

Effectiveness of Structured Teaching Programme on Care of Patients with Intercostal Drainage among Nurses

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ABSTRACT

Introduction: Intercostal Drainage or chest tube drainage or under water seal drainage system [UWSDS] has a paramount importance in critical care environment. Staff nurses being the caregivers require wholesome knowledge regarding the management of patients with ICD. Appropriate chest drain management is required to maintain respiratory function and hemodynamic stability.

Objective: This study attempts to assess the effectiveness of structured teaching programme on care of patients with Intercostal drainage among staff nurses

Methods: The study was conducted among 60 staff nurses working in Kempegowda Institute of Medical Sciences Hospital and Research Centre, Bangalore. The study involved one group pre-test and post-test using pre-experimental design in which convenient sampling method was used.

Results: Effectiveness of Structured Teaching Programme and association of demographic variables with knowledge scores was observed. Among which there was significant association with one selected demographic variable, educational status with p value (< 0.05). On comparison of pre-test and post-test knowledge scores the mean% of pre-test knowledge score was 58.95% and 75.44% in post-test with (21%) enhancement scores.

Conclusion: The challenges faced by staff nurses working in critical or emergency departments are enormous and they need to be updated. The study has enhanced the purpose by imparting knowledge regarding care of patients with Intercostal drainage.

Keywords: Intercostal Drainage (ICD), Chest Tube Drainage, Under Water Seal Drainage System [UWSDS], Nurses, Structured Teaching Programme (STP)

INTRODUCTION

An intercostal drainage or chest drain, placed in the pleural space to restore intrapleural negative pressure, allows re-expansion of the lungs. The chest tube also prevents air and fluid from returning to the chest. The drainage system consists of one or more chest tubes or drain, a collection of chamber placed below the chest level, and a water seal to keep air from entering the chest. The drainage system may be a stationary, disposable, self contained system with or without suction or vacuum assistance. ^[1]

The main indications for intercostal or chest drains are conditions followed by chest injuries like pneumothorax, hemothorax, chylothorax, flail chest, cor pulmonale, pleural effusion, empyema etc. Following cardiac surgeries also chest drains are used to regain normal functional status of lungs. ^[2]

The management of critically ill patients has become very important in modern medical and nursing system. At the same time the number of intensive care beds in hospitals has grown. The complexity of medical and nursing problems and the severity of illness in critically ill patients have also increased. Critically ill population now occupying intensive care units and demand appropriate diagnosis as well as management skills. ^[3]

Primary pneumothorax remains a significant global problem occurring in healthy subjects with a reported incidence of 18.28/10, 0000 per year for men and 1.2 to 6/10, 0000 per year for women. However, pneumothorax seems to occur most often in

males 25-40 years of age. Approximately, 1million pleural effusion cases are diagnosed each year in India. The clinical importance of pleural effusions ranges from incidental manifestation, of cardiopulmonary diseases to symptomatic, inflammatory or malignant diseases that require urgent evaluation and treatment. [4]

A recent study conducted on “An evaluation of a teaching intervention to improve the practice of chest tube drainage in intensive care units” in United Kingdom. This quasi-experimental study was a randomized, controlled, single-blinded comparison of two research-based teaching programmes, with 160 intensive care nurses, using non-participant observation and a self-report questionnaire. The study concluded that following teaching, significant [36%] improvements were seen in both knowledge and practice. [5]

The nursing care priorities for the patients with a chest tube are to ensure the integrity of the system, promote comfort, ensure chest tube patency, and prevent complications. The system is maintained until the lung is fully expanded and intrathoracic pressure returns to its normal level. [6]

MATERIALS & METHODS

The study was a pre- experimental type of study with one group pre-test and post-test design, in which pre-test was conducted followed by Structured teaching programme (STP) and then conducting post-test for the same group. Convenient sampling method was used and the samples included 60 staff nurses working in Kempegowda Institute of Medical Sciences, Hospital and Research Centre, Bangalore.

The tool used was a Structured Knowledge Questionnaire based on the research problem, review of the related literature and with suggestions and guidance of experts was prepared to assess the knowledge of nurses regarding care of patients on intercostal drainage. Split Half method with Spearman’s Brown Prophecy formula was used to test the reliability of the

tool. [$r_{tt} = 2r / 1 + r$], Where r_{tt} is reliability coefficient of correlation of whole test, r is reliability coefficient of correlation of half test. The reliability of the tool was 0.989. It was statistically significant and thus reliable.

The tool consists of two parts:

Part I: Consists of 7 demographic characteristics including age, sex, professional qualification, marital status, religion, area of work and total years of experience.

Part II: Consists of 40 items pertaining to knowledge regarding care of patients on intercostal drainage.

To find out the association with the selected demographic variables and knowledge scores, respondents are categorised into three groups. [Below 50% - Inadequate knowledge, 51-75%- Moderate knowledge, Above 75% - Adequate knowledge]

Problem Statement

Effectiveness of structured teaching programme on care of patients with intercostal drainage among nurses at Kempegowda Institute of Medical Sciences, hospital and research, centre, Bangalore.

