

# Knowledge of Endotracheal Suctioning Procedure Among Critical Care Practitioners' in University of Calabar Teaching Hospital (UCTH), Calabar

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## Introduction

Endotracheal suctioning is a clinical procedure that helps to clear airways in the respiratory system by mechanically removing accumulated pulmonary secretions in patients with artificial airways (Sharma, Sarin & Bala, 2014). Critically ill patients with artificial airways require endotracheal suctioning to remove secretions and prevent airway obstruction, without which the patient may experience inadequate oxygenation and ventilation. Endotracheal intubation is an artificial airway that inhibits cough reflex and interferes with normal muco-ciliary function, therefore increasing airway secretion production and decreasing the ability to clear such secretions (The Royal Children's Hospital Melbourne, 2012). Although endotracheal suctioning is an essential way of maintaining ventilation and oxygenation in patients with such artificial airways, it can result in adverse effects and serious complications when performed inappropriately or incorrectly (Kelleher & Andrews, 2008).

Day, Farrell and Hayes (2012) observed that the mean score for knowledge was 11.1 and majority of the subjects failed to perform suctioning as accurately as they had claimed. Similarly, in Cairo, a study by Nahla (2013) revealed that less than half of the nurses recognized closed system suctioning as recommended, while the rest were unfamiliar with closed system suctioning. Heyland, Cook and Dodek (2012) also reported on prevention of ventilator associated pneumonia practice in Canadian critical care units that nurses were familiar with closed suctioning practices because such practices were common in 88% of the ICUs. Sierra

(2010) reported that in Spain open tracheal suctioning was reported in 96% of the ICUs and added that closed suction systems are not commonly used, and thus nurses were unfamiliar with those systems. More than half of the nurses in the study knew that frequent change in suction systems, and kinetic beds decrease the risk and occurrence of pneumonia. While only 48% of nurses knew that semi-recumbent positioning help in prevention of pneumonia. A major responsibility of critical care practitioners is the management of critically ill patients with life threatening conditions that require dealing with the airway (Cattano & Cavallo, 2010). Endotracheal suctioning provides a direct opening for micro aspiration of secretions (Nseir, et al, 2011). Pery and Porter (2009) explained that endotracheal suctioning clears secretion from the airway of patients who cannot mobilize and expectorate them without assistance. Darrel, Farnell, Haynes, utilized triangulated method of observation, interview and questionnaire methods to explore nurses' theoretical knowledge and practical competence in endotracheal suctioning. Sole and Bennett (2014) conducted a comparison of airway management practices between registered nurses and respiratory care practitioners. A study was conducted by Mathew (2011) to determine the effectiveness of planned teaching programme on knowledge and practices of endotracheal suctioning procedure among staff nurses in the different units of selected hospital in Mangalore. the findings of Sharma, Sarin and Bala (2014) that indicated that nursing personnel had below average knowledge and poor practices regarding endotracheal suctioning during reimplementation phase were consistent with the findings of the study conducted by Dayalan, Fernadesh and Harayan (2010) to explore the nurse's knowledge and competence regarding endotracheal suctioning in acute and high dependency ward areas in India

There are observations that the critical care practitioners do not often adhere to the recommended procedures by the World Health Organisation and their level of competence in endotracheal suctioning practices is below expectation (Akram, Negin, Mohsen & Mohammadreza, 2012; Bighamian, Zarkeshan & Rafieeano, 2010; George & Sequiera, 2010)

The researchers is unaware of any empirical evidence of endotracheal suctioning knowledge and practices of critical care practitioners and has not come across any study on endotracheal tube suctioning in Nigeria. Hence, this research was undertaken to evaluate the effectiveness of endotracheal suctioning in terms of knowledge and practices of critical care practitioners in University of Calabar Teaching Hospital, Calabar.

### **Statement of Problem**

Hospital acquired infections such as Ventilator Assisted Pneumonia (VAP) among critical care patients is a major healthcare challenge. Incidence of hospital acquired infections has continued to rise, especially in the developing countries, despite advancements in health technology (Ulu-Kilic & Ahmed, 2013). Although they account for fewer than 10% of total beds in most hospitals, more than 20% of all nosocomial infections are acquired in ICUs (Ulu-Kilic & Ahmed, 2013). This study will therefore assess endotracheal suctioning knowledge among critical care practitioners in University of Calabar Teaching Hospital (UCTH), Calabar.

