A Pre-Experimental Study to Assess the Effectiveness of Structured Teaching Programme on Knowledge and Practice regarding Tracheostomy Care among Staff Nurses at Selected Hospitals of Punjab

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Abstract: _Background: Knowledge and skill both are necessary for effective tracheotomy management. Tracheostomy educational program significantly improved care provider confidence and comfort in assessing and treating tracheotomy patients and facilitated communication among team members. Objectives: To assess the effect of structured teaching programme on knowledge and practice regarding tracheostomy care among staff nurses. Methods: A pre experimental research design with one group pre-test & post-test was used to assess the effect of STP on knowledge and practice regarding tracheostomy care among staff nurses at selected hospitals of Punjab. Total three tools were used to collect data from 50 staff nurses working at Amar hospital Patiala i.e. structured demographic sheet, self structured knowledge questionnaire and self structured observational checklist. Results: The results of study showed that post-test knowledge sore (20.26 ± 2.89) regarding tracheostomy care among staff nurses was higher than pre-test knowledge score (13.58 ± 2.65) and moreover in case of practice score regarding tracheostomy care post-test practice score (20.2 ± 4) was higher than pre-test practice score (17.36 ± 4.39) and there is moderate relationship between knowledge score and practice score. Conclusion: Hence it was concluded that STP was effective as evidence by the result of pre-test and post-test knowledge and practice score regarding tracheostomy care. The knowledge and skills of nurses can be improved through in-service education programmes._

Keywords: STP, Knowledge, Practice, Staff nurses, Tracheostomy care

1. Introduction

A tracheostomy is one of a life saving surgical procedure in the intensive care unit for keeping airway open for the patient requiring respiratory support[1]. It is a permanent or temporary stoma formed by opening in the trachea when an individual's natural airway is compromised and requires long-term ventilation[2]. Moreover, the use of tracheostomy has increased over recent years; traditionally it was confined to emergency management of upper airway obstruction but now more recently indications have extended to include prolonged mechanical ventilation, chronic respiratory insufficiency, and management of excessive secretions[3]. It is frequently performed as part of the routine management of critically ill patients, particularly those who are admitted to ICU with head injury or trauma requiring long term ventilation. Along with the clinical benefits for patient outcomes early tracheostomy allows for better management of limited intensive care resources[4].

But tracheostomy as other surgeries can lead to complications that include bleeding, tracheostomy tube obstruction, infection and tracheitis.[2]According to the performed studies, the occurrence rate of complications resulted from tracheostomy has been reported from 6 % to 66%.In addition to this, Anil and Daiwani in 2008 concluded that care after tracheostomy surgery is very important. In case of using aseptic techniques during surgery and nursing care after surgery it will be preventable the development and progression of infection, pneumonia and lung abscess[5]. Therefore tracheostomy care and management is more and more necessary in both the intensive care setting and the general ward. It is, therefore, ever 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[6]

Although, there should be provision of several guidelines criteria to improve the quality of tracheostomy care. Knowledge and skill both are necessary for effective tracheotomy management. Tracheostomy educational program significantly improved care provider confidence and comfort in assessing and treating tracheotomy patients and facilitated communication among team members[13]

2. Material and Methods

A pre-experimental study was conducted at Amar hospital, Punjab. Methodological research design used was a pre experimental research design with one group pre-test and post-test .Total sample for study were 50 staff nurses selected by convenience sampling technique. Total three tools were used to collect data in this study i.e. structured demographic sheet, self structured knowledge questionnaire and self structured checklist. Validity of the research tool was established under the guidance of various experts from the field of medical surgical nursing. Reliability of closed ended questionnaire was established with the use of test-retest method and observational checklist was tested by inter rator method .The pilot study was conducted for the feasibility of study. Permission to conduct the study was taken from ethical committee and superintendents of hospitals. Analysis of the data was done by using both descriptive and inferential statistics

