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A Study To Assess The Efficacy Of Self Instructional Module (SIM) On The Knowledge Regarding Nursing Management Of Patients With Chest Drainage Among Staff Nurses Of Selected Hospitals Of Malwa Region Of Punjab

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Abstract
Background: *Under normal circumstances, intrathoracic pressure is below atmospheric pressure. When this pressure changes because of excess air and/or fluid, the lungs may collapse. If this occurs, a chest tube is inserted into the intrapleural space.*
Aim of the Study: *This study was carried out to assess the efficacy of Self Instructional Module (SIM) on the knowledge regarding nursing management of patients with Chest drainage among Staff nurses of selected hospitals of Malwa region of Punjab.*
Material and Methods: *Pre-experimental single group pretest posttest design was used to assess the knowledge of 30 Staff nurses with non probability convenience sampling technique. Structured knowledge assessment questionnaire was used to assess the knowledge of Staff nurses and self instructional module was administered to improve knowledge of staff nurses regarding nursing management of patients with chest drainage.*
Results: *Findings of the present study indicated that there was increase in mean post test knowledge scores (23.0) as compared to mean pretest knowledge scores (13.20) of staff nurses regarding nursing management of patients with chest tube drainage which established effectiveness of Self instructional module. There was statistically significant association ($p<0.05$) of the post test knowledge scores of staff nurses with their selected socio demographic variables of Professional education only while there was no statistically significant association ($p>0.05$) of the post test knowledge scores with the other socio demographic variables.*
Conclusion: *So there should be CNE, workshop and seminar etc. about nursing management of patients with chest drainage for Staff nurses to upgrade their knowledge and to improve the quality of nursing care.*
Keywords: *Self Instructional Module, Staff Nurse, Chest drainage.*

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I. Introduction of The Study

Breathing consists of two phases, inspiration and expiration. During **Inspiration**, when the capacity of the thoracic cavity is increased by simultaneous contraction of the intercostal muscles and the diaphragm, the parietal pleura move with the walls of the thorax and the diaphragm. This reduces the pressure in the pleural cavity to a level considerably lower than atmospheric pressure. The negative pressure created in the thoracic cavity aids venous return to the heart and is known as the respiratory pump. During **Expiration,** relaxation of the intercostal muscles and the diaphragm results in downward and inward movement of the rib cage and elastic recoil of the lungs. As this occurs, pressure inside the lungs exceeds that in the atmosphere and so air is expelled from the respiratory tract.[1] Under normal circumstances, intrathoracic pressure (The normal intrathoracic pressure is approximately 756 mmHg) is below atmospheric pressure (The normal atmospheric pressure is 760 mmHg). When this pressure changes because of excess air and/or fluid, the lungs may collapse. If this occurs, a chest tube is inserted into the intrapleural space. This lets excess fluids drain, restores normal pressure, reinflates the lung, and allows adequate gas exchange.[2] Installing an Intercostal chest drainage tube can be either an emergency or a planned procedure.[3] **Intercostal Chest drainage** includes Chest tubes and Water seal container.