### **Purpose of the Study**

The aim of this study is to assess endotracheal suctioning knowledge among critical care practitioners in University of Calabar Teaching Hospital (UCTH), Calabar.

### **Specific Objectives**

The specific objectives of the study are to:

1. Identify knowledge of endotracheal suctioning procedure among critical care practitioners' in University of Calabar Teaching Hospital (UCTH), Calabar.

### **Significance of the Study**

This study would be of immense benefit to health personnel/workers (physicians and nurses), researchers and the entire society. Physicians and nurses working in ICU in conjunction with hospital management would through the findings of this study prepare protocol for endotracheal suctioning in UCTH, Calabar. This will enable them adhere to

recommended suctioning techniques. Researchers would benefit from this study because it will serve as a reference material and it will add to existing literature on knowledge, practice and competence of endotracheal suctioning in the management of patients in critical care units.

### **Scope of the Study**

The focus of this study is to evaluate endotracheal suctioning knowledge among critical care practitioners in Intensive Care Unit of University of Calabar Teaching Hospital (UCTH), Calabar. It will involve both nurses and physicians that work in the critical care unit of UCTH, Calabar.

## **RESEARCH METHODS**

### **Research design**

The research design adopted for the study was the mixed method ( descriptive survey and observation). The descriptive survey design aims at observing, describing and documenting aspect of a situation or phenomenon of life situation as it normally occurs. (Polit and Berks, 2008). Frota *et al* (2013) successfully used descriptive survey design to assess knowledge of endotracheal suctioning in Mato Grosso de Sul Hospital, Brasil. Also, Darrel, Farnell, Haynes, Wainwright and Wilson-Barnett (2011) utilized triangulated observation, interview and questionnaire methods to explore nurses' theoretical knowledge in endotracheal suctioning. Therefore, the design was considered appropriate because it enabled the researcher to assess endotracheal suctioning knowledge among critical care practitioners in the University of Calabar Teaching Hospital (UCTH), Calabar

### **Area of Study**

The setting of the study was the University of Calabar Teaching Hospital, Calabar. Calabar is the capital of Cross River State, and a one-time capital of Nigeria. Calabar is located on a peninsula between Calabar River and the great Kwa River. It lies 4°56 North of the equator and 8°22 East of the Greenwich meridian. This study was conducted in a ten bedded Intensive

Care Unit (ICU), seven bedded recovery rooms (2) of University of Calabar Teaching Hospital (UCTH).

### **Target population**

The population of the study consists of all the nurses and physicians working at the Intensive Care Unit (ICU) and Recovery Room of UCTH, Calabar. University of Calabar Teaching Hospital.

### **Sample and Sampling Technique**

It was a total population study as the number is minimal. The study respondents comprise all the forty-six (46) nurses and 50 doctor anaesthetists working at the Intensive Care Unit (ICU) and Recovery Room of UCTH, Calabar, who met the inclusion criteria.

### **Instrument for Data Collection**

The instruments for data collection were self- report questionnaire and observational checklist. The questionnaire was to elicit respondents' characteristics and knowledge of endotracheal suctioning among critical care practitioners, while the observational checklist was used to elicit adherence to best-practices and level of competence in performing endotracheal suctioning among critical care practitioners. The questionnaire was divided into two (2) sections as follows: Section A was on socio-demographic data of participants and was made up of seven questions. Section B on knowledge of endotracheal suctioning and was made up of fourteen questions. The observational checklist on the other hand was made up of twenty three questions and was divided into three (3) sections as follows: Section A was made up of eight questions and elicited information on pre suctioning procedure, and nine questions elicited information on intra suctioning procedure while five questions elicited information on post suctioning procedure.

### **Validity of the Instrument**

The methods of validity that was adopted for the instruments were the face and content validity. This was determined by the judgment of the supervisor, and two consultant

anaesthetists, who are expert in intensive and critical care. They were given a draft copy of the questionnaire and checklist, purpose of the study and research questions to critically assess the relevance of content, clarity of statement and accuracy of the instrument. The necessary suggestions helped the researcher in the final refinement of the instrument.

