Original Article

Intensive Care Nurses' Knowledge and Practice of Endotracheal Suctioning Intubated Patients in Tertiary Care Public Sector Hospitals in Karachi, Pakistan

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ABSTRACT

Endotracheal suctioning is a prime and most common invasive procedure accomplished by inserting an artificial tube in the patient's airway. **Objectives:** To evaluate nurses' knowledge and practice regarding intubated patients' endotracheal suctioning in the intensive care units in the tertiary care hospitals of Karachi, Pakistan. **Methods:** The descriptive cross-sectional study design was employed on intensive care unit nurses from two tertiary care public sector hospitals. A validated and adopted questionnaire was used to collect data. Data were entered and analyzed by using SPSS version 21. A p-value ≤ 0.05 was considered as significant. **Results:** Out of a total of 80 nurses, 57.5% of the participants were males. Male participants' mean knowledge level of ES was 9.0 with SD 2.1 and females with 9.9 with SD 2.3. The mean knowledge level of the female participants was higher than male. Insignificant differences were found among the mean knowledge levels of the male and female participants, with a p-value of p=0.075. Furthermore, the mean score (11.4 ± 1.1 SD) of the practice level of male participants was higher than the mean score (10.8 ± 1.3 SD) of female participants. An insignificant difference was found between the mean practice level of males and females, with a p-value of p=0.126. **Conclusions:** It was concluded that the study's participants working in ICUs of tertiary care hospitals have good knowledge and practice of endotracheal suctioning.

INTRODUCTION

Endotracheal suctioning (ES) is a prime and most common invasive procedure accomplished by inserting an artificial tube in the patient's airway [1]. This procedure removes accumulated pulmonary exudation from the respiratory airway and endotracheal tube of intubated patient [2, 3]. The available suction method is utilized only when the ventilator is removed from the patient and the ventilator is connected during a closed system [4]. The ratio of nosocomial contamination is 40% in advanced countries [5]. The suitable performance of ES directly affects the patient's prognosis [6]. Consequently, all intensive care nurses should have proper, sufficient, and appropriate training regarding the performance of this intervention [7]. Furthermore, nursing science provides the knowledge and skill to nurses to deliver quality care to the patient [8]. Performing inappropriate endotracheal tube suctioning practices is a global problem and persisting in the health care facilities [9]. In developed countries, the patient hospitalization ratio is 10% compared to developing countries, with almost 25% of hospital-acquired infections, prolonged hospital stays, and high financial burden, morbidity, and mortality. It is randomly distributed

in lower-middle-income countries, and above 90% of these infections arisen [10-12]. Nurses has not been trained for proper endotracheal training, which can lead to recurrent harmful effects and complications of ES, like hypoxia, bronchospasm, atelectasis, tracheal tissue injury, ventilator-associate pneumonia, rise in intracranial pressure, and cardiac dysrhythmia [13-15]. The gap recognized that nurses working in ICUs of Tertiary care hospitals in the region have average knowledge of ET suctioning, though their practices were sound. This study aimed to determine the knowledge and practices of intensive care nurses' performance in endotracheal suctioning intubated patients at selected hospitals in Karachi, Pakistan.

METHODS

The present cross-sectional study was accomplished at Dr. Ruth KM. Pfau Civil Hospital Karachi and Dow University Hospital, Karachi for the period of six months from July 2020 to December 2020. All bed-sided ICU nurses working full time were included in this study. Nurses with a general nursing diploma, BSN or Post RN BScN, valid licenses from the Pakistan Council, and one year in ICU were enrolled for the study. Student nurses, nursing assistants, nursing managers, and infection control nurses were excluded. Universal sampling techniques were applied to approach the subjects. Written informed consent was obtained from all participants before data collection and subjects participated voluntarily. Confidentiality of data was assured. A validated and adopted questionnaire was used for data collection. The questionnaire was explicitly explained to all participants. Ethical approval was taken from the Institutional Review Committee (IRC) of the Institute of Nursing, Dow University of Health Sciences, Karachi, and permission was obtained from respective relevant authorities of both Hospitals. Data were entered and analyzed in SPSS version 21.0. Qualitative variables were presented in frequency and percentages and quantitative variables were computed in mean and standard deviation. Moreover, the practice score of endotracheal tube suctioning among participants was determined by utilizing standard deviation. A p-value ≤ 0.05 was considered as significant.

