

## **A study to evaluate the effectiveness of a self-instructional module on nursing management of patients with chest tube drainage for staff nurses in a selected hospital in Gwalior**

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### **Abstract**

Interventions in the form of ward-based educational programme specifically designed enhances nursing compliance, perceive gaps in their knowledge and would welcome the opportunity to be updated regularly. Using chest tubes and chest drainage units is a complex and critical nursing function. By learning about their components and techniques needed to use them, you have protected your patient and helped him recover from a serious pulmonary problem

**Aim of the study:** Find the effectiveness of SIM on “Nursing Management of patients, having chest tube drainage” in terms of gain in knowledge.

**Materials and Methods:** One group pre-test post test design with an evaluative approach was adopted. The sample for the study comprised of 100 staff nurses. Random sampling technique was used to select 100 staff nurses working in District Hospital, Gwalior. The data was analyzed using descriptive statistics and inferential statistics, paired ‘t’ test, Karl Pearson’s Co-efficient of Correlation and chi-square test.

**The Study Result:** showed the pre-test knowledge assessment, the mean percentage of response was 56.37% with mean and SD of  $19.73 \pm 4.46$ , which increased to 91.7% with mean and SD of  $32.10 \pm 2.55$  in the post- test. Area wise mean percentage was 58.83% in the area of mechanisms and principles involved in chest tube drainage and (54.57%) in the area of anatomy and physiology including signs and symptoms.

In the post-test a significant increase in knowledge was found in all the areas. The mean percentage was (92.86%) in the area of assessment and care of patient with chest tube drainage. The overall mean percentage of knowledge scores had drastic improvement from (56.37%) in pre- test to (91.71%) in post- test, showing that the self instructional module was very effective.

The area-wise effectiveness of SIM on nursing management of patients with chest tube drainage revealed that the overall mean percentage of effectiveness was (35.34%). Further effectiveness of self instructional module was tested by inferential statistics using paired ‘t’ test

**Conclusion:** Chest tube drains are used to manage various thoracic conditions by safely removing air (pneumothorax) or liquid (hemothorax, pleural effusion) from the Pleural cavity, preventing it from being reintroduced and enabling the lungs to expand. Maintain chest tube potency to achieve adequate drainage is often a problem in the intensive care units.

**Keywords:** self-instructional module, nursing management and chest tube drainage

### **Introduction**

Using chest tubes and chest drainage units is a complex and critical nursing function. By learning about their components and techniques needed to use them, you have protected your patient and helped him recover from a serious pulmonary problem<sup>[1]</sup>. A study by Wilson (1999), in North America on high incidence of pleural effusion after tube thoracostomy for hemothorax reported that 27 out of 290 patients (13%) with hemothorax, developed pleural effusion after removal of chest tubes and 40 out of 118 patients with hemothorax had pleural effusion at the time of being discharged from hospital<sup>[2]</sup>. An improper, handling of chest tubes can lead to complication such as infection and subcutaneous emphysema. Nurses should have skills to take

care of patients with chest tube drainage and provide timely intervention to minimize the associated problem and complications while the patients are undergoing chest tube drainage<sup>[3]</sup> Interventions in the form of ward-based educational programme specifically designed enhances nursing compliance, perceive gaps in their knowledge<sup>[4]</sup>. The rectification of chest tube drainage related issues requires attention to improve the knowledge of staff nurses, in this specific area. Hence the investigator felt the need to prepare a self-instructional module on nursing management of patient with chest tube drainage for staff nurses

### **The objectives of the study**

1. Determine the existing knowledge of nurses regarding

- the “Management of patients having chest tube drainage”.
2. Develop a SIM on “Nursing Management of patients with chest tube drainage”.
  3. Find the effectiveness of SIM on “Nursing Management of patients with chest tube drainage” in terms of gain in knowledge scores

**Methodology:** The study adopt a One group pre-test post-test design ( $O_1 \times O_2$ ), while The sample consisting of 30 staff nurses working in District Hospital, Gwalior who met the inclusion criteria..

**Tools:** The tool consisted of baseline Proforma, and structured questionnaire for assessing the knowledge of staff nurses based on assumption that they have some knowledge regarding management of patients with chest tube drainage.

