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A pre-experimental study to assess the effectiveness of a structured interventional program on knowledge regarding care of patients with chest tube drainage among staff nurses in IGMC and Hospital, Shimla, Himachal Pradesh

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ABSTRACT

Introduction: A chest tube insertion is a surgical procedure to remove the air, blood, pus, lymph and fluid from the pleural space by inserting a hollow, flexible drainage tube through the side of the chest in the pleural space. Chest tube is a widespread therapeutic intervention for patients admitted in medical and surgical care areas. It is associated with significant morbidity and mortality. **Objectives:** To assess the knowledge of staff nurses regarding care of patient with chest tube drainage, To evaluate the effectiveness of structured interventional program on knowledge regarding care of patient with chest tube drainage among staff nurses, to find out the association between pre test scores of knowledge regarding care of patient with chest tube drainage with selected socio demographic variables. **Methods:** A quantitative one group pre test and post test design was conducted at IGMC and Hospital Shimla, Himachal Pradesh. A total of 40 staff nurses were selected by convenience sampling technique. The tool used for data collection was structured knowledge questionnaire. A structured interventional programme on care of patient with chest tube drainage with the use of ppt was administered. **Results:** Majority of the subjects 19(47.5%) falls in the age group between 26-30 years. With respect to education 19(47.5) have done B.Sc nursing. 22 (55.0%) of the staff nurses had experience between 2-3 years, and 34(85.0) of them belongs to Hindu religion. Majority had 20 (70%) average knowledge, 16 (40%) of staff nurses had poor knowledge and 4(10%) of them had good knowledge whereas after intervention majority 28(70%) of the subjects has good knowledge, 12(30%) of subjects has average knowledge and none of subjects has poor knowledge regarding care of patients with chest tube drainage. The mean knowledge score in pre test was (16.6 ±7.98), in post test was (31.65±6.12) which indicates there is an increase in knowledge of the subjects. **Conclusion:** The study concluded that structured interventional programme on care of patient with chest tube drainage was found to be effective in increasing the knowledge of staff nurses. Staff nurses had a significant gain in knowledge regarding care of patient with chest tube drainage.

Keywords— Effectiveness, Chest tube drainage, Knowledge, Structured Educational Program, Staff Nurses

1. INTRODUCTION AND BACKGROUND OF THE STUDY

A chest tube insertion is a surgical procedure to remove the air (pneumothorax), blood (haemothorax), pus (empyema), lymph and fluid (pleural effusion) from the pleural space by inserting a hollow, flexible drainage tube through the side of the chest in the pleural space.¹ The purpose of chest tube and pleural drainage is to restore normal intrapleural pressure which helps to reexpand the lungs. Small accumulation of air or fluid in the pleural space may not require removal by thoracentesis or chest tube insertion. Instead, the air and fluid may not be reabsorbed over r time.²

The concept of chest drainage was first described by Hippocrates when he described the treatment of empyema by means of incision, cautery, and insertion of metal tubes.³ Chest tube is commonly made from clear plastic like PVC and soft silicon. Chest tube are made in a range of sizes measured by their external diameter from 6 Fr to 40 Fr. For adults, 20 Fr to 40 Fr are commonly used and 6 Fr to 26 Fr for children.⁴ Lungs are the vital organs for respirations process and covered by double- layered serous membrane called pleura. It contains two layers visceral and parietal pleurae. The pleural fluid is localizing into the space between pleura, facilitating movement between the lungs and the chest wall.⁵

The pressure presents in the chest cavity normally is lower than the atmospheric pressure which based on the principle of negative pressure, causing air to move into the lungs during inspiration. Whenever the chest is open, there is loss of negative pressure,

which results in collapse of the lung. The collection of air, fluid or other substances in the chest can compromise cardiopulmonary function and also cause the lungs to collapse. The pathologic substances that collect in the pleural space include fibrin or clotted blood, liquid (serous fluid, blood, pus, and chyle) and gases.⁴

Under normal condition, intrapleural pressure is below atmospheric pressure. If intrapleural pressure becomes equal to atmospheric pressure, the lungs will collapse (pneumothorax).² Chest tubes are usually inserted in an operating room. However, in some critical cases, a chest tube may be inserted in a treatment room or at the bedside. In the operation theater the chest tube is placed with the help of thoracotomy incision. In the emergency department or at the bedside, the patient is placed in a sitting position or is lying down with the effected side elevated. The area is prepared by the antiseptic solution, and the site is infiltrated with a local anesthetic agent. After a small incision is made, one or two chest tubes may be placed into the pleural space. If fluid is to be drained, a chest tube is placed posteriorly through the eighth or ninth intercostals space to drain fluid and blood. The tubes are sutured to the chest wall, and the puncture wound is covered with a dressing. During insertion the tubes are kept clamped. After the tubes are in place in the pleural space, which are connected to drainage tubing and pleural and the clamp is removed. Each tube may be connected to a separate drainage system and suction. More commonly, a Y- connector is used to attach both chest tubes to the same drainage system.⁶

