ASSESSMENT OF KNOWLEDGE REGARDING ENDOTRACHEAL SUCTIONING AMONG NURSES WORKING AT CRITICAL CARE UNITS OF TERTIARY CARE HOSPITAL PESHAWAR, PAKISTAN

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ABSTRACT

OBJECTIVES
To assess the knowledge of endotracheal suctioning among nurses working in Critical Care Units of Tertiary Care Hospital.

METHODOLOGY
This descriptive cross-sectional study was conducted from October 2019 to December 2019. A total of 110 nurses were selected from Critical Care Units of Tertiary Care Hospital Peshawar. Consecutive sampling technique was used for selecting sample. The knowledge was assessed by using a 25 items knowledge questionnaire.

RESULTS
The mean knowledge score was 11.06 with a standard deviation of 3.22. Score ranged from 2-25. Knowledge categories were based on percentage score. Among the participants 70.9% had poor knowledge, 22.7% had good knowledge, and 4.5% had very good knowledge while only 1.8% had excellent knowledge. There was no statistically significant difference in the mean knowledge score between different groups made on the bases of age, gender, and experience.

CONCLUSION
This study was designed to assess the knowledge of endotracheal suctioning among nurses working in the critical care units. Based on the findings of the study majority of nurses had poor knowledge about ET suctioning.

KEYWORDS: _Endo-Tracheal Suctioning, Nurses, ICUS, Knowledge, Critical Care_

INTRODUCTION

Endo Tracheal (ET) intubation is one of the important nursing skills for those patients who had diminished ability to breathe spontaneously.[1] In this procedure, a tube called endotracheal tube (ETT) is inserted into the airway of patient via oral cavity in-order to keep an artificial airway in unconscious or conscious patients with inability to breathe spontaneously.[2] But, once the patient is intubated he or she is unable to cough and this obstructs expectoration of mucus, therefore it increases production of airway secretions while decreases ability to expectorate and clear secretions.[3] Suctioning procedure is an alternative to normal muco-ciliary function which removes the respiratory secretions from the trachea of the unconscious patient who is unable to expel his/her secretions without support. In suctioning, respiratory secretions are removed from the pharynx or airway of unconscious patients through suction tube connected to a suction machine.[4] Suctioning of the endotracheal tube or endotracheal suctioning (ETS) is a common clinical procedure performed in patients with artificial airways i.e. endotracheal tube. It is mostly performed in ICU's patients who are either on mechanical ventilatory support or only with artificial airways.[5] In ETS lung's secretions are aspirated from a patient's endotracheal tube to stop its blockage. Assessment of different parameters like oxygen saturation, vital signs, respiratory flow, pressure, and tidal volume are mandatory before the initiation ET suctioning.[6] Much harm is associated with this clinical procedure so assessment of knowledge related suctioning and hygiene of endotracheal tube is essential.[7] Research guidelines offer information regarding ET suctioning which provide guidance for the procedure. Knowledge of these guidelines is very helpful to do ET suctioning in better way and to improve patient's outcomes.[8] An imperative professional responsibility of the nurse is to perform the procedure of ET suctioning with evidence based standard protocol to minimize and prevent complications. Research has uncovered that hypoxia is the most frequent complication of ET suctioning.[9] It is very important to know that suctioning may cause complications and one must know that for preventing those complications the best way is to not prolong the procedure than 15 seconds.[10] Sometime 0.9% normal saline solution is instilled into the ETT before suctioning but literature revealed that it may cause potential harm to the patient.[11] It is also vital to set the

