Nurses' Knowledge toward Prevention of Pneumothorax at Intensive Care Unit in AL-Hussein Medical City Hospital in Holy Karbala/Iraq

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Abstract

Aims: The study aims at assess nurses knowledge towards Pneumothorax and determine the relationship of those knowledge with their demographic characteristics.

Methodology: To investigate nurse information relevant to Pneumothorax at Intensive Care Unit, a quantitative descriptive analysis used to assess approach with questionnaire items is performed. Throughout the non-probability sampling method, a purposive random sample of (30) nurses is chosen. A constructed questionnaire includes (socio-demographic data and knowledge questionnaire items), data was collection through the use of a questionnaire and self report nurses. Through the application the descriptive statistic, data were analyzed.

Results: According to the analysis mean, the findings indicate that the majority (96**.7** %) of nurses were poor knowledge. As well as, there were no significant relationship between nurses knowledge and their demographic characteristics at p-value more than 0.05.

Conclusion: This research found knowledge in terms of Pneumothorax, nurses were poor knowledge. More years of experience in training the staff in intensive care unit and provide the health resources and exploiting young energies of nurses which indeed helps to develop their knowledge.

Keywords*: Knowledge, Nurses, Pneumothorax, Prevention, Intensive Care Unit.*

Introduction

The presence of air in the pleural cavity, known as pneumothorax, is a serious complication of mechanical ventilation that is linked to increased morbidity and mortality. It is a life-threatening condition found in the differential diagnosis of respiratory failure and chest pain, and it necessitates prompt identification and treatment [1]. Extra pulmonary air builds up in the chest, usually as a result of air leakage from the lungs. Pneumothorax may be either spontaneous or iatrogenic, with the latter being more widespread worldwide. According to the cause, pneumothorax may be classified as major, secondary, iatrogenic, or traumatic. In an intensive care unit, mechanical ventilation was discovered to be the most common cause of iatrogenic pneumothorax (ICU) [2].

Pneumothorax in intubated patients with normal lungs is uncommon, and the majority of patients with Pneumothorax Due to Mechanical Ventilation (PRMV) have underlying lung diseases ranging from primary obstructive pulmonary disease to secondary pneumonia and acute respiratory distress syndrome (ARDS) [3]. Pneumothorax can be difficult to identify in critically ill patients since they have a variety of clinical presentations and their positions are atypical and complicated by other disease processes [4]. Patients that undergo artificial ventilation have a 4 percent -15 percent chance of developing barotrauma. Depending on the severity and length of ARDS, as well as the type of ventilator used for management, a 14 percent to 87 percent chance of Pneumothorax has been registered [5]. A previous study showed that when protective lung strategies were

implemented in pediatric patients with extreme ARDS, the rate of Pneumothorax decreased. The occurrence of barotrauma in postoperative patients has been stated to be as low as 0.5 percent [6].

Methodology

To investigate nurse information relevant to Pneumothorax at Intensive Care Unit, a quantitative descriptive analysis used to assess approach with questionnaire items is performed. Throughout the non-probability sampling method, a purposive random sample of (30) nurses is chosen. A constructed questionnaire includes (socio-demographic data and knowledge questionnaire items), data was collection through the use of a questionnaire and self report nurses. Through the application the descriptive statistic, data were analyzed. "Frequencies and percentages, mean+ S.d. "Poor knowledge (mean <1.5), Good knowledge (mean ≥1.5)"

Results and Discussion

Descriptive Statistic of Demographic Factors -Table 1:-

Our findings represents the distribution of the nurses their demographic characteristics in term of frequencies and percentage. The nurses' ages ranged from 20 to 29 years old, and the majority of (83.3%) respectively. Gender related to results showed that male nurses predominated , accounting for 60% of the total, respectively, and residents in urban areas. This results come because the nature of the nursing profession, male nurses were accounted for most of the nursing staff, and all nurses who work in intensive care unit need to be young to cover all duties in this units. Also, this may be due to the fact that males cover night duties while females does not.