3. Analytical Approach

Statistical analysis was done using the Statistical Package for Social Sciences (SPSS) 17.0. Numerical data were summarized using means and standard deviation, while categorical data were summarized using frequencies and percentages. Comparison between groups was done using t test and Chi-square test

4. Results

Sample Characteristics

Table 1: Socio Demographic Profile of Staff Nurses
N = 50

Characteristics	Frequency	Percentage (%)
1.Age		
a) 21-25	35	70
b) 26-30	15	30
2.Gender		
a) Male	2	4
b) Female	48	96
3.Qualification		
a) B.Sc Nursing	11	22
b) P.BSc Nursing	6	12
c) General Nursing Midwifery	33	66
4.Experience		
a) ≤ 1 year	21	42
b) 2 year	14	28
c) 3 year	11	22
d) 4 year	4	8
5.Area of working		
a) ICU	14	28
b) CCU	9	18
c) General wards	19	38
d) Emergency	8	16
6.Source of previous knowledge to tracheostomy care		
a) Books	35	70
b) Journal	1	2
c) Mass media	4	8
d) Previous knowledge	10	20
7.Attended any in- service education programme regarding tracheostomy care		
7.1 Yes	26	52
7.2 No	24	48
7.1(a) Once	18	36
7.1(b) More than once	8	16

Table 1 depicts the sociodemographic characteristics of staff nurses out of 50 staff nurses 35 (70%) were found in age group 21-26yrs followed by 15 (30%) in 26-30yrs with Mean±SD was 24.36±0.14. Most of staff nurses were females 48 (96%). It was found that 33 (66%) of staff nurses had done GNM. Furthermore, 21 (42%) of staff nurses had 1 year experience or less, followed by14 (28%) staff nurses having 2 years of experience Most of staff nurses 19 (38%) were working in general wards followed by staff nurses 14 (28%) working in ICU Majority of staff nurses 35 (70%) acquired knowledge from books.

Table 2: Comparison of Pre-test and Post-test Knowledge Score regarding Tracheostomy Care among Staff Nurses

Knowledge Score	Mean ± S.D	t – test	P value
Pre-test knowledge score	13.58 ± 2.65	18.9 *	0.0001
Post-test knowledge score	20.26 ± 2.89		

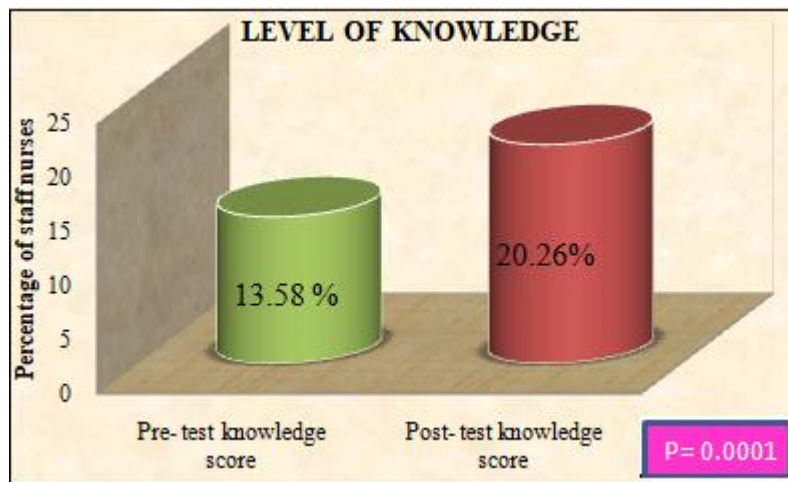*Significant ($P<0.05$), Degree of freedom (df) = 49

Figure 1: Cylindrical Bar Graph showing Mean Score of Pre-test and Post-test Knowledge regarding Tracheostomy Care among Staff Nurses

Table 2 and Fig 1 depict the pre-test and post-test knowledge score regarding tracheostomy care among staff nurses. The data revealed that the mean score of post-test knowledge (20.26 ± 2.89) was higher than mean score of pre-test knowledge (13.58 ± 2.65).So H_1 is accepted i.e. there will be significant difference between pre-test and post-test knowledge score regarding tracheostomy care among staff nurses