Most pleural drainage has three compartments, each with its own separate function. The first compartment, or collection chamber, receive fluid and air from the chest cavity.² The second compartment, called the water seal chamber, contain 2 cm of water, which act as a one-way valve. The incoming air enters from the collection chamber and bubbles up through the water. The water act as a one-way valve to prevent back flow of air into the patient from the system. Initial bubbling of air is seen in this chamber when a pneumothorax is evacuated. Intermittent bubbling can also be seen during exhalation, coughing, or sneezing due to an increase in the patient's intrathoracic pressure. In this chamber fluctuation, or "tidaling", will be seen that reflect the pressures in the pleural space. The third compartment, the suction control chamber, applies controlled suction to the chest drainage system. The chamber is typically filled with 20cm of water.²

Three principles are used in closed chest drainage systems: gravity, water seal, and suction Gravity: air and fluid flow from a higher level to lower level. Therefore, the chest drainage apparatus should always be kept below the level of the client's chest. Water seal: A water seal provide a barrier between atmospheric pressure and sub atmospheric intrapleural pressure. Water seal drainage system must be airtight between the pleural space and the water seal. Any air leak is an entry for atmospheric air into the pleural space that creates the positive pressure which results in the collapse of lungs. Suction: Is a pull force, must be in another bottle.⁷

A common complication after thoracic surgery that arises within 30 –50% of patients are air leaks. Major complication includes hemorrhage, infection, and reexpansion pulmonary edema. Injury to the liver, spleen or diaphragm is possible if the tube is placed inferior to the pleural cavity. Injuries to the thoracic aorta and heart can also occur. Infection at the skin site is also possible. The patient with a chest tube has frequent chest X- rays to evaluate for reexpansion and for evacuation of drainage. The chest tubes are removed when the lungs are reexpanded and fluid drainage has ceased. Generally, suction is discontinued and the patient is placed on gravity drainage 24 hours before the tube is removed. The tube is removed by cutting the suture; applying the sterile petroleum jelly gauze dressing; having the patient take a deep breath, exhale, and bear down (Valsalva maneuver); and then removing the tube.⁸

The physician is responsible for inserting the chest tube by using the aseptic techniques. Therefore, as long as the chest tube is kept inserted, the nurse's responsibilities include (1) monitoring the chest drainage bottle and suction level, (2) recording the quantity of drainage, (3) wound care and management of pain, and (4) providing support and information to the patient and family. The mismanagement causes serious problems such as respiratory troubleshoot, increased morbidity, extension of duration of hospital stay, and even in some cases death may also occur.⁹

Blunt traumas are frequent type of trauma in Europe and USA and which causes more than 150,000 deaths in the Europe per year. In which, rib fractures are common and associated with haemothorax, pneumothorax or haemopneumothorax that are the most typical lesions moreover, lung. In particular, around 18% of patients required a chest drain and thoracotomy was needed in 2.6%. Moreover, also in case of penetrating chest trauma, intercostal drain positioning can be adequate in up to 95% of cases without requiring any further surgical exploration Positioning of a pleural drain often represent the first step of the management of a chest trauma.¹⁰

A retrospective study was conducted in year 2016 at Geetanjali Medical College and Hospital, Udaipur (Tertiary care rural centre) and study findings reveals that chest injury occurs in a significant number of trauma patients and majority of the victims were males. Total 1620 patients were admitted to emergency department in GMCH, Udaipur, out of that 730 patients were having chest injury and chest tube drainage was performed in 331 patients and thoracotomy was needed in 12 patients. The time taken for full lung expansion and removal of chest tube was 2-8 days.¹¹

In IGMC Shimla (H.P.) India a hospital based Prospective study was conducted in year 2011-12 in the department of Medicine. In this study the total numbers of admissions were 7335 out of which 30 patients were diagnosed as spontaneous pneumothorax. Out of 30 patients 80% (24) were of secondary spontaneous pneumothorax and 20% (6) were of Primary spontaneous pneumothorax. In the study it was observed that all of the patients had to be managed by intercostal tube insertion. Study concluded that Intercostal tube drainage is the mainstay of the treatment and the overall response was good.¹²

1.2 Need for the study

Disorders of the thoracic cavity are common and are encountered by nurses in every setting from the community to the intensive care unit. Chest tubes are used after chest surgery and chest trauma and for pneumothorax or hemothorax to promote lung re-expansion. While caring a patient with a chest tube drainage the nurse requires problem solving skill and critical thinking ability. After the chest tube has been inserted, it is the nurse's responsibility to maintain a patent (clear) and intact pleural drainage system. Several complications can occur when managing a patient with a chest tube due to the carelessness of the health care professionals. It is important that nurses receive appropriate training in the management of care of patient with chest tube drainage and ensure that patients are cared for safely and competently.¹³

Most of the nurses working in an acute care setting will encounter patients with chest drains at some point in their careers. So even the non specialist nurse requires a good working knowledge of chest drain system. It is fundamental that the nursing professionals should know the materials used in the chest tube drainage as well as their maintenance.¹⁴

