AJMS
Asian Journal of Mathematical Sciences

RESEARCH ARTICLE

BRIDGING THE KNOWLEDGE GAP: ENHANCING TRACHEOSTOMY CARE SKILLS THROUGH STRUCTURED LEARNING

[*]Jeya Beulah D, [1]Usha Rani Kandula

[*], Associate professor, SCPM college of nursing and paramedical sciences, Gonda, Uttar Pradesh-271003, Atal Bihari Vajpayee University Lucknow,India.
[1]HOD, Department of Medical surgical nursing, SCPM college of nursing and paramedical sciences, Gonda, Uttar Pradesh-271003, Atal Bihari Vajpayee University Lucknow,India.

Email: neha2010dec@gmail.com

Received: 12-04-2024; Revised: 28-04-2024; Accepted: 08-05-2024

ABSTRACT

Background-Tracheostomy care is essential for patients with severe respiratory issues, yet traditional nursing education often inadequately prepares students for this complex procedure. This study explores the impact of a structured educational program on improving the knowledge and skills of nursing students in tracheostomy care.**Aim-**The primary objective of this study is to evaluate the effectiveness of a structured educational program in enhancing the knowledge, skills, and confidence of nursing students regarding tracheostomy care.**Methods-**An evaluative approach with a pre-experimental one-group pretest-post-test design was employed. The study was conducted at SCPM College of Nursing and Paramedical Sciences, Gonda, UP, involving 40 second-year GNM students. A structured questionnaire assessed knowledge levels before and after the intervention and study samples were recruited with the help of purposive sampling technique. Data collection was performed by six trained BSc nursing tutors and analysed using SPSS, with a significance level of <0.05 and a 95% confidence interval.**Results-**The pretest mean score was 11.42 (SD = 1.9596), while the post-test mean score increased to 17.50 (SD = 2.2870), with a mean difference of 6.08. The standard error was 0.47, and the calculated t-value was 12.76, compared to the tabulated value of 1.685, indicating a significant improvement in knowledge levels.**Conclusion-**The structured educational program significantly enhanced the knowledge and practical skills of nursing students regarding tracheostomy care, demonstrating its effectiveness as a teaching method.

Keywords: Covid-19, SEIR model, Social Distancing Measures, Mathematical Model, Reproduction Number

INTRODUCTION

Background and Rationale

Tracheostomy care is a crucial component of respiratory management, particularly for patients requiring long-term ventilation, those with upper airway obstructions, or patients needing airway protection. The procedure involves creating an opening in the neck to place a tube into a person's windpipe, allowing for breathing when the usual route for breathing is somehow blocked or reduced(1). The care of a tracheostomy demands meticulous attention to prevent complications such as infections, blockages, and other life-threatening issues. Given its complexity and the critical nature of the care required, it is imperative that nursing students are thoroughly trained and competent in managing tracheostomies(2).
However, traditional nursing education often lacks sufficient depth in specialized procedures like tracheostomy care. Many nursing curricula focus extensively on broad medical and surgical nursing principles, sometimes at the expense of specialized, high-risk procedures(3). This educational gap can result in nursing students feeling underprepared when they encounter such situations in clinical practice. Addressing this gap is essential to ensure that nursing graduates are not only knowledgeable but also confident and proficient in performing tracheostomy care(4,5).

Significance of the Study

The structured educational program on tracheostomy care was developed to address this educational deficiency. The program aims to provide a comprehensive learning experience that integrates theoretical knowledge with practical skills, thereby preparing nursing students to manage tracheostomies effectively and safely(5). This study evaluates the impact of such a program on the knowledge and skills of second-year General Nursing and Midwifery (GNM) students at SCPM College of Nursing and Paramedical Sciences, Gonda, UP.

LITERATURE REVIEWS

Previous studies have shown that structured educational interventions can significantly improve nursing students' competence in various clinical skills. For instance, simulation-based training has been widely recognized for its effectiveness in enhancing clinical performance and decision-making skills. Simulation provides a risk-free environment where students can practice and hone their skills, receive immediate feedback, and learn from their mistakes without endangering patients(6,7).
Moreover, educational programs that blend didactic lectures with hands-on practice and real-world clinical scenarios have demonstrated a higher retention rate of knowledge and skills. These programs foster an active learning environment where students engage more deeply with the material, leading to better long-term retention and application in clinical settings.

