



## Review of Compliance with the Standard Care for Tracheostomy and Endotracheal Tube in Nurses Working in Intensive Care Units in Ahwaz Golestan Hospital

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### ABSTRACT

One of the fundamental steps in the intensive care unit is maintaining an open airway, and if the procedure is not done properly for patients, it is accompanied with many complications. Thus the aim of this study was to evaluate compliance with the standard care of tracheostomy and endotracheal tube in nurses working in intensive care units in Golestan hospital in Ahwaz. In this descriptive cross-sectional study, by the completion of observational checklist containing 31 questions relating to the care standards of endotracheal tube and tracheostomy and a questionnaire, demographic information of 72 nurses working in the intensive care unit in Ahwaz Golestan hospital in 2015 were asked. To verify the validity of the questionnaire, the viewpoints of professors of nursing were used and the reliability of the questionnaire was verified by agreement between the present observers. Eventually, the data collected was analyzed using descriptive statistics and Kruskal-Wallis test, Mann Whitney U and Pearson correlation coefficients using SPSS version 20. The mean score of nurses in standard care of endotracheal tube and tracheostomy was  $51/10 \pm 45/78$  respectively. Also significant positive relationship was observed between age and occupational characteristics of nurses and their performance in the care of the airways ( $05/0 > P$ ). According to the results, despite of optimal performance of personnel, some nursing practices in the care of artificial airway are not done properly which need more control and supervision. Therefore, it is necessary to provide regular training programs in the field of artificial airway and optimal care in critically ill patients is crucial.

**Keywords:** standard care, intensive care, tracheostomy, endotracheal tube

### INTRODUCTION

As a principle, maintaining the airway is considered the first step of treatment in all patients who were in a critical condition incompatible with life and have suffered from loss of consciousness or difficulty breathing [1]. Occasionally, patients need artificial airway which is one of the most common forms of treatment in the intensive care unit [2]. Endotracheal tube and tracheostomy are considered as artificial airways [3,4]. Despite of their advantages, destroying the natural cleaning mechanisms of the airways such as cough can disrupt normal function of the respiratory system and provides a direct vent for microbes to enter and since they are a foreign body in the tracheostomy, pulmonary secretions will be increased [5,6]. Tracheostomy suctioning and endotracheal tube are widely used in intensive care unit regardless of whether patients are receiving mechanical ventilation or not [7]. Thus, it is imperative to increase oxygen, cleaning and keeping an open air for ducts and discharge of secretions [8,9] and given that nurses as the health care providers likely to encounter patients [10], should be legally and morally accountable in terms of quality of provided care [11]. Therefore, improving the quality of their care could

enhance the improvement of patients. In addition, the proper care and compliance with the standard care of the airways reduce the duration of hospital stay, lower costs reduce risk and mentioned complications and also reduce stress and improve the quality of life of the patient and his family [12].

Since in recent years, the intensive care unit has significantly helped to the management of intense and complex diseases, enhancing the care quality in these sectors is very important. Also according to the importance and role of proper ventilation in the function of the different systems of body, patients requiring ventilator support to prevent complications and promote treatment by a set of particular care that must be done properly. As nurses have a significant role in the care of these patients and care should be mainly done by them, thus enhancing the quality of care is the most important factor that could hasten healing [13]. Because of the importance of this issue, this study was conducted to evaluate the compliance with standard of care for tracheostomy and endotracheal tube of nurses working in the intensive care unit of Golestan hospital in Ahvaz.

### **Procedure**

In this descriptive cross - sectional study which was conducted from October to March 2015, the study population consisted of nurses working in intensive care unit of Golestan hospital in Ahvaz. The sample was 72 eligible nurses who were selected based on convenience sampling. The inclusion criteria were personal desire of nurses with a bachelor's degree, at least one year experience in current department and complete filling out of questionnaires. Also during the study, the participant could exclude from the study by their own permission. All ethical considerations should be observed in various stages of research. After confirming the thesis, it was scientifically and ethically examined by Research Council of University of Medical Sciences in Khorseگان and after the permission of the university authorities and hospitals, collection of data was began. Questionnaires were anonymous and people were justified about the nature and objectives of the research. To participate in the study was free and information was obtained by their consent. To collect data in this study, demographic questionnaire and observational checklist were used. Questions related to demographic data, including age of nurses, work experience, education, and work shift and .... Observational checklist was prepared by using valid scientific sources and guidelines of Nurses Association of America, Europe, and nursing books and was approved by experts. Observational checklist evaluated the manner of artificial airway care in patients based on the Likert scale. In the 31 questions about the measures that have been systematically implemented by nurses, standard care of endotracheal tube and tracheostomy was scored 1, the measures that have not been done systematically were scored 0/5 and the measures that have not been undertaken by nurses were scored 0. The range of scores from the set of measures was 31-0. At the end, the total score of each person from the checklist was calculated as a percentage. The cutoff point of compliance with existing standards was determined minimum score of 80% (Moseazadeh), so that 80 to 100 rating was considered favorable, 60 to 80 need to reform and less than 60 was considered as unfavorable rating. After attending the ward, the observational checklist was completed in different working shifts (morning, noon and evening) and by direct observation of nursing practice and the previous notification by the researcher, so that nurses were completely aware of the presence of the researchers and examining their performance. At the end of the study, completed demographic questionnaire was collected from the subjects. In the present study, to determine the validity of the scientific content, the checklist was given to ten specialists and faculty members of nursing and midwifery in Isfahan and Ahwaz and after consultation with professors and their viewpoint, the final checklist was prepared to determine its reliability. To determine the scientific reliability of the checklist, agreement between observers (assessment) was used.