### **Reliability of the Instrument**

Two methods of reliability were employed by the researcher. These are the test retest method and the inter rater method. The test-retest method of reliability was adopted for the questionnaire. The questionnaire was administered to ten (10) critical care practitioners at the University of Uyo Teaching Hospital, Uyo in two different occasions, within an interval of two weeks. The separate results were correlated using the Pearson's Product Moment Correlation ( $r$ ) to determine the reliability coefficient of the instrument. ( $r=0.785$ ) For the observational checklist, the inter rater method of reliability was established. The checklist was presented to two research assistants who practiced rating events together to find out to what extent returns were similar. The inter-rater reliability was found to be  $\kappa=0.75$ .

### **Ethical Consideration**

To obtain ethical clearance, the researcher obtained a letter of introduction from the Head of the Department of Nursing Science, University of Nigeria, Nsukka, Enugu. The letter was submitted to the ethical committee of the University of Calabar Teaching Hospital (UCTH), Calabar along with an application and proposal for permission to carry out the study in the healthcare facility. Respondents were given explanation of the nature and significance of the study to ensure voluntary participation. Data obtained was treated with utmost confidentiality through anonymity.

### **Procedure for Data Collection**

The questionnaire was administered to doctor anaesthetists and nurses in the unit by the researcher. To reduce the inter-rater reliability, the researcher also assessed the process of endotracheal suctioning; prior, during and post procedure using the structured, observational checklist. The researcher did a covert -participant observation. All participants answered the

questionnaire once. By virtue of the position and other logistics concerning the procedure, not all the staff was able to carry out the procedure within the period of data collection. However, all the people among the total number of respondents that were opportune to carry out suctioning were observed. Also event was observed more than once on a participant. To guard against observer effect on participant, the researcher mixed with the participants by working in the unit for the period of data collection. The researcher used two weeks for data collection. At the end of the exercise, all the questionnaires administered were retrieved without any losses.

### **Method of data analysis**

Data collected was tallied according to questionnaire items and using computer software packaged programme statistical package for social sciences (SPSS version 20). The demographic data was analyzed using descriptive statistics; frequencies and percentages. The response to questions on knowledge of endotracheal suctioning was rated as high for scores above 50%, scores between 0 -49% was rated as low/poor. The questionnaire had 22 items. To calculate the % score thus; Total score obtain divided by total number of items multiply by 100. Observational checklist on practice was scored over 23 and rated as follows: scores less than 13 as inadequate knowledge, scores from 14 -18 as moderately adequate while scores from 19-23 was rated as adequate. The hypotheses were tested for significance at 0.05 level of significance using the Chi-square ( $X^2$ ) of contingency group statistics.

### **RESULTS**

Ninety six questionnaires were administered and all were correctly filled and retrieved giving a return rate of 100%.

#### **Socio-Demographic Data of Participants**

The result in table 1 shows that 95 (99.0%) stated their age. 1 (1.0%) was between 26-30 years, 26 (27.4%) were between 31-35 years, 27 (28.1%) were between 36-40 years while 41 (42.7%) were above 40 years. 48 (55.2%) were females while 39 (44.8%) were males. Majority 84 (97.7%) were Christians while 2 (2.3%) were others. On marital status, 78 (81.3%) stated their marital status. 68 (87.2%) were married, 9 (11.5%) were singles while 1 (1.3%) was

divorced. About 40 (41.7%) stated their highest educational attainment. 16 (40.0%) had diploma, 21 (52.5%) had BSc while 3 (7.5%) had MSc. 92 (95.8%) stated their profession. 49 (53.3%) were physicians while 43 (46.7%) were nurses. On rank, 41 (42.7%) stated their rank. 7 (17.1%) were SNO, 5 (12.2%) were CNO, 3 (7.3%) were NO1, 2 (4.9%) were ACNO, 13 (31.7%) were registrar, 8 (19.5%) were senior registrar while 1 (2.4%) each was CNO Anaesthetist, Anaesthetist and Consultant. On working experience, 92 (95.8%) stated their years of working experience. 29 (31.5%) had worked between 1-5 years, 28 (30.4%) had worked between 6-10 years, 6 (6.5%) had worked 11-15 years, 15 (16.3%) had worked 16-20 years while 14 (15.2%) had worked above 20 years.