Table 3: Comparison of Pre-test and Post-test Practice Score regarding Tracheostomy Care among Staff Nurses

Practice Score	Mean ± S.D	t – test	P value
Pre-test practice score	17.36 ± 4.39	3.96*	0.0002
Post-test practice score	20.2 ± 4		

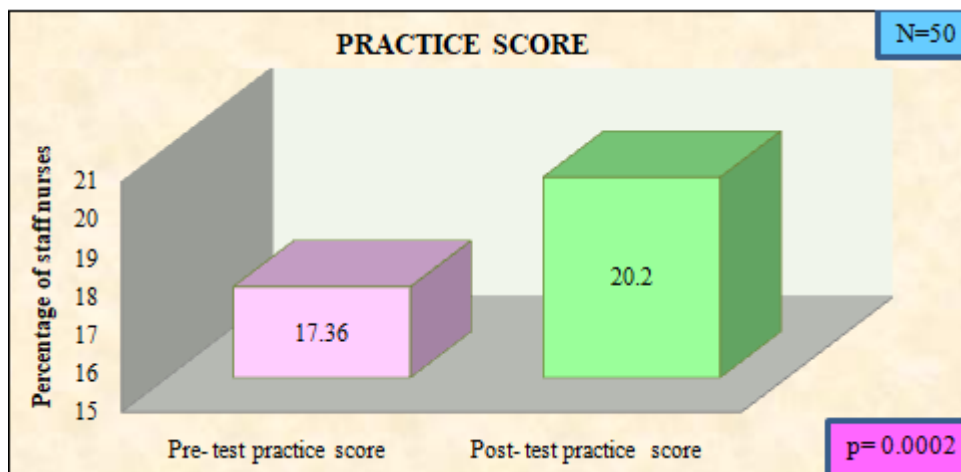*Significant (P<0.05), Degree of freedom (df) = 49*

Figure 2: Bar Graph showing Mean Score of Pre-test and Post-test Practice regarding Tracheostomy Care among Staff Nurses

Table 5 and Fig 2 depict the pre-test and post-test practice score regarding tracheostomy care among staff nurses. The data revealed that the mean score of post-test practice (20.2 ± 4) was higher than pre-test practice (17.36 ± 4.39). So H_2 is accepted i.e. there will be significant difference between pre-test and post-test practice score regarding tracheostomy care among staff nurses

Table 4: Relationship between Knowledge and Practice Score

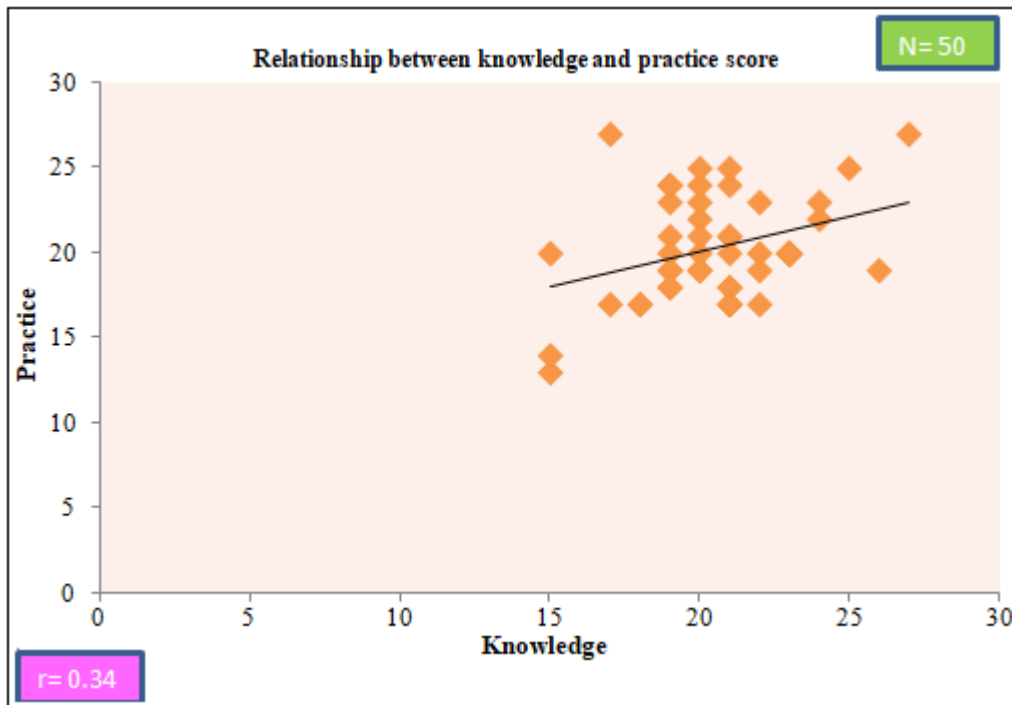| Score	Post-test knowledge Mean ± S.D	R
Post-test knowledge	20.26 ± 2.89	0.34 (moderate)
Post-test practice	20.2 ± 4	

