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A Study to Assess the Effectiveness of Structured Teaching Programme Regarding Tracheostomy Care on Knowledge of Staff Nurses in Selected Hospitals, at Bangalore

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Abstract: ***Introduction: The impact of tracheostomy on the respiratory system includes thorough knowledge of respiration, methods of humidification, and also suctioning techniques. In addition to this a tracheostomy may impact on swallowing, communication, and body image. Tracheostomy care and management is more and more necessary in both the intensive care setting and the general wards. It is therefore more important that trained nurses are equipped with the appropriate skills, knowledge, and support to meet the unique needs of each patient safely and competently. Thus, the nurse's knowledge can influence the care and outcome of tracheostomy patients. Methodology: A pre - experimental design with one group pre - test post - test was used.30 registered staff nurses working in the Silicon city multi - specialty hospital Hoskote, Bangalore. Demographic data were collected, and on care of clients with tracheostomy within one month with the knowledge Scores. The study was conducted in 2 phases. The research approach used for the 1st phase was descriptive survey mainly by record analysis. In phase II an evaluative approach with one group pre - test and post - test pre - experimental design. The investigator used non - probability convenience sampling setting used for ITU, HDU, ICCU and Special Unit of selected hospital. Results: The findings of the study showed that the mean post - test knowledge score (27.47) in all the areas were higher than the mean pre - test knowledge score (17.67). The paired 't' test (t = 26.39) analysis showed that post - test knowledge mean scores (27.47) was significantly higher than that of the pre - test mean (17.67) 't' (29) = 2.04, 2.76, p < 0.05, 0.01The findings of modified gain suggested that the post - test mean score in all areas of knowledge were higher than the pre - test mean score. The data was computed using the paired 't' test which showed that the research hypothesis was accepted, depicted that gain in knowledge on tracheostomy care and the staff nurses significantly gained knowledge on tracheostomy care. Hence it is concluded that structured teaching programme was effective in improving the knowledge of the staff nurse. Conclusion: The occurrence of tracheostomy patient is high in the selected hospital where the investigator conducted her study. Thus, the result indicate the need for good tracheostomy care to prevent the complication of tracheostomy. Tracheostomy suctioning is a very important nursing intervention in nursing practice. The nation has kept the goal to reduce the complication of tracheostomy patient. It will be only possible through good tracheostomy care. The staff nurses need to acquire special knowledge of tracheostomy care. The findings of the study in terms of its effectiveness may encourage the teachers and nursing staff to impart education in an effective way. Nursing education should emphasize on preparing prospective nurse to handle the tracheostomy patients and to impart health information and assist the community in developing their health potentials.***

Keywords: Tracheostomy, Intensive care setting, Evaluative approach

1. Introduction

Nurses globally are occupied in pioneering performance on an everyday basis ensuring in important development in the physical conditions of patients, populations, and health systems. Their roles have been basic foundations of development, of quality health care of clients/patients around the globe.[1]

A constant exchange of oxygen and carbon dioxide between the living organism and its environment is essential for survival. Respiration is the process which performs this function. structural, functional, or microbiological changes within the lungs can be closely related to epidemiological, environmental, occupational personal and social factors. Primary respiratory diseases are responsible for a major burden of mortality and morbidity. Impairment of respiratory function threatens the individual's survival and disturbs the health and the quality of life.[3]

The highly prevalent life - threatening conditions of respiratory problems can be treated and managed only by tracheostomy. Tracheostomy is a lifesaving surgical intervention to make an opening or hole into the trachea. It can be done electively or as an emergency procedure.[3]

Tracheostomy is among the most commonly conducted procedures in critically ill patients. It is performed predominantly in patients who require prolonged mechanical ventilation, frequent suctioning for broncho - pulmonary toilet, or have obstruction of the upper airway. Tracheostomy on the body stimulates the emergence of a strong emotional reaction, a direct impact on treatment and prognosis of the disease.[4]