In terms of marital status, nurses were married and constituted (76%), due to most of these age groups are the age of marriage.

In terms of education, diploma nurses graduated, accounting 56.75 percent. As being the diploma degree were considered the major proportion of staff nurses in health organization, due to the large number of institutions that graduate such degrees. Also, this result come because of the hospital wards are totally depends on nurses who graduated from nursing institute and nursing secondary school while nurses who graduated from nursing college are allocated in special units as well as they are still in small number compared to other nurses.

The majority of findings participants had less than 5 years of experience and made up 53.3 percent. In addition, in both classes of studied nurses who did not attend a training session, which made up (46.7 percent) as being the few years of nursing experience in intensive care unit could be explained by the fact that have a frequent rotating from one unit to another within the hospital.

The above our findings of demographic variables come in the same line with findings of study conducted in Public Hospitals in Sana'a City-Yemen. Their results of the study showed that 51 percent are males, and 52 percent are married, have work experience of less than five years, and do not participate in training courses [7].

Also, our findings come consisting with study conducted in Baghdad City at critical care unit. The findings of this study illustrated that (64%) of the study sample were males and (58%) at age group (20-29) years old, (52 %) were married, (46 %) were graduate from Institute, (66%) had (1-5 years) experience in critical unit [8].

Table1: Descriptive Statistic Nurses Demographic Variables

Demographic Data	Groups	Freq.	%
Age / Years	20-29 years	25	83.3
	30-39 years	4	13.3
	40-49 years	1	3.3
	50 and older	0	0.0
Gender	Male	18	60.0
	Female	12	40.0
Residence	Urban	22	73.3
	Rural	8	26.7
Marital Status	Single	6	20.0
	Married	23	76.7
	Widow	1	3.3
Education level	School nursing	5	16.7
	Diploma	17	56.7
	Bachelor's	8	26.7
Years of experience	<5 years	16	53.3
	5-10 years	9	30.0
	>10 years	5	16.7
Training session in nursing	No	14	46.7
	1 session	9	30.0
	2 sessions	4	13.3
	≥ 3 sessions	3	10.0

Table 2:Relationship between nurses responses and their Demographic Data

Demographic Data	Chi-Square Value	D.f	P-Value
Age /years	0.207	2	0.902 NS
Gender	0.690	1	0.406 NS
Residency	2.845	1	0.092 NS
Marital Status	0.315	2	0.854 NS
Level of Education	0.791	2	0.673 NS
Years of Experience	0.905	2	0.636 NS
Training Sessions	1.182	3	0.757 NS