r = correlation
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Figure 3: Scatter Bar diagram showing Relationship between Knowledge and Practice Score

Table 4 and Fig 3 depict the relation between knowledge and practice score regarding tracheostomy care among staff nurses. There is moderate degree of correlation between knowledge score and practice score. Hence H_3 is partially accepted that there will be significant relationship between knowledge score and practice score regarding tracheostomy care among staff nurses as measured by structured closed ended questionnaire and structured observational checklist

5. Discussion

The study analysis was divided into the following of the sections

Section I: This section include analysis of socio-demographic data of staff nurses.

Section II: This section includes objective wise analysis and interpretation

Section I: Socio demographic data of the staff nurses
The present study shows that maximum number of staff nurses (70%) was found in age group 21-26yr. In relation to age, majority of staff nurses were females (96%) and most of staff nurses (66%) were GNM. Furthermore, (42%) of staff nurses had 1 year experience or less**.** According to the area of working most of staff nurses (38%) were working in general wards. Majority of staff nurses i.e.70% acquired knowledge from books regarding tracheostomy care. In addition to this, 26 (52%) nurses had attended the in-service education programme regarding tracheostomy care out of which 18 (36%) staff nurses had attended only once and rest 08 (16%) had attended more than once in-service education programme of tracheostomy care and remaining 24 (48%) staff nurses had never attended in-service education programme.

Section II: This section includes objective wise analysis and interpretation

Objective 1 To assess and compare pre-test and post-test knowledge score regarding tracheostomy care among staff nurses.

This study findings indicate that maximum number of the subjects i.e.62% had below average knowledge followed by 38% had average knowledge in pre-test knowledge of tracheostomy care while in post-test 60% of the subjects have average knowledge score followed by 40% of the subjects had good knowledge about tracheostomy care. The mean score of post-test knowledge (20.26 ± 2.89) was higher than mean score of pre-test knowledge (13.58 ± 2.65) regarding tracheostomy care among staff nurses which was statistically significant (P<0.05).These findings of the study were consistent with findings of **Dorton LeighAime (2014)** carried out an observational study to evaluate the competency of health-care providers managing patients with tracheotomies, and assess the need for, and efficacy of, a multidisciplinary educational program incorporating patient simulation The result showed that before the education the subjects reported an average comfort level of 3.3 on a 5-point Likert scale across 10 categories in the questionnaire, which improved to 4.4 after the training (p < 0.0001). The subjects' mean scores improved from 56% on the pre-course test to 91% on the post-course test (p < 0.0001).Hence it was concluded that tracheotomy educational program was effective in improving provider confidence, increasing provider knowledge, and teaching the skills necessary for managing patients with a tracheotomy[33]

Objective 2 To assess and compare pre-test and post-test practice score regarding tracheostomy care among staff nurses.