A Tracheostomy is usually done for one of three reasons i. e. to bypass an obstructed upper airway, to clean and remove secretions from the airway, to more easily and usually more safely, deliver oxygen to the lungs. Airway Problems that may require a tracheostomy [Tracheomalacia, Laryngeal injury or spasms, Laryngectomy], Lung Problems that may require a tracheostomy, Chronic pulmonary disease, Chest wall injury, Diaphragm dysfunction] other reasons for a tracheostomy such as neuromuscular paralyzing diseases, Long - term unconsciousness or coma, facial surgery and facial burns, anaphylaxis (severe allergic reaction).3

With the increasing use of advanced technologies in tracheostomy, a wider range of healthcare providers are now directly involved in the care of patients with a tracheostomy and need to be familiar not only with tracheostomy care, but also with the techniques of decannulation and management of acute and life - threatening complications related to tracheostomy. Therefore, nurses play a vital role in providing quality care to the clients with tracheostomy.5

2. Need for the study

The advent of intensive care units and presence of ventilators during 1950s changed the status of tracheostomy from a lifesaving emergency procedure to that of a prolonged life supporting procedure. It is important that tracheostomy is a lifesaving treatment for a blocked or dislodged airway. For patients with chronic respiratory failure or failure to wean from ventilator, it may be performed to replace an endotracheal (ET) tube and facilitate long - term mechanical ventilation. In most cases, patients who have been on mechanical ventilation for over 14 days may be indicated for tracheostomy primarily to prevent secondary complication like ventilator associated pneumonia (VAP).

Care for a patient with tracheostomy requires a clear understanding of each patient's need for the tracheostomy and the type of tube that is inserted. The impact of tracheostomy on the respiratory system includes thorough knowledge of respiration, methods of humidification, and also suctioning techniques. In addition to this a tracheostomy may impact on swallowing, communication, and body image. Tracheostomy care and management is more and more necessary in both the intensive care setting and the general wards. It is therefore more important that trained nurses are equipped with the appropriate skills, knowledge, and support to meet the unique needs of each patient safely and competently. Thus, the nurse's knowledge can influence the care and outcome of tracheostomy patients.

A Study Conducted at Lahore, in Mayo Hospital, to evaluate the indications, complications and outcome of patients requiring tracheostomy. Researchers designed a study on 250 patients who were offered this surgery as a life - saving procedure. The study spanned over a period of three years from June 2002 to June 2005. The information gathered included age, sex, presenting symptoms, clinical findings, surgical technique, post - operative complications, and follow - up. The Results was Upper airway malignancies were the most common indications accounting for 62% and Diphtheria and Tetanus together accounted for 16% of all procedures. Primary hemorrhage was the most common complication seen in 6% of all patients. They suggested that this procedure has a life - saving role in under developed parts of the globe.

Investigator further identified that many tracheostomy patients were receiving general care than the specific care which avoided many complications related to tracheostomy by this knowledge and skillful procedures. So, the investigator felt the need to undertake the study to assess and impart the knowledge regarding care of clients with tracheostomy.

3. Objectives of the study

1) Assess the Knowledge of Staff Nurses on Care of Clients with Tracheostomy by Using Structured Knowledge Questionnaires.
2) Assess the Effectiveness of Structured Teaching Programme regarding Care of Clients with Tracheostomy among Staff Nurses by Comparing Pre and Post test Scores.
3) Find the Association between the Selected Socio - Demographic variables like Age, Sex, Marital Status, Education, Professional Qualification, Years of Experience, Area of work, Years of Experience in the present working area, attend any training on tracheostomy care or suctioning after basic nursing training on care of clients with tracheostomy within one month with the knowledge Scores.

Hypotheses:
H1 - There is significant difference between Pre and Post test knowledge scores of staff Nurses regarding Care of Clients with Tracheostomy.
H2 - There is significant association between knowledge level of staff nurses with selected Socio - Demographic variables like Age, Sex, Area of Work, Qualification, Experience. on Care of Clients with Tracheostomy in the last 1 1 month of period.

