World Journal of Advanced Research and Reviews
eISSN: 2581-9615 CODEN (USA): WJARAI
Cross Ref DOI: 10.30574/wjarr
Journal homepage: https://wjarr.com/

(RESEARCH ARTICLE)

Effectiveness of educational intervention on knowledge regarding tracheostomy care among the staff nurses

Sandeep Kumar [1,*] and Taj Mohammad [2]

[1] *Seth Dhanpal chand jain hospital and institute of Nursing, Khekra, Baghpat, U.P. India.*
[2] *Excel school of nursing 22 Singrausi Unnao, UP, India.*

World Journal of Advanced Research and Reviews, 2025, 28(02), 1599–1605

Publication history: Received on 11 October 2025; revised on 17 November 2025; accepted on 19 November 2025

Article DOI: https://doi.org/10.30574/wjarr.2025.28.2.3894

Abstract

Introduction: Nurses have a critical role in tracheostomy care. By its very nature, it is a technical procedure, requiring expertise to manage the safety and patency of the patient's airway, and avoid complications. Nurses support patients with tracheostomies whilst in the care and emergency setting. Tracheostomy is indicated to reduce anatomical dead space to aid in the process of weaning off artificial ventilation; prevent or treat residual tracheobronchial secretions; chronic upper airway obstruction and bypass acute upper airway obstruction

Objectives: To assess the knowledge score regarding tracheotomy care among staff nurses. To evaluate the effectiveness of educational intervention Program regarding Tracheostomy care among Staff Nurses. To find the association between pre-test level of knowledge score with selected socio demographic variables.

Material and Methods: A True experimental, Pre-test post-test only design was used to conduct the study at District hospital, Baghpat and Sarvodaya hospital and institute of medical science, Baghpat. Simple Random Sampling Technique was used to select the nurses. Data was collected multiple choice 40 knowledge questionnaires. 100 staff nurses, selected in control group followed by next 100 staff nurses selected in experimental group. Educational Intervention which need of Tracheostomy/How to care of Tracheostomy, management of Tracheostomy care, implemented through verbal discussion, demonstration, and poster to experimental group and the same was withheld from the control group. Post-test was conducted after 7 to 14 days after intervention among both the groups. The average time to complete the session was 20-25 minutes. Descriptive statistics includes frequency, percentage, mean, mean difference and standard deviation was used to describe the result.

Conclusion: The present study concluded the structured teaching program were effective in improving the knowledge, regarding prevention of tracheostomy care among the staff nurses. Awareness was created among the staff nurses. The nursing educator can use the results of study and can improve the knowledge level and can create awareness regarding tracheostomy care among the staff nurses.

Keywords: Educational Intervention; Knowledge; Tracheostomy Care; Staff Nurse

1. Introduction

Health (or health care) is the diagnosis, treatment and prevention of disease, illness, injury, and other physical and mental impairments in humans. Practitioners in medicine, dentistry, nursing, pharmacy, and allied health provide healthcare. Nurses care for patients continuously, 24 hours a day. They help patients to do what they would do for themselves if they could. In order to provide their patients with the best care possible, nurses monitor their breathing,

* Corresponding author: Sandeep Kumar

make sure they are getting enough food and fluids, assist their patients in sleeping and resting, see to it that they are comfortable, tend to their body's need for waste removal, and help them avoid the negative effects of immobilization, such as pressure sores and stiff joints. Nurses provide round the-clock, continuous patient care. When a patient is able to take care of oneself, they assist them in doing so. The nurse often based on the patient's information and potential issues, independently determines what kind of care the patient requires. They help patients to do what a tracheostomy is the formation of an opening into the trachea usually between the second and third rings of cartilage.

Tracheostomy is indicated to reduce anatomical dead space to aid in the process of weaning off artificial ventilation; prevent or treat residual tracheobronchial secretions; chronic upper airway obstruction and bypass acute upper airway obstruction. The tracheostomy consists of two parts. Inner cannula smaller tube that fits inside the tracheostomy tube, which can be removed quickly if it becomes obstructed. This is often used for patients who have copious secretions. Tracheostomy tube an indwelling tube that keeps the tracheostomy open. It can be made of throwaway plastic or metal (for long-term use). When caring for the site in the initial days following the surgical creation of the tracheostomy, extra measures should be exercised. The location is sensitive to tracheostomy tube movement and prone to bleeding. Therefore, it is more crucial than ever that certified nurses have the abilities, know-how, and assistance needed to safely and effectively satisfy each patient's specific needs. The nursing model or framework used should be creative, responsive, holistic and individualized, based on sound knowledge in accordance with local policies.