RESULTS

Table 1 disclosed the demographic characteristics of the study participants. The sample size of this study was eighty participants (n=80), ICUs Nurses from two different tertiary care hospitals in Karachi. The larger number of the participants were males (57.5%) and the remaining were females (42.5%). The academic educational level of the majority of participants was intermediate, n=35(43.75%), matric level participants were n=23(28.45%), and

Bachelor's level was n=22(27.50%). The professional qualification of the majority of the participant was a diploma in general nursing n=47(58.75%), Post RN/Generics BSN n=33(41.25%). The duration of experience of the participants was calculated. 35% of the participants had the most extended period of job experience of 5 years, 22.5% of the participants had ten years of experience, and 22.5% had 20 years of experience. 15% of the participants had 15.5% years of experience. The majority (58.8%) of participants had five years of ICU experience, 21.2% had ten years of ICU experience, 15% had 15 years of experience at ICU, and 3.8% had >20 years of experience in ICU.

Factors	Variable	Frequency (%)
Gender	Male	46 (57.5%)
	Female	34 (42.5%)
Academic Education	Matrices	23 (28.75%)
	Intermediate	35 (43.75%)
	Bachelor	22 (27.5%)
Professional Education	Diploma	47 (58.8%)
	BSc Post RN, BSN	33 (41.2%)
Experiences	1-5 year	28 (35%)
	6-10 year	18 (22.5%)
	11-15year	12 (15%)
	16-20year	18 (22.5%)
	21-25year	4 (5%)
ICUs Experiences	1-5year	47 (58.8%)
	6-10year	17 (21.2%)
	11-15year	12 (15%)
	16-20year	3 (3.8%)
	21-25year	1 (1.2%)
Over, all age Mean	Mean + SD 32.4 + 5.444	

Table 1: Demographic Characteristics of study participants (n=80)

Table 2 exhibits the mean knowledge level of endotracheal suctioning among ICU nurses. Male participants' mean knowledge level of ES was 9.0 with SD 2.1 and females with 9.9 with SD 2.3. The results revealed that the mean knowledge level of the female participants was higher than males. Insignificant differences were found among the mean knowledge levels of the male and female participants, with a p-value of p=0.075. The study results showed that the mean knowledge level of ICU nurses regarding ES of the Dr. Ruth KM Pfau Civil Hospital was higher with a mean 10.4 (SD 1.8) compared to Dow University Hospital with a mean of 8.7 (SD 2.2). A significant difference was found among the knowledge levels of nurses working in the ICUs of Civil Hospital and Dow University Hospital with a P value of p<0.05 (0.0001). A significant difference was found among the education levels of nurses working in the ICUs of Civil Hospital and the Dow University of Hospital with a p-value of <0.05 (0.001). On the other hand, an insignificant difference was found in the professional education of nurses working in the ICUs of Civil Hospital

and Dow University Hospital with a p-value of <0.05 (0.229). In addition, a significant difference was found among the job experiences of nurses working in the ICUs of Civil Hospital and the Dow University of Hospital with a p-value of <0.05 (0.0001). ICU experiences of more than five years were high at 9.9 (SD 2.0) compared to those of less than five years of ICU experience at 8.9 (SD 2.3). Additionally, a significant difference was established among the job experiences of nurses working in the ICUs of Civil Hospital and the Dow University of Hospital with a p-value of <0.05 (0.042). Nurse patient ratio of more than three patients was high at 10.4 (SD 1.9) as compared to nurses who assigned more than 03 patients, 8.8 (SD 2.2) Significant difference was found in the nurse-patient ratio of nurses working in the ICUs of Civil Hospital and Dow University Hospital with a p-value of <0.05 (0.002).

Factors		Knowledge Score Mean ± SD	p-Value
Gender	Male	9.0 ± 2.1	0.075
	Female	9.9 ± 2.3	
Nurses I/D	Dow Hospital	8.7 ± 2.2	0.0001
	Civil Hospital	10.4 ± 1.8	
Education	Matric	10.7 ± 2.1	0.001
	Intermediate	9.0 ± 2.1	
	B. Sc	8.5 ± 2.0	
Professional Education	Diploma	9.1 ± 2.3	0.229
	Post-R/N	9.7 ± 2.1	
Job experience	<10	8.6 ± 2.0	<0.0001
	>10	10.3 ± 2.2	
ICUs Experience	<5	8.9 ± 2.3	0.042
	>5	9.9 ± 2.0	
Nurse Patient Ratio	1:<3	8.8 ± 2.2	0.002
	1:>3	10.4 ± s1.9	

Table 2: Mean of Knowledge level about Endotracheal Suctioning among ICU nurses (n=80)