suction machine at sufficiently high negative pressure (recommended a setting of 120mmHg) to effectively remove the secretions while preventing injury to the bronchial tree.[12] Nurses working at ICUs must have knowledge of proper suctioning and they should be adhered with the guidelines of proper suctioning techniques in order to prevent associated infections. Published studies revealed contradictory findings i.e. different knowledge as well as compliance score of ICU's nurses about ETT suctioning. Majority of the research studies stated that nurses had poor knowledge of the current guidelines of suctioning and nurse's practice is not according to guidelines i.e. their practice is centered on ritual and tradition.[13] In ICUs correct and timely judgments that is based on empirical evidence is very important skill.[14] Research demonstrates that nurses have low or lack of knowledge regarding the knowledge and practice guidelines of ET suctioning. Endotracheal suctioning is one of the important clinical procedures and it must be done according to practice guidelines.[15] Similarly, a study revealed that the knowledge and practice of nurses about endotracheal suctioning is average and poor.[16] This study was conducted to assess nurse's knowledge of endotracheal suctioning at ICUs and to find out any possible association of knowledge of ET suctioning with selected demographic variables.

METHODOLOGY

The descriptive cross sectional design was used to conduct the study from October 2019 to December 2019. In order to assess the knowledge of ET suctioning data were collected from nurses by adopted questionnaire including 25 questions in Critical Care Units in the tertiary care hospitals of Peshawar Pakistan. A consecutive sampling technique was used to include all accessible subjects as part of the sample. A total of 110 nurses were selected for the final study. All nurses having experience of at least one year were selected for the study, those who were not directly involved in patient's care were excluded. The questionnaire comprised of two sections. Part one included socio economic data such as age, sex, professional qualifications, total year of experience in years. Section-II had a total 25 questions regarding the knowledge of ET Suctioning. Permission was taken through official latters from heads of the departments. Informed written consent was secured from the study participants before the data collection. The data were analyzed with identifier numbers for every participant to maintain confidentiality. The data obtained from the nursing staff was entered in SPSS version 22 and analyzed by descriptive statistics and is presented in the form frequency tables and bar graphs for categorical

data. Mean and standard deviation was calculated for continuous data. T test was used to find association between knowledge and selected demographic variables.

RESULTS

The age of sample ranged from 21-50 years with mean age of 29.66, median of 30 and standard deviation of 4.44 years. 70.9% females while 29.1% males participated in the study. Age categories were made based on the age distribution of sample so as to have a minimum number under each class. The data given in Fig 1 below shows the majority of sample (69.1%) belongs to the younger age category (21-30)
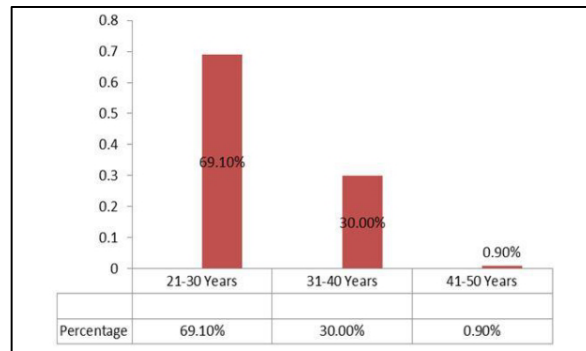

Figure 1: Age Categories of Participants

Among the study participants, 47.3% of nurses were Diploma in General Nursing & Midwifery (GNM), 49.1% were BS Nursing, 0.9% MS Nursing as shown in the figure below.
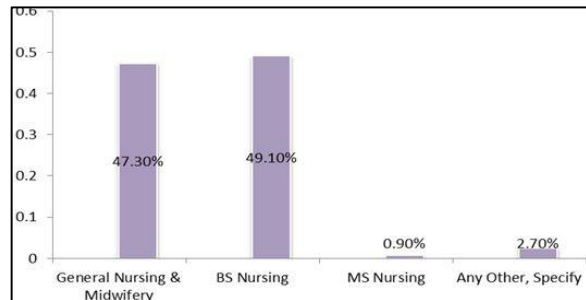