A recent tracheostomy nursing care audit indicated a need for further education to increase overall competency. When caring for the site in the initial days following the surgical creation of the tracheostomy, extra measures should be exercised. The location is sensitive to tracheostomy tube movement and prone to bleeding. While performing site care, it is advised that another medical expert hold the tube securely. In order to decrease the risk of the tube being pulled out and the patient losing their airway, tracheostomy care shouldn't be performed on an agitated or restless patient. Since they are in charge of providing tracheostomy care in an acute care setting, nurses play a major part in this process. The nurse may receive assistance from the respiratory therapist both throughout the procedure and the respiratory assessment.

Aim

Aim To assess the effectiveness on knowledge regarding tracheotomy care among the staff nurses.

Objectives

- To assess the level of knowledge scores regarding tracheotomy care among staff nurses.
- To evaluate the effectiveness of an educational intervention program on tracheostomy care among staff nurses.
- To find the association between the pre-test knowledge scores of the experimental and control groups with their selected socio-demographic variables.

2. Materials and methods

- Research Approach: Quantitative Approach
- Research Design: True Experimental Design (Pre-test Post-test Only Design).
- Setting of the study: District Hospital, Baghpat and Sarvodaya Hospital and Institute of Medical Science, Baghpat.
- Population: All staff nurses working in the selected hospitals.
- Sample: Staff Nurses working in the selected hospital
- Sampling Technique: Simple Random Sampling Technique.

2.1. Inclusion criteria

- Staff nurses employed in selected hospitals at Baghpat, U.P.
- Staff nurses willing to participate in the research project.
- Staff nurses who are available during the time of data collection.

2.2. Exclusion criteria

- Staff nurses working in the Medical Records Department (MRD).
- Staff nurses who are above 34 years of age.

2.3. Variables of study

- Independent Variable: Educational intervention on tracheostomy care among staff nurses.
- Dependent Variable: Knowledge about tracheostomy care among staff nurses.

2.4. Description of Research Tool

The tool consists of two parts, namely:

- Part A: Socio-demographic data
- Part B: Structured Knowledge Questionnaire to assess knowledge on Tracheostomy care.

The structured questionnaire consists of two parts.

2.4.1. Part A: Socio-demographic data

Demographic variable includes age in years, professional qualification in Nursing, monthly income, designation, experience, previous exposure to education program regarding complementary therapy for labor pain.

Section A: Demographic Data includes Age, sex, marital status, Professional Education, Experience, Have you ever provided tracheostomy care to patient, Tracheostomy care.

2.4.2. Part B

Section B: This will include Structured Knowledge Questionnaire to assess knowledge on Tracheostomy care. This part has 26 questions regarding selected complementary therapies for labour pain and it's divided into 4 sections

The recommendation and suggestions of experts were considered to modify the items of tool as well as the content of structured teaching program.

2.5. Reliability of the tool

In order to establish the reliability of the tool, it was administered to four Nurses. reliability was obtained by split half technique. Reliability of the tool was found highly significant and reliable

Educational intervention program includes various structured knowledge questionnaire-This will include the questionnaire regarding knowledge of tracheotomy care.

The parameters related to knowledge questionnaire are

- Tracheostomy care
- Causes of tracheostomy
- Clinical feature.
- Management of tracheotomy care
- Follow up

2.6. Data collection procedure

The final study was conducted among staff nurses from August 2022 to May 2023 after obtaining ethical clearance from the Institutional Ethics Committee and administrative permission from Sarvodaya Hospital and Institute of Medical Sciences, Baghpat. Written informed consent was obtained from each participant after clearly explaining the purpose of the study, procedures involved, voluntary participation, and assurance of confidentiality. The study population comprised staff nurses working in various units of the hospital. A total of 160 staff nurses were selected using a simple random sampling (lottery) method, based on predefined inclusion and exclusion criteria, and were allocated into two groups: 80 in the control group and 80 in the experimental group. Data were collected using a structured and pre-tested 40-item knowledge questionnaire developed by the investigator. The tool covered major areas of tracheostomy care and was validated by experts in medical–surgical nursing; reliability was established through a pilot study. Both experimental and control groups completed the pre-test questionnaire before the intervention. The educational intervention was administered only to the experimental group and included verbal discussion, demonstration, PPT presentation, charts and clarification of doubts, whereas no such intervention was provided to the control group to avoid contamination. The average duration of each session was 20–25 minutes. The post-test was administered to both

groups 7–14 days after the intervention to evaluate improvement in knowledge. Throughout data collection, participants showed good cooperation, and the process was completed without interruption. Descriptive statistics such as frequency, percentage, mean, mean difference, and standard deviation were used to summarize the data. Inferential statistics including the paired t-test, unpaired t-test, and Chi-square test were applied to assess the effectiveness of the educational intervention and to determine associations with selected demographic variables.