MATERIAL AND METHODS

Operational Definitions

1. Structured Educational Program

A systematic and organized teaching method designed to enhance nursing students' knowledge and skills regarding tracheostomy care. This program includes a combination of didactic lectures, interactive sessions, simulation-based training, and practical hands-on experiences. It aims to provide a comprehensive understanding and improve the competency of nursing students in performing tracheostomy care

.

2. Knowledge

In the context of this study, knowledge refers to the theoretical understanding that nursing students possess about tracheostomy care. This includes their awareness of procedures, protocols, complications, and management techniques associated with tracheostomy. Knowledge will be measured using a structured questionnaire administered before and after the educational intervention.

3. Tracheostomy Care

Tracheostomy care encompasses all the medical and nursing procedures involved in maintaining and managing a tracheostomy. This includes stoma care, suctioning, changing tracheostomy tubes, infection prevention, and emergency response to complications. Effective tracheostomy care is essential for patient safety and involves both routine and critical care skills(8).

4. Nursing Students

Individuals enrolled in the second year of the General Nursing and Midwifery (GNM) program at SCPM College of Nursing and Paramedical Sciences, Gonda, UP. These students are in the process of acquiring foundational and advanced nursing skills and are the target population for the structured educational program on tracheostomy care.

METHODOLOGY

This study employs an evaluative approach with a pre-experimental one-group pretest-post-test design to assess the effectiveness of a structured educational program on tracheostomy care among nursing students. Conducted at SCPM College of Nursing and Paramedical Sciences, Gonda, Uttar Pradesh, the study involves 40 purposively selected second-year General Nursing and Midwifery (GNM) students. A structured questionnaire, developed to evaluate theoretical knowledge of tracheostomy care, was administered before and after the intervention. The educational program includes didactic lectures, simulation-based training, clinical practice, and interactive sessions, designed to enhance both theoretical knowledge and practical skills. Data collection was carried out by six trained BSc nursing tutors and subsequently analysed using SPSS software. Descriptive statistics, including mean and standard deviation, along with inferential statistics, such as paired t-tests, were used to determine the significance of the changes in pretest and post-test scores, with a significance level set at <0.05 and a 95% confidence interval. Ethical approval was obtained, and informed consent was secured from all participants. The expected outcome is a significant improvement in students' knowledge and skills related to tracheostomy care, demonstrating the program's effectiveness in preparing students for clinical practice.

Eligibility Criteria

Inclusion criteria

For inclusive criteria, we welcome GNM second-year students currently enrolled at SCPM College who exhibit a keen interest in advancing their knowledge of tracheostomy care through participation in our study. We prioritize students who willingly engage in the research process, eager to contribute to the advancement of nursing education. Additionally, students who are present during the data collection sessions are eligible for inclusion, ensuring the integrity and completeness of our sample.

Exclusion criteria

On the other hand, for exclusive criteria, we respectfully decline participation from GNM students who express reluctance to engage in the study, acknowledging and respecting their autonomy in decision-making regarding their involvement. Furthermore, students who are absent at the time of data collection are excluded, as their absence may introduce bias and compromise the reliability of our findings. Through these carefully crafted criteria, we aim to assemble a cohesive and dedicated cohort of participants

committed to enhancing their understanding of tracheostomy care through our structured educational program.

Study Variables

Independent variable

In our study, the independent variable is the Structured Training Program (STP) focused on the prevention of tracheostomy care complications. This innovative program serves as the catalyst for enhancing the knowledge of second-year General Nursing and Midwifery (GNM) students in our sample. We believe that by implementing a comprehensive and meticulously designed training regimen, we can empower these students with the necessary skills and insights to mitigate risks associated with tracheostomy care.

Dependent variable

The dependent variable in our research is the knowledge level of GNM second-year students. This encompasses their understanding of tracheostomy care protocols, procedures, and preventative measures. Through our structured training program, we aim to observe a significant improvement in the knowledge base of these students, as they become more adept at identifying potential complications and implementing effective preventative strategies.

Demographic variables

Moreover, our study considers various demographic variables that may influence the outcomes. These include age, gender, education level, family income, religion, prior experience in healthcare settings, and participation in in-service education programs. By analysing these demographic factors alongside the effectiveness of our training program, we gain valuable insights into the diverse backgrounds and experiences that shape the learning process for nursing students. This holistic approach ensures that our findings are comprehensive and reflective of the multifaceted nature of nursing education and practice.
Study instruments

In our study, we employed a structured questionnaire designed with two distinct sections to comprehensively assess and evaluate the impact of our Structured Training Program (STP) on the prevention of tracheostomy care complications.

