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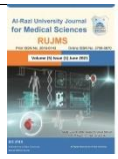

Practice Toward Procedure Endo-Tracheal Intubation Among Anesthesia Staff at Public Hospitals-Sana'a City-Yemen

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Abstract:

Background: Endo-tracheal intubation is an important medical procedure that saves countless lives by providing an airway for patients to breathe. When physicians and medical staff perform the procedure improperly however or fail to intubate a patient in need of this treatment, the consequences can be disastrous. **Aims:** Therefore, the current study aimed to assess practice toward procedure endo-tracheal intubation among anesthesia staff. **Method:** A descriptive cross-sectional study, data collected during one month from 1st-30 May 2022. The sample size was 76 of anesthesia staff. Checklist observation sheet was used as a study tool, this study was conducted in public hospitals-Sana'a City-Yemen. **Results:** 90.8% of participants were male, belonged on between 20-30 yrs. (38.2%). Most (38.2%) of them were Anesthesiologist and 48.7% had years' experience between 1to 5 years. (77.6%) of them had inadequate practice toward procedure endo-tracheal intubation, while (22.4%) of them had adequate practice. There was statistically significant difference association between the level of participants practice regarding procedure endo-tracheal intubation with age group, and years' experience (p-value=0.024, 0.011 respectively). **Conclusion:** More than two third of participants had inadequate practice toward procedure endo-tracheal intubation.

Keywords: Anesthesia, Intubation, Practice, Staff.

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Introduction

Tracheal intubation is defined as passing a tracheal tube through the glottic opening and sealing the tube with a cuff inflated against the tracheal wall. When the tube is passed into the trachea through the mouth, the procedure is called orotracheal intubation. When the tube is passed into the trachea through the nose, the procedure is called nasotracheal intubation.[1]

Endotracheal intubation is the gold standard for airway management.[2] Endotracheal intubation is a fundamental procedure for securing the airway, performed for resuscitation in emergency scenarios or elective conditions such as general anesthesia. Successfully placing the endotracheal tube (ET) in the trachea is a skill learned over time.[3]

Endotracheal tube is in place, there is a risk of infection due to its prolonged presence in the patient's mouth and trachea. This could be due to bacteria already present on the tube from poor sterilization and handling practices. Infections may also be the result of bacteria within the mouth and trachea creating a biofilm on the tube, which could boost the chances of the patient developing an infection.[4]

The endotracheal intubation procedure is integral to modern medicine and essential to emergency care, surgical practice, and intensive care procedures. Prior to an operation, a patient is intubated under anesthesia-induced sedation to maintain proper ventilation during the surgery. In emergencies, a patient may need to be intubated due to lack of consciousness, inadequate ventilation, acute respiratory failure, or airway depression due to an altered mental status. Upon placement of the tube, a mechanical ventilator can be connected to provide artificial respiration when a patient cannot maintain adequate respiratory function.[5]

Endotracheal intubations errors accounted for half the death associated with general anesthesia and featured as a direct cause of mortality & morbidity. Factors associated with intubations errors unfemininity with airway equipment or process.[6]

Many common intubation errors result from the fact that the procedure has become quite commonplace, and thus has come to be viewed by many in the medical profession as routine. But, though common, the procedure is serious, and must be taken seriously if the patient is to avoid brain injury and death. Therefore, for these reasons, there is a clear need to assess practice toward procedure endo-tracheal intubation among anesthesia staff.

Research Methodology

A descriptive cross-sectional study on hospital based. The study was conducted in operating room at public hospitals in Sana'a. A convenience sampling method was used for this study. The sample size was finally (76). The data was collected through observation checklist sheet based on American Association of Nurse Anesthesiology[7] practice about procedure endotracheal intubation which consist of three parts: *Part I:* Demographic characteristics of anesthetics staff which include type of operation room, age (year(, sex, qualification level, and years' experience. *Part II:* Observational checklist sheet for assess practice toward procedure endo-tracheal intubation. The observational checklist comprised of (53) steps.

Scoring system for practice: Each correct answer scored one grade correct done and score zero for the incorrect done or practice. The total level of practice score (53), it was categorized as follows: adequate practice level was assigned to anesthesia staff who got 75%-100% (40 to 53 scores), and (0-39 scores) for value less than 75% was inadequate practice.