**Table 1: Showing Socio-Demographic Data of Participants**

		Frequency	Percent
Age	26-30 years	1	1.1
	31-35 years	26	27.4
	36-40 years	27	28.4
	Above 40 years	41	43.2
Gender	Female	48	55.2
	Male	39	44.8
Religion	Christian	84	97.7
	Others	2	2.3
Marital status	Married	68	87.2
	Single	9	11.5
	Divorced	1	1.3
Highest educational attainment	Diploma	16	40.0
	BSc	21	52.5
	MSc	3	7.5
Profession	Physician	49	53.3
	Nurse	43	46.7
Rank	SNO	7	17.1
	CNO	5	12.2
	NO I	3	7.3
	CNO Anaesthetist	1	2.4
	Anaesthetist	1	2.4
	ACNO	2	4.9
	Registrar	13	31.7
	Consultant	1	2.4
	Snr Reg	8	19.5



Years of working experience	1-5 years	29	31.5
	6-10 years	28	30.4
	11-15 years	6	6.5
	16-20 years	15	16.3
	Above 20 years	14	15.2

### knowledge of Endotracheal Suctioning knowledge Procedure

The result in table 2 shows that out of the 96 critical care practitioners in the study, 75 (78.1%) identified correctly endotracheal suctioning procedure as a procedure that clears the airway by mechanically removing secretions in the patient with artificial airway, while others were wrong. 82 (85.4%) identified open suctioning procedure and 68 (70.8%) identified closed suctioning procedure as types of suctioning procedures, others were wrong. 60 (62.5%) identified open suctioning procedure as the suctioning procedure in which the patient is temporarily removed from the ventilator before suctioning , others were wrong. 57 (59.4%) identified closed suctioning procedure as the suctioning procedure that can be used multiple times and permits suction without disconnection . 89 (92.7%) identified that explaining the procedure to the patient is one of the things to be done before commencing endotracheal suctioning, 59 (61.5%) identified check cuff pressure and 79 (82.3%) identified carrying out pre-suctioning hyper oxygenation Out of the 96 critical care practitioners in the study, 47 (49.0%) identified open suctioning procedure with suctioning pressure ranging up to 120mm , the rest were wrong. While 32 (33.3%) identified that suctioning pressure ranging up to 160mmHg should be used for closed suctioning procedure .52 (54.2%) identified size 12 French catheter as the size of catheter routinely used during suctioning procedure in adults other were wrong. 51 (53.1%) identified using larger suction catheter as what critical care practitioners should do to minimize number of suction passes and ensure secretions are cleared, while 76 (79.2%) identified normal saline instillation. 78 (81.3%) identified deep endotracheal suctioning as the method whereby catheter is inserted beyond the tip of the endotracheal tube

or until it touches the carina. Only 2 (2.1%) identified at least every 8 hours as the length of time endotracheal suctioning should be performed for adult patients.

Out of the 96 critical care practitioners in the study, 70 (72.9%) Only 15 (15.6%) identified 1-15 seconds as the recommended duration of suctioning each time for adult patients, 83 (86.5%) identified wearing of gloves, apron, and face mask during suctioning as one of the infection control practices during suctioning procedure, 75 (78.1%) identified hand disinfection prior to suctioning, 22 (22.9%) identified assessment of patient for chest auscultation, 81 (84.4%) identified proper disposal of used catheter and gloves as infection control practices. 88 (91.7%) identified documenting colour and consistency of secretions as one of the thing to do after endotracheal suctioning, 64 (66.7%) identified check of the cuff pressure, 91 (94.8%) identified checking for air entry as things to do after suctioning.