Section A- Section A of the questionnaire focused on gathering socio-demographic variables, including age, gender, education level, family income, religion, prior experience in healthcare settings, and participation in in-service education programs. By capturing this diverse array of demographic data, we aimed to gain a holistic understanding of the background characteristics that may influence the participants' knowledge levels and responses.

Section B- \Section B of the questionnaire was dedicated to assessing the participants' knowledge regarding the prevention of tracheostomy care complications. This section comprised a series of targeted questions aimed at evaluating the subjects' understanding of essential protocols, procedures, and preventative measures related to tracheostomy care. Each question was meticulously crafted to gauge the depth and breadth of the participants' knowledge in this critical area of nursing practice.

Data Collection Procedure

The data collection procedure followed a structured approach to ensure the integrity and reliability of our findings. Initially, a pre-test was conducted using the structured questionnaire to assess the subjects' baseline knowledge levels. Subsequently, all participants received the STP intervention, designed to enhance their understanding and competency in preventing tracheostomy care complications. Following the completion of the STP, a post-test was administered seven days later, utilizing the same structured questionnaire as the pre-test. This sequential approach allowed us to measure the effectiveness of the STP by comparing the participants' pre-test and post-test responses, thus providing valuable insights into the program's impact on knowledge acquisition and retention.

By employing this innovative data collection procedure and utilizing a comprehensive structured questionnaire, our study aims to contribute novel insights into the effectiveness of educational interventions in improving nursing students' knowledge and skills in preventing tracheostomy care complications.

Ethical Consideration

Ethical considerations in our study were diligently addressed to uphold the rights and well-being of participants. Prior ethical approval was obtained from SCPM College of Nursing's ethics committee. Informed consent was obtained from all participants, ensuring they were fully informed about the study's purpose, procedures, and their voluntary participation. Confidentiality of data was strictly maintained, with anonymization measures in place. Participants were assured of their right to withdraw from the study without penalty. Measures were taken to minimize any potential harm or discomfort. Upholding these ethical standards ensured the integrity and validity of our research findings while prioritizing participant welfare.

RESULTS

In this section, we present a comprehensive analysis of the data collected during our study on the effectiveness of a Structured Training Program (STP) in preventing tracheostomy care complications among General Nursing and Midwifery (GNM) second-year students. The analysis focuses on evaluating the impact of the STP on participants' knowledge levels regarding tracheostomy care. By examining pre-test and post-test data, we aim to assess the effectiveness of the program in enhancing participants' understanding of essential protocols, procedures, and preventative measures related to tracheostomy care. Through rigorous statistical analysis, we seek to identify significant changes in knowledge levels and provide valuable insights into the efficacy of educational interventions in improving patient care outcomes.

Section-I

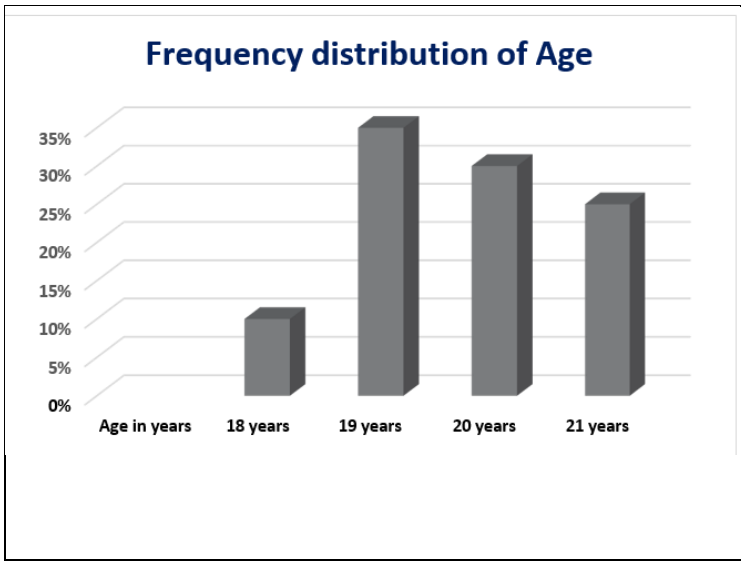
Table -1 Frequency distribution of socio demographical variables (n=40)