3. Results

Table 1 Distribution of demographic variables

Demographic variable		Experimental group		Control group	
		F	*%*	*F*	*%*
Age in years	22-25	40	40	36	36
	26-29	15	15	19	19
	30-33	18	18	13	13
	≥35	7	7	12	12
Gender	Male	16	16	30	30
	Female	64	64	50	50
Marital Status	Married	14	14	29	29
	Unmarried	66	66	51	51
Professional Education	G.N.M	53	53	60	60
	B.Sc. Nursing	22	22	11	11
	Post Basic Nursing	4	4	8	8
	NPCC	1	1	1	1
Experience	0-2Years	35	35	34	34
	3-5Years	23	23	16	16
	6-8Years	9	9	21	21
	>8Years	13	13	9	9
Any in-service education program regarding Tracheostomy care	Yes	21	21	30	30
	No	59	59	50	50
Area in which you are working.	Emergency ward	15	15	14	14
	Operation Theatre	10	10	12	12
	Post- Operative ward	18	18	6	6
	Other ward	37	37	48	48
Source of Information	Friends	22	22	41	41
	Seniors	30	30	18	18
	Teachers	20	20	14	14
	Juniors	8	8	7	7

Table 2 Comparison of mean pre-test and post-test knowledge scores of the experimental group

Test	Range	Mean ± SD	Mean Difference	Df	t- value (p-value)
Pre-test	29-8=21	13.66± 3.73	10.82	79	14.35
Post-test	37-17=20	24.48 ± 5.29			

t_{79}=1.66, p<0.05

The final study revealed that Majority, 40% of the participants was belongs to 22-25 years age group and 18% of the participants were belong to 30-33 years and 15% were belong to 26-29 years age group and 97% belong to more than 35 years. In control group,36 % of the participants were belongs to above 22-25 years of age, 19% were belongs to 26-29 years, 12% of the participants was above 35 years and remaining 13% was belong to 30-33 years. Experimental group, most of the participants, 64% were female and remaining 16% were male. In control group, 50 % of the participants were female and 30% of the male. Experimental group, 66 % of the participant were unmarried, 14% of the participants 14 % were married. In control group, 51% of the participant were unmarried, 29% were married. Experimental group, 53% were having GNM qualification, 22% were having B.Sc. Nursing degree and 4% was having post basic nursing degree and remaining 1% having NPCC degree. In control group, 60% of the participants having GNM qualification, 11% were having B.Sc. Nursing degree and 8% were having post basic nursing degree and remaining 1% having NPCC degree. Experimental group, 35% were having 0-2 years' experience, 23% were having 3-5 years' experience and 13% were having more than 8 years' experience and remaining 9% having 6-8 years' experience. In control group, 34% of the participants were having 0-2 years of experience, 16% were having 3-5 years of experience and 21% were having 6-8 year of experience and remaining 9% having more than 8 year of experience. Experimental groups, majority of the participants are that is 59% were not participated in any in service educational program and remaining 21% were participated in in-service educational program. In control group, 50 % of the participant was not participated in any service educational program and 30% of participants were participated in in-service educational program. Experimental group, largest number of participants are that is.37% were working in others wards and remaining 18% were working in post-operative ward and 15 % working in emergency and remaining 10% working in Operation Theatres. In control group, 48% of the participant was working in other wards and 14% of participants are working in emergency and 12% were working in Operation Theatres and remaining 6% were working in post-operative wards. Table 1 shows that in experimental group, majority of the participants are that is.59% were not participated in any in service educational program and remaining 21% were participated in service educational program. In control group, 50 % of the participants were not participated in any service educational program and 30% of participants are participated in in-service educational program.

