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Original Research Article

Assessment of knowledge and practices of intensive care unit nurses about endotracheal suctioning for adult patients in Baghdad teaching hospitals, Iraq

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ABSTRACT

Background: Mechanical ventilation is a vital, life-saving therapy for clients with dangerous illness and respiratory disorder. Objective of the study was to assess knowledge and practices of ICU nurses about endotracheal suctioning for adult patients and to determine the relationship between demographic characteristic data with nurse's knowledge and practices.
Methods: A cross-sectional design study was conducted in the period of 1st June 2016 to 15th November 2016. On purposive of (50) nurses who were working at intensive care unit in Baghdad, these hospitals were: Baghdad teaching hospital, Surgical Specialties Hospital /Medical City Directorate descriptive and Al- Kidney Teaching Hospital/Al Rusafa health.
Results: The majority of nurses' ages were (20-29) years old that were accounted for (60%), Most of them (70%) were male, the level of education represented that most of them (54%) were from nursing college, (34%) for less than one years were employee in the intensive care unit, Majority of them (58) were employee (1-5) years were employment in nursing, (58%) of them have training session in the intensive care unit.
Conclusions: Nurses have best practical level than knowledge level and their no significant relationship significant nurse's demographic characteristics and levels of knowledge and practice.

Keywords: Endotracheal tube suction, Intensive care unit nurses, Knowledge, Practice

INTRODUCTION

Mechanical ventilation is a vital, life-saving therapy for clients with dangerous illness and respiratory disorder. Endotracheal tube suction is a procedure which aims to maintain clear pathway by mechanically expelling accumulated pulmonary excretions, inpatients with artificial airways.[1] This procedure is associated with consequences and risks: haemorrhage, lesions of the tracheal mucosa, infections, atelectasis, cardiovascular disorder, hypoxemia and increase intracranial pressure.[1,2] The ETA is a vital part in airway path management in clients on artificial ventilation, being one of the most commonly conduct invasive procedures in the Intensive Care Unit (ICU). Its major aim is to evacuate accumulated lung excretion in order to keep the air pathways permeability; provide sufficient oxygenation; avoid the risk of ventilator-associated pneumonia (VAP) and prevent atelectasis and pulmonary consolidation.[3] Suctioning for intubated and ventilated patients is a routine nursing procedure, but perform differ between doctors and hospitals. Some suctioning practices which have little to no guide to backing their use are still being performed. It should be distinguished that a lack of research guide does not necessarily intend that a practice is of no advantage.

Alternatively, there may be some practices that continue guide when strong guide clearly indicates either no benefit or actual harm. Invasive techniques such as manual ventilation with a bag-valve-mask and instillation of normal saline have been shown to have no advantage to the patient when suctioning yet despite this, these practices continue in some units.[4]

In this regard, endotracheal suctioning is one the actions most importance in nursing care, directed at expelling secretions and, through this, consolidation the upkeep of the airways' permeability, as well as optimizing ventilation and oxygenation. The procedure is main for the stability of respiratory function, as the presence of a ventilator prosthesis interferes in the physiology of coughing and of the mucociliary system, which can inviabilize the enough clearance of excretions from the tracheobronchial tree and cause stasis of this content. This can cause atelectasis, infections, respiratory distress, occlusion of the endotracheal tube, hemodynamic changes and death. There are presently two methods, or distinct systems, for carrying out the procedure: open and closed. In the first, it is necessary to open the respiratory circuit by disconnecting the mechanical ventilator from the ventilatory prosthesis, followed by suctioning with a single-use catheter; in the second, which dispenses with the disconnection of the ventilator, the suction catheter is multiple use, and may still connected to the system for up to 24 hours, in line with the maker's recommendation. Here is controversy regarding these systems' adequacy in degrading infections, oxy-hemodynamic changes and length of time on mechanical ventilation, as well as the hospitalization duration.

