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Knowledge of Nurses Regarding Chest Drain Care at Public Tertiary Care Hospital Lahore

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Abstract: The chest tube is used to restore the intra pleural pressure and to prevent the collapse of lungs. Chest tube management includes the actions to keep the tube functioning properly, which is the prime role of nurses while caring of patients with chest tube drainage Elfeky, 2013. The main objective of this study was to determine the level of knowledge regarding chest drains care among staff nurses of Mayo hospital Lahore. A cross-sectional descriptive study design was used to assess the level of nurses' knowledge regarding chest drains care. A Convenient sample technique was used in this research study. A sample of n=150 was recruited**.** The main instrument for Information was questionnaire adopted from the research (Danish Ruhel 2013). The questionnaires were divided into two sections. Section 1 comprised of demographic information of respondents; Section two consist of knowledge based questions. Data was analyzed through SPSS version 21. The results are shown below. The finding of this study shows that among the participants 24% had poor knowledge of chest drainage care and they answered 13 or less correct answers off the 23 questions being asked. 24% of the participants had moderate knowledge and scored 14-19 correct responses, while 40% of the study participants had good knowledge of drainage care and answered above 19 correct responses**.** Overall there was a satisfactory level of knowledge regarding the chest tube drainage care among nurses of the selected hospital in Lahore.

Keywords: Chest drainage, Nurses, Knowledge of chest drain care.

INTRODUCTION

A chest tube insertion is a surgical procedure in which a hollow, flexible drainage tube is inserted through the side of the chest in to the pleural space in order to drain the pleural cavity of air, blood, pus or lymph. The water seal container connected to the chest tube allows one way movement of air and fluid from the pleural cavity [1].

The chest tube is used to restore the intra pleural pressure and to prevent the collapse of lungs. Chest tube management includes the actions to keep the tube functioning properly, which is the prime role of nurses while caring of patients with chest tube drainage [1].

Chest drainage is commonly used in the treatment of respiratory diseases, heart surgery, chest surgery or trauma. Chest drainage is a surgical procedure or an invasive procedure; that require sufficient knowledge and skills to avoid the serious complications of the respiratory system [2].

Chest tube is a flexible plastic tube that is inserted in to the mediastinal cavity or pleural space. The purpose of this tube to remove the air (pneumothorax), water, blood and other fluids or pus (empyema). This tube is also known as intercostal catheter [1].

Generally chest drainage tubes are the consistent and necessary part of the post-operative management for thoracic and heart surgery, therefore chest drainage tubes have not been removed until output is less than 150ml in 24 hours and although all air leaks are completely resolved [3].

Chest drainage tubes are placed through the side of the chest in the pleural place rather than in to the lungs. The actual space for chest tube insertion is between the parietal and visceral pleurae. The parietal pleura (outer wall) cover the chest wall and diaphragm. It contains serious fluid (about 50 ml) that covers the opposing surfaces and visceral pleura (inner) enabling the surfaces to avoid from friction and helps the pleural surfaces to adhere to each other [4].

The common indications of chest tube drainage are pneumothorax (accumulation of air in the pleural space), pleural effusion (accumulation of fluid

in the pleural space), chylothorax (collection of lymphatic fluid in the pleural space), and empyema (a pyogenic infection of the pleural space) hemothorax (accumulation of serous fluid in the pleural space). In addition to these cardiothoracic surgeries and chest trauma are common indications of chest tube insertion [1].

Breathing is the automatic and necessary component of life, therefore inadequate oxygen, lack of ventilation and disorders of our respiratory system can suddenly become life threatening. So it is important that healthcare professionals have adequate knowledge and skills to assist the preparation of the chest drainage, ongoing patient assessments, document routinely and also find out the possible problems related to the use of chest tube [4].

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 may cause serious complications such as respiratory troubleshoot problems, increased morbidity, extension of duration of hospital stay, and even in some cases death may also occur [5].

A survey research study was conducted on nursing practice of draining or stripping chest tube for preventing cardiac tamponade among cardiac surgery patients. The researcher also observed the negative clinical outcomes of milking or stripping of chest tube. When conducted the survey among 189 nurses 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 [2].

Another study conducted that the questionnaire form prepared for which the least correct answer was provided by the nurses in the present study was related to the position of the patient during the insertion of the chest tube. While this question was answered correctly at a rate of 44.4% in the study of Lehwaldt and Timmins [6].

