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Impact of an Educational Program on Knowledge and Practices of Nurses about Caring of Patient with Chest Tube.

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Abstract: *Since nurses are the first people after chest tube placement on the patient's bedside, so they should have enough information on the care of chest tube. Nursing care of chest drains can either be pre-procedural or post-procedural. Pre-procedural care includes obtaining an informed consent and providing health education to the patient, preparing the equipment and assisting the procedure for tube thoracostomy. Post-procedural care entails monitoring vital signs, assessing and documenting drainage, caring the water seal drainage system, assisting patients during change of position and in removing of the chest tube after it has served its function . Appropriate training in the management of chest drains should be received by the nurses to ensure that patients are cared for safely and competently .*

Aims of the Study: *To assess knowledge, practice and of nurses regarding care of chest tube and to evaluate the impact of educational program on knowledge and practices of nurses about caring of patient with chest tube.*

Subjects and Methods: A *quasi experimental study design was utilized to accomplish this study.The study was performed in two sittings, Thoracic surgery unite at Tanta Emergency University Hospital and intensive care unit at Tanta Educational hospital All available nurses were taken from the settings that previously mentioned. The total number was 40 nurses .*

Tow tools *were used to collect data for this study. They included two sheets of Interview questionnaires and sheet of observational checklists.*

Results: *The study revealed that more than half of nurses 52.5% less than 30 years old and 55% 0f them had technical education, while 65% of them had experience less than 5 years in caring of chest tube. Majority of studied nurses 95% had no past training in caring of chest tube. The mean posttest knowledge scores of studied nurses regarding chest tube had significantly higher than their mean pretest knowledge scores as test P< 0.05 level of significance.Total performance level was unsatisfactory less than 60% in preprogram implementation,while immediate post program 40% of studied nurses had satisfactory performance and after month of program implantation 42.5% of nurses performance needed improvement*

Conclusion and Recommendations: *The study concludes that planned teaching 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 and skill regarding care of patient with chest tube drainage. Nurse's educational needs regarding chest drains care should be assessed to improve clinical practice and reducing unnecessary complications.*

I. Introduction

The most important vital organs for respiration process are the Lungs. The lungs are covered by double-layered serous membrane called pleura.It contains the visceral and parietal pleurae. The pleural fluid is localized in the space between the pleura which helps in lubrication and prevents friction between the lungs and chest wall [1].A tube that is insertedbetween the ribs through the chest wall into the pleural cavity is called the chest tube ,to drain blood in the pleural space(hemothorax), air (pneumothorax),fluid (pleural effusion) or pus (emphysema) out of the chestand to promote infection prevention[2].An adequately positioned drain is required to promote the effective drainage of air, blood or fluid from the pleural space and maintaining the sub-atmospheric intra, pleural pressure[3].Moreover there-expansion of the lungs are allowed.Use ofchest tube drainage as a drain on the last centuryhas been common [4].

Since nurses are thefirst people after chest tube placement on thepatient's bedside, sothey should have enoughinformation on the care of chest tube [5].Nursing care of chest drains can either be pre-procedural or post-procedural. Pre-procedural care includesobtaining an informed consent and providinghealth education to the patient, preparing the equipment and assisting the procedure for tube thoracostomy. Post-procedural care entails monitoring vital signs, assessing and documenting drainage, caring the water seal drainage system, assisting patients during change of position and in removing of the chest tube after it has served its function [6]. Unacceptable and sometimes life-threatening complications may be associatedwith inadequate nursing care and poor surgical techniques during insertion that can be classified as technical or infective [7].

While caring a patient with chest tube drainage by the nurses, thecritical thinking abilityand problem solving skillsare required.The nurse's responsibility to maintain a patent (clear) and intact pleural drainage systemafter the chest tube has been inserted.As a result of the carelessness of the health care professionals, several complications may be occurring when managing a patient with chest tube drainage [8].Appropriate training in the management of chest drains should be receivedby the nursesto ensure that patients are cared for safely and competently [9].