In recent decades, the closed suction system has been gaining popularity in developed countries. In the United States, for example, this system is used especially in 58% of critical Care Units, while the open system is used especially in only 4% of the centers.[5] Endotracheal suctioning is a frequently performed method that has numerous related dangers and sequels. This research was designed to investigate to what extent intensive care unit nurses' knowledge and practice of endotracheal suctioning is based on research evidence, to determine the relationships between knowledge and practice.[6]

METHODS

A cross-sectional design study. Sample of the study: The sample was selected purposive (non-probability) of 50 nurses. Setting of the study: Baghdad Teaching Hospital (Intensive care unit) (15) nurses were included, Surgical Specialties Hospital (Intensive care unit) (20) nurses were included and Al Kidney Teaching Hospital (Intensive care unit) (15) nurses were included and collected data from1st June 2016 to 15th November 2016. Instruments: The questionnaire was constructed for the study. The instrument consisted two parts: Part I: socio demographic characteristic, which includes (6) variables (age, gender, level of education, years of the service in the field of the nursing profession, years of experience in the intensive care unit, training session).

Part Π: Consists of two tools: The first tool was a questionnaire for assessing knowledge regarding endotracheal suctioning which refers to the level knowledge of nurses about endotracheal suctioning as measured by the correct response to the items through using of two options for answering (where1= Incorrect answer, 2=Correct answer), the second tool which used was a checklist for assessing nursing performance about endotracheal suctioning procedure which refers to options were used for the doing the step or not (where1= Not done, 2=Done) through direct observation method was used.

The data was analyzed by using SPSS package which include descriptive statistical approach (frequency, percentage and mean of score) and inferential statistical approach (standard deviation and One way An ova).The level of knowledge was ranked into three levels; (1-1.34) are poor score knowledge, (1.34-1.67) are fair score knowledge, and (1.67-2) are good score knowledge, and the level of practice was ranked into three levels; (1-1.34) are poor practice, (1.34-1.67) are fair practice , and less than (1.67-2)are good practice.

Validity and Reliability of the instrument: Content validity of the questionnaire was determined through a panel of (12) experts. Reliability of questionnaire was determined through test re-test (r=0.80) of pilot study.

RESULTS

The majority of nurses' ages were (20-29) years old that were accounted for (60%), most of them (70%) were male, the level of education represented that most of them (54%) were from nursing college, (34%) for less than one years were employee in the intensive care unit, majority of them (58) were employee (1-5) years were employment in nursing, (68%) of them have training session in the intensive care unit (Table 1).

DISCUSSION

Throughout the course of the data analysis of the present study, the findings shows the most of the study samples are males (70%) while the remaining are females, and the present of the study demonstrate that (60%) of the study samples at age between (20-29) year old, The level of education represented that most of them (54%) were from nursing college, (34%) for less than one years were employee in the intensive care unit, Majority of them (58) were employee (1-5) years were employment in nursing,(68%) of them have training session in the intensive care unit.

This finding can be supported by another study the findings who reported that study the findings of that around two thirds of the study subjects were males and

their ages ranged between (25-34) years old (93%) with at the average age of 29±2.8.[7] This finding can be supported by another study. They present that of 14 (51.9%) subjects were male. The average age was 40.6 years±7 (24-55).[8]

Table 1: Proportion of intensive care nurses (n=50 nurses) per their demographic characteristics.

Variable	Freq.	Percent	Cumulative percent
Age group (per Years)			
20-29Years	30	60.0	60.0
30-39Years	13	26.0	86.0
40-49Years	4	8.0	94.0
50-59Years	3	6.0	100.0
Gender			
Male	35	70.0	70.0
Female	15	30.0	100.0
Level of education			
Secondary nursing school	6	12.0	12.0
Medical Institute	17	34.0	46.0
Nursing College	27	54.0	100.0
Years of employment in ICU			
Less than 1Years	17	34.0	34.0
1-5 Years	16	32.0	66.0
6-10 Years	11	22.0	88.0
11-15 Years	6	12.0	100.0
Years of employment in nursing			
1-5 Years	29	58.0	58.0
6-10 Years	11	22.0	80.0
11-15 Years	2	4.0	84.0
16-20 Years	1	2.0	100.0
No. of session in ICU			
No Session	9	18.0	18.0
1-3 Session	34	68.0	86.0
4-6 Session	7	14.0	100.0