**Table 2: Respondents' knowledge of Endotracheal Suctioning knowledge Procedure**

		<i>F</i>	%
Meaning of endotracheal suctioning procedure	** Endotracheal suctioning is a procedure that clears the airway by mechanically removing secretions in the patient with artificial airway	75	78.1
	Endotracheal suctioning is ability to ventilate the patient	4	4.2
	Endotracheal suctioning is suctioning of endotrachium to clear it	10	10.4
	Endotracheal suctioning is suctioning via tracheostomy to clear the airway	5	5.2
What are the types of endotracheal suctioning	Weaning suctioning procedure	25	26.0
	** Open suctioning procedure	82	85.4
	Exposed suctioning procedure	14	14.6
	** Closed suctioning procedure	68	70.8
	Ventilated suctioning procedure	23	24.0
Endotracheal suctioning procedure in which the patient is temporarily removed from the ventilator before suctioning	Weaning suctioning procedure	21	21.9
	** Open suctioning procedure	60	62.5
	Exposed suctioning procedure	6	6.3
	Closed suctioning procedure	8	8.3
	Ventilated suctioning procedure	17	17.7
	All of the above	1	1.0
Endotracheal suctioning procedure that can be	Weaning suctioning procedure	5	5.2
	Open suctioning procedure	29	30.2

used multiple times and permits suction without disconnection	Exposed suctioning procedure	8	8.3
	** Closed suctioning procedure	57	59.4
	Ventilated suctioning procedure	3	3.1
Things to be done before commencing endotracheal suctioning	** Explaining the procedure to the patient	89	92.7
	** Check cuff pressure	59	61.5
	Increase the length of suctioning tube	9	9.4
	Protect the central venous catheter from secretions	28	29.2
	** Carry out pre suctioning hyper oxygenation	79	82.3
Suctioning pressure ranging up to 120mmHg should be used for which suctioning procedure	Weaning suctioning procedure	10	10.4
	** Open suctioning procedure	47	49.0
	Exposed suctioning procedure	6	6.3
	Closed suctioning procedure	34	35.4
	Ventilated suctioning procedure	12	12.5
Suction pressure ranging up to 160mmHg should be used for the following	Weaning suctioning procedure	7	7.3
	Open suctioning procedure	39	40.6
	Exposed suctioning procedure	13	13.5
	** Closed suctioning procedure	32	33.3
	Ventilated suctioning procedure	5	5.2
	All of the above	1	1.0
Size of catheter routinely used during suctioning procedure in adults	Size 8 French catheter	8	8.3
	Size 10 French catheter	14	14.6
	** Size 12 French catheter	52	54.2
	Size 14 French catheter	21	21.9
	Size 16 French catheter	9	9.4
	All of the above	1	1.0
If secretions are thick, what should critical care practitioners do to minimize number of suction passes and ensure secretions are cleared	** Use larger suction catheter	51	53.1
	Carry out pre suctioning hyper oxygenation	15	15.6
	Premeasured the distance needed for insertion	3	3.1
	Change the suctioning procedure	4	4.2
	Normal saline instillation	76	79.2
The method whereby catheter is inserted beyond the tip of the endotracheal tube or until it touches the carina is known as	** Deep endotracheal suctioning	78	81.3
	Steep endotracheal suctioning	5	5.2
	In depth endotracheal suctioning	11	11.5
	Shallow endotracheal suctioning	0	0.00
	Critical endotracheal suctioning	1	1.0
Which method of catheter insertion clears secretions from within the lumen of tube without stimulating cough reflex	Deep endotracheal suctioning	9	9.4
	Steep endotracheal suctioning	3	3.1
	In-depth endotracheal suctioning	6	6.3
	** Shallow endotracheal suctioning	78	81.3
	Critical endotracheal suctioning	4	4.2

How often should endotracheal suctioning be performed each time for adult patients	At least every 2 hours	64	66.7
	At least every 4 hours	22	22.9
	At least every 6 hours	9	9.4
	** At least every 8 hours	2	2.1
	At least every 10 hours	0	0.0
what is the recommended Duration of suctioning each time for adult patients	5-10 seconds	70	72.9
	** 1-15 seconds	15	15.6
	16-20 seconds	1	1.0
	21-25 seconds	1	1.0
	26-30 second	10	10.4
Which of the following are infection control practices during suctioning procedure	** Wearing of gloves, apron, and face mask during suctioning	83	86.5
	** Hand disinfection prior to suctioning	75	78.1
	Assessment of patient for chest auscultation	22	22.9
	** Proper disposal of used catheter and gloves	81	84.4
	Burning of used gloves, apron and face mask after suctioning	4	4.2
Which of the following should be done after endotracheal suctioning	** Document colour and consistency of secretions	88	91.7
	** Check for cuff pressure	64	66.7
	** check for air entry and breathe sounds	91	94.8
	none of the above	2	2.1