Table 3 Comparison of post-test score of both experimental and control group (n=80+80)

Post-test	Range	Mean±SD	Mean Difference	DF	t- value (p-value)
Experimental Group	37-17=20	24.28 ± 5.29	2.24	158	3.25
Control Group	32-14=18	22.04 ± 4.22			

t_{158}=1.65, p<0.05

Table 4 Frequency and percentage distribution of staff nurse's experimental group pre-test score regarding knowledge on tracheostomy care

Knowledge	Frequency	Percentage (%)
Inadequate	39	48.75%
Moderate	40	50%
Adequate	01	1.25%

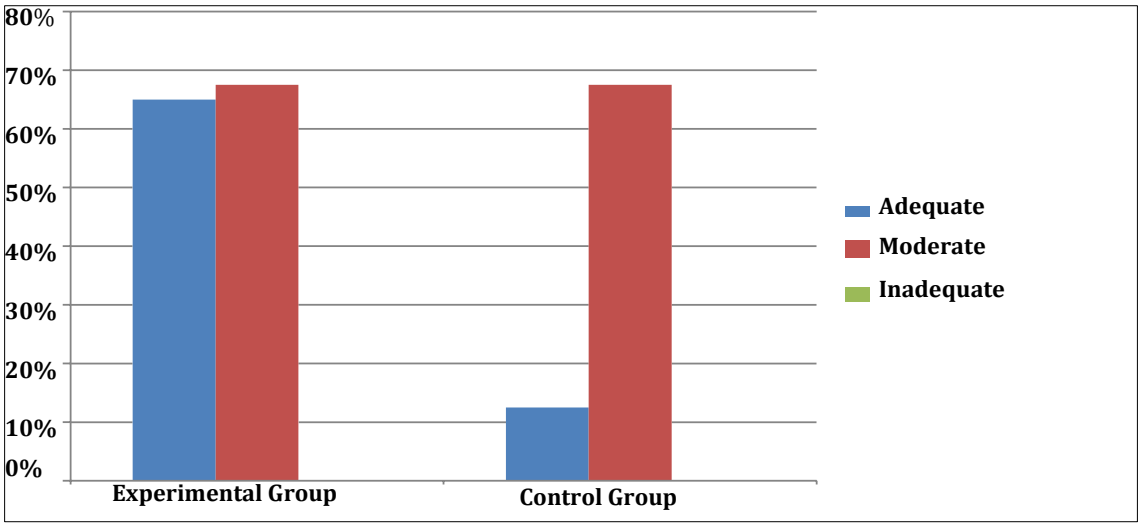

Figure 1 Comparison of mean post-test knowledge score of the experimental and control group

4. Discussion

The findings of the present study clearly demonstrate that the educational intervention significantly improved the knowledge of staff nurses regarding tracheostomy care. The post-test mean knowledge score of the experimental group (24.48 ± 5.29) was substantially higher than the pre-test means score (13.66 ± 3.73), with a mean difference of 10.82, and the calculated t-value (t = 14.35) exceeded the table value (t_{79} = 1.99), indicating a statistically significant gain in knowledge following the intervention. This improvement highlights the effectiveness of structured teaching through verbal explanation, demonstration, and visual aids in enhancing nurses' understanding and competency. The demographic distribution also suggests that improvement occurred across diverse age groups, qualifications, experience levels, and work areas, emphasizing the universal applicability of the training. These results align with previous research suggesting that focused educational strategies strengthen clinical preparedness and promote evidence-based practice in airway management. The study underscores the need for regular in-service education, standardized training protocols, and wider dissemination of tracheostomy care guidelines to sustain long-term knowledge retention. Additionally, the findings suggest future scope for qualitative studies, comparative evaluations across medical and paramedical disciplines, and replication with larger samples to enhance generalizability. Overall, the intervention proved beneficial in increasing awareness and equipping nurses with essential knowledge required for safe and effective tracheostomy care.

5. Conclusion

The present study concluded the structured teaching program were effective in improving the knowledge, regarding prevention of tracheostomy care among the staff nurses. Awareness was created among the staff nurses. The nursing educator can use the results of study and can improve the knowledge level and can create awareness regarding tracheostomy care among the staff nurses. In order to prevent tracheostomy care, nurses can increase their knowledge. Future researchers can use the study's findings to assist them conduct qualitative research. The same study can be conducted in the different college of nursing area. A comparison between medical and paramedical fields can be made, and the same study can be duplicated on large samples, allowing results to be generalized.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of ethical approval

- Research approval has taken from the institutional research committee. The present research work does not contain any studies performed on animal/ humans' subjects by any of the authors
- Permission has taken from the hospital before conducting the study and informed consent was obtained

from all the participants included in the study.