**Reliability of the tool:** The reliability of the tool was established by administering the tool to 10 staff nurses, who were working in the medical ward of the KDJ hospital. To find out the coefficient of internal consistency of the tool (Comfort Scale) Split-Half method was used. The reliability of the tool was found out using Karl Pearson Coefficient of Correlation with a reading of 0.8.

**Description of the tool** The tool consisted of two parts:  
**Part I: Baseline proforma** It consisted of 7 items, such as subject number, designation, clinical area, age, sex, professional qualification and total years of experience.

**Part II = Structured knowledge questionnaire on nursing management of patients with chest tube drainage.**

Structured knowledge questionnaire on management of patients with chest tube drainage consisted of 35 knowledge questionnaire covering areas like anatomy and physiology of chest, meaning and indication of chest tube drainage and signs and symptoms of pneumothorax, 15 items (43%), mechanisms and principles involved in chest tube drainage, 6 items (17%), assessment and care of patient with chest tube drainage and prevention of complications, 14 items (40%). The total possible score was 35.

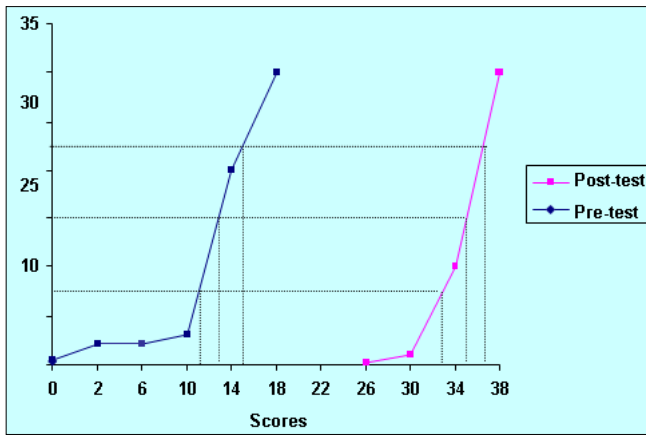
**Pilot study:** The pilot study was conducted in a private hospital in Gwalior from 14<sup>th</sup> October to 21<sup>st</sup> October. The written permission to conduct the study was obtained from the managing director of the institution. The data was collected from 10 staff nurses working in intensive care units and the trauma unit in the selected hospital. Simple Random sampling was adopted. Informed written consent was obtained. Confidentiality was assured to all the subjects. On the first day of commencing the study, pre-test was conducted by a structured knowledge questionnaire after which the Self Instructional Module was administered. The investigator informed the subjects to go through the self instructional module for 7 days and called them for post-test on the 8<sup>th</sup> day which was also a day for the follow up. Each written test was completed within 35-40 min. Data analysis was done using descriptive and inferential statistics. The findings of the pilot study revealed that the tool was feasible, practicable and acceptable. The investigator then

proceeded for the main study.

**Data collection process:** The investigator obtained written permission from the Managing Director of the hospital prior to the data collection period. The data collection period extended from 22.10.18 to 29.10.18. The investigator met the respondents individually in the respective wards and units. The purpose of the study was explained to them and informed consent was obtained. Confidentiality was assured to all the subjects to get their co-operation. The pre-test was conducted using a structured knowledge questionnaire. The time taken to conduct pre-test was 40-45 min. The pre-test was conducted on 33 staff nurses and Self Instructional Module was administered on the same day. Post-test was conducted on the 8<sup>th</sup> day to find out the effectiveness of SIM in terms of their gain in knowledge. Out of the 33 staff nurses, 2 of them were on leave and one had an off on the post-test day. Hence post-test was done on the rest of the 30 staff nurses. The subjects were very co operative. The data collection process was terminated by thanking the subjects. The data obtained was analyzed using both descriptive and inferential statistics, on the basis of objectives and hypothesis of the study.