Figure 2: Level of Education

Almost half (47.3%) of the study participants had experience of 5 years and above while 22.7% had 3-4 years, 16.45% had 2-3 year's experience. Majority (68.2%) had not attended any training on Airway Suctioning while only 31.8% had attended training on Airway Suctioning. Mean and standard deviation of the knowledge score were calculated i.e. mean score was 11 with a standard deviation of 3.22. Minimum score was 2 while maximum was 25. Knowledge categories

were made based on percentage score. Percentage of below 50% was considered as Poor Knowledge, 51-60% was Good Knowledge, 60-80% was very Good while more than 80% score was considered as Excellent knowledge. Among the participants 70.9% has Poor Knowledge, 22.7% has Good Knowledge, and 4.5% has Very Good Knowledge while only 1.8% has Excellent Knowledge.
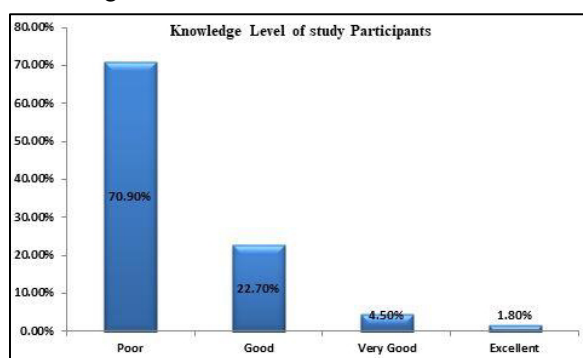

Figure 3: Knowledge Regarding ETT Sectioning

Independent t test was used to find out whether there is any significant difference in the mean knowledge score between age male and female. Mean score in male was 12.04 while in female mean knowledge score was 10.8. However the difference in mean knowledge scores between male and female was not statistically significant (P value 0.101). Further Independent t test was used to find out whether there is any significant difference in the mean knowledge score by Experience. Mean score for a group 1 having experience 0-4 years was 10.91, while for Group 2 who has experience of 5 years and above, mean knowledge score was 11.23. However the difference in mean knowledge scores between Group 1 and Group was not statistically significant (P value 0.609).

DISCUSSION

In this study mean knowledge score was 11.06 with a standard deviation of 3.22. Maximum possible score was 25 as the mean score is less than the half of maximum score which indicate that knowledge of nurses regarding ET suctioning was poor. This is similar to the result of a study which demonstrated a poor level of knowledge for many subjects.[10] The total knowledge score ranged from 2-25. The knowledge was also categorized into Poor, Good, Very Good and Excellent. Percentage of below 50% was considered as Poor Knowledge, 51-60% was Good Knowledge, 60-80% was Very Good while more than 80% score was considered as Excellent Knowledge. Among the participants 70.9% has Poor Knowledge, which is similar to the study conducted in UK which reported poor level of knowledge for nurses regarding ET

Suctioning.[17] The knowledge of nurses were compared with experience, gender and age but there was no statistically significant different in the mean knowledge score of the groups on the bases of experience, gender and age. This is similar to a study conducted on nurses to assess their knowledge regarding ET Suctioning which also reported no statistically significant difference in the mean knowledge score between the groups on the base of experience, gender and age.[18] Cross sectional studies of large scale as well as experimental studies are suggested to be undertaken to investigate the problems more accurately.

LIMITATIONS

The article may have a limited sample size, which may not be representative of the overall population of nurses who perform endotracheal suctioning in ICUs of tertiary Care.

CONCLUSIONS

Study findings revealed that knowledge of nurses regarding endotracheal tube suctioning is not up to the mark. Since suctioning is an important procedure, therefore it is mandatory for hospitals to arrange continuous education sessions for nurses regarding ETT suctioning to upgrade and update nurse's knowledge and skills regarding suctioning and other critical care procedures.