Frequency, Percent, Cumulative percent

These findings were in good agreement with that obtain by other researcher who stated in their study among the study participants, 38 (76%) were male and 12 (24%) were female. The mean age of patients was 30.7 years, ranging from18 to 45 years old.[9] These results were similar to those results obtained by other researcher who stated that All of them held the BS degree as level of education.[7]

Forty three percent of the study samples are less than one years were employee in the intensive care unit, Majority of them (58) were employee (1-5) years were employment in nursing, (68%) of them have training session in the intensive care unit. These findings were in good agreement with that obtain by other researcher who stated Two-third of nursing personnel (66.67%) had less than one year of experience in ICU and rest 33.33% had 1-5years of experience in ICU. More than half of nursing personnel (56.67%) have attended the in-service education related to endotracheal suctioning organized in their past working institutions.[10]

Table (2) The Knowledge Scores of Intensive Care Unit Nurses (n=50) about Endotracheal Suctioning for Adult Patients in Baghdad Teaching Hospitals.

One of the study objectives, in order to assess intensive care unit nurse's knowledge, about endotracheal tube suctioning for adult patients (Table 2) In the present study, show the average of nurses' score in knowledge and performance was calculated the level of knowledge was ranked into three levels; (1-1.34) are poor score knowledge, (1.34-1.67) are fair score knowledge, and (1.67-2) are good score knowledge, and the level of practice was ranked into three levels; (1-1.34) are poor practice, (1.34-1.67) are fair practice, and less than (1.67-2) are good practice, This study revealed that 72% of nurses tells that it's frequency of ETS is done when required and 72% of them said that closed method is best for endotracheal tube suctioning, 50% of nurses answering that nasotracheal suctioning catheter inserted up to16-20cm, 48% only of nurse's said endotracheal tube suctioning must be done while withdrawing the

catheter, 58% of them answer limited suction time was 10-15 seconds, 70% of them declare that the semi Fowler's is appropriate and comfortable position for ETS, 66% of nurses said endotracheal tube must be changed after each suction.

Table 2: The Knowledge scores of intensive care unit nurses (n=50) about endotracheal suctioning for adult patients in Baghdad teaching hospitals.

Knowledge questions	Correct		Incorrect		M.S	Ass.
	F.	%	F.	%		
ETS frequency	36	72.0	14	28.0	1.72	Good
Best method for suctioning	36	72.0	14	28.0	1.72	Good
Nasotracheal suctioning catheter inserted up to	25	50.0	25	50.0	1.50	Fair
The following is true about ETS	24	48.0	26	52.0	1.48	Fair
Recommended time duration for ETS 10-15	29	58.0	21	42.0	1.58	Fair
Appropriate position for perform ETS	35	70.0	15	30.0	1.70	Fair
Successful ETS is verify by	13	26.0	37	74.0	1.26	Poor
Nerve is stimulated during ETS	18	36.0	32	64.0	1.36	Poor
Complication of suctioning due to irritation of Carina	21	42.0	29	58.0	1.42	Fair
ETS source pressure	13	26.0	37	74.0	1.26	Poor
ETS catheter changed	33	66.0	17	34.0	1.36	Poor
Complication can arise due to absence of hyperventilation before ETS	29	58.0	21	42.0	1.58	Fair
Don't instilled sodium bicarbonate through the ET tube	37	74.0	13	26.0	1.74	Fair
Size of ETS catheter	32	64.0	18	36.0	1.64	Fair
Prevention of nosocomial infections	23	46.0	27	54.0	1.44	Fair
Effect of Pre-oxygenation in ETS	28	56.0	22	44.0	1.52	Fair
Contraindications for ETS	29	58.0	21	42.0	1.58	Fair
Normal Saline instillation during ETS	23	46.0	27	54.0	1.44	Fair
The reason behind discontinuation of procedure	16	32.0	34	68.0	1.36	Fair
Effect of increased ETS frequency	21	42.0	29	58.0	1.44	Fair
Effect normal Saline instillation	9	18.0	41	82.0	1.20	Poor
Total	530		520		1.49	