**Correct answer was scored 1 while wrong answer was scored 0**

**Wrong answer implies any answer apart from the exact correct answer and nothing more or less**

**\*\* implies correct answer**

### Knowledge of Endotracheal Suctioning Procedure

Out of the 96 critical care practitioners in the study, 33 (34.4%) had knowledge of the meaning of endotracheal suctioning procedure while 63 (65.6%) did not have. 43 (44.8%) had knowledge that open suctioning and closed suctioning procedures are the types of endotracheal suctioning procedure while 53 (55.2%) did not have. 48 (50.0%) had correct knowledge that in open suctioning procedure the patient is temporarily removed from the ventilator before suctioning while 63 (65.6%) did not have. 51 (53.1%) had the correct knowledge that closed suctioning procedure could be used multiple times and permits suction without disconnection while 63 (65.6%) did not have. 35 (36.5%) had complete knowledge that explaining endotracheal suctioning procedure to the patient, checking cuff pressure and carrying out pre-

suctioning hyper oxygenation were to be done before endotracheal suctioning while 61 (63.5%) did not have this complete knowledge. 39 (40.6%) had the correct knowledge that open suctioning pressure ranges up to 120mmHg while 57 (59.4%) did not have this knowledge. 31 (32.3%) had the correct knowledge that closed suctioning pressure ranges up to 160mmHg while 65 (67.7%) did not have this knowledge. 48 (50.0%) had the correct knowledge that size 12 French catheter should be routinely used during suctioning procedure for adults while 48 (50.0%) did not have this knowledge. 18 (18.8%) had the correct knowledge that using larger suction catheter minimizes number of suction passes and ensures secretions is cleared if secretions become very thick while 78 (81.3%) did not have this knowledge. 77 (80.2%) had the correct knowledge that deep endotracheal suctioning is the method whereby catheter is inserted beyond the tip of the endotracheal tube or until it touches the carina while 19 (19.8%) did not have this knowledge. 73 (76.0%) had the correct knowledge that shallow endotracheal suctioning is the catheter insertion method that clears secretions from within the lumen of the tube without stimulating cough reflex while 19 (19.8%) did not have this knowledge. Only 1 (1.0%) practitioner had the correct knowledge that endotracheal suctioning is performed on a patient for at least every eight hours while 95 (99.0%) did not have this knowledge. Similarly, 14 (14.6%) practitioner had the correct knowledge that the duration of suctioning per time for adult patient is 1-15 seconds while 82 (85.4%) did not have this knowledge. 43 (44.8%) practitioner had the complete knowledge that wearing of gloves, apron and face mask during suctioning, hand disinfection prior to suctioning and proper disposal of used catheter and gloves are infection control practices during suctioning procedure while 53 (55.2%) did not have this knowledge. 63 (65.6%) practitioner had the complete knowledge that documenting colour and consistency of secretions, checking of cuff pressure and checking for air entry and breathe sound should be done after endotracheal suctioning while 33 (34.4%) did not have this knowledge

**Table 3: Knowledge of Endotracheal Suctioning Procedure**  
**n = 96**

Items	Responses	Frequency	Percent
Meaning of endotracheal suctioning procedure	Correct answer	33	34.4
	Wrong answer	63	65.6
What are the types of endotracheal suctioning	Correct answer	43	44.8
	Wrong answer	53	55.2
Endotracheal suctioning procedure in which the patient is temporarily removed from the ventilator before suctioning	Correct answer	48	50.0
	Wrong answer	48	50.0
Endotracheal suctioning procedure that can be used multiple times and permits suction without disconnection	Correct answer	51	53.1
	Wrong answer	45	46.9
Things to be done before commencing endotracheal suctioning	Correct answer	35	36.5
	Wrong answer	61	63.5
Suctioning pressure ranging up to 120mmHg should be used for which suctioning procedure	Correct answer	39	40.6
	Wrong answer	57	59.4
Suction pressure ranging up to 160mmHg should be used for the following	Correct answer	31	32.3
	Wrong answer	65	67.7
Size of catheter routinely used during suctioning procedure in adults	Correct answer	48	50.0
	Wrong answer	48	50.0
If secretions are thick, what should critical care practitioners do to minimize number of suction passes and ensure secretions are cleared	Correct answer	18	18.8
	Wrong answer	78	81.3
The method whereby catheter is inserted beyond the tip of the endotracheal tube or until it touches the carina is known as	Correct answer	77	80.2
	Wrong answer	19	19.8
Which method of catheter insertion clears secretions from within the lumen of tube without stimulating cough reflex	Correct answer	73	76.0
	Wrong answer	23	24.0
How often should endotracheal suctioning be performed each time for adult patients	Correct answer	1	1.0
	Wrong answer	95	99.0
Correct answer		14	14.6