Table 3 reveal the mean practice level for endotracheal suctioning among ICU nurses. The findings of this study showed that the mean score (11.4 ± 1.1 SD) of the practice level of male participants was higher than the mean score (10.8 ± 1.3 SD) of female participants. An insignificant difference was found between the mean practice level of males and females, with a p-value of p=0.126. An insignificant difference was found among nurses working in the ICUs of Civil Hospital and Dow University Hospital with a P-value of p<0.05 (0.06). A significant difference was found between Civil Hospital and Dow University Hospital's professional education, p-value <0.05 (0.01). Insignificant difference was established among the job experiences of nurses working in the ICUs of Civil Hospital and the Dow University of Hospital with a p-value of <0.05 (0.393). Insignificant difference was computed among the job experiences of nurses working in the ICUs of Civil Hospital

and the Dow University of Hospital with a p-value of <0.05 (0.164). Nurse patient ratio of more than three patients was high at 11.2 (SD 1.2) as compared to nurses who assigned more than 03 patients, 10.3 (SD 1.2) Insignificant difference was determined among the nurse-patient ratio of nurses working in the ICUs of Civil Hospital and Dow University Hospital with a p-value of <0.05 (0.148).

Factors		Practice Score Mean ± SD	p-Value
Gender	Male	11.4 ± 1.1	0.126
	Female	10.8 ± 1.3	
Nurses I/D	Dow Hospital	11.2 ± 1.2	0.6
	Civil Hospital	11.0 ± 1.2	
Education	Matric	10.3 ± 1.0	0.032
	Intermediate	11.6 ± 1.1	
	B. Sc	11.2 ± 1.2	
Professional Education	Diploma	10.7 ± 1.1	0.01
	Post-R/N	11.7 ± 1.1	
Job experience	<10	11.3 ± 1.2	0.393
	>10	10.9 ± 1.1	
ICUs Experience	<5	11.0 ± 1.2	0.164
	>5	11.7 ± 1.2	
Nurse Patient Ratio	1:<3	11.3 ± 1.2	0.148
	1:>3	10.6 ± 1.1	

Table 3: Mean of Practice level for Endotracheal Suctioning among ICU nurses (n=80)

DISCUSSION

This study aimed to assess the knowledge and Practice of ICU nurses regarding ES of the intubated patient at two selected public hospitals in Karachi. At Civil hospital, nurses' knowledge was reasonable compared to Dow hospital. In contrast, practices were the same in both hospitals. It was found that the mean score and standard deviation of nurses for knowledge were (10.4 ± 1.8 SD), respectively, which disclosed that almost all nurses have a good understanding. However, the mean score and standard deviation of practice were (11.2 ± 1.2 SD) respectively. Similarly, a study conducted in Ethiopia in 2017 showed that the mean and standard deviation of nurses' knowledge was (11.14 ± 2.68 SD). In comparison, the mean score and standard deviation of practice were 16.11 ± and 4.14 SD) respectively. 80% of the participants had poor practice, and only 20% of nurses had fair practice. A good score was not observed equally in knowledge and practice [16]. In general, the consequence of this study recommends that using the standard of ES is further effective. However, the positive effects of using the unified methods in the standard ES technique are well-known by numerous nurses, but they do not apply it regularly. The reason for this can be accomplished as follows, lack of awareness of nurses about positive possessions of consuming regular ES procedure; deficiency of average

strategies or checklist in the practice of nurture involvements; training of nurses on relating to ES lack of nurses in ICU and absence of continuous supervision [17]. A similar study in Turkey in 2017 showed nurses' knowledge at a very good level (59.7%) and a reasonable level (34.7%) [18]. A study carried out in India in 2016 reported that only 42% of nurses washed hands before and 28% of nurses after suctioning, 88% used a face mask, 46% of participants kept sterility of the suction catheter up until introduced into the airway and investigator recognized that in most cases suction catheter was touched with the patient linen and with non-sterile gloves. However, ES specified on the recommendation of AARC that it was a sterilized procedure. Nurses working in India revealed that 7% of staff nurses had inadequate knowledge, 73% had moderate knowledge, and 20% had adequate knowledge [19]. While the results of a recent study presented a mean knowledge of the participants regarding ES, which was 50.04%±18.963%, and the mean practice was 80.37%±8.37. The Practice of Nurses associated with ES occupying a different part of the world was similarly significant. Nurses working at Nepal teaching hospital had better practice than knowledge [20]. The nurse's knowledge regarding the levels of pre, during, and post tracheal suctioning applies and its complications in Aga Khan University, Karachi Pakistan, determined that the suggestion based applies approaches were monitored and continued by the health care specialists and performance a dynamic role in improving and wellbeing of the patient [21].

C O N C L U S I O N S

It is concluded that the study's participants working in ICUs of tertiary care hospitals have good knowledge and practice of endotracheal suctioning. Knowledge of endotracheal suctioning was found to be a statistically significant association with gender and practice with professional education. Nurses need provision, education, and drill relating to endotracheal suctioning

Conflicts of Interest

The authors declare no conflict of interest.

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R E F E R E N C E S

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