This result agrees with that of the other researcher who reported that 66.6% of ICU nurses frequently should the endotracheal/tracheal suctioning be done when needed, 100% majority of them asked that closed method the best for ETS, 43.33% of nurses said about nasotracheal suctioning to an adult patient, suction catheter should be inserted up to16-20 cm, 100% majority of them asked that endotracheal suctioning tube removed when withdrawal catheter, 93.33% maximum time limit for an endotracheal suctioning was 10-15 second, 63.33% semi fowlers position most appropriate position for giving endotracheal suctioning, 96.66% ET suction catheter be changed after suctioning.[11]

Another objective was nurse's knowledge concerning endotracheal suctioning complication during suctioning, revealed that 36% only of nurses said that vagus nerve is stimulated during ETS, 42%, of them said Paroxysmal cough due to irritation of carina, 74% most of them stated that lung tissue damage due to instillation of sodium bicarbonate through the endotracheal tube.

This result with same line with the other researcher who reported that 73.33% most of them tells that vagus nerve is stimulated during endotracheal suctioning, 80% majority of nurses Sayers that possible complication of suctioning due to irritation of carina, 66.6% Lung tissue damage due to sodium bicarbonate instilled through the ET tube.[11]

Regarding complication and side effects of endotracheal suction, the study demonstrate that 58% of nurses stop suctioning procedure while patient have increase intracranial pressure and severe high blood pressure both are contraindicated from the procedure, 56% of nurses said increase pre oxygenation before your start suctioning to avoid hypoxia, 46% of nurses said normal saline instillation not recommended through performing endotracheal tube suctioning and 32% of nurses should be discontinue suctioning when the heart rate is above or below normal level and 18% said normal saline instillation that maybe causes tachycardia and dyspnea.

These findings are in line with other researcher who reported that regarding complication and adverse effects of endotracheal suction, the study revealed that 14.3% of nurses think that patients with high intracranial pressure and severe hypertension both are contraindicated from the procedure.

Nurse's lack of knowledge regarding complications, adverse effects and contraindications complicates patient status even more. Nurse's knowledge pertaining normal saline instillation and its effect was also assessed. revealed that only 14.3% of nurses said that saline instillation during suction procedure it's not recommended, 42.9% of nurses think that tachycardia, dyspnea, ventilator associated pneumonia are the result of instilling saline during suction procedure this can only mean that the nurses are not updated to current practice guidelines regarding saline instillation. The knowledge about the effect of increased frequency of suctioning was also assessed. Result showed that only 16.7% of nurses said that it causes atelectasis. This result reflects nurse's lack of knowledge pertaining suctioning frequency. Suctioning the patient too much would damage the lung mucosa.[12]

Nurse's knowledge regarding prevention of nosocomial infections the result of study shows that 46% of nurses wash your hands and maintain aseptic technique to prevention of nosocomial infections. The study show also assessed knowledge about suction pressure recommended for suctioning in adult patients it revealed that only26% of nurse's uses 80-120 mmHg pressure, the nurse's knowledge about catheter size for suctioning. It revealed that over half the nurses 64% use a size that is less than the internal diameter of the tracheal tube.

The results of study agree with study conducted by other researcher who stated that 45.2% of them use 80-120 mmHg pressure. It revealed that over half the nurses 64.3% use a size that is less than the internal diameter of the tracheal tube, correct tube size decreases patient distress and tracheal mucosa damage.[12] Total knowledge was assessed using grading scale for knowledge. Demonstrates total of mean of score knowledge level in Baghdad teaching hospitals and as observed the majority of ICU nurses (1.49) have fair knowledge, regarding endotracheal suctioning procedures but there is poor knowledge in five areas differing results among the professional classification.