For this purpose, the checklist was given to the second observer and two observers simultaneously evaluated the performance of ten nurses according to the checklist. Then the scores of view of two observers were calculated by correlation coefficient that it was 95.8 %, respectively. Data collected was analyzed by using descriptive statistics (frequency, mean and standard deviation) and parametric and non-parametric analysis by 20 SPSS software.

### **Findings**

The study examined 72 nurses working in an intensive care unit of Golestan hospital in Ahvaz with an average age of  $9/11 \pm 34/37$  years. The overall average of work experience of workers surveyed was  $8/85 \pm 5/09$  years and the mean work experience in a special section was  $4/00 \pm 7/06$  years (Table 1).

**Table 1: Frequency distribution of research units based on the demographic characteristics**

Variable	Standard Deviation	Mean	Percent	Number	Category
<b>Gender</b>	---	---	0.0	0	Male
			100.0	72	Female
<b>Age</b>	9.11	37.34	41.7	30	30-20 years 40-31 years 50-41 years
			54.2	39	
			4.2	3	
<b>Marital status</b>	---	---	38.9	28	Single
			61.1	44	Married
<b>Employment</b>	---	---	18.1	13	Contractual Official Projective
			58.3	42	
			22.2	16	
			1.4	1	
<b>Work experience</b>	4.81	9.26	16.7	12	Less than 5 years
			51.4	37	10.5 years 15-10 years 20-15 years 25-20 years
			22.2	16	
			6.9	5	
			2.8	2	
<b>Work experience in intensive unit</b>	4.00	7.06	31.9	23	less than 5 years 10.5 years 15-10 years 20-15 years
			52.8	38	
			2.8	2	
<b>Working shift</b>	---	---	16.7	12	morning
			0.0	0	noon
			1.4	1	night
			81.9	59	in circulation
<b>Record of course</b>	---	---	76.4	55	yes
			23.6	17	no
<b>Total</b>			100.0	72	

Findings from the study indicate that among the care standards of endotracheal suctioning and tracheostomy, the measures for suctioning and opening of normal saline solution have been properly undertaken by all nurses present in the sample and emotional support of the patient to reduce the thrill and calming the patient have been undertaken by the majority of nurses [88/9 percent]. In addition, the compliance with the care standards of practice of endotracheal tubes and tracheostomy has been presented in Table 2.

**Table 2: Frequency distribution of research units based on the compliance of nurses with care standards of endotracheal tube and tracheostomy suction**

Compliance with standards	Standard deviation	mean	Highest score	Lowest score	Percent	Number
Unfavorable					2.8	2
Need to reform	10.51	78.45	96.77	45.16	44.4	32
Favorable					52.8	38
Total					100.0	72

The results of our study indicate that based on the result of independent t-test, no significant difference was observed between the mean scores of two groups of nurses (05/0> p) and the mean score of nurses with over 30 years of age was significantly higher than nurses with less than 30 years. The average score of the endotracheal tube and tracheostomy care and suctioning in single nurses was 11/ 22± 73/10 and in married nurses was 8/ 54± 81/85, respectively. Based on the results of independent t-test, a significant difference was observed between the mean scores of two groups of nurses (05/0> p) and the mean score of married nurses was significantly higher than single

nurses. Other information about the mean percentage of score of nurses in endotracheal tube suctioning and tracheostomy care based on the demographic characteristics has been presented in Table 3.