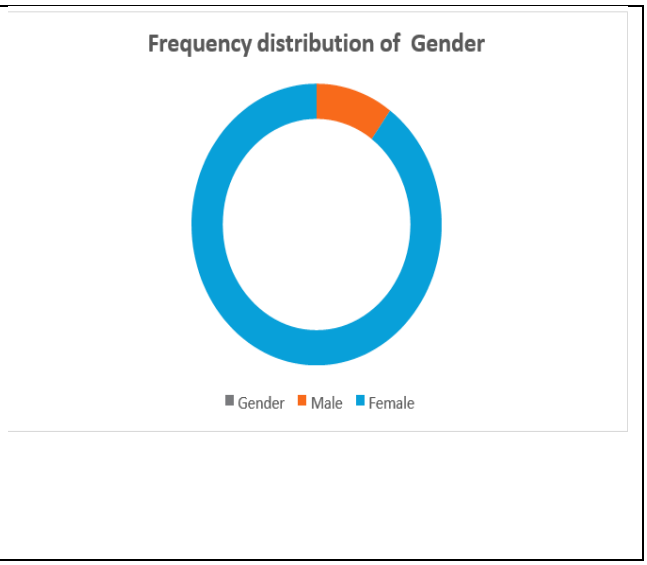
S. No	VARIABLES	FREQUENCY	Percentages
1	Age in years		
	18 years	04	10%
	19 years	14	35%
	20 years	12	30%
	21 years	10	25%
2	Gender		
	Male	04	10%
	Female	36	90%
3	Area of living		
	Rural	21	52.5%
	Urban	19	47.5%

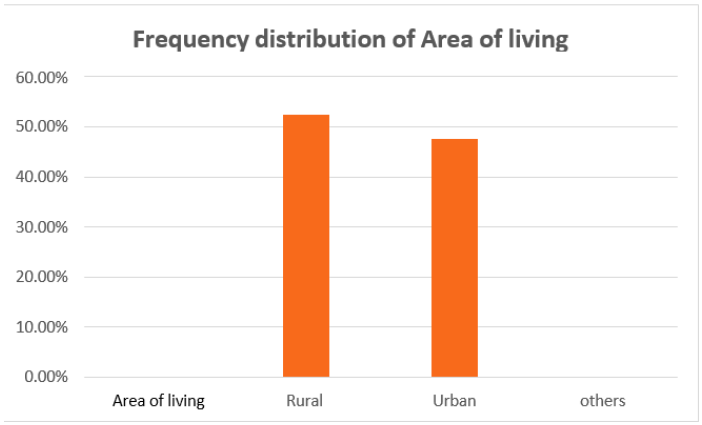
	others	--	--
4	Religion Hindu Muslim Christian others	 35 05 -- --	 87.5% 12.5% -- --
5	Type of Family Nuclear Joint Extended others	 25 15 -- --	 62.5% 37.5% -- --
6	Earlier knowledge to tracheostomy care Yes No	 40 --	 100% --

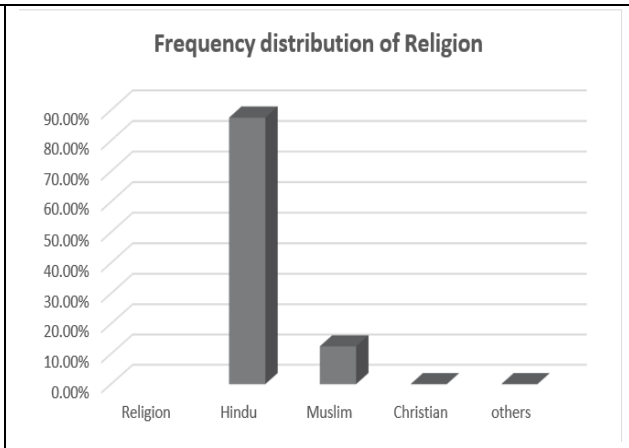
The table provides a comprehensive overview of the socio-demographic characteristics of the study participants, consisting of 40 individuals. It reveals a diverse distribution across various categories. In terms of age, the majority fall within the 19-year-old bracket (35%), followed closely by those aged 20 years (30%). Gender distribution shows a significant predominance of female participants (90%) compared to male participants (10%). Geographically, participants are almost evenly split between rural (52.5%) and urban (47.5%) areas, with no representation from other regions. Religiously, the majority identify as Hindu (87.5%), with a smaller percentage identifying as Muslim (12.5%). Family structures primarily consist of nuclear families (62.5%) followed by joint families (37.5%), with no participants from extended or other family types. Remarkably, all participants (100%) report prior knowledge of tracheostomy care, indicating a uniformly high baseline understanding among the study population. This comprehensive analysis underscores the diverse demographic composition of the study participants and provides valuable insights into the characteristics of the sample population (Table-1, Figure-1).