A prospective case- note audit was conducted to identify the nurses' level of knowledge regarding chest drain management and how nurses keep informed and support and directed by doctors related to drain insertion and care of patient with chest tube drainage. In the study 29 drains were inserted in which 65% patients suffered no complications but 25% reported pain during insertions. Anecdotally there appears to be lack of consensus among nurses only 12% of the nurses reported that they have received formal training and 34% were confident in managing a drain. Complications are correlated with nurses' responses; 34% reported that pain relief was only indicated following insertion; 8% would clamp the tube for a pneumothorax 20% were unsure whether a pneumothorax drain should be clamped; 16% believed that pleural effusion drain should never be clamped while, 28% were unsure. Nurses in respiratory wards have limited knowledge of drain management. 78% of nurses felt poor instruction was given by wards doctors. Lack of evidence- based nursing care and insufficient training has resulted in deficit knowledge about chest drain care and poor instructions from the doctors regarding management of chest drainage also compromise patient care. Study concluded that a carefully designed and implemented care bundles to guide nurses about drain management could significantly lower post insertion complications.¹⁵

A cross-sectional descriptive study was conducted to assess the level of nurses' knowledge regarding chest drains care. 150 nurses were included in the study by convenient sample technique. The finding of this study shows that among the participants 24% had poor knowledge of chest drainage care. 24% of the participants had moderate knowledge, while 40% of the study participants had good knowledge of drainage care. Overall there was a satisfactory level of knowledge regarding the chest tube drainage care among nurses of the selected hospital in Lahore but in-service education or teaching will help the staff nurses who have poor or average knowledge to gain their knowledge and provide good nursing care to patient with chest tube drainage.¹

In year 2019, selected Hospital of Malwa Region of Punjab a pre- experimental study was conducted to assess the efficacy of self instructional module (SIM) on the knowledge regarding nursing management of patient with chest drainage among staff nurses. 30 staff nurses were included in the study and findings showed that there is significant increase in mean post test knowledge scores (23.0) as compared to mean pre test knowledge scores (13.20). Finding of the study concluded that the Self Instructional Module is effective to improve the knowledge of staff nurses, so there should be continuous education programme, seminar and workshop etc. about nursing management of patient with chest tube drainage to upgrade their knowledge and improve quality of nursing care and they can perform evidenced based practice to reduce the occurrence of complications.¹⁶

During my clinical posting I observed many patient with chest tube drainage and due to chest tube drainage patient get many complications like infection at incision site, soiling of the dressing. Intake and output chart was not maintained so that for physician it was impossible to know how much fluid were drained in 24 hours, to overcome with these complications there is a need to improve the knowledge regarding care of patient with chest tube drainage among staff nurses to provide quality care.

2. CONCEPTUAL FRAMEWORK

The conceptual framework refers to interrelated concept of abstraction that are assembled together in some rational scheme by virtue of their relevance to a common theme. Present study is to find out and to evaluate the effectiveness of care of chest tube drainage on knowledge among staff nurses in IGMC Hospital Shimla (H.P).

The conceptual framework used for this study is J.W, Kenny's Open system model {1968}, this system consists of set of interacting component with the boundary that filter the type and rate of exchange with the environment, The system have been defined as "set of component or units interacting with each other "within a boundary that filter both the kind and rate of flow and input and output from the system "general system theory is concerned with the change due to interaction between various factors or variable in the situation.

According to Polit and Hungler 1999 "conceptual framework is a cohesive supportive linkage of selection interrelated concept, it is a device for organizing ideas and in turn bringing order object, observation, event and experience, it serve as a guidance to research and spring board for the generation of research thesis.

The main concepts of general system theory are input, throughput, and output. The input refers of any other form of information energy of material system through its boundary. Throughput refer to a process whereby systems transforms, creates and organizes. Output refers to energy, information or matter that is transferred to the environment as a result of the throughput.

INPUT: is a matter, energy and transformation that enter the system

In this study input refers to the assessment of demographic variable, clinical variables such as Age, gender, Marital status, Area of residence, Professional educational status, Year of experience, Religion, Area of clinical experience, Working experience in medical ward, working experience in surgical ward, ever attended any educational program related to chest tube drainage, currently working place.

THROUGHPUT: is a process that occur at some point between the input and output process, which enable the input to be transferred as output in such a way that it can be readily used by the systems.

Throughput mode consists of manipulation which the investigator provide in terms of administration of structured interventional program and change in cognition level through the process of gain in knowledge regarding care of patient with chest tube drainage among staff nurses. Interventional programme includes anatomy and physiology of respiratory system, thoracic cavity, principles, purpose, indications, contraindications, procedure, nursing management of patient with chest tube drainage, complications, removal of chest tube drainage.

OUTPUT: is the return of matter, energy, information to environment in the form of both physical and psychological behavior, the expected outcome was obtained by assessing the change in subjective wellbeing of staff nurses. Feedback is different in pre and post assessment scores. In the present study the feedback was considered as process of maintaining the effectiveness on knowledge regarding care of patient with chest tube drainage among staff nurses. It was assessed by comparing pre-test and post-test assessment score.