Data Collection

1. Data collection during one month from the 1st -30 May 2022.

2. Validity and Reliability: the content was established by a panel of in Razi University, five experts of anesthesia consultation who reviewed the tools for clarity, relevance comprehensiveness and applicability for implementation and according to their opinion, some modifications were applied. The observational checklist was filled by the researchers during observation in an area.
3. Data were collected, computed, and statistically analyzed using the Statistical Package for Social Sciences (SPSS) version 24.0. The demographic characteristics was tabulated, and percentages were found by using number, and percent for categorical variables, and the mean and standard deviation for numerical variables. The association between the demographic characteristics and practice were analyzed by chi square test and independent t-test used comparison mean score between public hospital of participants' practice. The 0.05 level was used as the cut off value for statistical significance.
4. Ethical Considerations: Approval of the study was obtaining prior to carrying out this study from the ethical committee of the Al Razi University-Faculty medicine and Health Sciences. The data was collecting from the hospital sitting. Formal permission obtained from the authorities and head of department of operation therapy for the collection of data.

Results

Socio-demographic characterization

Distribution of demographical characteristics for anesthesia staff. Majority (90.8%) of them were male, belonged on between 20-30 yrs. (38.2%). Most (38.2%) of them were had board anesthesia and (38.2%) of them were had years' experience between 1to 5 years. Table 1 show that, majority (85.5%) of participants correct practice toward during intubation implementation, follow by (59.2%) of them correct practice toward preoperational preparation. On other hand (75%) of them incorrect practice toward pre-intubation implementation, and (71.1%) of them incorrect practice toward post-intubation. implementation. Finally, only (9.2) of them incorrect practice toward documentation.

Figure 1 shows that, level of participants practices toward procedure endo-tracheal intubation. Majority (77.6%) of them had inadequate practice toward procedure endo-tracheal intubation, while (22.4%) of them had adequate practice toward procedure endo-tracheal intubation. The total means of practice according to procedure endo-tracheal intubation implementation 33.59±6.99.

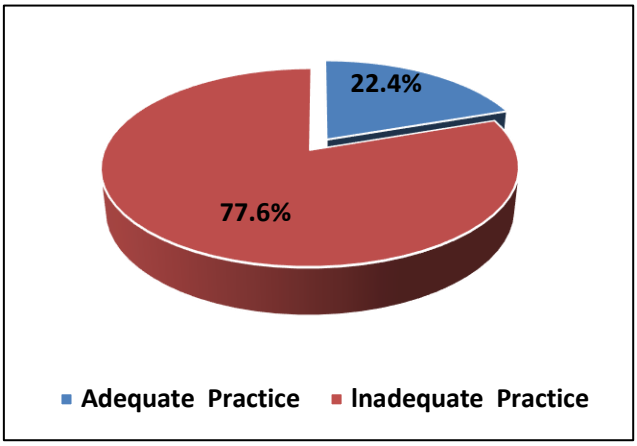

Figure 1. Level of participants practice toward procedure endo-tracheal intubation implementation (n=76).

Discussion

The aim of the study to evaluate practice towed endo-tracheal intubation among anesthesia staff in operation rooms. The present of the study shows that majority (90.8%) of them were male, belonged on between 20-30 yrs. (38.2%). Most (38.2%) of them were had Anesthesiologist and (48.7%) of them were had years' experience between 1 to 5 years.

The current result agreement with Satyapal et al., who study "Errors and clinical supervision of intubation

Table 1. Distribution of mean score participants practice according to procedure endo-tracheal intubation implementation (n=76).

Items	Correct practice F (%)	Incorrect practice F (%)	Mean±S.D
Preoperational preparation	45 (59.2%)	31(40.8%)	6.50±1.38
Pre-intubation implementation	19 (25.0%)	57 (75.0%)	8.70±3.13
During-intubation implementation	65 (85.5%)	11 (14.5%)	8.04±1.14
Post-Intubation implementation	22 (28.9%)	54 (71.1%)	7.41±2.05
Documentation	7 (9.2%)	69 (90.8%)	2.95±3.48

Table 2: Association between the level of participants practice regarding procedure endo-tracheal intubation and demographic characteristics.

Demographic characteristics		Adequate Practice F (%)	Inadequate Practice F (%)	p-value
Age group	20-30 yrs.	2 (2.6)	27 (35.5)	**0.024**
	31-40 yrs.	4 (5.3)	16 (21.1)	
	41-50 yrs.	7 (9.2)	11 (14.5)	
	51-60 yrs.	4 (5.3)	5 (6.6)	
Sex	Male	15 (19.7)	54 (71.1)	0.679
	Female	2 (2.6)	5 (6.6)	
Educational level	Board Anesthesia	9 (11.8)	20 (28.9)	0.104
	Bachelor's Anesthesia	2 (2.6)	23 (30.3)	
	Diploma Anesthesia	6 (7.9)	16 (21.1)	
Years' Experience	1-5 yrs.	4 (5.3)	33 (43.4)	**0.011**
	6-10 yrs.	3 (3.9)	14 (18.4)	
	11-15 yrs.	3 (3.9)	6 (7.9)	
	>15 yrs.	7 (9.2)	6 (7.9)	