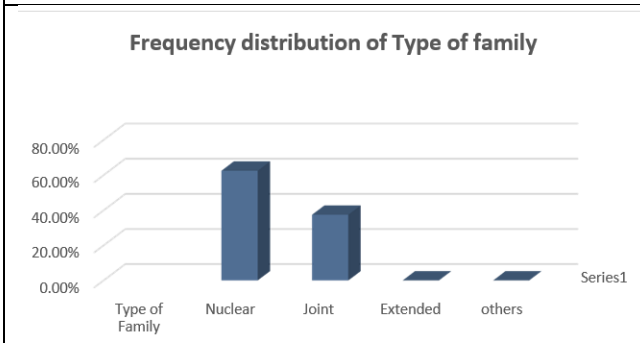
Graphical Presentation Of Demographic Variables

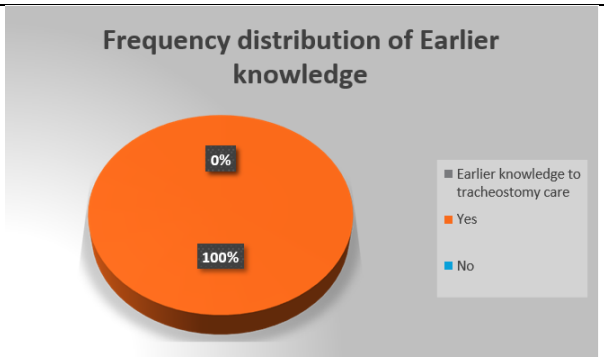












Section-II

Table -2 Percentage distribution of overall knowledge level (n=40)

S. N	Level of knowledge	% of score	Pretest		Post-test	
			Frequency	%	Frequency	%
1	Inadequate	0-40	04	10	--	--
2	Moderate	41-70	36	90	09	22.5
3	Adequate	71 and above	--	--	31	77.5

The table presents a breakdown of participants' levels of knowledge concerning tracheostomy care, categorized into inadequate, moderate, and adequate levels based on percentage score ranges. Initially, 10% of participants demonstrated inadequate knowledge in the pretest, but none remained in this category post-intervention, indicating a complete improvement to higher knowledge levels. The majority of participants (90%) exhibited moderate knowledge levels in the pretest, which notably decreased to 22.5% post-intervention, showcasing a significant enhancement in knowledge. Interestingly, none of the participants displayed adequate knowledge in the pretest; however, after the intervention, a remarkable 77.5% achieved this level, reflecting a substantial improvement in understanding. These findings

underscore the efficacy of the intervention program in elevating participants' knowledge levels, evident through the notable shift towards higher knowledge categories in the post-test results (Table-2).

Section-III

Table-3 Significance difference between pre-test and post-test knowledge scores (n =40)

S. No	Score	Mean	S. D	Std. error	Mean difference	D.F	t' table	
							Calculated value	Table value
	Pre-test	11.42	1.95960	0.4762	6.08	39	12.76	1.685
	Post-test	17.50	2.28709					

The table provides a comparison of the pretest and post-test scores, along with relevant statistical measures, in assessing participants' knowledge of tracheostomy care. In the pretest, participants obtained an average score of 11.42, with a standard deviation (S.D.) of 1.9596. The standard error (S.E.) associated with this mean score is 0.4762. Following the intervention, participants' post-test scores significantly increased to a mean of 17.50, with a slightly higher standard deviation of 2.28709. The calculated mean difference between pretest and post-test scores is 6.08, indicating a substantial improvement in knowledge levels post-intervention. A t-test was conducted to determine the significance of this difference, resulting in a calculated t-value of 12.76, surpassing the critical t-value of 1.685 at a significance level of 0.05. These findings suggest a statistically significant enhancement in participants' knowledge of tracheostomy care following the structured educational program (Table-3).

Section-IV

Table no. 4 (A) shows Mean, mean% and standard deviation of pre-test knowledge scores (n=40)

S. NO	AREA	MAXIMUM SCORE	MEAN SCORE	MEAN %	S. D
1	Anatomy And Physiology of Trachea	5	3.3250	66.5%	**.91672**
2.	Question regarding tracheostomy tube	9	4.1250	45.83%	**1.34331**
3.	Question related tracheostomy care	10	4.2500	42.5%	**1.27601**
	Total	24	11.4250	47.60	1.95969