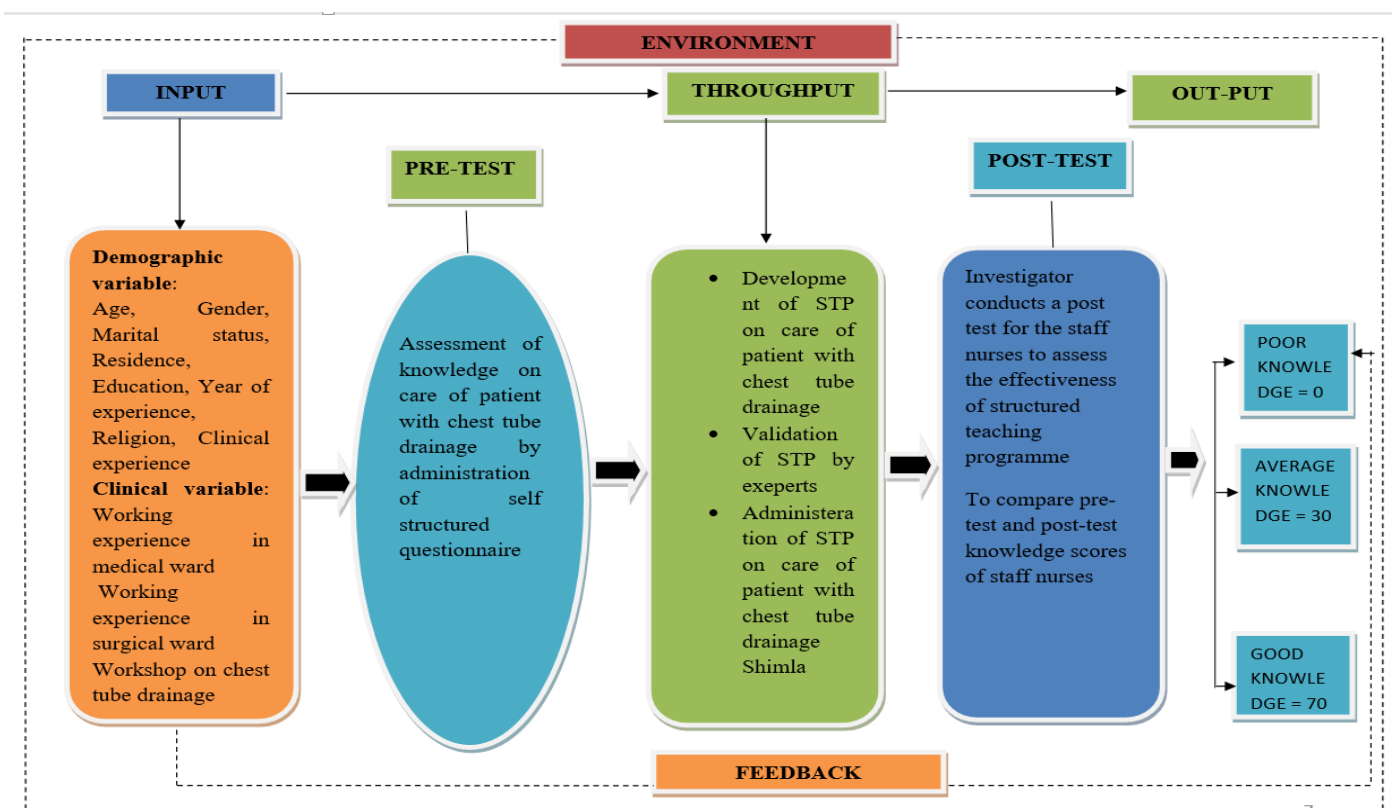


Fig. 1: Conceptual framework based on J.W, Kenny's Open system model {1968}

2. REVIEW OF LITERATURE

Section I: Studies related to incidence and prevalence of chest tube insertion

Kepka S, Dalphin JC, Pretalli JB, Parmentier AL, Lauque D, Trebes G, Mauny F. (2019) conducted a study to assess the management of spontaneous pneumothorax from June 2009 to May 2013, 14 hospitals in France were retrospectively included. 1868 cases of all spontaneous pneumothorax were included among 1868 (10%) were managed by using outpatient management strategy, (2%) with no intervention. (1%) were treated by aspiration and discharged to home after admission. Observation was the chosen strategy for patients (53%). And thoracic drainage was the most frequent choice in patients (76%). This study showed that the chest tube drainage and hospitalization remain most frequent choices for the management of spontaneous pneumothorax.¹⁷