*Significant statistics at *P*-value <0.05.

attempts by the inexperienced" who mentioned that most of participants were medical interns. The current study result show that majority (97.4%) of them were inserted ETT via oral. Because easier to perform, faster and less painful than nasal intubation under direct laryngoscopy and less complication. This result accepted with Satyapal et al., who reported that, (78%) oral intubations. The present study 80.9% of participants were had correct practice according to preoperational preparation.[6] Our study supported with Nørskov et al., who report risks of aspiration, difficulties with rescue procedures, and difficult intubation should all be considered during an airway examination. Assessments for difficult intubation have limited specificity, minimal practice mistakes, and little positive predictive value.[6] The present study shows 78.9% of them were incorrect practice toward hand hygiene. Our result disagrees with Pinto et al., who found that, most of sample was hand wash prior to procedure.[9] The present study shows 61.8% of them were incorrect practice toward Mallapati. Our result agrees with Cho et al., who found that, (56.9%) of the cases related to delayed or failed intubation because limited mouth opening and didn't check before intubation.[10] The current study shows 67.1% of participants request that an assistant apply cricoid pressure. This result supported with Aziz et al., who writes that, maximize cricoid force (cricoid pressure), head extension, and access to the cricothyroid membrane, make sure the mattress is as hard as feasible.[11] The present study shows that 82.9% of

samples were lift the laryngoscope handle until the vocal cords are visualized. This result supported with Kristensen et al., who the 'laryngeal handshake' technique is recommended to identify the cricothyroid membrane. Ultrasonography may be helpful for determining the size, depth, deviation, overlaying blood vessels, or thyroid tissue since it is more accurate than palpation.[12] Our result of study (88.2%) of participants were Inflate cuff with 5 to 10 mL of air depending on the manufacturer's, majority of them were confirmed endotracheal tube placement while manually bagging with 100% oxygen, and (60.5%) of them were not attach continuous end-tidal CO 2 monitor and watch for detection of CO 2. Our study similar with Jong et al., reported that, End-tidal oxygen concentration (>85%) is the preferred method for determining sufficient preoxygenation.[12] Constantin et al., who reported intubation, recruitment maneuvers in hypoxic patients may be helpful if hemodynamic stability is maintained. Without causing any negative side effects, an inspiratory pressure of 30–40 cm H2O for 25–30s can enhance lung capacity, oxygenation, and minimize atelectasis. As regarding to level of participants practice toward endo-tracheal intubation.[13] Most (77.6%) of them had inadequate practice toward endo-tracheal intubation, while (22.4%) of them had adequate practice toward endo-tracheal intubation, due to insufficient practice among staff about endotracheal intubation, lack of years' experience, and lack training program. Our result compatible with Higgs et al., who study " Guidelines for the management of tracheal intubation in critically ill adults" reported that, human factors, which are the most frequent reason for medical mistakes, were frequently mentioned in NAP4 ICU reports. Up to half of ICU critical occurrences involve human factors deficiencies such inadequate patient preparation, inadequate equipment inspections, or protocol departure.[14] Moreover, Greenland, reported that, access to the patient is restricted by monitoring and equipment. Equipment for airways should be selected with care. Cognitive overload and poor decision-making can be brought on by complicated machinery or devices with numerous variations. Our result found that, (90.8%) of participants were had inadequate practice level about documentation.[15] The present study accepted with Winton et al., who mentioned that presence or absence of adverse events was recorded in 37% and 54%. All five elements were present in 8.2% and 25% of medical records of endotracheal intubation.[15] Moreover, Haza'a et al., who reported that, the mean score of participants were had inadequate practice during of endotracheal tube care.[16] The present study, there was statistically significant difference association between the level of participants practice regarding endo-tracheal intubation with demographic characteristics, toward age group, and years' experience at (p-value =0.024, 0.011) respectively.

Conclusion

Majority of anesthesia staff had inadequate practice toward endo-tracheal intubation procedure, while (22.4%) of them had adequate practice. There was statistically significant difference association between the level of participants practice regarding endo-tracheal intubation procedure with demographic characteristics regarding to age group, and years' experience at (p-value =0.024, 0.011) respectively.

Recommendations

Conducting training courses for anesthesia staff on the correct method of tracheal intubation. Awareness of anesthesia service providers about the risks of not adhering to the correct method. Anesthesia staff could be more motivated to have a better performance in their work.

Conflict of interest

No conflict of interest is associated with this work.

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