The table presents data on the assessment of knowledge regarding tracheostomy care across three different areas: Anatomy and Physiology of Trachea, Questions regarding tracheostomy tube, and Questions related to tracheostomy care. Each area is evaluated based on maximum score, mean score, mean percentage, and standard deviation. In the Anatomy and Physiology section, participants achieved a

mean score of 3.3250 out of a maximum of 5, corresponding to a mean percentage of 66.5% with a standard deviation of 0.91672. For questions regarding the tracheostomy tube, the mean score was 4.1250 out of a maximum of 9, resulting in a mean percentage of 45.83% and a standard deviation of 1.34331. Similarly, in the section related to tracheostomy care, the mean score was 4.2500 out of 10, translating to a mean percentage of 42.5% with a standard deviation of 1.27601. Overall, across all sections, the total mean score was 11.4250 out of a maximum of 24, with a mean percentage of 47.60% and a standard deviation of 1.95969. These results provide insights into the distribution of knowledge levels among participants regarding different aspects of tracheostomy care, highlighting areas of strength and areas needing improvement (Table-4. A).

Table no. 4. (B) shows Mean, mean% and standard deviation of post-test knowledge scores (n=40)

S. NO	AREA	MAXIMUM SCORE	MEAN SCORE	MEAN %	S. D
1	**Anatomy AndPhysiology of Trachea**	5	3.7750	75.5%	**.73336**
2.	**Question regarding tracheostomy tube**	9	6.1250	68.05	**1.32409**
3.	**Question related tracheostomy care**	10	7.2500	72.5	**1.42775**
	Total	24	**17.5000**	**72.91**	**2.28709**

The provided table outlines the evaluation of knowledge levels concerning tracheostomy care across three distinct areas: Anatomy and Physiology of Trachea, Questions regarding tracheostomy tube, and Questions related to tracheostomy care. Each area is characterized by its maximum score, mean score, mean percentage, and standard deviation. In the Anatomy and Physiology category, participants attained a mean score of 3.7750 out of a possible 5, equating to a mean percentage of 75.5%, with a standard deviation of 0.73336. For questions related to the tracheostomy tube, the mean score was 6.1250 out of a maximum of 9, resulting in a mean percentage of 68.05% and a standard deviation of 1.32409. Likewise, in the section concerning tracheostomy care, the mean score was 7.2500 out of 10, translating to a mean percentage of 72.5% with a standard deviation of 1.42775. Overall, across all sections, the total mean score was 17.5000 out of a maximum of 24, yielding a mean percentage of 72.91% and a standard deviation of 2.28709. These findings offer valuable insights into the proficiency levels of participants regarding different facets of tracheostomy care, indicating areas of competence as well as potential areas for further enhancement (Table-4. B).

Table-IV.C. Effectiveness of Planed teaching programme among G.N.M. students on tracheostomy care knowledge by comparing the pre-test and post-test assessment

S. No	Area	Score	Pre-test (x)			Post- test (y)			Effectiveness (y-x)		
			Mean	**Mean %**	**S.D.**	**Mean**	**Mean %**	**S. D**	**Mean**	**Mean %**	S. D
1	Anatomy And Physiology of Trachea	5	3.325	66.5 %	.91672	3.7750	75.5%	.73336	0.45	9	**0.1833**
2	Question regarding tracheostomy tube	9	4.125	45.83 %	1.3433	6.1250	68.05 %	1.32409	2	22.22	**0.01921**
3	Question related tracheostomy care	10	4.250	42.5 %	1.2760	7.2500	72.5%	1.42775	3	30	**0.1517**
	Total	24	11.42	47.60	1.9596	17.5000	72.91 %	2.28709	6.08	25.33	0.3274

The table presents data on the effectiveness of teaching interventions in three areas related to tracheostomy care and anatomy. The pre-test and post-test scores indicate the improvement in knowledge levels, with the effectiveness calculated as the difference between post-test and pre-test scores. In the Anatomy and Physiology of Trachea area, the mean effectiveness was 9%, indicating a moderate improvement. For questions regarding tracheostomy tube, the mean effectiveness was 22.22%, reflecting a substantial enhancement in understanding. Similarly, in questions related to tracheostomy care, the mean effectiveness was 30%, suggesting a significant increase in knowledge. Overall, the teaching interventions yielded an average effectiveness of 25.33%, indicating a positive impact on participants' understanding of tracheostomy-related topics. These findings underscore the importance and success of the educational efforts in enhancing knowledge in this critical area of healthcare (Table-4.C).