Section II: Studies related to the chest tube drainage and its management

Wang H, Hu W, Ma L, Zhang Y. (2019) did systematic review and Meta - analysis to compare between digital chest drainage systems versus traditional chest drainage system. 20 studies were assessed in which 1487 patients who met the eligibility criteria were included in this meta- analysis among 1487 patients, digital chest tube drainage were used in 720 patients and traditional chest tube drainage were used in 767 patients. The results of these meta- analysis study depicts that digital chest drainage system significantly reduced the duration of chest drainage and hospital stay compared with traditional chest drainage system, also found that compared to traditional chest drainage, digital chest drainage reduced the risk of complications in patients. Digital chest drainage system is expected to benefits patients to attain faster recovery and higher life quality and also reduce the risk of post operative complications.¹⁸

Section III: Studies related to the complications of chest tube drainage

Hashmi U, Nadeem M, Aleem A, Khan FU, Gull R, Ullah K, Khan IH. (2018) Conducted an observational study in the department of Thoracic Surgery at Nishter Medical University Multan, Pakistan from 2015 to 2017 to find out various causative factors which are responsible for dysfunctional closed chest drainage. The population was individual with tube thoracostomy and had significant failure in draining the pleural collection. Total 139 cases were included in the study. Study findings revealed that a wrong connection of closed chest drain unit was the most common cause for dysfunctional closed chest drain unit (17.3%) and other common problems involves underwater seals(13.7%), inadequate prime fluid (10.8%), loose connections(10.8%), overfull bottles (8.6%), kinked tubes (7.2%). Dysfunctional closed chest drain unit is common and serious problem and these mistakes are due to inadequate knowledge and poor level of experience for nurses and residents.¹⁹

Section IV: Studies related to knowledge and practices of staff nurses on Care of patient with chest tube drainage

Zhao Z, Zhang T, Yin X, Zhao J, Li X, Zhou Y. (2017) conducted a survey on nursing practice of draining or stripping chest tube for preventing cardiac tamponade in cardiac surgery patients among staff nurses. The researcher also observed the negative clinical outcomes of milking or stripping of chest tube. 189 nurses were included from two large teaching hospitals, 30% of nurses responded that milking chest tubes keeps the chest tube patent. 58% felt that the activity was not helpful and 12% were unsure.²⁰

3. RESEARCH METHODOLOGY

This chapter describes how and under what condition the empirical data underline this thesis have been produced and utilized.