A chest tube is a catheter inserted through the thorax to remove air and fluids from the pleural space, to prevent air or fluid from reentering the pleural space or to reestablish normal intrathoracic pressure.[4] When chest tubes are inserted, they must be connected to a sealed drainage system or a one- way valve that allows air and fluid to be removed from the chest cavity. Such a drainage system is called a water-sealed (underwater) drainage. In a Water-sealed drainage, fluid in the bottom of the container prevents air from entering the chest tube and thus entering the pleural cavity. The system must be kept below the level of the client's chest so that the fluid in the container is not drawn into the pleural cavity by gravity.[5] With a water seal system, when the client inhales, the water prevents air to entering the system from atmosphere. During exhalation, air can exit the chest cavity, bubbling up through the water. Suction can be added to the system to facilitate removing air and secretions from the chest cavity.[6] Drainage system use three mechanisms to drain fluid and air from the pleural cavity; positive expiratory pressure, gravity and suction. When the pleural cavity contains some air or fluid, a positive pressure develops during expiration. This positive pressure is abnormal, but it does help expel the air and, to some extent, fluid from the pleural space. Placing the tube so that it descends from the insertion site to drainage receptacle allows gravity to act as an evacuation force. Suction is used in conjunction with the other two forces in some drainage system.[5] There are several kinds of water-sealed drainage system: one and two bottle gravity systems; two and three bottle suction systems and disposable unit systems. In a one-bottle (water-seal) system, a single receptacle receives both the fluid and air from the client and seals the system. A two-bottle system uses one bottle to receive the fluid or air from the client and the second bottle to create the water seal. The three-bottle system has a collection bottle (1), a water seal bottle (2) and a suction control bottle (3). The newest system available is the mobile chest drain and the dry chest drainage system. Mobile systems rely on gravity, not suction, for drainage.[5] The indications of Chest tube drainage are pleural effusion, hemothorax, pneumothorax, and empyema.[7] The other conditions that may need to be treated by chest drainage therapy include pyopneumothorax and spontaneous pneumothorax that causes more than a 25% collapse of the lung. Cancer that causes excessive secretions, hydrothorax, lung or heart surgery are also the indications for chest tube drainage.[1] Nurses working in cardio-thoracic units must have a thorough knowledge regarding the care of patient from life-threatening situations.[8] **Complications** of chest tube drainage are blocked tube (clot), retained haemothorax, empyema, pneumothorax after removal (poor technique) and Infection. A patient with a chest tube is at increased risk for infection. This risk can be reduced by cleaning the chest tube site and changing the dressing regularly.[7] Most often the nursing management of patient who have a chest drain in situ, has received little attention. After a chest tube is inserted, nurses are responsible for managing the chest tube and drainage system. They should have adequate knowledge regarding the chest-tube position, controlling fluid evacuation, identifying when to change or empty the containers, and caring for the tube and drainage system during patient transport. The water-seal container should not be changed and clamped unnecessarily. By following a logical system of practice, the critical care nurse will be able to master the art of chest drainage with little difficulty.[3] Nurses are in close and continuous contact with the patients. They will immediately recognize the changing of the patient and development of complications. Quick observation and skill is needed by the nurses for efficient management of patients with Chest drainage. From the personal experience, the investigator realized that chest tube drainage has to be managed effectively to prevent complications. Some of the staff nurses may have less knowledge regarding management of patients with chest drainage because of diversity of training. Proper education and training for the staff nurses is essential. Hence the investigator felt the need to improve the knowledge of staff nurses regarding chest drainage for which self instructional module will be used as educational strategy.

Aim of the Study

The aim of the study is intended to assess the efficacy of Self Instructional Module (SIM) on the knowledge regarding nursing management of patients with Chest drainage among Staff Nurses to improve the better quality of nursing care.

Objectives

1. To assess the efficacy of SIM on the knowledge regarding nursing management of patients with Chest drainage among Staff Nurses.
2. To find out the association between posttest mean knowledge scores among Staff Nurses with their selected Socio-demographic variables.

Hypothesis

H_1: There will be a statistically significant enhancement in posttest knowledge scores as compared to pretest mean knowledge scores of staff nurses regarding nursing management of patients with chest drainage.

II. Materials and Methods

Research Approach: - The Researcher had adopted Quantitative evaluative research approach**.**
Research Design:- In this study the research design selected was Pre experimental single group pretest posttest design.

Research Setting: - The setting for this study was selected hospitals of Malwa region of Punjab. The researcher has covered following Hospitals of Malwa region for conducting the study:

1. Civil Hospital, Faridkot
2. Civil Hospital, Bathinda
3. Adesh hospital and research centre , Sri Muktsar sahib
4. Adesh hospital and research centre, Bathinda

Target Population:- Thus in the present study, the target population and accessible population was all the staff nurses currently working in selected hospitals of Malwa region of Punjab.
Sample:- The sample for the present study was Staff nurses who were fulfilling the inclusive criteria.
Sample Size :- The sample size was 30 Staff nurses.
Sampling Technique :- Non Probability convenience sampling technique was used to select the sample for the purpose of the study.