Section-V

Table-5. Association between the knowledge of among G.N.M. students on tracheostomy care with selected demographic variables (n=40)

S. No	Variable	Chi square χ^2		d.f	Level of Significance
		Calculated value	**Tabulated value**		
1	**Age in years** 18 years 19 years 20 years 21 years	6.667[a]	7.815	3	**0.05 NS**
2	**Gender** Male Female	.494[a]	3.841	2	**0.05 S**

3	**Area of living** Rural Urban others	1.348[a]	3.841	1	**0.05** **NS**
4	**Religion** Hindu Muslim Christian others	.635[a]	3.841	1	**0.05** **NS**
5	**Type of Family** Nuclear Joint Extended others	2.667[a]	3.841	1	**0.05** **NS**
6	**Earlier knowledge to tracheostomy care** Yes No	--	--	**0**	**0.05** **NS**

The chi-square test of independence was conducted to investigate the potential relationship between demographic variables and knowledge about tracheostomy care. Across six variables including age in years, gender, area of living, religion, type of family, and prior knowledge of tracheostomy care, the calculated chi-square values were compared against critical values at a significance level of 0.05. Results indicated no statistically significant associations between any of the demographic factors and knowledge about tracheostomy care. Specifically, for age in years ($\chi^2 = 6.667$, d.f. = 3), gender ($\chi^2 = 0.494$, d.f. = 2), area of living ($\chi^2 = 1.348$, d.f. = 1), religion ($\chi^2 = 0.635$, d.f. = 1), and type of family ($\chi^2 = 2.667$, d.f. = 1), all calculated chi-square values were lower than the respective critical values, suggesting non-significance. Additionally, while not provided with a calculated value, prior knowledge of tracheostomy care also exhibited non-significance at the 0.05 level. Therefore, based on these results, it can be concluded that none of the examined demographic variables are significantly associated with knowledge about tracheostomy care (Table-5).

DISCUSSION

In our study evaluating the effectiveness of a Structured Training Program (STP) on tracheostomy care among General Nursing and Midwifery (GNM) second-year students, the results indicate a significant improvement in participants' knowledge levels following the intervention. This discussion aims to delve into the implications of these findings, drawing on examples and contextual insights. Similar study findings according to Tony Gaterega (2021) etal.(9), Nurses knowledge and practices regarding tracheostomy care at a selected referral hospital in Rwanda – A descriptive cross-sectional study findings explained on nurses' knowledge as, the majority of nurses (71%) had moderate knowledge, 26.5% lower knowledge and Only 2(2,5%) of nurses had high knowledge on tracheostomy definition, types and care.

Firstly, the substantial increase in participants' post-test knowledge scores compared to pretest scores underscores the efficacy of the STP in enhancing understanding of tracheostomy care. For instance, participants who initially scored low on the pretest, such as those in the inadequate or moderate knowledge categories, demonstrated notable improvements post-intervention. This improvement is exemplified by the shift of participants from lower to higher knowledge categories, reflecting a tangible impact of the educational program. According relevant study findings from Khushbu (2022) etal.(10), efficacy of structured teaching program on knowledge and practice regarding endotracheal suctioning amongst staff nurses – a quasi-experimental approach. The results of the study demonstrated a significant increase in post-test knowledge after the management of the informational dataset. ($p < 0.01$). Practice was significantly improved after showing a PPT video related to tracheostomy ($p < 0.001$).

Moreover, the significant association between gender and pretest knowledge levels highlights the influence of demographic factors on baseline understanding. For instance, female participants may have

demonstrated higher baseline knowledge levels compared to their male counterparts, indicating potential disparities in prior exposure or educational experiences. This finding underscores the importance of considering demographic variables in educational interventions and tailoring programs to address specific needs and disparities among student populations.

Furthermore, the lack of significant associations between pretest knowledge levels and variables such as area of living, religion, and type of family provides valuable insights into the multifaceted nature of knowledge acquisition. For example, participants from rural or urban areas may have exhibited similar baseline knowledge levels, suggesting that geographical location may not be a determining factor in initial understanding of tracheostomy care. Similarly, participants from diverse religious or family backgrounds may have demonstrated comparable baseline knowledge levels, indicating the universal applicability of the educational program across different demographic groups. In contrast, Gaterega (2021) etal.(9), there is no significant demographic factors associated with knowledge and practice of nurses.

Overall, the discussion emphasizes the importance of targeted educational interventions in nursing education, with our study highlighting the effectiveness of the STP in enhancing participants' knowledge of tracheostomy care. By considering demographic factors and analysing their associations with knowledge levels, we gain valuable insights into the complex interplay between educational interventions and student characteristics. Through examples and contextual insights, we elucidate the implications of our findings and underscore the importance of evidence-based educational strategies in promoting patient safety and quality care in clinical practice.