This study indicated that all studied nurses (100.0%) had statistically significant unsatisfactory level of practice pre-program implementation. The statistically significant level of improvement in nurses' practice was very high, therefore immediately after the program implementation and there was decline in the studied nurses' total practice scores throughout the first follow –up and second follow up after program implementation but it showed significant improvement than pre-test [7].

A retrospective study was conducted on chest tube complications over a period of 12 months at a regional trauma center. The researcher retrospectively received all severely injured trauma patients who underwent tube thoracotomy. Insertional, positional and infective complications were identified. Thoracoabdominal CT scans and corresponding chest x rays were also used to determine the rate of complications. Of the patients, 338 (44%) had CXR and CT imaging. there were 17 complications; 6 (35%) were insertional; 9 (53%) were positional and 2 (12%) were infective [8].

A prospective study was conducted to assess the incidence of chest tube malposition in critically ill. The study comprises of 122 chest tubes percutaneously inserted in 75 consecutive critically ill patients. Malposition was detected in 30% of percutaneously inserted chest tubes, Twenty-two chest tubes were diagnosed as being intra fissural (21%), and 10 were diagnosed as being intra parenchymal (9%). Avoiding the use of a trocar may reduce significantly the incidence of chest tube malposition [9].

According to this study infectious, traumatic, or neoplastic processes in the chest often result in fluid collections within the pleural, parenchymal, or mediastinal spaces. The same fundamental principles that guide drainages of the abdomen can be applied to the chest. This review discusses various pathologic conditions of the thorax that can result in the abnormal accumulation of fluid or air, and their management using image-guided methods [10].

AIMS OF THE STUDY

The purpose of this study was to assess the knowledge of nurses regarding chest drain care at Mayo hospital.

SIGNIFICANCE OF THE STUDY

- This study help me to know about chest drain management life and also motivate to improve the chest drain practice and management
- This study will improvements in chest drain management in nursing profession related to turnover and shortage in future
- Through this this study the health work organization will improve their nursing practice towards management of chest drain due to this the patients revisit for further treatments.
- The institute will provide enough information to their future about the chest drain practice and management

- This study will provides baseline information on knowledge level and practice among staff nurses as well as in future

METHODS

SETTING

The setting for this research was medical units, surgical units, ICU and emergency department unit of Mayo hospital, Lahore, Pakistan.

RESEARCH DESIGN

A cross-sectional descriptive study design was used to assess the level of nurses' knowledge regarding chest drains care, among staff nurses of Mayo hospital Lahore

POPULATION

All nurses of medical units, surgical units, ICU and emergency department Mayo hospital, Lahore, Pakistan

SAMPLING

For recruiting the study participants, a convenient non probability sampling methods was applied.

RESEARCH INSTRUMENT

The main instrument for Information was questionnaire adopted from the research [11]. The questionnaires were divided into three sections. Section 1 comprised of demographic information of respondents; Section two variables of the study this questionnaire are categorical and four point graded scale (likert scale) ranging from strongly Disagree =1, Disagree= 2, Agree=3 to strongly Agree=4.

DATA GATHERING PROCEDURE

- After taking informed consent, data was collected by the researcher will the help of pre- tested data collection tool (questionnaire/ performed)
- Data was collected according to the variables of the questionnaire which are as follows.
- Demographics data was taken from the participants Question was asked according to variables of the study methods

USED TO ANALYZE DATA

Data was analyzed by using SPSS version 21.0 statistical software for data analysis. This study was descriptive and all the descriptive study was obtained through SPSS.

STUDY TIMELINE

The data was collected from February, 2018 to April, 2018.

ETHICAL CONSIDERATION

First of all permission was carry out from the HOD of the Nursing College of National hospital Lahore. A consent form was signed from the participants, so that they are willing to be a part of the study. The participants have right to choose whether to fill the questionnaire or not. Confidentiality was considered by informing participants. Beneficence of the participants must be maintained .The study was doing no harm to the participants, as the study is descriptive it was not related to any experiment, so there is no risk for harm. All the participants participating in the study were treated equal. Were kept optional and sensitive information was not shared unnecessarily. To maintain confidentiality codes or secret numbers were provided instead of participants names. The information or data was being remained to the first researcher.

RESULTS

PROFILE OF THE RESPONDENTS

Respondents were taken from different selected groups of DHQ Hospital Faisalabad.