Description of Tool:- Tool consisted of three sections section I, section II and section III.
Section I- It consisted of 8 items for socio-demographic data i.e. age, gender, marital status, professional education, professional experience, area of work experience, nursed patient with chest tube drainage, attended CNE workshop, seminar etc. about chest tube drainage.

Section II- The final draft of self instructional module on the knowledge regarding nursing management of patients with chest tube drainage was constructed.

Section III- It consisted of self administered knowledge assessment questionnaire with thirty multiple choice questions related to content of SIM. Each multiple choice questions had four options, out of which only one option was a correct response. The under mentioned criteria was laid while selecting the test items:

- Items provide answers within the module itself.
- From each unit items were selected to formulate the questions.

Data Collection Procedure:- The data was collected from 19th December,2012 to 19th January,2013.The investigator sought a prior permission from the institution authority i.e. medical and nursing superintendent of selected hospitals of Malwa region of Punjab. In this study, self administered knowledge assessment questionarrie was used to obtain data relevant to the study objectives and research questions.

Plan of Data Analysis:- Analysis and Interpretation of data of this study was done by using descriptive and inferential statistics. Descriptive statistical measures include percentage distribution, mean and standard deviation to compute the socio-demographic characteristics of the subjects. Inferential statistical measures include Paired 't' test to assess the effectiveness of SIM using pretest and posttest knowledge score and Chi-square was employed to assess the association of posttest knowledge scores with their selected socio-demographic variables

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III. Results

Organization of data analysis
The data collected was organized and presented under the following headings:
Section-I Sample characteristics:- socio-demographic variables.
Section-II To assess the efficacy of SIM on the knowledge regarding nursing management of patients with Chest drainage among Staff Nurses.
Section-III To find out the association between posttest mean knowledge scores among Staff Nurses with their selected Socio-demographic variables.

Section-I Sample characteristics :- Socio demographic variables

Table – 2 Frequency and percentage distribution of selected socio-demographic variables of staff nurses. N=30

S. No	Socio-demographic Variables	Frequency	Percentage Distribution
1.	**Age (in years):**		
	a) 20-25	10	33.3
	b) 26-30	07	23.3
	c) 31-35	05	16.6
	d) 36 & above	08	26.6
2.	**Gender**		
	a) Male	02	06.6
	b) Female	28	93.3
3.	**Marital Status**		
	a) Married	21	70
	b) Unmarried	09	30
	c) Divorced	00	00
	d) Widow	00	00
4.	**Professional Education**		
	a) GNM	19	63.3
	b) Post-Basic B. Sc Nursing	09	30.00
	c) Basic B. Sc Nursing	02	06.66
	d) M. Sc. Nursing	00	00
5.	**Professional Experience(Years):**		
	a) Less than 5	19	63.3
	b) 5-10	06	20.00
	c) 11-15	01	03.33
	d) More than 15	04	13.30
6.	**Area of Work Experience**		
	a) Medical ward	13	43.3
	b) Surgical ward	03	10.0
	c) Emergency	04	13.3
	d) ICU	10	33.3
7.	**(i) Nursed patient with Chest Tube Drainage**	15	50
	a) Yes	15	50
	b) No		
	(ii) If Yes:	07	23.3
	i During training	08	26.6
	ii After training	15	50
	iii Not applicable		
8.	**Attended CNE Workshop, Seminar etc. about Chest Tube Drainage:**		
	a) Yes	02	6.66
	b) No	28	93.3

Section II

Objective 1: To assess the efficacy of self instructional module (SIM) on the knowledge regarding nursing management of patients with Chest drainage among Staff Nurses in selected hospitals of Malwa region of Punjab.