Assumptions of the study:
1) Staff Nurses will have some knowledge regarding Care of Clients with Tracheostomy.
2) Structured Teaching Programme will improve the knowledge of staff nurses regarding Care of Clients with Tracheostomy.
3) Structured teaching programme is an effective method of bringing a change in knowledge and practice of nursing personnel.
4) The nurse will be willing to participate in the study.
5) The patients will feel free to express their satisfaction.
6) Individual difference is present in the level of satisfaction

Conceptual Framework:
The present study aims at determining the effectiveness of a need base structured teaching programme for nurses on need and care of tracheostomy patient. The conceptual framework of the study is based on Donabedian's System Model (1996) and Orlando's (1972) communication and inter - personal relationship model. The system model has 3 components — Structure, Process and Outcomes.

4. Material and Methods

A pre - experimental design with one group pre - test post - test was used.

Phase – I: A descriptive approach was used.

Phase – II: An evaluative approach was used to find the effectiveness of structured teaching programme.

Inclusive criteria:
Adult tracheostomy patient (18 - 70 years).
Nurses of the special ward who have at least 1 year experience

30 registered staff nurses working in the Silicon city multy speciality hospital Hoskote, Bangalore. who were available during the period of data collection. Data was collected using the prepared tool it consist of two sections:

Section A- consists of questionnaire on demographic

Section B- consists of questionnaire on knowledge regarding tracheostomy suctioning.

Percentage of knowledge on tracheostomy

The data given in Table - 10 shows that the knowledge of nurses in the sub - areas of tracheostomy care ranged from 96.6 to 100% except in the area of saline instillation, where the sample had 46.7% only.

S. No.	Area of knowledge	Frequency	Percentage
1.	Procedure	30	100%
2.	Suction Pressure	29	96.6%
3.	Suctioning time	30	100%
4.	Tracheostomy care (time)	30	100%
5.	Cuff care	30	100%
6.	Cuff management	29	96.6%
7.	Saline instillation	14	46.7%
8.	Tracheostomy and food intake	30	100%
9.	Infection	29	96.6%
10.	Complication	30	100%

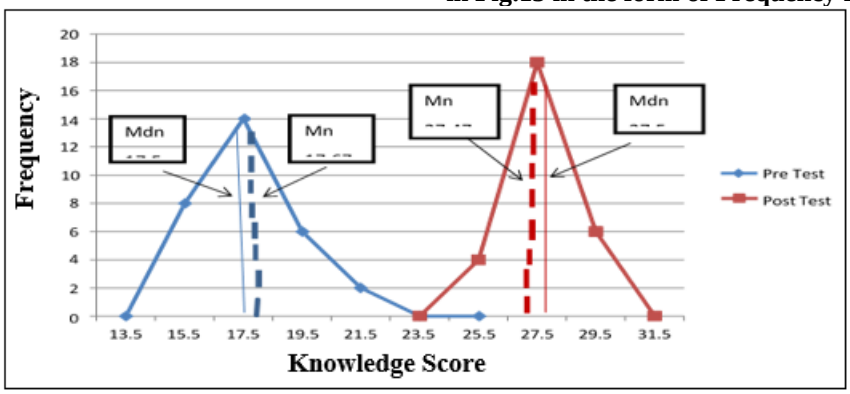
Frequency and percentage distribution of pre - test knowledge scores of the staff nurses

Range of knowledge score class interval	Pre - test		Post Test	
	Frequency	Percentage	Frequency	Percentage
13 - 14	0	0	0	0
15 - 16	8	26.67	0	0
17 - 18	**14**	**46.67**	0	0
19 - 20	6	20	0	0
21 - 22	2	6.66	0	0
23 - 24	0	0	0	0
25 - 26	0	0	5	16.67
27 - 28	**0**	**0**	**19**	**63.66**
29 - 30	0	0	6	20
31 - 32	0	0	0	0

Maximum Score = 30

The interpretation of the knowledge score can be done as in the pre - test 2 (6.67%) staff nurse belongs to good category group and 25 (83.33%) of the staff nurses belongs to the category of average group and 3 (10%) of the staff nurses belongs to the category of poor group where as in the post test none of the staff nurses are in the poor or average group, 28 (93.33%) of the staff nurses belong to excellent group and 2 (6.67%) of the staff nurses belongs to the good category. Hence it showed that there was apparent increase in posttest knowledge score than that of pre - test knowledge.