These results were similar to those result obtained by other researcher to determine the knowledge and practice of nurses before and after training and the development of protocol for open and closed system suctioning methods in patients with ETTs which had shown a significant increase in the post-implementation knowledge and practice score.[13] This finding is in accordance with result obtained by other researcher who stated the knowledge of professionals was qualified as fair (73.2% correct), but worryingly, it was considered poor in five areas with differing results among the professional categories.[8] The results of study disagree with study conducted by other researcher who stated that. The findings emonstrated a poor level of knowledge for many subjects.[14]

The study also assessed the practical level of ICU nurses (Table 3), result showed that 66% most of them gather necessary equipment for suctioning, 74% over half of nurses monitor and check function of devise before suctioning,80% of all nurses check vital signs, half of nurses 50% only monitor oxygen saturation,6% of all nurses only auscultate breath sounds for patients and over of half 82% of nurses don't identifies indications for suctioning to patient. This result may be supported with other researcher result showed that all nurses 100% check functioning of suctioning apparatus, monitor heart rate and record blood pressure but none of them 100% auscultate breath sounds which indicate that they don't assess the patient.[12]

Nurses practical regarding infection- control prevention data showed, the majority of nurses 88% perform hand hygiene before suctioning, 88% of all nurses wear sterile gloves, also majority of nurses put face mask ,and most of them78% connect sterile suction catheter this finding demonstrate majority of nurses using precaution transmission through performing procedure to prevent infection. The findings of the study are in same line with study conducted by other researcher the result shows, the most significant discrepancies were observed in ETS practices related to infection-control practices. Infection-control practices (e.g., hand hygiene 72.2%, protection of practioners and patients from secretions as well as adequate disposal of the used catheter 67.7% and gloves100.0%, and maintenance of the sterility of the suction catheter) are crucial elements in the prevention of cross-infections and transmission of pathogens via hands or equipment.[15,16]

This result agrees with that of the other researcher who reported that In relation to the use of personal protective equipment (PPE), similarly to what is found in the literature high adherence to the use of gloves was ascertained (92%) as was regular use of the mask and apron (72% and 60%), although there was no adherence to the use of eye protection (0%). Studies have shown that the nurses themselves, in spite of recognizing the importance of the use of PPE, do not use it appropriately when under taking the ETS procedure.[17,18] The others practice of concerning infection- control prevention,84% Place the sterile gloves on the towel/bed table during procedure,84% of nurses don't place towel over chest of patient, majority of them 80% destroy equipment and 84% of nurses perform hand washing after suctioning.

Table 3: Practices scores of intensive care unit nurses (n=50) about endotracheal suctioning.