Table-1 show Gender of the participants. The male participant's score were 0% and the female participant's score were 100 %., the age of the participants. 21-25 years participants score were 27.3 %, 26-30 years participants score were 48.7 %, 31-35 years participant's score were 24.0% and above 35 years participants score were 42 %., the qualification of the participants. General nursing participant's score were 42.0%, nursing with specialization participant's score were 42.7%, BSN/ post RN 15.3%. The Experience of the participants. 1-5 years participant's score were 37.3 %, 6-10 years participants score were 45.3%, 11-15 years participant's score were 45.3% and above 15 years participants score were .7%. Table also show marital status of the participants in which single 50% and married is 50%

Table-1: Demographic frequency

Variables	n	%
Age		
21-25 years	41	27.3
26-30 years	73	48.7
31- 35 years	36	24.0
Qualification		
Nursing with specialty	64	42.7
General Nursing	63	42.0
BSN/Post RN BSN	23	15.3
Marital status		
Single	75	50
Married	75	50
Experience		
1- 5 years	56	37.3
6-10 years	68	45.3
11-15 years	25	16.7
Above15 years	1	.7
Gender		
Female	150	100.0
Male	0	0

Table-2:

S #	**Variables**	**Yes**	**No**	**Don't know**
1	The fluid in the drainage bottle has to be kept 90 cm below the chest level in order to prevent the fluid from entering the pleural space.	86.7 %	6.7%	6.7%
2	The chest tube inserted to the pleural space provides re inflation of the collapsed lung.	88.7%	10.7%	.7%
3	Pneumothorax is the most important case for which the insertion of a chest tube is necessary.	90.0%	7-3%	2.7%
4	Intrapleural pressure is the pressure in the pleural space.	89.3%	9.3%	1.3%
5	Regular oral analgesic use is effective in reducing the pain stemming from the chest tub	70.0%	24.7%	5.3%
6	Gurgitation seen in the drainage bottle may be an indicator of air leak.	84.0%	13.3%	2%
7	In inspiration, the lower end of the tube must be at least 2 cm inside water so that the atmospheric air does not enter from the tube system into the pleural cavity.	81.3%	10.7%	8%
8	The movement of fluid by breathing in a chest tube is called oscillation.	66.7%	24%	9.3%
9	The use of premedication during the insertion of a chest tube will reduce the pain experienced by the patient.	84.0%	9.3%	6.7%
10	Drainage bottles should be changed every day in order to prevent respiratory system infections.	72.0%	26%	2%
11	Chest tube incision should be dressed only when it gets dirty.	29.3%	67.3%	3.3%
12	The up and down movement of the fluid in the drainage bottle gives information about general negative pressure.	82.0%	14%	4%
21	It is not appropriate for the patients to position toward the healthy lung during the insertion of chest tube.	76.0%	18%	6%
22	Patients must perform the Valsalva maneuver during the removal of a chest tube.	46.0%	20%	34%
23	Fluid accumulation to touch the short air tube in the drainage bottle is not a problem.	39.3%	47.3%	13.3%

Table-2 show the score of the participants about the fluid in the drainage bottle has to be kept 90 cm below the chest level in order to prevent the fluid from entering the pleural space in which 86.7% score to true, 6.7% to false and 6.7% to don't know, the score of the participants about The fluid in the drainage bottle has to be kept 90 cm below the chest level in order to prevent the fluid from entering the pleural

space in which 88.7% score to true, 10.7 % to false and .7 % to don't , the score of the participants about Pneumothorax is the most important case for which the insertion of a chest tube is necessary.in which 90.0% score to true, 7.3 % to false and 2.7 % to don't know , the score of the participants about Intrapleural pressure is the pressure in the pleural space. 89.3% score to true, 9.3 % to false and 1.3 % to don't know, the score of the participants about Regular oral analgesic use is effective in reducing the pain stemming from the chest tub. 70.0% score to true, 24.7 % to false and 5.3 % to don't know, show the score of the participants about Gurgitation seen in the drainage bottle may be an indicator of air leak. 84.0% score to true, 13.7 % to false and 2 % to don't know, the score of the participants about in inspiration, the lower end of the tube must be at least 2 cm inside water so that the atmospheric air does not enter from the tube system into the pleural cavity. 81.3% score to true, 10.7 % to false and 8 % to don't know, the score of the participants about the movement of fluid by breathing in a chest tube is called oscillation.66.7% score to true, 24.0% to false and 9.3 % to don't know, the score of the participants The use of premedication during the insertion of a chest tube will reduce the pain experienced by the patient. 84.0 % score to true, 9.3 % to false and 6.7% to don't know, the score of the participants Drainage bottles should be changed every day in order to prevent respiratory system infections.72.0 % score to true, 26 % to false and 2 % to don't know, the score of the participants the up and down movement of the fluid in the drainage bottle gives information about general negative pressure. 82.0 % score to true, 14.0 % to false and 4 % to don't know, the score of the participants' Additional analgesic should not be applied during the insertion of a chest tube because it can cause shortness of breath. 83.3% score to true, 12.0% to false and 4.7% to don't know

