

Effect of Tracheostomy Care Training on Nurse's Performance at Critical Care Units in Erbil City

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ABSTRACT

Background and objectives: Tracheostomy is one of the oldest known surgical procedures. Tracheostomy patients are at high risk for airway obstruction, impaired ventilation, and infection as well as other lethal complications. Skilled bedside nursing care can prevent these complications. Therefore, this study aimed to evaluate the effect of progressive tracheostomy care practice on nurses and physiotherapists in the ICU and RCU in Erbil City-Iraq.

Methods: A quasi-experimental study was conducted at four Intensive Care Units (ICU) and Respiratory Care Unit (RCU) Hospitals (Hawler Teaching Hospital, East Emergency Hospital, West Emergency Hospital, and Lalav RCU Hospital) in Erbil City/Iraqi Kurdistan Region. Nurses and physiotherapists from hospitals were selected as the control group, and study group respectively. Nurses and physiotherapists were evaluated through the demographic data questionnaire and tracheostomy care (preparatory phase, performance phase, and follow-up phase) scale.

Results: A total of 90 nurses and physiotherapists (40 nurses and 5 physiotherapists from the interventional group and 38 nurses and 7 physiotherapists from the control group) participated. At the end of the study, there were significant improvements in tracheostomy care practice (P-value was 0.001).

Conclusion: Nurses and physiotherapists had incompetent practice regarding tracheostomy care (TC) in the ICU, and RCU and the nurses and physiotherapists who received progressive tracheostomy care procedure training had more knowledge and practice than those who did not attend this program. Attempts should focus on improving tracheostomy care in ICUs and RCUs and establish management guidelines.

Keywords: Effect; Nurses; Practice; Tracheostomy.

Received: 15/07/2022

Accepted: 29/09/2022

Published: 30/11/2023

INTRODUCTION

Tracheostomy is one of the oldest and most famous surgical procedures. Tracheostomy is a rescuing procedure done for emergency open-airway inpatients with upper respiratory tract obstruction. Needs to be opened in the trachea or stoma, and then a tube is inflicted through the gate to the passage of air and remove respiratory or other secretions through the tracheostomy. According to some authors, tracheostomy is more permanent opening when described in this terms [1]. Airway obstruction is a life-threatening and medical emergency that needs artificial airway support, such as the use of tracheostomy. A capable nurse is required to educate the patient or their relatives, to help in the supply of care, and to finance the obviousness of the airways [2]. A greater number on third of patients in RCU and ICU will need tracheostomy tube for long-period ventilation. Recently, there have been an estimated 6.5 million people in the United States living with tracheostomy despite of its increasing prevalence, care of the stoma is a "high-risk, low-incidence skill" that is in many cases educated as described interesting knowledge from one provider to another [3]. This term (tracheostomy) is increasingly carried out in ICUs and RCUs by adults for upper airway protection or maintenance, airway obstruction, bronchial cleaning, lengthening mechanical ventilation, and promoting weaning. The tracheostomy causes physical changes in the person, such as body image, airway clearance, communication, breathing, smell, and swelling. These often cause social and psychological outcomes. These changes can also self-esteem, and the sense of self-efficacy and often reduce interpersonal and social relationship activity [4]. Nurses are a frontline caregiver and first react in an airway emergency. As much, need to be provided to replay appropriately to prevent unnecessary

mortality and morbidity, being sufficient knowledgeable of the respiratory system, anatomical tracheostomy, and underline physiology are necessary aspects of a nurse's ability to sufficiently assess and care for patients both knowledge and practice essential main component in exactly identifying potential problems and acting immediately to prevent serious complications. Complications associated with nurses who are absent the essential skills and training are mucus plugging, accidental decannulation, bleeding, tube displacing inappropriate or inadequate tracheostomy suctioning, or complications during tracheostomy change [5]. An important surgery called a tracheostomy is used to help patients with respiratory distress secure their airways so that they can receive adequate care and avoid situations that could lead to death. The practice problem is that, as seen during yearly competency evaluations, staff nurses have shown poor knowledge, abilities, and confidence in the delivery of care to patients living with a tracheostomy. For instance, despite evidence that the practice is unsafe; nurses are continuing to caring for patients with tracheostomies by installing a standard saline bullet into the ostomy to break up mucus. Additionally, the nurses are not adhering to the advised practice when making judgments about tracheostomy care on an individual basis. Additionally, they are not keeping the necessary supplies in patient rooms to act quickly if a tracheostomy tube comes loose. The objective of this study is to evaluate the effect of progressive tracheostomy care on nurses and physiotherapists in ICUs and RCUs in Erbil City-Iraq.