What is the recommended duration of suctioning each time for adult patients	Wrong answer	82	85.4
Which of the following are infection control practices during suctioning procedure	Correct answer	43	44.8
	Wrong answer	53	55.2
Which of the following should be done after endotracheal suctioning	Correct answer	63	65.6
	Wrong answer	33	34.4

### Relationship between Demographic Data and Knowledge of Endotracheal Suctioning Procedure

Out of 48 females critical care practitioners, 34 (70.8%) had low knowledge while 14 (29.2%) had high knowledge. Likewise, out of 39 male critical care practitioners, 28 (71.8%) had low knowledge while 11 (28.2%) had high knowledge. Comparing the knowledge distribution for males and females, a Chi-Square Test of Association revealed no significant difference between them, ( $p = .921$ ). This implies that the level of knowledge of endotracheal suctioning procedure was the same for both male and female practitioner. Hence, there is no relationship between gender and knowledge. Out of 49 physician, 33 (67.3%) had low knowledge while 16 (32.7%) had high knowledge. Likewise, out of 43 nurses, 30 (69.8%) had low knowledge while 13 (30.2%) had high knowledge.

**Table 5: Relationship between Demographic Data and Knowledge of Endotracheal Suctioning Procedure**

		Level of knowledge		Total	Chi-Square	Df	p-value
		Low knowledge (%)	High knowledge (%)				
Age	31-35 years	23 (85.2)	4 (14.8)	27 (100.0)	14.564	2	.001
	36-40 years	23 (85.2)	4 (14.8)	27 (100.0)			
	Above 40 years	20 (48.8)	21 (51.2)	41 (100.0)			
	Total	66 (69.5)	29 (30.5)	95 (100.0)			
Gender	Female	34 (70.8)	14 (29.2)	48 (100.0)	.010	1	.921

	Male	28 (71.8)	11 (28.2)	39 (100.0)			
	Total	62 (71.3)	25 (28.7)	87 (100.0)			
Level of education	Diploma	12 (75.0)	4 (25.0)	16 (100.0)	-	-	1.000
	Degree	17 (70.8)	7 (29.2)	24 (100.0)			
	Total	29 (72.5)	11 (27.5)	40 (100.0)			
Profession	Physician	33 (67.3)	16 (32.7)	49 (100.0)	.062	1	.803
	Nurse	30 (69.8)	13 (30.2)	43 (100.0)			
	Total	63 (68.5)	29 (31.5)	92 (100.0)			
Working experience	1-5 years	25 (86.2)	4 (13.8)	29 (100.0)	16.560	3	.001
	6-10 years	22 (78.6)	6 (21.4)	28 (100.0)			
	11-20 years	13 (61.9)	8 (38.1)	21 (100.0)			
	Above 20 years	4 (28.6)	10 (71.4)	14 (100.0)			
	Total	64 (69.6)	28 (30.4)	92 (100.0)			

## Discussion

The study shows that the level of knowledge of endotracheal suctioning procedure was not the same for the different age groups. A Chi-Square Test of Association revealed a significant difference between them,  $p = .001$ . Practitioners who were above 40 years were associated more with high knowledge than those below that age. This result was so because practitioners above 40 years had practiced for more years and had also gained experience on the job. This study finding is confirmed by Ozen and Gorgulu (2012) where their respondent that aged above 40 years had score of 70% for knowledge. Likewise years of experience, knowledge level increased with years of experience, out of 14 practitioners that have practiced above 20 years, few (28.6%) had low knowledge while majority (71.4%) had high knowledge. This is in



agreement with the study of Negro et al (2014) where experienced intensive care practitioners demonstrated a better knowledge than the inexperienced.