The pre - test and post - test knowledge score are depicted in Fig.13 in the form of Frequency Polygon, n = 30



Frequency polygons showing the distribution of pre - test and post - test knowledge score.

The above picture shows that the majority of the staff nurses in the pre - test were in the average knowledge group and in the post - test majority of staff nurses were in the excellent knowledge group score. The skewness of the pre - test and post - test frequency polygon are SK = **(.20)** and **(- 1.37)** respectively. This showed that pre - test frequency graph is positively skewed or distributed more towards the right end of the graph and the post - test frequency graph is negatively skewed or distributed more towards the left end of the graph. So, it is evident that the post - test score of most the staff nurses fell beyond the pre - test score which indicate that there was considerable knowledge gain suggesting the effectiveness of the structured teaching programme.

Area wise Actual and Modified Knowledge Scores of Staff Nurses About Tracheostomy Care, n = 30

Sl. No.	Content Areas	Maximum possible score	Pre - test		Post - test		Actual gain in percentage	Modified gain in percentage
			Obtained Mean Score	Mean Score in %	Obtained Mean Score	Mean Score in %		
1	Area I	6	4	66.67	5.6	93.33	26.66	.80
2	Area II	9	5.13	57	8.07	89.97	32.97	.77
3	Area III	15	8.47	56.47	13.8	92	35.53	.82

- Are – I: Basic knowledge.
- Area – II: Necessities in Tracheostomy suctioning.
- Area – III: Management of Tracheostomy patient.
- The data presented in the Table – 13 showed that post test mean percentage in all three areas higher than the pre - test mean percentage of knowledge score. The maximum gain (.82) is in the area of III (Management of Tracheostomy patient care) and the least gain (.77) was found in the area

of II (Altered physiological problem) and moderate gain (.80) was in the area I (Basic knowledge).

Effectiveness of Structured teaching programme:
In order to find out the effectiveness of plan teaching programme computed mean, median, standard deviation of knowledge score in pre - test and post - test Paired 't 'test was applied to test the significant.

Range, Mean, Median, Standard deviation of knowledge Scores in Pre - test and Post – test, n = 30

S. No.	Knowledge Score	Range	Mean	Median	SD
1	Pre - test	15 – 22	17.67	17.5	1.68
2	Post - test	25 – 30	27.47	27.5	1.17

The data presented in Table shows that the pre - test knowledge score range from (15 - 22) and the post - test knowledge score range from (25 – 30). The mean post - test knowledge score (27.47) was higher than the mean pre - test knowledge score (17.67). The median of post - test knowledge score (27.5) was higher than the median of pre - test knowledge score (17.5). Further the post - test score (SD = 1.17) seemed to be less dispersed than the pre - test score (SD = 1.68).

Mean, Mean difference, Standard deviation (SD) and paired 't' value of Pre - test and Post - test knowledge score, n= 30

S. No.	Knowledge Score	Mean	Mean Difference	SD	't' value
1	Pre - test	17.67	9.80	1.68	26.39*
2	Post - test	27.47		1.17	

df = 29 = 2.04 and 2.76, p < 0.05 and 0.01. * Significant.

In order to find the statistical significance between the pre - test and post - test knowledge scores the research hypothesis was stated as:

H1 - There is significant association between the mean of pre - test and post - test knowledge score on tracheostomy care at 0.05 and 0.01 level of significance.

The data presented in Table 15 showed that the mean difference between the post - test and pre - test score was 9.80. In order to find out significant difference between two co - related means of pre - test and post - test knowledge score, 't' value was computed. Tabulated 't' value at df 29 in0.05 and 0.01 level are 2.04 and 2.76. Calculated 't' value was found significant, **t (**29) = 26.39, p < 0.05 and 0.01.

Research hypothesis was accepted that is mean post - test score is significantly higher than the mean pre - test knowledge score of staff nurses.

Association between Pre - test Knowledge of the Staff Nurse and Selected variables:
In order to find out the association between pre - test knowledge scores of the staff nurse on care of tracheostomy patient with selected demographic variables.