Table – 3 Frequency and percentage distribution of Staff nurses according to their pretest and posttest level of knowledge score regarding nursing management of patients with chest tube drainage.

Levels of knowledge scores	Range	Pretest		Posttest	
		Frequency	%	Frequency %	%
Very poor	0-6	01	3.33	00	00
Poor	7-12	13	43.3	00	00
Average	13-18	14	46.7	03	10
Good	19-24	02	6.7	14	46.7
Very Good	25-30	00	00	13	43.3

Table 3 and figure 10 shows that majority i.e. 14 (46.7%) of subjects had average knowledge scores followed by 13(43.3%) who had poor knowledge scores. only 2 (6.7%) had good knowledge scores while 01(3.33%) was having very poor knowledge scores in pretest. On the other hand in the posttest, majority 14 (46.7%) study subjects had good knowledge scores followed by 13(43.3%) who had very good knowledge scores whereas 3 (10%) had average knowledge scores regarding nursing management of patients with chest tube drainage. It reveals that administration of self instructional module had significantly improved the study subjects knowledge scores level in post test as compared to pretest.

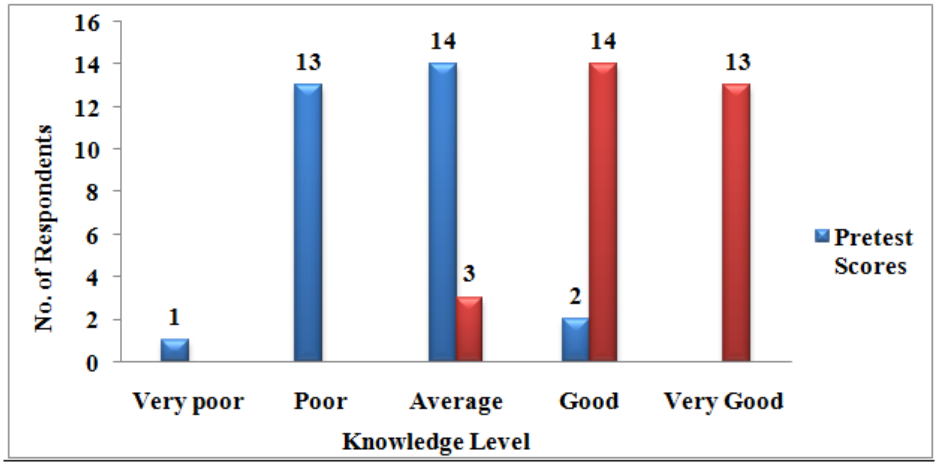

Figure:-10 Percentage distribution of staff nurses according to level of knowledge scores in pretest and posttest

Table – 4 Comparison of mean Pretest and Post test knowledge score
N=30

Pretest		Post test		t- value	P-value
Mean	S.D	Mean	S.D		
13.20 ± 3.690		**23.0 ± 3.797**		**16.039***	**P< 0.05**

* is significant

Table 4 and figure 11 indicates comparison between mean pretest knowledge scores (**13.20 ± 3.690**) and post test knowledge scores (**23.0 ± 3.797**) among 30 staff nurses. Findings shows that there was highly significant (**p< 0.05**) increase in post test knowledge scores as compared to pretest knowledge scores of staff nurses regarding nursing management of patients with chest tube drainage which established effectiveness of Self instructional module . Hence, Hypothesis H_1 was accepted.