Schematic Diagram

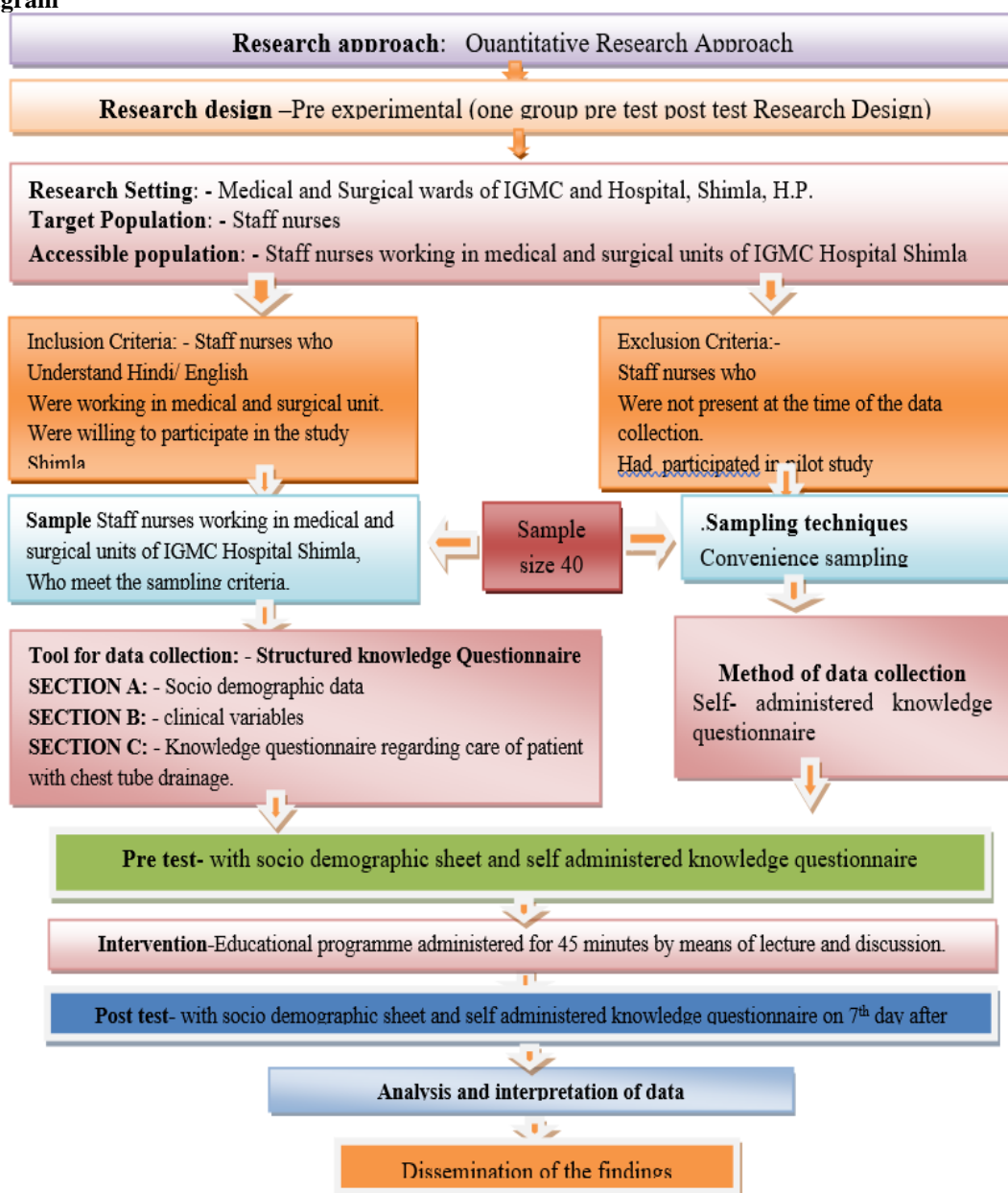


Fig. 2: Schematic representation of research methodology

4. DATA ANALYSIS AND INTERPRETATIONS

In current study data analysis and Interpretation has done on the basis of following sections:

Section A: Frequency and percentage distribution of socio demographic profile and clinical profile of the study participants.

Section B: Effectiveness of structured interventional programme on knowledge regarding care of patient with chest tube drainage among staff nurses.

Section C: To find out the association between pre-test score of knowledge regarding care of patient with chest tube drainage with selected socio demographic variable.

Table 1: Socio-demographic variables of study participants, N=40

Demographic Variables	Categories	f	%
AGE	21-25 years	1	2.5
	26-30 years	19	47.5
	31-35 years	18	45
	36 Years Above	2	5
GENDER	Male	0	0
	Female	40	100
MARITAL STATUS	Married	13	32
	Unmarried	27	67
	Widow	0	0
	Separated/divorced	0	0
AREAS OF RESIDENCE	Urban	14	35
	Rural	22	55
	Semi- urban	4	10
PROFESSIONAL EDUCATIONAL STATUS	GNM	13	32.5
	B.Sc Nursing	19	47.5
	GNM + Post Basic Nursing	8	20
	M.Sc Nursing & above	0	0
	Others	0	0

Table shows the frequency; percentage distribution of socio demographic variable of the subject. 19(47.5%) staff nurses lies in the age group 26-30 years which is followed by 18(45%) were between 31-35 years. while 50 (100%) of them were females. On the basis of marital status 27(67.5%) of them were Unmarried and 13(32%) of them were married. The result showed that majority of the staff nurses 22(55.0%) were residing in the rural area. With respect to education status of staff nurses majority 19(47.5%) were graduated.

Table 2: Socio-demographic variables of study participants, N=40

Demographic Variables	Categories	f	%
YEAR OF EXPERIENCE	Fresher (0-1 year)	2	5
	2-3 years	22	55
	4-5 years	5	12.5
	6 Years and Above	11	27.5
RELIGION	Hindu	34	85
	Muslim	0	0
	Sikh	0	0
	Christian	0	0
	Any other	6	15
AREAS OF CLINICAL EXPERIENCE	Medical ward	20	50
	Surgical ward	20	50
	Cardiac ward	0	0
	Critical care unit	0	0
	Any Other	0	0

Table shows that, 22 (55.0%) of the staff nurses had year of experience between 2-3 years, and 11(27.5%) had year of experience between 6 years and above. Almost, 34(85%) of them belongs to Hindu religion, 6(15%) of them belongs to any other religion. In respects of area of clinical experience, 20(50%) belongs to medical ward and 20(50%) belongs to surgical ward.

Table 3: Clinical variables of study participants.

N=40

Clinical Variables	Categories	f	%
WORKING EXPERIENCE IN MEDICAL WARD	1-2 yr	4	10
	3-4 yr	15	37.5
	5-6 yr	6	15
	7-8 yr	10	25
	Above 8 yr	5	12.5
WORKING EXPERIENCE IN SURGICAL WARD	1-2 yr	0	0
	3-4 yr	11	27.5
	5-6 yr	17	42.5
	7-8 yr	12	30

	Above 8 yr	0	0
ATTENDED ANY WORKSHOP RELATED TO CHEST TUBE DRAINAGE	Yes	0	0
	No	40	100
MONTHS ATTENDED	< 6 Months	0	0
	6 Month – 1 Year	0	0
	1 Year	0	0
CURRENTLY UNIT	Medical Ward	20	50
	Surgical Ward	20	50

Table shows that majority of the staff nurses 15 (37.5%) having 3-4 years of experience in medical ward and 17(42.5%) having 5-6 years of experience in surgical ward, the findings of the present study indicated that all of them had not attended any workshop related to chest tube drainage, half of the staff nurses 20(50%) who participated in the study were currently working in medical ward and half of them 20 (50%) working currently in surgical ward.

Section B: Pre test and Post test Knowledge scores of the staff nurses regarding care of patient with chest tube drainage.