To test the statistical significance in association between the pre - test knowledge score and selected variables.
The research hypothesis was stated as:

Ho2 – There is no significant association between the pre - test knowledge of staff nurses of tracheostomy care and selected variables such as age, sex, marital status, education, professional qualification, years of experience, area of working, years of experience in the present working area, attend any training on tracheostomy care or suctioning after basic nursing training.

Chi - square was computed and level of knowledge was divided into two categories: Inadequate knowledge (below the median score) and adequate knowledge (at and above median score). Also, chi - square was computed with Yates correction formula for small frequency in 2x2 contingency table with df (1).

Chi - square values is computed to determine the significance of association between knowledge of the staff nurses with selected variables

Sl. No.	Variables	Pre - test knowledge score		Chi - Square	df	p - Value in 0.05 &0.01 level	Significance at 0.05 & 0.01 level
		At & Above Median (17.5)	Below Median (17.5)				
1	Age of Staff Nurses						
	a) 25 - 35 years	2	3	4.64	3	7.815, 11.345	NS
	b) 36 - 45 years	10	8				
	c) 46 - 55 years	0	4				
	d) > 55 years	2	1				
2	Sex						
	a) Male	1	5	1.414	1	3.841, 6.635	NS
	b) Female	13	11				
3	Marital Status						
	a) Married	11	9	0.82	1	3.841, 6.635	NS
	b) Unmarried	3	7				
4	Education						
	a) H, S,	11	16	1.8	1	3.841, 6.635	NS
	b) Graduate	3	0				
5	Professional Qualification						
	a) GNM	2	4	0.53	2	5.991, 9.21	NS
	b) B. Sc	6	6				
	c) Post B. Sc	6	6				
6	Years of Experience						

	a) > 10 years	3	9	2.46	1	3.841, 6.335	NS
	b) < 10 years	11	7				
7	Area of Working						
	a) HDU	1	4	3.66	2	5.991, 9.21	NS
	b) ITU	14	8				
	c) ICCU	1	2				
8	Years of Experience in the present working area.						
	a) 1 - 5 years	2	0	2.9	2	5.991 9.21	NS
	b) 6 - 10 years	6	6				
	c) 11 - 15 years	6	10				
9	Attend any training on tracheostomy care or suctioning after basic nursing training						
	a) Yes	3	9	2.46	1	3.841, 6.635	NS
	b) No	11	7				

Significance at 0.05 and 0.01 level. NS = non - significant

5. Discussion

The following are the major findings of the study. The mean percentage of occurrence of tracheostomy patient in selected hospitals was 23.45%. Sample characteristics Maximum 50% of the staff nurse belong to the age group of 25 - 35 years. Maximum 66.67% of the staff nurse are female. Maximum 63.3% staff nurse are GNM and 23.7% are B. Sc. Nursing. Maximum 96.6% of knowledge of tracheostomy cuff care management. Description of Knowledge Score showed that the post - test of all 30 staff nurses got the score of 25 and above whereas in the pre - test all got below the score of 25. The cumulative frequency graph showed that the post - test score was higher than pre - test score in entire distribution. Effectiveness of planned teaching on knowledge scores of staff nurses showed that the paired 't' test (t = 26.39) analysis showed that post - test knowledge mean scores (27.47) was significantly higher than that of the pre - test mean (17.67) 't' (29) = 2.04, 2.76, $p < 0.05$, 0.01. Effectiveness of Structured teaching programme in terms of gain in knowledge of staff nurses on tracheostomy care: The findings of the present study showed that the mean post - test knowledge score (27.47) in all the areas were higher than the mean pre - test knowledge score (17.67). The findings of modified gain suggested that the post - test mean score in all areas of knowledge were higher than the pre - test mean score. The data was computed using the paired 't' test which showed that the research hypothesis was accepted, depicted that gain in knowledge on tracheostomy care and the staff nurses significantly gained knowledge on tracheostomy care. Hence it is concluded that structured teaching programme was effective in improving the knowledge of the staff nurse.

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Conflict of Interest
Researcher does not have any Conflict of Interest

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