Objectives of the Study

1. To assess the knowledge on care of patients with intercostal drainage among staff nurses.
2. To assess the effectiveness of Structured teaching programme on care of patients with intercostal drainage among staff nurses.
3. To find out the association between knowledge scores of staff nurses with selected demographic variables.

Operational definitions

Effectiveness: Refers to gain in knowledge as determined by the significant difference between pre-test and post test knowledge scores.

Structured teaching programme: Refers to a planned and organized teaching programme aimed at educating the participants regarding management of patients with Intercostal drainage.

Intercostal drainage: Refers to a procedure to place a flexible, hollow drainage tube into the chest [Thorax] in order to remove an

abnormal collection of air or fluid from the pleural space.

Patient: Refers to a person who is on Intercostal drainage.

Nurse: Refers to registered nurses working at Kempegowda Institute of Medical Sciences, Hospital and Research Centre.

Statistical Analysis

The data obtained was analysed in terms of achieving the objectives of the study using descriptive and inferential statistics.

Statistical Analysis of Data included:

1. Entering the data in master sheet.
2. Frequencies and percentages are used for analysis of demographic characteristics.
3. Calculation of mean, and standard deviation of pre-test and post-test scores.

4. Application of paired 't' test to ascertain whether there is significant difference in the mean knowledge score of pre-test and post-test values.

5. Application of chi-square to find the association between demographic variables with knowledge scores

RESULTS

The effectiveness of structured teaching programme was assessed using paired "t" test and Chi square were calculated to find out the association between knowledge scores with selected demographic variables, level of knowledge on care of patients with Intercostal drainage.

Table 1 : Component / Aspects wise pre - test mean knowledge scores N=60

Component wise analysis of pretest knowledge score	Max. score	Range	Median	Mean	SD	Mean (%)
Knowledge regarding anatomy and physiology of respiratory system.	10	3-10	8	7.16	1.62	71.6
Knowledge regarding meaning, indications and principles involved in chest drainage.	9	2-8	5	5.04	1.61	56
Knowledge regarding different types, sizes and mechanisms of chest tube drainage.	12	2-11	6	6.75	2.26	56.25
Knowledge regarding chest tube insertion and removal.	5	0-5	3	2.9	1.32	58
Knowledge regarding care of patients with chest tube drainage.	4	0-4	2	2.06	1.10	51.61
Overall pre-test knowledge score	40	14-33	24.5	23.91	4.79	58.95

Table 2: Component / Aspect wise analysis of post test knowledge scores N = 60

Component wise analysis of pretest knowledge score	Max. score	Range	Median	Mean	SD	Mean (%)
Knowledge regarding anatomy and physiology of respiratory system.	10	6-10	10	9.22	1.41	92.2
Knowledge regarding meaning, indications and principles involved in chest drainage.	9	2-9	7	6.93	1.77	77.0
Knowledge regarding different types, sizes and mechanisms of chest tube drainage.	12	3-12	8	8.37	2.18	69.75
Knowledge regarding chest tube insertion and removal.	5	1-5	4	3.5	1.14	70.0
Knowledge regarding care of patients with chest tube drainage.	4	0-4	3	2.73	1.06	68.25
Overall post-test knowledge score	40	20-38	33	30.75	5.05	75.44

The following tables [Table 3 and Table 4] expresses the association between selected demographic variables and knowledge levels in pre test and post test scores.

Table 3. Analysis of association between selected demographic variables and over all pre test knowledge scores. N=60

Demographic variables	Responses	Overall pre test knowledge		Chi- square value	df	P- value
		Below median	Above median			
Age (yrs)	26 – 30	16	10	2.443 ^{NS}	df= 1	0.118
	31 – 35	14	20			
Sex	Female	30	30			
Education	B.Sc. Nursing	16	9	3.360 ^{NS}	df= 1	0.067
	PC B.Sc.	14	21			
Marital status	Unmarried	7	14	3.590 ^{NS}	df= 1	0.058
	Married	23	16			
Religion	Hindu	9	8	0.268 ^{NS}	df= 2	0.874
	Christian	13	15			
	Muslim	8	7			
Department	Medical ward	12	9	1.281 ^{NS}	df= 2	0.527
	Surgical ward	10	9			
	Intensive care unit	8	12			
Experience	1-5 years	10	15	1.714 ^{NS}	df= 1	0.190
	6-10 years	20	15			

* is significant; ^{NS} is not significant

As per tables 1 & 2, the study confirmed that the overall knowledge levels of nurses was significantly low in the pre-test with the overall mean pre-test knowledge scores of 58.95% when compared to the mean post-test knowledge scores of 75.44%.

Table 4. Analysis of association between selected demographic variables and over all Post - test knowledge scores.