Table 4: Pre test score on level of knowledge among staff nurses, N=40

S.No	Score	Pre-Test f (%)	Post Test f (%)
1	Good	4 (10%)	28 (70%)
2	Average	20 (50%)	12 (30%)
3	Poor	16 (40%)	0 (0%)
Mean±SD		16.6±7.98	31.65±6.12

Table shows that in pre test, 16(40%) of staff nurses in pre- test were having poor knowledge (score 0-14), 20(50%) of staff nurses in pre-test were having average knowledge (scores 15-28) and only 4(10%) of staff nurses in pre-test were having good knowledge (scores 29-41). In post test 12(30%) of the subjects had average knowledge whereas 28(70%) had good knowledge after the educational intervention.

It revealed that educational programme was effective to increase the level of knowledge regarding care of patient with chest tube drainage.

Section C: Effectiveness of Interventional programme on knowledge regarding care of patient with chest tube drainage among staff nurses.

Table 5: Comparison of Pre test and Post test knowledge regarding care of patients with chest tube drainage among staff nurses, N=40

S.No	Knowledge scores	Mean ± S.D.	Mean Difference	t	p value
1	Pre test knowledge scores	16.6±7.98	15.05	8.576	<0.001**
2	post test knowledge scores	31.65±6.12			

**Highly significant at p<0.001

Table shows that the pre test mean knowledge score was 16.6 with a standard deviation was 7.98 and post test mean knowledge score was 31.65 with standard deviation was 6.12 which showed that there was increase in knowledge of the subjects. The statistical paired “t” indicated that the two samples mean namely the pre test and post test differed significantly from each other indicating rejection of the null hypothesis and upholding the alternate hypothesis pointing to the effectiveness of the educational intervention.

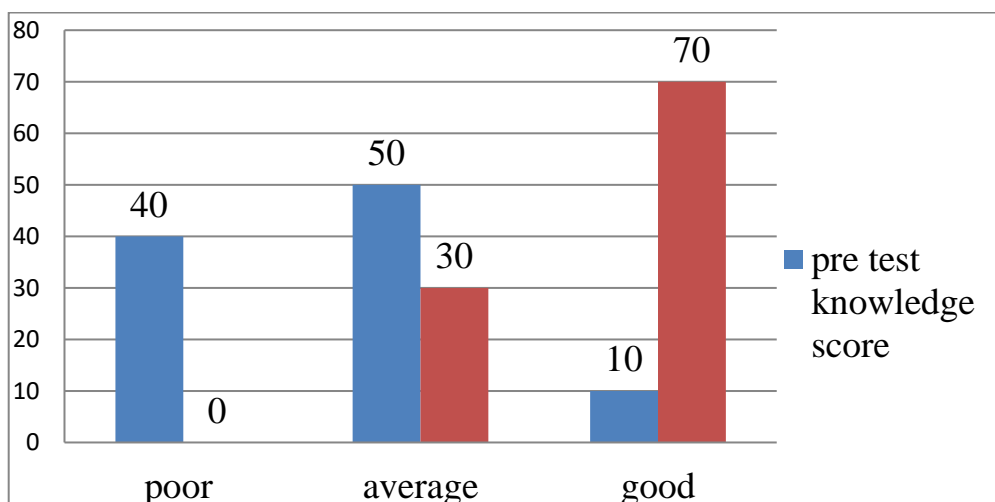


Fig. 3: Showing comparison of pre and post test knowledge score, N=40

SECTION C: Association of pre-test score of knowledge regarding care of patient with chest tube drainage with selected socio demographic variable.**Table 6: Association of pre-test knowledge score with selected socio demographic variable of staff nurses, N=40**

Variables	Categories	Good	Average	Poor	Chi Test	df	P Value
AGE	21-25 years	0	0	1	9.737	6	0.136
	25-30 years	4	10	5			
	30-39 years	0	10	8			
	40-45 years	0	0	2			
GENDER	Male	0	0	0	NA		
	Female	4	20	16			
MARITAL STATUS	Married	4	4	5	9.744	2	0.008**
	Unmarried	0	16	11			
	Widow	0	0	0			
	Separated/divorced	0	0	0			
AREAS OF RESIDENCE	Urban	0	4	10	15.018	4	0.005**
	Rural	4	15	3			
	Semi-urban	0	1	3			
PROFESSIONAL EDUCATIONAL STATUS	GNM	4	6	3	23.498	4	0.000**
	B.Sc Nursing	0	14	5			
	GNM + Post Basic Nursing	0	0	8			
	M.Sc Nursing & above	0	0	0			
	Others	0	0	0			

Table shows that in terms of the knowledge score with socio demographic variables, it was found that the variables marital status, area of residence and professional educational status had significant association with the knowledge score of the respondents. Whereas, age and gender had no significant association with the knowledge score of the respondents.