(Freq.): Frequency, (%): percentage

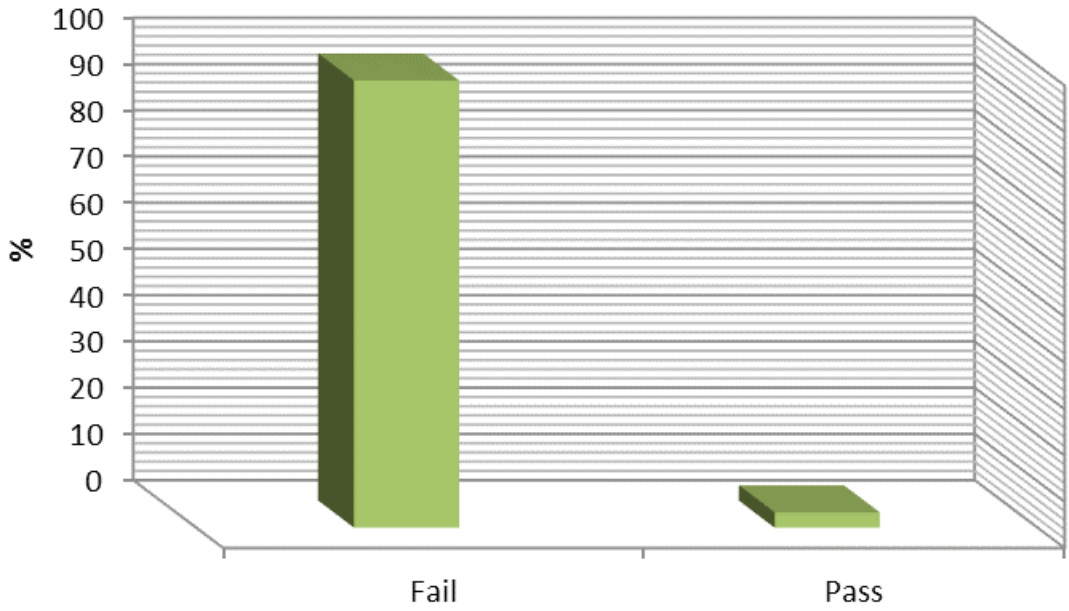

Figure 1: Overall Nurses Knowledge Responses

Nurses knowledge towards Pneumothorax Figure 1:-

The study results indicate that the nurses were fail knowledge towards prevention of pneumothorax attendant with mechanical ventilation (Mean <1.5). Due to less years of experience and limitation of training, add to that education attainment (if Bachelor's graduated better than Diploma in those importance area of care). This result reflects the need of education regarding prevention of pneumothorax attendant with mechanical ventilation. This results agree with results of Kesieme et al. (2016), who conducted study deals with nurses knowledge at intensive care unit Nigerian semi urban university hospital. Their findings illustrated that nurses with poor knowledge and need more training to qualified it [9].

The deficit knowledge regarding prevention of pneumothorax attendant with mechanical ventilation might be due to several reasons; the nurses do not develop and update their knowledge continuously, most of nurses who work in health institutions quit book reading so they do not follow up and only indulge in nursing practices, consequently they became unable to remember some information particularly the knowledge that related to pneumothorax.

Moreover, in a study of Markle (2014), stated study deals with common complications of mechanical ventilation. Find the knowledge has been associated with prevention of complication due to less of experience and limitation of training [10].

As well as, study of Hadi and Abdul-Wahhab (2016), conducted study deals with nurses knowledge towards mechanical ventilation. Their findings confirmed that need to special training programs to promote nurses knowledge concerning mechanical ventilation (especially in weaning and endotracheal suctioning techniques) added to that Encourage the nurses to complete their academic study to be equipped with advance skills& knowledge that enable them to provide efficient care [8].

The main goal of management should be to reduce as much as possible any potentially harmful effects of mechanical ventilation while ensuring adequate gas exchange. This needs to adequately qualify the nursing staff [11]. As well as, nurses work at Intensive Care Units in Mansura University Emergency Hospital were unsatisfactory knowledge to management of patients

with pneumothorax and mechanical ventilation. Its need to be trained enough to give effective and safe care to such patients [12].

Furthermore, our findings disagree with finding of study include 100 nurses who work at intensive care unit assessed for their knowledge towards respiratory distress syndrome and mechanical ventilation. The findings demonstrated the overall nurses knowledge were good level, it constituted 68% as a majority, due to the nurses work in those area were Bachelor graduated and participated in training sessions [13].

Relationship between nurses responses and their Demographic Data -Table 2:-

Findings shows that there is a non-significant association between the nurses knowledge and their demographic data at p-value more than 0.05. This results come with findings of Hamel and Ahmed (2020), who depicted there were non-significant relationship between nurses knowledge in intensive care unit and their demographic characteristics [14]. Also Arrar and Mohammed (2020), confirmed in their findings Illustrated that not all intensive care unit nurses were trained adequately on the nursing care guide in the ICU, approved by Iraqi Ministry of Health. That there are non-significant differences between demographical data with their knowledge [15].