Item	Done		Not done		M.S	Ass.
	F.	%	F.	%		
Assemble equipment	33	66.0	17	34.0	1.66	Fair
Check function of suction apparatus	37	74.0	13	26.0	1.74	Good
Monitor vital signs	40	80.0	10	20.0	1.80	Good
Monitor oxygen saturation	25	50.0	25	50.0	1.50	Fair
Auscultate breath sounds.	3	6.0	47	94.0	1.06	Poor
Explain the procedure to the patient	6	12.0	44	88.0	1.12	Poor
Identifies indications for suctioning.	9	18.0	41	82.0	1.18	Poor
Places the patient in supine position with head slightly extended.	22	44.0	28	56.0	1.44	Fair
Prepares ambu bag and oxygen supply	41	82.0	9	18.0	1.82	Good
Checks suction device with connecting tubing	38	76.0	12	24.0	1.76	Good
Attaches sterile suction catheter.	39	78.0	11	22.0	1.78	Good
Pour normal saline into the bowl for cleaning tubing	41	82.0	9	18.0	1.82	Good
Wash hands	44	88.0	6	12.0	1.88	Good
Puts on mask	44	88.0	6	12.0	1.88	Good
Place the sterile gloves on the towel/bed table	42	84.0	8	16.0	1.84	Good
Put on the sterile gloves	40	80.0	10	20.0	1.80	Good
Place the sterile towel on the patient's chest	8	16.0	42	84.0	1.16	Poor
Hyper oxygenate the patient before suctioning	37	74.0	13	26.0	1.74	Good
Don't apply suction while inserting the catheter	28	56.0	22	44.0	1.56	Fair
Removes catheter in rotating movement	18	36.0	32	64.0	1.36	Fair
Limits suction time to 10-15 seconds	26	52.0	24	48.0	1.52	Fair
Discontinue if heart rate is below or above normal	35	70.0	15	30.0	1.70	Good
Resumes oxygen delivery system	41	82.0	9	18.0	1.82	Good
Rinse catheter and suction tube with normal saline until clear	38	76.0	12	24.0	1.76	Good
After suctioning hyper oxygenates ventilator100% O2	32	64.0	18	36.0	1.64	Fair
Reassess patient's respiratory status.	12	24.0	38	76.0	1.24	Poor
Don't perform more than 4suction per suctioning	25	50.0	25	50.0	1.50	Fair
Discards equipment after suction	40	80.0	10	20.0	1.80	Good
Perform hand wash 100	42	84.0	8	16.0	1.84	Good
Monitor any changes in the vital signs	37	74.0	13	26.0	1.74	Good
Document of suction procedure	35	70.0	15	30.0	1.70	Good
Total	958		592		1.61	

F= Frequency, %= Percent, MS= mean of score, Ass. = (1-1.34) are poor knowledge**,** (1.34-1.67) are fair knowledge, and (1.67-2) are good

Regarding the measures recommended to be taken immediately prior to the suctioning, most of them 74% give hyper oxygenation to patient before suctioning, majority of them 82% of them Prepares ambu bag and oxygen supply, majority of them 82% used normal saline or distil water to rinse suctioning tube until clear, 56% of

nurses don't aspirate while insert catheter, only 36% of nurses removes catheter in rotating movement. This findings of study are supported by other findings who state that the measures recommended to be taken immediately prior to the suctioning, high adherence was observed to items (respectively, maintaining or placing the patient in the semi-Fowler position and introducing the suction catheter in the OTT with the vacuum suction system switched off), use of a sterile suction catheter, undertaking the procedure respecting aseptic technique, washing the suction system with distilled water or Nacl at the end of the suctioning, protection of the suction system after suctioning with a clean and dry packaging.[19]

The majority of nurses 82% resumes oxygen delivery system, 70% of nurses stop suctioning immediately if the heart rate above or low normal level, most of them 64% give hyper oxygenation directly after suctioning, mostly of nurses 74% monitor any change hemodynamic status during suction, only 50% of nurses don't perform more than four suction per suctioning and 52% of nurse's limits suction time to 10-15 seconds.

Table 4: The relationship between nurses' knowledge and selected sociodemographic variables.

Variable nurse's knowledge	Sum of squares	Df	Mean Square	F	Sig.
Age					.588
Between Groups	848	2	.424	.536	
Within Groups	37.152	47	.790		
Total	38.000	49			
Gender					.312
Between Groups	.507	2	.254	1.193	
Within Groups	9.993	47	.213		
Total	10.500	49			
Level of education					.578
Between Groups	.557	2	.278	.554	
Within Groups	23.623	47	.503		
Total	24.180	49			
Years of employment in ICU					.313
Between Groups	2.476	2	1.238	1.192	
Within Groups	48.804	47	1.038		
Total	51.280	49			
Years of employment in nursing					.600
Between Groups	1.305	2	.652	.517	
Within Groups	59.275	47	1.261		
Total	60.580	49			
Training course					.664
Between Groups	.275	2	.138	.413	
Within Groups	15.645	47	.333		
Total	15.920	49			