Table 7: Association of pre-test knowledge score with selected socio demographic variable of staff nurses, N=40

Variables	Categories	Good	Average	Poor	Chi test	df	p value
YEAR OF EXPERIENCE	Fresher (0-1 year)	0	0	2	27.341	6	0.000**
	1-3 years	4	17	1			
	3-6 years	0	0	5			
	Above 6 years	0	3	8			
RELIGION	Hindu	4	20	10	10.588	2	0.005**
	Muslim	0	0	0			
	Sikh	0	0	0			
	Christian	0	0	0			
	Any other	0	0	6			
AREAS OF CLINICAL EXPERIENCE	Medical ward	4	13	3	12.050	2	0.002**
	Surgical ward	0	7	13			
	Cardiac ward	0	0	0			
	Critical care unit	0	0	0			
	Any Other	0	0	0			

Table shows that the variables, year of experience, religion and area of clinical experience had significant association with the knowledge score of the respondents.

Table 8: Association of pre-test knowledge score with clinical variables of staff nurses, N=40

Variables	Categories	Good	Average	Poor	Chi Test	df	P Value
WORKING EXPERIENCE IN MEDICAL WARD	1-2 yr	0	2	2	29.967	4	0.000**
	2-3 yr	4	10	1			
	3-4 yr	0	6	0			
	5-6 yr	0	2	8			
	Above 6 yr	0	0	5			
WORKING EXPERIENCE IN SURGICAL WARD	1-2 yr	0	0	0	23.436	4	0.000**
	2-3 yr	4	6	1			
	3-4 yr	0	12	5			
	5-6 yr	0	2	10			
	Above 6 yr	0	0	0			
WORKSHOP CHEST	Yes	0	0	0	NA		

TUBE DRAINAGE	No	4	20	16			
MONTHS ATTENDED	< 6 Months	0	0	0	NA		
	6 Month – 1 Year	0	0	0			
	1 Year	0	0	0			
CURRENTLY UNIT	Medical Ward	4	13	3	12.050	2	0.002**
	Surgical Ward	0	7	13			

Table shows that in terms of the knowledge score with clinical variables, it was found that the variables working experience in medical ward, working experience in surgical ward and currently working unit had significant association with the knowledge score of the respondents whereas, whether attended any workshop related to chest tube drainage had no significant association with the knowledge score of the respondents.

5. STRENGTH OF THE STUDY

- Educational Intervention was adopted as intervention in Hospital to improve the knowledge regarding care of patient with chest tube drainage
- This study focusses on prevention of chest tube drainage
- The study helps to reduce the complications of chest tube drainage.
- The study focusses on improving knowledge of staff nurses regarding care of patient with chest tube drainage.
- The study helps to find out prevalence of chest tube insertion.
- The study focusses on in service education of staff nurses.

6. LIMITATIONS

- No control over population.
- Convenience sampling technique was used
- No standardized tools were available therefore the investigator prepared a tool for the purpose of the study.
- The present study was conducted in single hospital dealing with chest diseases. The data was collected through a single questionnaire form, and only theoretical information was evaluated. Future study should investigate the applications of nurses in the subject through observation and explain the results of patient that are affected by these applications.
- It was difficult to gather all the nurses from the same department at the same time to attend the program session. This problem was overcome by dividing the studied nurses in each shift in each department to various groups.
- Interventional programme administration was for 45 minutes because of busy schedule of staff nurses in IGMC & Hospital Shimla H.P.

7. NURSING IMPLICATIONS

The findings of the study have the practical application in nursing field. The effectiveness of structured interventional program will help in reducing the hospital stay and cost of the treatment

7.1 Nursing practice

- Nurses can take the responsibility to identify knowledge practice gap and undergo training and in service education to develop the skills.
- Study reveals that nurses have lack of knowledge in providing care to the patient with chest tube drainage. And findings can be used to bring about some awareness and they can develop a clinical teaching program for the nurses regarding care of patient with chest tube drainage.

7.2 Nursing Education

Health care personnel should be given an opportunity to update their knowledge periodically. Educators will help student, colleagues, and junior staff to be trained in chest tube drainage management.

7.3 Nursing Administration

- Nurse administrator can plan and organize training program for the student's nurses and the nurses regarding chest tube drainage and its prevention.
- Nurse administrator can organize educational programs in the nursing schools, colleges, community health centers, primary health centers and the other community settings.
- Necessary administrative support has to be provided to conduct health educational workshops in schools, colleges and other community area with appropriate A.V. aids, mass media, posters and role plays, drama and puppet show.
- Nurses should be motivated to take keen interest in preparing different teaching strategies suitable for the schools, colleges as well as other community settings on chest tube care and its prevention

7.4 Nursing Research

- The findings of the nursing research study have added to the existing body of the knowledge in the care of patient with chest tube drainage. Other researcher may utilize the suggestions and recommendations for conducting further study.
- An observational study may be conducted to identify the practice of staff nurses.
- An explorative study may be conducted to identify factors leading to poor practice.

8. RECOMMENDATION

- Another 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.

9. CONCLUSION

The study concluded that structured interventional programme on care of patient with chest tube drainage was found to be effective in increasing the knowledge of staff nurses. Staff nurses had a significant gain in knowledge regarding care of patient with chest tube drainage.

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