

Table (4) shows that there was a significant association between nurses' clinical knowledge and their gender at P ≤ 0.05 level.

**Table (5)** Association between Nurses' Clinical Knowledge about Tracheostomy and Their Years of Experience

| **Their Years of Experience** / **Knowledge about tracheostomy** | **Study sample (N=40)** | | | | | |
|---|---|---|---|---|---|---|
| | **Sources of Variance** | **Sum of Square** | **df** | **Mean Square** | **F** | **P ≤ 0.05** |
| | Between Group<br>Within Group<br>Total | 28.933<br>16.842<br>45.775 | 16<br>23<br>39 | 1.808<br>0.732 | 2.470 | 0.024<br>S. |

The table (5) shows that there was a significant association between nurses' clinical knowledge and their years of experience at P ≤ 0.05 level.

**Table (6)** Association between Nurses' Clinical Knowledge about Tracheostomy and Their Years of

Experience in ICU

| Their Years of Experience In ICU / Knowledge about tracheostomy | Study sample (N=40) | | | | | |
|---|---|---|---|---|---|---|
| | **Sources of Variance** | **Sum of Square** | **df** | **Mean Square** | **F** | **P≤ 0.05** |
| | Between Group<br>Within Group<br>Total | 9.430<br>6.170<br>15.600 | 16<br>23<br>39 | 0.589<br>0.268 | 2.197 | 0.041<br>S. |

The table (6) shows that there was a significant association between nurses' clinical knowledge and their years of experience in ICU at $P \leq 0.05$ level.

## 4. Discussion

Regarding socio-demographic characteristics which are presented in table (1) showed the eligible sample for this study consisted of (40) adult nurse. 63% are females. The current outcome can be similar to a research was conducted by researchers who stated that the results of the study were females. There was significant difference at ($p > 0.05$) between the nurses' clinical knowledge and their gender, years of experience and years of experience in ICU. Our age findings are similar to the results of a survey design study that was conducted by [5] at the intensive care unit at El-Azhar University Hospital to determine the quality of care on patients with tracheostomy that their participants were 30-40 years old of age [5].

According to current findings of study which showed a descriptive assessment of tracheostomy care questionnaire for samples' knowledge, results of the study found that nurses' clinical knowledge was good. Ibrahim and colleagues conducted a descriptive, cross-sectional study in Department of Intensive Care Unit, Ankara Research and Training Hospital, Ankara, Turkey. Their results revealed that the level of nurses' knowledge of tracheostomy care was within the expectations. Recognition of the training requirements of the nursing staff who are frontline caregivers for tracheostomy care is important to close the knowledge gap [6].

## 5. Conclusions

In conclusion, the results of the current study show that the nurses' clinical knowledge toward patients with tracheostomy is very good and there was a significant association between the nurses' gender, years of experience and years of experience in ICU and nurses' overall knowledge about tracheostomy. The study recommended conducting periodically continuous training courses concerning tracheostomy care and management for nurses who work in critical care units in Al-Imam Al-Hussein Medical City and other hospitals.

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