**Table 3: Mean percentage of score of nurses in endotracheal tube suctioning and tracheostomy care based on the demographic characteristics**

Variable	Standard deviation	Degree of freedom	Test statistics	Standard deviation	Mean	Number	Category
<b>Employment</b>	<b>&lt;.001</b>	<b>3</b>	<b><math>\chi^2=27.292</math></b>	<b>7.58</b>	<b>68.49</b>	<b>13</b>	<b>Contractual</b>
				<b>8.34</b>	<b>79.03</b>	<b>42</b>	<b>Official</b>
				<b>6.79</b>	<b>87.10</b>	<b>16</b>	<b>Projective</b>
				<b>.</b>	<b>45.16</b>	<b>1</b>	
<b>Work experience</b>	<b>&lt;.001</b>	<b>----</b>	<b>r=.678</b>	<b>7.68</b>	<b>64.25</b>	<b>12</b>	less than 5 years
				<b>7.45</b>	<b>77.38</b>	<b>37</b>	5-10 years
				<b>5.16</b>	<b>87.60</b>	<b>16</b>	10-15 years
				<b>8.26</b>	<b>87.56</b>	<b>7</b>	more than 5 years
<b>Work experience in intensive unit</b>	<b>&lt;.001</b>	<b>---</b>	<b>r=.751</b>	<b>7.86</b>	<b>67.81</b>	<b>23</b>	less than 5 years
				<b>6.75</b>	<b>81.66</b>	<b>38</b>	5-10 years
				<b>6.59</b>	<b>89.59</b>	<b>11</b>	more than 10 years
<b>Working shift</b>	<b>.001</b>	<b>---</b>	<b>U=149.00</b>	<b>8.11</b>	<b>87.34</b>	<b>13</b>	fixed, morning, noon, night
				<b>10.00</b>	<b>76.49</b>	<b>59</b>	In circulation
<b>Record of courses</b>	<b>&lt;.001</b>	<b>---</b>	<b>U=28.5</b>	<b>7.46</b>	<b>82.64</b>	<b>55</b>	yes
				<b>6.86</b>	<b>64.90</b>	<b>17</b>	no

**DISCUSSION**

In the present study, 72 nurses were participated. Demographic data of nurses were collected to determine mentioned aspects of the research units as well as to investigate the possible relationship between demographic and study variables including the care and endotracheal suctioning, tracheostomy. According to the study, care and endotracheal tube suctioning and tracheostomy care needs to be modified. Nematie et al., showed in a study that tracheostomy care at teaching hospitals is not desirable and the main reasons for it are the failure of the doctor prescription, lack of medical and nursing agenda, empirical and subjective act, and inaccurate execution of orders by nurses or physicians for routine care in wards [14]. Unlike the results obtained by Mazaherie et al., the results of the present study showed that in the majority of cases (88/percent) performance of personnel on the taking care of endotracheal tube in mechanically-ventilated patients was good and none of the staff had poor performance suggesting that the performance is not good at taking care of intubated and mechanically ventilated patients and did not comply with the standard. Thompson et al., showed that 70% of the performance of personnel in the care of intubated mechanically ventilated patients is desirable [15]. These results were inconsistent with the findings of this study, because the study only 4/44% of nurses had a satisfactory performance, and the overall mean score was less than 80% (desirable level), respectively.

So, the performance of nurses should be generally reformed in terms of endotracheal tube and tracheostomy care according to the average score of 78/45 % and in some cases, health care was not desirable, and in 2.8% cases, poor and unsatisfactory performance was also observed.

In a self-report study by Cason et al., (2007) in America, 77% of nurses noted that they used gloves in providing care for patients with endotracheal tube and tracheostomy and 82% washed their hands for each patient [16], which are consistent with the results of our study. But in general, the nurse don't commit themselves to act based on the guidelines provided by nurses. This study shows that nursing care of endotracheal tubes and tracheostomy in the ICU is not desirable. Thus, it is important to identify the associated factors and avoid the future complications. Based on the results of independent t-test, a significant difference between mean scores of nurses were observed according to age and marital status (05/0> p).The positive relationship was also observed between demographic characteristics, including employment status, work experience, work experience and training requirements in the intensive care unit and their performance in the airways care of the patients.

## CONCLUSION

The results of this study showed that the performance of ICU nurses in the care of an endotracheal tube and tracheostomy need to be improved. So training and improving performance and endotracheal tube suctioning and tracheostomy cares are essential. It seems that problems such as lack of time and resources and manpower as well as lack of knowledge on how to properly take care of endotracheal tubes and tracheostomy are effective in this regard. It seems that the cause of some inconsistencies and differences in studies of diverse populations and communities of the subjects was attributed to the different methods and tools in collecting information.

**Conflict of interest:** In this study there was no conflict of interest.

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