The present study findings indicate that maximum number of the subjects (56%) had below average practice followed

by (38%) that had average practice and only (6%) had good practice in pre-test practice regarding tracheostomy care while in post-test maximum number of the subjects (78%) had average practice followed by (18%) that had below average practice and (4%) had good practice regarding tracheostomy care. The data revealed that the mean score of post-test practice (20.2 ± 4) was higher than pre-test practice (17.36 ± 4.39) regarding tracheostomy care. The findings of study are supported by **Abnes. (2008)** conducted a quasi experimental to assess the effectiveness of a video-assisted teaching (VAT) on tracheostomy care regarding knowledge and practice of staff nurses in 2007. The study used pre-test and post-test control group design in which sixty staff nurses were selected as sample by non-probability judgment sampling technique. The findings of the study showed that in the pre-test, the experimental as well as the control group staff nurses had on an average 42% knowledge on tracheostomy care. In the post-test, staff nurses scored up to 78% whereas in control group staff nurses without video assisted teaching scored only 44.5% regarding tracheostomy care. In the pre-test, experiment group practice score was 34.5% and control group nurses practice score was 35.5%. In the post-test, experiment group practice score was 80.6% and control group nurses practice score was 36.8% [31].

Objective 3: To find out association of pre-test and post-test knowledge and practice score with selected demographic variable i.e. age, gender, educational status & experience etc.

The present study findings indicate that there is association between pre-test and post-test knowledge score and attended any in-service education regarding tracheostomy care but there is no association between pre-test and post-test practice score and demographic variables such as age, gender, qualification, experience, area of working, source of previous knowledge & in-service education regarding tracheostomy care. These findings of the study were consistent with finding of **Sharma Bhartendra (2014)** Quasi-Experimental Study to Assess the Effect of Video Assisted Teaching Module Regarding Tracheostomy Care on Knowledge and Skill of Staff Nurses at Vinayaka Mission Hospital, Salem, Tamilnadu. The study revealed that there was no significant association between the knowledge and skill scores with the demographic variables[34].

Objective 5: To find out relationship between knowledge and practice score regarding tracheostomy care among staff nurses.

The present study findings indicate that there is moderate degree of correlation between knowledge score and practice score (0.34).The finding of study were consistent with **Sharma Bhartendra.(2014)** Quasi-Experimental Study to Assess the Effect of Video Assisted Teaching Module Regarding Tracheostomy Care on Knowledge and Skill of Staff Nurses at Vinayaka Mission Hospital, Salem, Tamilnadu which showed that Karl Pearson's coefficient of correlation analysis between knowledge and skill (r = 0.42) i.e. significant relation, which revealed that when knowledge level increased, the skill also increased. In contrast to this study **Miller Smith (2006)** conducted a study on Graduate nurses' comfort and knowledge level regarding tracheostomy care. This study examined 104 new graduate nurses' (GNs) comfort level before and after a tracheostomy in-service educational session. Results indicate no correlation between reported comfort level and knowledge in caring for patients with tracheostomies. Findings demonstrate that GNs can benefit significantly from in-service education and skills integration. This suggests that hands-on skills content should be a priority for inclusion into nurse residency programs, particularly with specialized, high-risk, low-incidence nursing skills, regardless of how comfortable nurses report they are with a given patient population

6. Conclusion

The study showed that
- Post test knowledge and practice score was higher than pre-test knowledge and practice score regarding tracheostomy care among staff nurses.
- This study also highlighted that there is association between pre-test and post-test knowledge score with demographic variable i.e. attended any in-service education regarding tracheostomy care but no association is found in pre-test practice and post-test practice score with any of demographic variable.

Hence it was concluded that STP was effective as evidence by the result of pre-test and post-test knowledge and practice score regarding tracheostomy care. The knowledge and skills of nurses can be improved through in-service education programmes.

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