Demographic variables	Responses	Overall post test knowledge		Chi- square value	df	P-value
		Below median	Above median			
Age (yrs)	26 – 30	14	12	0.558 ^{NS}	1	0.455
	31 – 35	15	19			
Sex	Female	29	31			
Education	B.Sc. Nursing	16	9	4.212*	1	0.040
	PC B.Sc.	13	22			
Marital status	Unmarried	7	14	2.911 ^{NS}	1	0.088
	Married	22	17			
Religion	Hindu	18	14	1.721 ^{NS}	1	0.190
	Christian	11	17			
Department	Medical ward	10	11	3.100a ^{NS}	2	0.212
	Surgical ward	12	7			
	ICU	7	13			
Experience	1-5 years	12	13	0.002*	1	0.965
	6-10 years	17	18			

* is significant; ^{NS} is not significant

DISCUSSION

Majority (43.3%) of the respondents were in the age group of 26-30 years and (58.3%) were married. Most of the staff nurses (33.3%) were working in Intensive care units (31.7%). Relating to the samples clinical experience, most (58.4%) of them had 6-10 years or above.

Except educational status and clinical experience no other demographic variables had significance in pre and post test scores as shown in table 3. When comparing the pre test and post test scores, there was quite a big marginal difference (16.5%) in the knowledge scores. It indicates need for further study on similar topics which will improve nursing care efficiency.

Nurses are the primary care providers of medical interventions to patients, with intercostal drainage tube. Vigilant and expert nursing care can prevent serious complications in the patient with a chest tube and drainage system. All the following studies explain the need for further research on nursing care aspect in chest tube management.

A Descriptive Study on "Nurses' Knowledge Levels of Chest Drain Management" was conducted by Tarhan et al in Turkey. [7] The study was conducted

with 153 nurses who worked in a chest diseases and thoracic surgery hospital. The study revealed that 69.3% of nurses stated that they had obtained information from colleagues. There was statistically significant difference between knowledge level and educational background, clinic work type, working unit, years of professional experience, institutional experience and frequency of contact patients with chest drain.

A cross-sectional study on "Variation in nurse self-reported practice of managing chest tubes" was conducted in China in 2018 by Lu C, Jin YH et al. [8] 296 clinical nurses whose work included nursing management of chest drains were made to answer a questionnaire. The results showed that nurses were the primary decision-makers in the replacement of chest tubes, manipulation of chest tubes and monitoring of drainage fluid. This study was concluded with the indication that nurses were the primary decision-makers for three of eight procedures regarding management of chest drains, which reflects that clinical nurses' decision-making power regarding management of chest drains was weak.

Another cross sectional study on "Nurses' knowledge of care of chest drain in a Nigerian semi urban university hospital"

by Kesieme et al [9] among nurses using pretested self-administered questionnaires concluded with the finding that the knowledge of care of chest drains among nurses is poor, especially in the key post procedural care. There is an urgent need to train them so as to improve the nursing care of patients managed with chest drains.

CONCLUSION

The management of critically ill patient needs a continual balancing act in which the risks and benefits of diagnostic procedure and interventions must be carefully measured. Today chest drainage systems play an important role in patient recovery from a variety of conditions. The nurses need to be competent in the management of patients with intercostal drainage. Staff development programmes through continuous education, training, teaching and learning materials are factors in shaping the future of the nursing profession. The results of the study have implications on nursing practice, education, administration and nursing research.

REFERENCES

1. Ignatavicius DD, Workman ML. Medical Surgical Nursing(Patient centered collaborative care). 7th edition. Elsevier publications; 2013. p. 634-7
2. Andreoli TE, Carpenter CCJ, Griggs RC et al. Cecil's Essentials of Medicine. 7th edition. Elsevier (Saunders) publications; 2007. P. 246
3. Goldman L, Ausiello D. Cecil Textbook of Medicine. 22nd Edition. Saunders Publications; 2004.p. 357-65
4. Davies CWH, Gleeson FV, Davies RJO. BTS Guidelines- Management of Pleural Infection. British Medical Journal. 2003; 58 (18):18-20.
5. Day T, Wainwright SP, Wilson-Barnett J. An evaluation of a teaching intervention to improve the practice of chest tube drainage in intensive care units. Journal of Clinical Nursing. Sep 2001; 10 (5):682-96.
6. Monahan FD, Sands JK, Neighbors M et al. Phipp's Medical Surgical Nursing, Health And Illness Perspectives. Mosby Elsevier publication;2007.p.653-4
7. Tarhan M, Gökdoğan SA, Dalar L et al. Nurses' Knowledge Levels of Chest Drain Management: A Descriptive Study. Eurasian Journal of Pulmonology.2016;18: 97269
8. Lu C, Jin YH, Gao W et al. Variation in nurse self-reported practice of managing chest tubes: A cross-sectional study. Journal of clinical Nursing. March 2018; 27(5-6): e1013-e1021
9. Kesieme EB, Essu IS, Arekhandia BJ et al. Nurses' knowledge of care of chest drain: A survey in a Nigerian semiurban university hospital. Annals of African Medicine. April-June 2016; 15(2): 95

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