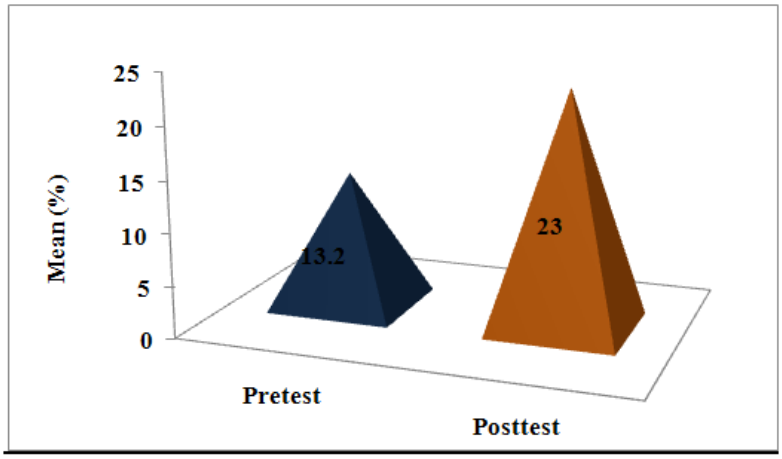

Figure:- 11 Percentage distribution of mean pretest and posttest knowledge level

Section-III

Objective 2: To find out the association between posttest mean knowledge scores among Staff Nurses with their selected Socio-demographic variables.

Table – 5 Association of post test mean knowledge scores among staff nurses regarding nursing management of patients with chest tube drainage with their socio demographic variables
N=30

Sr.No	Socio-demographic Data	Knowledge Scores					Chi-square value	df
		Very Poor	Poor	Average	Good	Very Good		
1.	**Age (years)**							
	a) 20-25	0	0	3	5	2		
	b) 26-30	0	0	0	2	5	9.907^{NS}	9
	c) 31-35	0	0	0	2	3		
	d) 36 & above	0	0	0	5	3		
2.	**Professional Education**							
	a) GNM							
	b) Post-Basic	0	0	0	11	8		
	B.Sc. Nursing	0	0	3	1	5		
	c) Basic B.Sc. Nursing						12.354^{*}	6
	d) M.Sc. Nursing	0	0	0	2	0		
		0	0	0	0	0		
3.	**Professional Experience (years)**							
	a) Less than 5	0	0	3	10	6		
	b) 5-10	0	0	0	1	5	8.066^{NS}	9
	c) 11-15	0	0	0	0	1		
	d) More than15	0	0	0	3	1		
4.	**Area of Work Experience**							
	a) Medical ward	0	0	0	8	5		
	b) Surgical ward	0	0	0	0	3		
	c) Emergency	0	0	0	3	0	10.930^{NS}	9
	d) ICU	0	0	0	3	5		
5.(i)	**Nursed Patient with Chest tube drainage**							
	a) Yes	0	0	2	8	5		
	b) No	0	0	1	6	8	1.311^{NS}	
(ii)	**If Yes:**							3
	a) During training	0	0	2	3	2		
	b) After training	0	0	0	5	3		
	c) Not applicable	0	0	1	6	8	4.736^{NS}	6

6.	**Attended CNE workshop, seminar etc. about Chest tube drainage**							
	a) Yes	0	0	0	1	1		
	b) No	0	0	3	13	12	0.241^{NS}	3

P<0.05

* is significant; ^{NS} is not significant

Table 5 depicts that there was statistically significant association ($p<0.05$) of the post test knowledge scores of staff nurses with their selected socio demographic variables of Professional education only while there was no statistical association ($p>0.05$) of the post test knowledge scores with the other socio demographic variables.

IV. Conclusion

Findings of the present study concluded that Self Instructional Module is effective to improve the knowledge of Staff nurses regarding nursing management of patients with chest drainage. So there should be CNE, workshop and seminar etc. about nursing management of patients with chest drainage for Staff nurses to upgrade their knowledge and to improve the quality of nursing care, so that the Staff nurses can do evidence based practice to reduce the chances of occurrence of complications. If it is not possible to have frequent CNE workshop, seminar etc. due to heavy workload in the wards then atleast SIMs or procedure manuals should be made available for Staff nurses to improve their knowledge.

V. Recommendation

- A similar study can be conducted with large sample for establishing the generalization of its findings.
- A comparative study can be spread over different hospitals.
- A similar study can be conducted on practice of nursing care of chest tube drainage.
- An Educational Module can be developed on nursing management of patients with chest drainage.

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