Conclusion

This research found knowledge in terms of Pneumothorax, nurses were poor knowledge. More years of experience in training the staff in intensive care unit and provide the health resources and exploiting young energies of nurses which indeed helps to develop their knowledge.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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References

1. Hsu CW, Sun SF. Iatrogenic pneumothorax related to mechanical ventilation. World journal of critical care medicine. 2014 Feb 4;3(1):8.
2. El-Nawawy AA, Al-Halawany AS, Antonios MA, Newegy RG. Prevalence and risk factors of pneumothorax among patients admitted to a Pediatric Intensive Care Unit. Indian journal of critical care medicine: peer-reviewed, official publication of Indian Society of Critical Care Medicine. 2016 Aug;20(8):453.
3. Hadzic D, Skokic F, Husaric E, Alihodzic H, Softic D, Kovacevic D. Risk factors and outcome of neonatal pneumothorax in Tuzla Canton. Materia socio-medica. 2019 Mar;31(1):66.
4. Sartelli M, Chichom-Mefire A, Labricciosa FM, Hardcastle T, Abu-Zidan FM, Adesunkanmi AK, Ansaloni L, Bala M, Balogh ZJ, Beltran MA, Ben-Ishay O. The management of intra-abdominal infections from a global perspective: 2017 WSES guidelines for management of intra-abdominal infections. World Journal of Emergency Surgery. 2017 Dec;12(1):1-34.
5. Yarmus L, Feller-Kopman D. Pneumothorax in the critically ill patient. Chest. 2012 Apr 1;141(4):1098-105.
6. Villar J, Ferrando C, Martínez D, Ambrós A, Muñoz T, Soler JA, Aguilar G, Alba F, González-Higueras E, Conesa LA, Martín-Rodríguez C. Dexamethasone treatment for the acute respiratory distress syndrome: a multicentre, randomised controlled trial. The Lancet Respiratory Medicine. 2020 Mar 1;8(3):267-76.
7. Al-Gunaid AA. *Knowledge and Practice of Intensive Care Nurses Towards Weaning Criteria From Mechanical Ventilation at Public Hospitals in Sana'a City-Yemen* (Doctoral dissertation, Al-Razi University).
8. El-Feky HA. Intensive Care Nurses' Self Reported versus Observed Mastery of Competencies at a University Teaching Hospitals-Cairo.
9. Kesieme EB, Essu IS, Arekhandia BJ, Welcker K, Prisadov G. Nurses' knowledge of care of chest drain: A survey in a Nigerian Semiurban University Hospital. Annals of African medicine. 2016 Jan;15(1):28.
10. Markle AG. *Common complications of mechanical ventilation and multimodal prevention strategies*

(Doctoral dissertation, University of Zagreb. School of Medicine. Department of Anaesthesiology, Resuscitation and Intensive Care in Surgical Specialities).

11. Chiumello D, Brochard L, Marini JJ, Slutsky AS, Mancebo J, Ranieri VM, Thompson BT, Papazian L, Schultz MJ, Amato M, Gattinoni L. Respiratory support in patients with acute respiratory distress syndrome: an expert opinion. Critical care. 2017 Dec;21(1):1-8.
12. Hesham S. Assessment of nurses' performance regarding management of patients on mechanical ventilator. Port Said Scientific Journal of Nursing. 2016 Jun 1;3(1):161-77.
13. Alridh MS, Arrar AA, Al-Abedi GA. Nurse's of knowledge toward respiratory distress syndrome to have children Maysan Hospital for Child and Childbirth. Indian Journal of Forensic Medicine & Toxicology. 2019 Oct;13(4):1062-7.
14. Hamel OL, Ahmed SA. Effectiveness of an Educational Program on Nurses' Knowledge and Practices Regarding Nursing Interventions of Chest Tube Drainage System in Ibn Alnafees Teaching Hospital. Indian Journal of Public Health Research & Development. 2020 Apr 1;11(4).
15. Arrar AA, Mohammed SJ. Evaluation of Nurses' Knowledge and Practices Concerning Nursing Care Guide in the Intensive Care Unit in Misan Governorate Hospitals. kufa Journal for Nursing sciences. 2020;10(1).