## Result

Assessment of the level of knowledge of staff nurses regarding nursing management of patients with chest tube drainage revealed that Highest percentage (56.6%) of the respondents were in the age group, 20- 30 years. Age of 23.33 percentage of respondents were between 31-40 years and 13.33% of respondents were between 41-50 years. Age of 6.67% of respondents were above than 50years  
Distribution of staff nurses according to their gender shows 66.67% of them were females and 33.3% of them were males. Percentage distribution of staff nurses according to their professional qualification shows that majority, (50%) of the samples were B.sc nurses and 46.6% of the sample were general nurses. Only a minority of 3.33% of the sample were post basic B.sc nurses. Percentage distribution of staff nurses according to total years of experience reveals that the majority of samples (56.67%) had below 5 years of experience. Thirty percentage of the samples had 6-10 years of experiences and a majority of 13.33% of samples had experience above 11years. The findings revealed that majority of respondents (90%) had only average knowledge whose percentage of scores ranged between 35-70. Only 3.33% of the respondents had good knowledge and 6.67% of the respondents had poor knowledge level regarding management of patients with chest tube drainage. The total mean percentage of the knowledge scores was 56.37% with mean and SD  $19.73 \pm 4.46$ . Area-wise mean percentage of knowledge scores was 58.83% in the area, of ‘Mechanisms and principles involved in chest tube drainage’ with mean and SD  $3.53 \pm 1.61$ . In the area of ‘assessment, care of patient with chest tube drainage and prevention of complication’, the mean percentage was 57.14% with mean SD  $8 \pm 2.30$ . The least mean percentage (54.57%) was observed on the item, ‘anatomy and physiology including signs and symptoms’, with mean and SD  $8.2 \pm 2.34$ .



**Fig 1:** O give curve of pre-test and post-test scores of staff nurses on management of patients with chest tube drainage

The data presented in the form of Ogives showed significant difference between pre- test and post- test knowledge scores. By graphical method, the pre- test median score is 13 whereas the post-test median score is 35. The difference between the different quartiles of pre-test and post-test is more. This revealed that there is significant increase in the knowledge of staff nurses, regarding management of patients with chest tube drainage.

The data presented in the form of graph showed that in the pre-test, maximum number of staff nurses (17) scored between 18-22, whereas in the post-test, the maximum number of staff nurses (20) scored between 34-38. This revealed that there is a significant increase in the knowledge scores of staff nurses after administration of SIM.

The area-wise, mean, SD and mean percentage of the knowledge scores of the pre-test and post-test reveals an increase of 35.34% in the mean knowledge score after administration of SIM.

In the area of ‘assessment and care of patients with chest tube drainage’ there was an increase of 35.72% in the mean knowledge score with mean and SD of  $5 \pm 2.61$ .

In the area of ‘anatomy and physiology including signs and symptoms’ there was an increase of 36.1% in the mean knowledge score with mean and SD of  $5.4 \pm 2.63$ .

In the area of ‘mechanisms and principles involved in chest tube drainage’, there was an increase of 32.84% in the mean knowledge score with mean and SD of  $1.97 \pm 1.52$ .

Item-wise comparison revealed that 56.67% of effectiveness was observed on the item ‘average amount of intra-pleural fluid in a healthy adult is 20-25ml’. The least percentage (16.67%) of effectiveness was observed on the item, ‘Lubrication and prevention of friction are the functions of intra-pleural fluid’.

The findings of the study showed a significant increase in the post-test knowledge scores and the mean gain was very highly significant. Hence it can be inferred that the SIM was effective in increasing the knowledge of staff nurses regarding management of patients with chest tube drainage.

**Conclusion**

It is concluded from the present study, by using an evaluative research approach with one group pre-test post-test design the sample consisted of 30 staff nurses, working in a selected hospital in Gwalior. A random sampling technique was used for the study. A structured knowledge

questionnaire with 35 items on management of patients with chest tube drainage was used to assess the know ledge of staff nurses before and after administration of SIM. The data obtained was analyzed by using descriptive and inferential statistics. The findings of the study showed that a very high significant increase in the post-test knowledge scores and the mean gain ( $P < 0.005$ ) in all the areas of management of patients with chest tube drainage. The study revealed that the self-instructional module was very effective in increasing the knowledge of staff nurses on ‘management of patient with chest tube drainage

**Recommendations**

On the basis of the findings of the study can be replicated on a large sample to have generalization. A similar study can be conducted using other teaching strategies like video assisted teaching module (VATM), a similar study can be conducted in terms of gain in skill of staff nurses, an experimental study can be undertaken with a control group.

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