METHODS

Control and interventional groups of nurses and physiotherapists were recruited as per the quasi-experimental study design from the Intensive Care Unit (ICU) and Respiratory Care Unit (RCU) of four hospitals (Hawler Teaching Hospital, East Emergency Hospital, West Emergency Hospital and Lalav RCU Hospital) in Erbil City/Iraqi Kurdistan Region. Inclusion criteria: Include nurses and physiotherapists who provided tracheostomy care for patients admitted to RCU and ICU, both genders, who had experience at least one year, and also who have graduated from [Hawler Medical Institute (Nursing institute which also includes physiotherapy department and/ or Nursing College)]. After an interview with 130 nurses and physiotherapists (40 nurses and physiotherapists refused to enroll in the study

and the remaining 90 were recruited). Participants were randomly assigned to control or intervention groups using a numbered list of names (the odd names recruited into the control group and the even names recruited into the intervention group) with proper matching of the two groups in factors such as age, sex, academic qualification, marital status, years of experience, and attending training course. After the exclusion of the 40 nurses for a variety of reasons, including (the limitation of their time and having second jobs), an interview was performed for 45 participants (40 nurses and 5 physiotherapists) in the intervention group and 45 participants (38 nurses and 7 physiotherapists) in the control group (Figure 1).

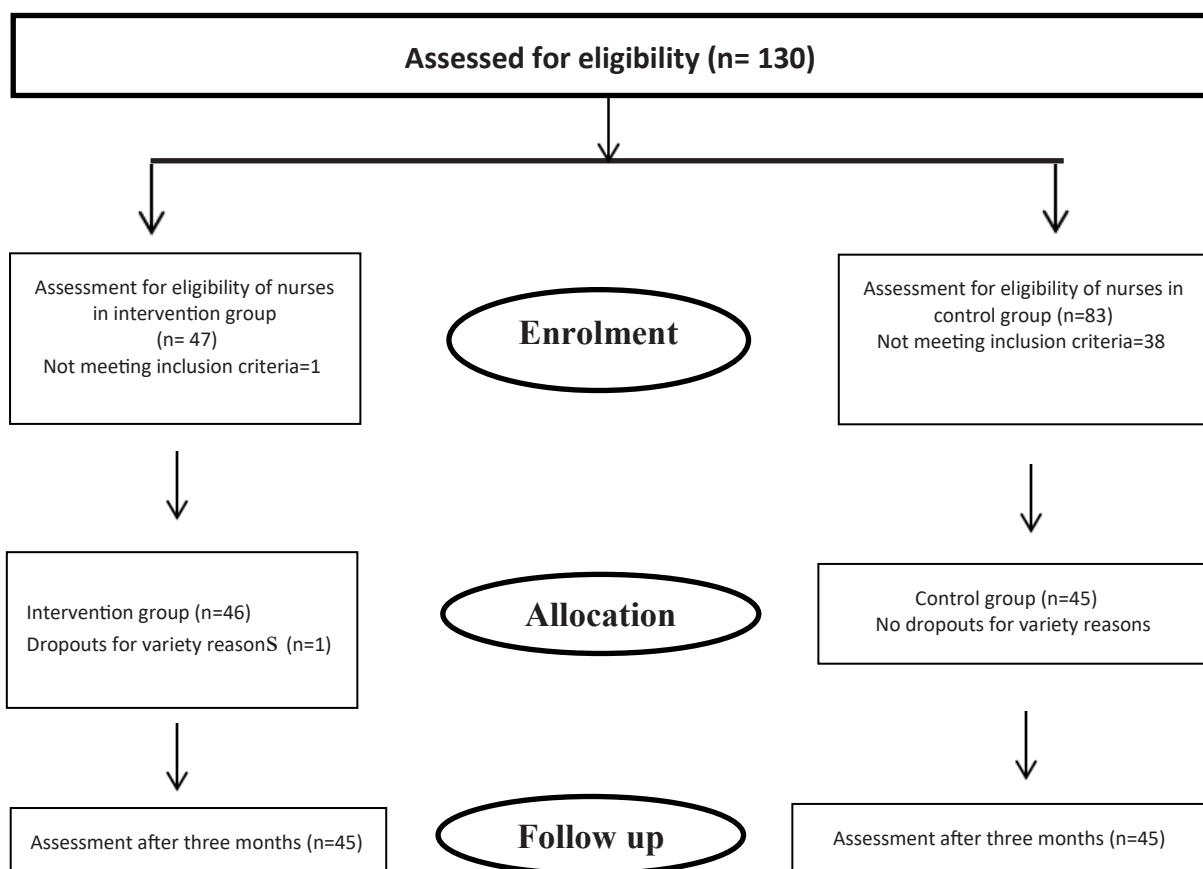


Figure 1. Flow Diagram of control and interventional group of tracheostomy care.