Sum of squares, Degree of freedom, Mean squares, Significant

The findings agree with other researcher who stated that the patient should be reconnected to oxygen within 10 seconds post suctioning majority of them 89.2%, Post-suctioning hyper oxygenation most of them 62.5% patient reassured respiratory status55.3%,75.05 number of suction passes ≤2, and 72.5% duration of suction applied to airway (<15 seconds).[15] Nurse's practice related nursing documentation for endotracheal tube suctioning procedure the result demonstrates most of them 70% of nurses document suctioning procedure. The finding is disagreeing with other researcher who stated all of nurse's intensive care unit doesn't document suctioning procedure.[12]

The total practice level was analyzed by practice grading scale level of practice was ranked into three levels; (1-1.34) are poor practice, (1.34-1.67) are fair practice, and less than (1.67-2) are good practice, As observed in this study, total mean of score that (1.61) of nurses have fair practice level. There are significant discrepancies was noticed in critical care unit nurses' performance in relation to current recommendations in their practice before, during and post endotracheal tube suctioning procedures. This matches what Miia found in her study in 2013 in Finland hospital ICUs that the ETS practices prior to, during and post events was significantly lower than the required quality of care.[15]

The result in the line with other researcher who stated that, the study was conducted in a relatively small sample of 30 nurses. This study clearly portrays that nearly half of the nurses had above average knowledge score.[11] According to the findings of the study that show in (Table 4,5) there are no significant association nurses knowledge, practices except training course with nurse's certain demographic characteristics. Normally; as working experience increases; knowledge and practice level also increase practice performance depended on training course to improve nurse's skills and knowledge about endotracheal tube suctioning. This study agrees with previous studies, there is no significant relationship between years of experience, knowledge and practice. P-value is (0.905, 0.962) for knowledge and practice level respectively. This matches what Mary found in her research in Indian hospitals 2005. When the results were compared, both in practice and knowledge, with the years of experience in ICU; no statistically significant differences were found. There is any significant difference in the mean knowledge between two age groups however the observed increase in mean knowledge was not statistically significant (P value 0.18), there was no statistically difference in the mean practice score of both group (P value=0.27).[11,12,20]

The result of the study show there is association between nurses' practice and training course, work training course for ICU nurses improve knowledge and practice toward efficient suctioning performance and reinforcement of nurses to promoting knowledge and practices in this field.

Table 5: The relationship between nurses' practice and selected sociodemographic variables.

Variable Nurses Practices	Sum of squares	df	Mean Square	F	Sig.
Age					
Between Groups	.486	2	.243	.304	.739
Within Groups	37.514	47	.798		
Total	38.000	49			
Gender					
Between Group	.086	2	.043	.193	.825
Within Groups	10.414	47	.222		
Total	10.500	49			
Level of education					
Between Groups	.051	2	.026	.050	.951
Within Groups	24.129	47	.513		
Total	24.180	49			
Years of employment in ICU					
Between Groups	.673	2	.336	.312	.733
Within Groups	50.607	47	1.077		
Total	51.280	49			
Years of employment in nursing					
Between Groups	2.451	2	1.226	.991	.379
Within Groups	58.129	47	1.237		
Total	60.580	49			
Training course					
Between Groups	2.263	2	1.131	.3.894	.027
Within Groups	13.657	47	.291		
Total	15.920	49			

Sum of squares, Degree of freedom, Mean squares, Significant

CONCLUSION

This study demonstrates that, despite fair knowledge, nurses' performance was good in endotracheal suctioning procedure. With concerning to the actual that the role of education during service has become more important in recent years and nurses are obligated to take part in such educational courses, it seems that education alone, especially theoretical education, has better effect on nurses' performance and along with theoretic education, special attention should be paid to practical education and other prevocational and managerial factors. And the nurses also must be provided with appropriate devices for performing endotracheal suctioning correctly.

Recommendations

- Educational program for intensive care unit nurses to improve knowledge and practices about endotracheal

tube suctioning and avoid complication through performing procedure suctioning.

- The need to place practice guidelines and teaching programme to be perform and up dated in all Iraq hospitals.
- The same study would be repeated in other intensive care units and increasing the size of the sample at other teaching hospitals in the Iraq.

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