DISCUSSION

A cross sectional study conducted in Mayo hospital among 150 nurses to determine to determine the level of knowledge regarding chest drains care among staff nurses. The results show the participants about the fluid in the drainage bottle has to be kept 90 cm below the chest level in order to prevent the fluid from entering the pleural space in which 86.7% score to true, 6.7% to false and 6.7% to don't know, the score of the participants about The fluid in the drainage bottle has to be kept 90 cm below the chest level in order to prevent the fluid from entering the pleural space in which 88.7% score to true, 10.7 % to false and .7 % to don't , the score of the participants about Pneumothorax is the most important case for which the insertion of a chest tube is necessary.in which 90.0% score to true, 7.3 % to false and 2.7 % to don't know , the score of the participants about Intrapleural pressure is the pressure in the pleural space. 89.3% score to true, 9.3 % to false and 1.3 % to don't know, the score of the participants about Regular oral analgesic use is effective in reducing the pain stemming from the chest tub. 70.0% score to true, 24.7 % to false and 5.3 % to don't know, show the score of the participants about Gurgitation seen in the drainage bottle may be an indicator of air leak. 84.0% score to true, 13.7 % to false and 2 % to don't know. A prevalence study was conducted to analyze the safety and outcome of medical thoracoscopy in the treatment of multiloculated empyema among 3,564 patients hospitalized for pneumonia, between 2000 and 2003, of whom 216 patients (6%) acquired pleural empyema. Of these, 32 patients (15%) with multiloculated empyema were treated with medical thoracoscopy and 23 patients (11%) were treated with surgical VATS or thoracotomy with pleurectomy; 161 of 216 patients (75%) were treated with chest tube drainage. Chest tube drainage was maintained for a median of 7 days (range, 2 to 23 days). Time of drainage was ≤ 7 days and ≤ 14 days in 58% and 93% of cases, respectively [6]. The score of the participants about in inspiration, the lower end of the tube must be at least 2 cm inside water so that the atmospheric air does not enter from the tube system into the pleural cavity. 81.3% score to true, 10.7 % to false and 8 % to don't know, the score of the participants about the movement of fluid by breathing in a chest tube is called oscillation.66.7% score to true, 24.0% to false and 9.3 % to don't know, the score of the participants The use of premedication during the insertion of a chest tube will reduce the pain experienced by the patient. 84.0 % score to true, 9.3 % to false and 6.7% to don't know, the score of the participants Drainage bottles should be changed every day in order to prevent respiratory system infections.72.0 % score to true, 26 % to false and 2 % to don't know. A survey was conducted by North American cardiothoracic surgeons and specialty cardiac surgery nurses on chest tube related complications and their management. A total of 106 surgeons and 108 nurses responded. The survey revealed that clogging of chest tube leads to chest tube dysfunction. Of surgeons responding 106 of 106(100%) had observed tube clogging as major cause for chest tube dysfunction and 93 of 108(87%) nurses reported adverse patient outcomes from clogged tube [8]. The score of the participants' Additional analgesic should not be applied during the insertion of a chest tube because it can cause shortness of breath. 83.3% score to true, 12.0% to false and 4.7% to don't know

LIMITATIONS

- Less sample size 150 due to which, the findings cannot be generalized.
- Time was too short, to see any prospective events or detailed associations of awareness and practices
- Convenient sampling technique was used which may have some biasness

CONCLUSION

A cross sectional study conducted in Mayo hospital among 150 nurses to determine the level of knowledge regarding chest drains care among staff nurses. In this study mostly participants are well known knowledge about chest drainage and their care, and have good response. The data was collected from nurses of medical units, surgical units, ICU and emergency department. Most nurses have more experience

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