Problem solving and knowledge applicationare required forcaringof a patient with a chest tube. Maintaining patency and proper functioning of chest tube drainage system are the main roles of the nurses. Therefore a comprehensive understanding about the procedure of chest tube drainage system and requiring special considerations todecrease the complications that may resulting from chest tube drainage should be maintained by the nurse. [10, 11].Learning is the process of obtaining the new knowledge and experience. Learning and teaching are integral parts of nursing. The educationof patients related to various aspects and keep themselves updated is the responsibility of Nurses. Lecturing, demonstration, discussion and self-education are the most common various teaching strategies that are used to increase knowledge.Also thereare methods of self-educationthat have the advantages over the others as the learner can educate himself [10].

Significant of the Study

An educational program for nurses,Also its hoped that data generated from thisstudy could help in planning and providing care of chest tube in ICU, Cardiothoracic care unit, IntensiveCardiothoracic unit, general surgery units to provide education and training adequately for the personal responsiblefor such care.

It has been observed from the researchers at Tanta university hospital that most of hospitalizedpatients with chest tube may have manycomplications from poor nursing management. So it was decided by the researchers to planning and implementingthe educational program for nurses who providing care for those patients

Aims of the study

1. Assess knowledge , practice and of nurses regarding care of chest tube
2. Evaluate the impact of educational program on knowledge and practices of nurses about caring of patient with chest tube.

Hypotheses:

1. The nurses who didn't receive training courses about caring of patients with chest tube have inadequate knowledge and practice.
2. The knowledge and practices of nurses who providecaring of patients with chest tube will improve after educational program.

II. Subjects and Methods

Research design: A quasi experimental study design was utilized to accomplish this study.

Settings: The study was performed intwo sittings, Thoracic surgery unite at Tanta Emergency UniversityHospitaland intensive care unit at Tanta Educationalhospital.

Sampling: Allavailable nurseswere taken from the settings that previously mentioned**.** The total number was 40nurses were included in the study , 25 nurses had worked in Thoracic surgery unite at Tanta Emergency University Hospital and 15 nurses had worked in intensive care unit at Tanta Educational hospital.Power analysis was used to determined appropriate sample size. Non probability convenient sampling technique was used to select the sample.

Age of nurses ranged from 18- 50 years old, educational level were diploma, technical nursing education, and baccalaureate degree.

They haveprovided care to the chest tube patients; and didn't have training courses in caring of chest tube previously.

Tools for data collection: Two different tools were used to collect data for this study. They included Interview questionnaires sheet and observational checklist.

1. **Tool I : Interview questionnaires sheet :** It consists of two parts

- **Part one: It was concerned with socio-demographic characteristics of studied nurses** such asCode, age, sex, current occupation, degree of qualification, years of experience, years of experience in caring of chest tube, attendance of related training courses, date and time of courses .
- **Part two: It was developed by the researchers based on the related literature**[4,5,7] to assess knowledge of nurse about chest tube, include composition of chest tube, sizes , shape, indications, assessment, caring

of chest tube patients,changing of chest tube, dressing, Preventing postoperative complications after thoracic surgery, contraindications and complications and Documentation,

- **Tool II : Observational checklist, it was developed by the researchers based on the related literature**[8,9,10]to assess practice of nurses about , patient's assessment,assessment and preparationof chest drainage system,nursing care provided to patient with chest of tube, changing the drainage system, chest tube dressing and removal, preventing post-operative complication after thoracic surgery , and documentation .

Tools were be used preprogram implementation, immediately post program and afterone for follow up.

Scoring systems

1. Assessment sheet for measuring **knowledge questionnaire**,thirty two questions, total score ranged from (0-50). It described as follows; less than 50% was graded as poor, 50% to less than 75% score was graded as fair and more than 75% score was graded as good.
2. Checklist sheet to assess practice of nurses, fifty two check list observations, total score ranged from (0-55) It described as follows; less than 50% the grad was poor, 50% to less than 75% score the grad was fair and more than 75% score the grade was good.