In a 20-minutes direct interview with participants (face to face), the questionnaire and check lists were filled out; five minutes for sociodemographic data, and 15 minutes for observing participants during practices by the researcher in pre and post-educational programs two times per week. The program was developed from the Fundamental of Nursing, Lippincott Manual of Nursing Practice and Tracheostomy Care Program [6,7,8] and validated by expert recommendations. The study questionnaire consisted of socio demographic characteristics including (age, sex, academic qualification, marital status, years of experience, and attending training courses) and the practice (6 items included for suctioning the trachea during tracheostomy care and 27 activities to be done). The practice was prepared for three tracheostomy care aspects (preparatory phase, performance phase, and follow-up phase). Each of the aspects of tracheostomy scores on a 2-point scale (0: not achieved and 1 achieved). Thus, scores on each subscale range from 0 to 33. Good scores indicate good performance of the practice; the categories of pre and post-practice are interpreted as poor (below 16), fair (16-24), and good (25-33). At the beginning of the study, the two groups were interviewed and the data were taken (a questionnaire was filled out and checklist completed), then the tracheostomy care practice level of participants in both groups was evaluated (pre-test), and then the intervention group underwent the tracheostomy care practice training (4 hours per week for two successive weeks). All the participants carried on their official duties at the ICUs and RCU of their hospitals. Three months later, participants from both groups were interviewed again and evaluated for their levels of tracheostomy care practice (post-test). Ethical consideration was the main principle in data collection. Permission is taken from

nurses before starting the interview by signing the informed consent prepared by the researcher. The researcher is fully aware of research ethics; therefore, nurses dignity, values, and protection from impacts that could happen during data collection. Before data collection, the researcher explained the objectives of this study for nurses and the request for participation in this study. The answers and information raised from the study were kept confidential and used for this study only. In addition, the researcher provided opportunities for participants to ask questions or express concerns at any point. Moreover, the local ethical approval was obtained from the Ethical Committee of Hawler Medical University at the College of Nursing to conduct the study. The date was October 25, 2020, and the code number was 129. Data were analyzed through the SPSS (Version 23) application for statistical data analysis based on the objective by using descriptive and inferential statistics. [Frequency, Percentage, Mean, and standard deviation] and t-test.

RESULT

Table 1 shows that the number of participants (nurses and physiotherapist) was 45 per each of the control groups and the intervention. Participants were grouped into 3 age categories, where the category of 20-31 years scored the highest percentage among both groups of participants (44.4%). The gender distribution was 66.7% and 71.1% female in the control and intervention groups, respectively. The qualifications of participants were 57.8% Diploma graduates from Hawler Medical Technical Institute (nursing and physiotherapist) in the control group and 53.3% in the intervention group. According to the marital status 57.8% and 60% were married in intervention and control groups,

respectively; Most of participants at both control and interventional groups had 1-4 years of work experience in critical care units (73.3%). The majority of the participants had not attended any previous training on tracheostomy care (91.1% of the control group and 95.6% of the interventional group).

There were no significant differences between the socio demographic characteristics of the nurses and physiotherapists in intervention and control groups (p. value ≥ 0.05).

Table 1 : Socio-demographic characteristic of nurses

Items	Control group (n=45)		Intervention group (n=45)		P. value
	F	(%)	F	(%)	
Age group/Years	20-31	29 (64.4)	30 (66.7)		0.170
	32-43	12 (26.7)	13 (28.9)		
	44-55	4 (8.9)	2 (4.4)		
Sex	Male	15 (33.3)	13 (28.9)		0.160
	Female	30 (66.7)	32 (71.1)		
Qualification	Institute	26 (57.8)	24 (53.3)		0.160
	College	19 (42.2)	21 (46.7)		
Marital	Single	19 (42.2)	18 (40.0)		0.323
	Married	26 (57.8)	27 (60.0)		
Work experience in critical department (RCUs & ICUs)/years	1-4	33 (73.3)	33 (73.3)		0.209
	5-8	8 (17.8)	8 (17.8)		
	9-12	4 (8.9)	4 (8.9)		
Tracheostomy Care Training	Yes	4 (8.9)	2 (4.4)		0.160
	No	41 (91.1)	43 (95.6)		

Table 2 reveals that there is no statistically significant difference between the control and intervention groups regarding doing tracheostomy care (preparatory phase, performance with suctioning phase, and

follow-up phase) in the pre-test, while a very high significant difference result was observed in the post-tests after three months in the study group (P-value=0.001).