- Prior to conducting the study, ethical clearance was obtained from the Institutional Ethics Committee of Bareilly International University.
- Permission was obtained from the Medical Superintendents of the selected hospitals.
- The data collection procedure was explained to the participants, and informed consent was obtained. Participants were assured that their data would be kept confidential and used solely for research purposes.
- Participants were informed of their right to withdraw from the study at any time without any consequences.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

References

[1] Khanum T, Zia S, Khan T, Kamal S, Khoso MN, Alvi J, et al. Assessment of knowledge regarding tracheostomy care and management of early complications among healthcare professionals. Braz J Otorhinolaryngol. 2022;88(2):251–6. Available from: http://dx.doi.org/10.1016/j.bjorl.2021.06.011

[2] 4Russell C. Providing the nurse with a guide to tracheostomy care and management. Br J Nurs. 2005;14(8):428–33. Available from: https://pubmed.ncbi.nlm.nih.gov/15924022/

[3] Serra A. Tracheostomy care. Nurs Stand. 2000;14(42):45–52. Available from: https://journals.rcni.com/nursing-standard/tracheostomy-care-ns2000.07.14.42.45.c2872

[4] Meister KD, Pandian V, Hillel AT, Walsh BK, Brodsky MB, Balakrishnan K, et al. Multidisciplinary safety recommendations after tracheostomy during COVID-19 pandemic: State of the art review. Otolaryngol Head Neck Surg. 2021;164(5):984–1000. Available from: http://dx.doi.org/10.1177/0194599820961990

[5] Elango G, Kaur R. A pre-experimental study to assess the effectiveness of structured teaching programme on knowledge regarding tracheostomy care among staff nurses working in selected hospitals at District Sangrur, Punjab [Internet]. Jetir.org. [cited 2023 Dec 5]. Available from: https://www.jetir.org/papers/JETIR2212120.pdf

[6] Okam A. Knowledge and practice of tracheostomy care: A case of Federal Medical Centre, Umuahia South East of Nigeria [Internet]. Texilajournal.com. [cited 2023 Dec 5]. Available from: https://www.texilajournal.com/thumbs /article/Nursing_Vol%202_Issue%202_Article_21.pdf

[7] Effect of an Educational Training Program in Tracheostomy Care on Nurses' Knowledge and Skills [Internet]. Researchgate.net. [cited 2023 Dec 5]. Available from:

[8] https://www.researchgate.net/publication/350877821_Effect_of_an_Educational_Training_Program_in_Tracheostomy_Care_on_Nurses'_Knowledge_and_Skills

[9] Constitution of the World Health Organization [Internet]. Who.int. [cited 2023 Dec 5]. Available from: https://www.who.int/about/accountability/governance/constitution

[10] Cheung NH, Napolitano LM. Tracheostomy: Epidemiology, indications, timing, technique, and outcomes. Respir Care. 2014;59(6):895–919. Available from: https://pubmed.ncbi.nlm.nih.gov/24891198/

[11] Rohail A, Malik MF, Gill ZI, Malik WY. Incidence of complications of tracheostomy and their management [Internet]. Pjmhsonline.com. [cited 2023 Dec 5]. Available from: https://pjmhsonline.com/2010/apr_june/pdf/mm%20%20%20Incidence%20of%20Complications%20of%20Tracheostomy%20and%20their%20Management.pdf

[12] Bonvento B, Wallace S, Lynch J, Coe B, McGrath B. Role of the multidisciplinary team in the care of the tracheostomy patient. J Multidiscip Healthc [Internet]. 2017 [cited 2023 Dec 5];10:391–8. Available from: http://dx.doi.org/10.2147/jmdh.s118419

[13] Paul F. Tracheostomy care and management in general wards and community settings: literature review. Nurs Crit Care [Internet]. 2010;15(2):76–85. Available from: http://dx.doi.org/10.1111/j.1478-5153.2010.00386.x

[14] Mlambo M, Silén C, McGrath C. Lifelong learning and nurses' continuing professional development, a metasynthesis of the literature. BMC Nurs [Internet]. 2021;20(1). Available from: http://dx.doi.org/10.1186/s12912-021-00579-2

[15] Ransmayr G. Challenges of caregiving to neurological patients. Wien Med Wochenschr [Internet]. 2021 [cited 2023 Dec 5];171(11–12):282–8. Available from: http://dx.doi.org/10.1007/s10354-021-00844-8