Method

1- To carry out the study an official permission was obtained from responsible authorities at Faculty of Nursing at Tanta University. Then, the administrative authorities from educational Tanta university hospital and emergency university hospital provide the permission to conduct the study .

2- The purposes of the study were explained to the nurses and their consents to participate were obtained and those who were willing to participate were given a questionnaire to answer it. Their anonymity and the confidentialitywas maintained during the study. The study was extended from August 2015 to December 2015.

Field Work: -

3- Tools validity were checked by 5 experts in the related field of medical surgical nursing and medical specialty atfaculty of Nursing Tanta University.

4- Reliability (coefficient alpha) was tested for all tools and it was = (0.87) for tool 1 part 2 and 0.78 for tool 2.

5- Pilot study was conducted on 10% of nurses. The pilot study was excluded from the studied sample to identify the obstacles and problems that may be encountered in data collection, applicability and feasibility of the developed tools

Data collection

The program was conducted on four phases which include the following:-

1**. Assessment Phase:**

All nurses were assessed for knowledge using tool I part 2 and practice using tool 2. Also patients were assessed for complications using tool2.

2. Planning phase:

In this phase planning was formulated for each nurses based on assessment phase and literature review, booklet also was formulated to be distributed to each nurses in implementation phase.

The general objectives of the guideline model improve the nurses' knowledge and practice about caring ofchest tube.

3. Implementation Phase:

A clear and simple explanation was offered to nurses about the study and expected outcomes for them. Each nurse was assessed individually (10-20 minutes) using the previously mentioned tools. The application of designed nursing teaching program was performed by the researchers. The researchers prepared the training places, teaching aids and media (computer, picture, handouts).The total number of 40 nurses divided into 8 group and each group composed of 5 nurses and total studying sessions are four sessions, 2 sessions for theoretical part and other 2 sessions for practice and demonstration parts. The program was introduced to each nurse separately over a period of 6 weeks, 4 sessions/week the total numbers of sessions was 24 sessions. Each session is ranged from 30-60 minutes; the total time needed was 22 hours. In the first pre-test was done and objectives of the program were explained to the nurses. Also, a copy from program was given to eachnurse.

Division of sessions

Two theoretical sessions

Sessions one: It included introduction of anatomy and physiology of lungs, definition of chest tube, composition and different sizes of chest tubes, advantages and disadvantages of different types of drainage systems.

Session two: it included assessment, caring, changing and dressing of chest drainage, postoperative complication, contraindication and documentation.

Two practical sessions:

Sessions one: it included preparing equipment of chest tube and drainage system and suture removal kit, insertion of chest tube, changing, dressing, removal of tube and documentation **.**

4. Evaluation phase:

The evaluation of the effectiveness the educational program was carried out immediately post program implementation and after one month later post the program for their knowledge using tool I part 2 and for their practice using tool 2.Also each patient was evaluated preprogram implementation and immediately post program implementation for their complications.

III. Statistical Analysis

The analysis was performed using statistical software SPSS version 16.For quantitative data, the mean and standard deviation were calculated. For qualitative data, a comparison between one group before and after intervention was done by using Chi-square test ($\chi 2$). For comparison between means of one group before and after intervention, 1-way ANOVA test was used. A significance was adopted at $P<0.05$ for interpretation of results of tests of significance.[27]

Results

Table (1): Distribution of socio-demographic data among studied nurses.

Categories	**The studied nurses (n=40)**	
	N	**%**
Age in years		
▪ 18-29 y	21	52.5
▪ 30-40 y	16	40.0
▪ 41-50 y	3	7.5
Education level		
▪ Diploma	15	37.5
▪ technical education	22	55.0
▪ baccalaureate degree	3	7.5
Occupation		
▪ practical nurse	29	72.5
▪ clinical supervisor	9	22.5
▪ head nurse	2	5.0
Years of experience		
▪ Less than 5 y	16	40.0
▪ 5-10 y	19	47.5
▪ more than 10 y	5	12.5
Years of experience in chest tube ward		
▪ Less than 5 y	26	65.0
▪ 5-10 y	14	35.0
Past training		
▪ No	40	100

The study revealed that more than half of nurses 52.5% less than 30 years old and 55% 0f them had technical education, while 65% of them had experience less than 5 years in caring of chest tube. Majority of studied nurses 95% had no past training in caring of chest tube.