Table 2 Tracheotomy care practice mean score in pre and post tests

TC	Control group	Intervention group	t-test	C.N
	Mean	Mean	P-value	
Pre-tests	10.7333	10.8000	0.404	NS
Posttest (after 3 months)	10.4667	27.7111	0.000	VHS

Table3 shows the performance of tracheostomy care practices in pre and post-procedures (preparatory phase, performance with tracheostomy suctioning phase, and follow-up phase), where a poor level of performance was observed in

a control group in both pre and post-test 95.6%, while in the intervention group the performance was poor level in the pre-test 97.8 % and good level at the post-test 91.1 %.

Table 3 : Overall tracheostomy care practices level in pre and post test.

TC Practice level	Control group				Intervention group			
	Pre test		Post test		Pre test		Post test	
	F	(%)	F	(%)	F	(%)	F	(%)
Poor	43	(95.6)	43	(95.6)	44	(97.8)	0	(0)
Fair	2	(4.4)	2	(4.4)	1	(2.2)	4	(8.9)
Good	0	(0)	0	(0.0)	0	(0)	41	(91.1)

DISCUSSION

In this study, the ages of the participants in the control group (20-31) (64.4%) and intervention group (20-31) (66.7%) were consistent with the results of Thomas and Dhudum (2021), and Babiker and Yousif (2016) [9, 10]. The majority of the study samples were females; this finding is supported by Padma et al. (2016) [11] study and Mwakanyanga et al (2018) with Abdulrahman, and Hamed (2015) study. [12,13], possibly because of a cultural belief in the Kurdistan region that females can better manage nursing duties and hence more encouraged to attend such carriers. For decades, the only teaching institution for nursing and physiotherapist in Hawler (Erbil) was Hawler Medical Institute which used to provide Diploma certificates, and it is just recently that more institutions and nursing and physiotherapist colleges established, that is why the majority of participants were Diploma graduates, which means fewer years of study and training, this result agreed with the result conducted by Ochoki et al. (2021) Mungan, et al. (2019) [14, 15]. The

result of the present study shows that the highest percentage of the study sample was married and this result was supported by Nwakaego (2016) [16]. The intensive care facilities are lacking in Erbil and the nurses and physiotherapists usually rotate among governmental hospitals departments according to MOH rules. This affected on years of work of participants (majority of study sample were within 1-4 year work group, a finding of this study similar to the study by Pritchett et al (2019) and Khanum, et.al. (2021) [17,18]. In regard to the training program for nurses and physiotherapists in critical care units in Erbil city, the results indicated that the majority of the study sample did not attend any training courses in chest physiotherapy, possibly because of a lack of interest in attending and a lack of encouragement and training programs by their institution; on the other hand, there may be limited time to attend such trainings because of long duties at ICUs and RCUs , this result agreed with the results of the studies conducted by Alnemare (2020) and Qalawa

etal (2017) [19,20].The present study showed that three months after CPT training, the performance of participants in the intervention group improved statistically very significantly (P- value < 0.000) as compared to control group. The performance difference between the two groups was not significant at baseline evaluation (pre-test P- value = 0.632); The Mehta etal (2019) [21] and other studies [22,23,24,25,26,27,28] did not show the difference in performance between intervention and control group in pre-test but showed a significant difference in the tracheostomy care program at the post-test. Furthermore, the findings of the present study found that the majority of both the intervention and control groups had poor level scores regarding the performance of chest physiotherapy in the pre-test. After three months of training, the score changed just in intervention group from poor to good performance in the post test. This result was in concordance with the study done by Frota, et.al. (2013) [29] and other studies [30,31].

CONCLUSION

Studied nurses and physiotherapists had incompetent practice regarding tracheostomy care in intensive care units and respiratory care units in Erbil hospitals, while those who underwent training for three months improved in their practice of three phases (preparatory phase, performance phase, and follow-up phase) of tracheostomy care. Attempts should focus on improving tracheostomy care among nurses and physiotherapists at ICUs and RCUs and establish protocols to be developed according to guidelines.

ACKNOWLEDGEMENTS

We are thankful to the nurses and physiotherapists for giving their time to interview with us and providing reliable practice.

Ethics approval and informed consent to participate

Ethical consideration was the main principle in data collection. Permission is obtained from nurses and physiotherapists before starting the interview by signing the informed consent prepared by the researcher. The researcher is fully aware of research ethics; therefore, nurses and physiotherapists dignity, values, and protection from impacts that could happen during data collection. Before data collection, the researcher explained the objectives of this study for nurses, and physiotherapists, and the request for participation in this study. The answers and information raised from the study were kept confidential and used for this study only. In addition, the researcher provided opportunities for participants to ask questions or express concerns at any point. Finally, the results of the study were given to all the participants of the study. Moreover, the local ethical approval was obtained from the Ethical Committee of Hawler Medical University, at College of Nursing to conduct the study.

CONFLICT OF INTEREST

The authors declare that they have no competing interests.

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