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REFERENCES

1. Pinto HJ, D'silva F, Sanil TS. Knowledge and practices of endotracheal suctioning amongst nursing professionals: a systematic review. Indian Journal of Critical Care Medicine: Peer-reviewed, Official Publication of Indian Society of Critical Care Medicine. 2020;24(1):23.
2. Negro A, Ranzani R, Villa M, Manara D. Survey of Italian intensive care unit nurse's knowledge about endotracheal suctioning guidelines. Intensive Crit Care Nurs 2014;30(6): 339-345.
3. Mwakanyanga ET, Masika GM, Tarimo EA. Intensive care nurse's knowledge and practice on endotracheal suctioning of the intubated patient: A quantitative cross-sectional observational study. PloS one. 2018. 16;13(8):e0201743.
4. Chen W, Hu S, Liu X, Wang N, Zhao J, Liu P, Chen K, Hu J. Intensive care nurse's knowledge and practice of evidence-based recommendations for endotracheal suctioning: a multisite cross-sectional study in Changsha, China. BMC nursing. 2021;20:1-2.
5. Yılmaz İ, Özden D. Evidence-based knowledge and emotional experiences of undergraduate nursing students regarding endotracheal suctioning: A cross-sectional, descriptive study. Intensive and Critical Care Nursing. 2021 Aug 1;65:103040.

6. Frota OP, Loureiro MD, Ferreira AM. Knowledge about endotraheal suctioning on the part of intensive care nursing professionals: a descriptive study. Online Brazilian Journal of Nursing. 2013;12(3):546-54.

7. Alkubati SA, Al-Sayaghi KM, Alrubaiee GG, Hamid MA, Saleh KA, Al-Qalah T, Al-Sadi AK. Adherence of critical care nurses to endotracheal suctioning guidelines: a cross-sectional study. BMC nursing. 2022 Nov 14;21(1):312.

8. Sole ML, Poalillo E, Byers JF, Ludy JE. Bacterial growth in secretions and on suctioning equipment of orally intubated patients: a pilot study. Am J Crit Care. 2002;11:141–149.

9. Nazmiyeh H, MirJalili M, Emami Maibodi R. Comparison of the effects of open and closed endotracheal suction on cardiovascular and ventilation parameters for patients undergoing mechanical ventilation. Journal of Rafsenjan University of Medical Sciences. 2010;9(2):97-106

10. Miller EK, Beavers LG, Mori B, Colquhoun H, Colella TJ, Brooks D. Assessing the clinical competence of health care professionals who perform airway suctioning in adults. Respiratory care. 2019 Jul 1;64(7):844-54.

11. Akgül, S. and Akyolcu, N. Effects of normal saline on endotracheal suctioning. Journal of Clinical Nursing, 2002; 11: 826–830.

12. Ashurst S. Nursing care of the mechanically ventilated patient in ITU. British Journal of Nursing, 2007; 6(8), 447–54

13. Day T, Iles N, Griffiths P (2009) Effect of performance feedback on tracheal suctioning knowledge and skills: randomized controlled trial. J Adv Nurs 2009; 65(7): 1423-1431.

14. Ebrahimi HK, Jafarnejad S, Sohrabi S, Abbasi A, Esmaeilian S. Effect of simulation-based suction education on the knowledge and performance of pediatric intensive care unit nurses. Journal of Critical Reviews. 2020;7(4):685-94.

15. Wood C J. Can nurses safely assess the need for endotracheal suction in short – term ventilated patients, instead of using routine techniques? Crit Care Nurs 1998; 14:170-178.

16. Varghese ST, Moly KT. Exploratory study on the knowledge and skill of critical care nurses on endotracheal suctioning. The Journal of National Accreditation Board for Hospitals & Healthcare Providers. 2016; 3(1):13-19

17. Day T, Farnell S, Hayness S, Wainwright S, Wilson J. Tracheal suctioning: an exploration of knowledge and high dependency ward areas, J Adv Nurs 2002 Jul;39 (1):35-45

18. Nishamol Y. A study to assess the knowledge and practice of endotracheal suctioning among neuronurses SCTISMT. 2017.

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