Limitations

Our study, while providing valuable insights into the effectiveness of a Structured Training Program (STP) on tracheostomy care among General Nursing and Midwifery (GNM) second-year students, is not without limitations. Firstly, the study's sample size is relatively small, consisting of only 40 participants from a single educational institution. This limited sample size may affect the generalizability of the findings to broader student populations. Additionally, the study's reliance on self-reported data and subjective measures, such as knowledge assessments through questionnaires, may introduce response biases and measurement errors. Furthermore, the short duration of the intervention and follow-up period may not capture long-term retention of knowledge or behavioural changes among participants.

Implications

Despite these limitations, our study has important implications for nursing education and practice. The significant improvement in participants' knowledge levels following the STP underscores the importance of structured educational interventions in enhancing student competency and preparedness for clinical practice. By equipping nursing students with the necessary knowledge and skills in tracheostomy care, educators and healthcare institutions can contribute to improved patient outcomes and safety in clinical settings. Additionally, our findings highlight the need for ongoing professional development and training programs to address knowledge gaps and ensure continued competence among nursing professionals.

Recommendations

Based on our study findings, several recommendations can be made to enhance nursing education and practice. Firstly, educational institutions should prioritize the integration of structured training programs, simulations, and hands-on clinical experiences into nursing curricula to effectively prepare students for real-world practice. Additionally, educators should consider incorporating interactive and experiential learning strategies to promote active engagement and knowledge retention among students. Moreover, ongoing evaluation and assessment of educational interventions are crucial to identify areas for improvement and tailor programs to meet the evolving needs of nursing students and healthcare settings.

CONCLUSION

In conclusion, our study demonstrates the effectiveness of a Structured Training Program in improving knowledge levels of tracheostomy care among GNM second-year students. While acknowledging the study's limitations, the findings have important implications for nursing education and practice. By addressing knowledge gaps and enhancing student competency, structured educational interventions can contribute to improved patient care and safety. Moving forward, continued research and innovation in nursing education are essential to ensure the delivery of high-quality, evidence-based care in clinical practice.

REFERENCES

1. Raimonde AJ, Westhoven N, Winters R. Tracheostomy. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 [cited 2024 Jun 5]. Available from: http://www.ncbi.nlm.nih.gov/books/NBK559124/

2. Morris M, Boruff JT, Gore GC. Scoping reviews: establishing the role of the librarian. J Med Libr Assoc JMLA. 2016 Oct;104(4):346–54.

3. Dawson D. Essential principles: tracheostomy care in the adult patient. Nurs Crit Care. 2014 Mar;19(2):63–72.

4. Jamshidi N, Molazem Z, Sharif F, Torabizadeh C, Najafi Kalyani M. The Challenges of Nursing Students in the Clinical Learning Environment: A Qualitative Study. Sci World J. 2016;2016(1):1846178.

5. Saifan A, Devadas B, Daradkeh F, Abdel-Fattah H, Aljabery M, Michael LM. Solutions to bridge the theory-practice gap in nursing education in the UAE: a qualitative study. BMC Med Educ. 2021 Sep 13;21(1):490.

6. Alrashidi N, Pasay an E, Alrashedi MS, Alqarni AS, Gonzales F, Bassuni EM, et al. Effects of simulation in improving the self-confidence of student nurses in clinical practice: a systematic review. BMC Med Educ. 2023 Oct 30;23(1):815.

7. Chabrera C, Diago E, Curell L. Development, Validity and Reliability of Objective Structured Clinical Examination in Nursing Students. SAGE Open Nurs. 2023 Oct 9;9:23779608231207217.

8. Ernstmeyer K, Christman E. Chapter 22 Tracheostomy Care & Suctioning. In: Nursing Skills [Internet] [Internet]. Chippewa Valley Technical College; 2021 [cited 2024 Jun 5]. Available from: https://www.ncbi.nlm.nih.gov/books/NBK593189/

9. Gaterega T. Nurses knowledge and practices regarding tracheostomy care at a selected referral hospital in Rwanda – A descriptive cross-sectional study. Int J Afr Nurs Sci. 2021 Jan 1;15:100350.

10. Khushbu, Rajamani S. Efficacy of Structured Teaching Program on Knowledge And Practice Regarding Endotracheal Suctioning Amongst Staff Nurses – A Quasi-Experimental Approach. V Pub J Nurs Med Res. 2022 Dec 1;1(1):1–4.