Majority of physician, (67.3%) had low knowledge while (32.7%) had high knowledge. Likewise, nurses, (69.8%) had low knowledge while (30.2%) had high knowledge. The level of knowledge of endotracheal suctioning procedure was the same for both physician and nurse practitioner. Hence, there is no relationship between profession and knowledge. This finding was supported by Sole and Bennett (2014) who conducted a comparison of airway management practices between registered nurses and respiratory care practitioners. Also, Nahla (2013) in his study concluded that all critical care practitioners irrespective of year of experience, level of education had unsatisfactory knowledge about endotracheal suctioning measures

Out of the 96 critical care practitioners in the study, (34.4%) had knowledge of the meaning of endotracheal suctioning procedure while majority (65.6%) did not have. The study reveals that most of the critical care practitioners do not have knowledge of the meaning of endotracheal suctioning. This is supported by Frota *et al* (2013) who documented that some critical care practitioners do not have sufficient knowledge about current recommendations for endotracheal suctioning and their practice is based on rituals and traditions. This is also supported by Darrel *et al* (2011) who explore nurses' theoretical knowledge and practical competence in endotracheal suctioning and reported that many (37.5%) nurses failed to demonstrate an acceptable level of knowledge and competence in practice. In a related study, Day *et al* (2012) examined knowledge and practice of endotracheal suctioning among critical care practitioners and the study revealed a low level of knowledge among most of the study participant.

Comparing the knowledge distribution for doctors and nurses, a Chi-Square Test of Association revealed no significant difference between them,  $p = .803$ . This implies that the level of knowledge of endotracheal suctioning procedure was the same for both physician and nurse practitioner. Hence, there is no relationship between profession and knowledge. Out of 27 practitioners between 31-35 years, 23 (85.2%) had low knowledge while 4 (14.8%) had high

knowledge. Likewise, out of 27 practitioners between 36-40 years, 23 (85.2%) had low knowledge while 4 (14.8%) had high knowledge and out of 41 practitioners who were above 40 years 48.8% had low knowledge while 51.2% had high knowledge. Comparing the knowledge distribution for the difference age groups, a Chi-Square Test of Association revealed a significant difference between them,  $p = .001$ . This implies that the level of knowledge of endotracheal suctioning procedure was not the same for the different age groups. Practitioners who were above 40 years were associated more with high knowledge than those below that age.

Out of 29 practitioners that have practiced between 1-5 years, 25 (86.2%) had low knowledge while 4 (13.8%) had high knowledge. Likewise, out of 22 practitioners that have practiced between 6-10 years, 22 (78.6%) had low knowledge while 6 (21.4%) had high knowledge; out of 6 practitioners that have practiced between 11-15 years, 3 (50.0%) had low knowledge while 3 (50.0%) had high knowledge; out of 15 practitioners that have practiced between 16-20 years, 10 (66.7%) had low knowledge while 5 (33.3%) had high knowledge and out of 14 practitioners that have practiced above 20 years, 4 (28.6%) had low knowledge while 10 (71.4%) had high knowledge. Comparing the knowledge distribution for different level of working experience, a Chi-Square Test of Association revealed a significant difference between them,  $p = .001$ . This implies that the level of knowledge of endotracheal suctioning procedure was not the same for the different levels of working experience. Practitioners who have practiced above 20 years were associated more with high knowledge than those below that age while those with 1-5 years of practice were associated more with low knowledge. Out of 16 practitioners with diploma, 12 (75.0%) had low knowledge while 4 (25.0%) had high knowledge. Likewise, out of 24 practitioners with Degree (B.Sc/M.Sc), 17 (70.8%) had low knowledge while 7 (29.2%) had high knowledge. Comparing the knowledge distribution for the difference educational attainment, a Fisher's Exact Test revealed no significant difference between them,  $p = 1.000$ . This implies that the level of knowledge of endotracheal suctioning

procedure was the same for both diploma and degree holders. Hence, there is no relationship between educational level and knowledge.

## Conclusion

The following conclusions were drawn on the basis of the findings of the study.

The overall knowledge of practitioners was low. Majority 68.8% had low knowledge of endotracheal suctioning procedure while only 31.2% had high knowledge .

There was no difference between knowledge among nurses and physicians. A chi square test of association revealed no significant difference . $p=.151$ .

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