Table (2): Mean scores of knowledge domains and their total among studied nurses (n=40).:

Knowledge domains	Mean ± SD			F	P
	Pre	Immediate	Follow up		
Anatomy and physiology of respiratory system	1.60±1.172	4.48±1.339	2.75±1.256	52.950	0.00*
Indications of chest tube	2.62±1.170	3.50±1.219	3.72±1.176	9.558	0.00*
Nursing care for patient with chest tube	8.92±3.316	12.35±1.819	12.10±2.468	21.448	0.00*
Problems associated with chest tube and complications	4.30±1.224	5.88±1.828	5.10±1.172	11.976	0.00*
A. Health education	1.60±1.150	2.40±0.672	2.52±0.554	14.521	0.00*
Total knowledge score	19.05±6.524	28.60±3.828	26.20±4.084	40.080	0.00*

* Significant at $P < 0.05$

The mean posttest knowledge scores of studied nurses regarding chest tube had significantly higher than their mean pretest knowledge scores as test P< 0.05 level of significance.

Table (3): showed the distribution of performance domains of the studied nurses .

Performance domains	The studied nurses (n=40)						χ^2	P
	Pre		Immediate		Follow up			
	N	%	N	%	N	%		
A. Assessment of patient						32.5		
▪ <12 No	40	100	13	32.5	13	25.0	**56.537**	**0.00***
▪ 12-17 NI	0	0.0	3	7.5	10	42.5		
▪ ≥ 18 Yes	0	0.0	24	60.0	17			
B. Drainage system:						17.5		
a. Disposable without suction						42.5		
▪ <3 No	14	35.0	5	12.5	7	40.0	**12.777**	**0.012***
▪ 3-4 NI	19	47.5	14	35.0	17			
▪ ≥ 5 Yes	7	17.5	21	52.5	16		**10.732**	**0.03***
b. Disposable with suction								
▪ < 12 No	9	22.5	8	20.0	10	25.0		
▪ 12-17 NI	31	77.5	23	57.5	22	55.0		
▪ ≥ 18 Yes	0	0.0	9	22.5	8	20.0		
C. Chest drainage						15.0	**26.534**	**0.00***
▪ <13 No	20	50.0	3	7.5	6	32.5		
▪ 13-19 NI	13	32.5	13	32.5	13	52.5		
▪ ≥ 20 Yes	7	17.5	24	60.0	21			
D. Chest tube dressing						42.5		
▪ < 12 No	35	87.5	15	37.5	17	27.5	**26.763**	**0.00***
▪ 12-17 NI	5	12.5	11	27.5	11	30.0		
▪ ≥ 18 Yes	0	0.0	14	35.0	12			
E. Chest tube removal							**18.401**	**0.001***
▪ < 8 No	33	82.5	20	50.0	17	42.5		
▪ 8-11 NI	7	17.5	10	25.0	11	27.5		
▪ ≥ 12 Yes	0	0.0	10	25.0	12	30.0		
Total performance level							**50.333**	**0.00***
▪ **<60 No**	**40**	**100**	**17**	**42.5**	**15**	**37.5**		
▪ **60-89 NI**	**0**	**0.0**	**7**	**17.5**	**17**	**42.5**		
▪ **≥ 90 Yes**	**0**	**0.0**	**16**	**40.0**	**8**	**20.0**		

* Significant at P < 0.05 NI = Need Improvement

There are significance differences between pre and posttest in relation to nurses' performance. Total performance level was unsatisfactory less than 60% in preprogram implementation , while immediate post program 40% of studied nurses had satisfactory performance and after month of program implantation 42.5% of nurses performance needed improvement.

Figure: Distribution of total performance score of the studied sample.

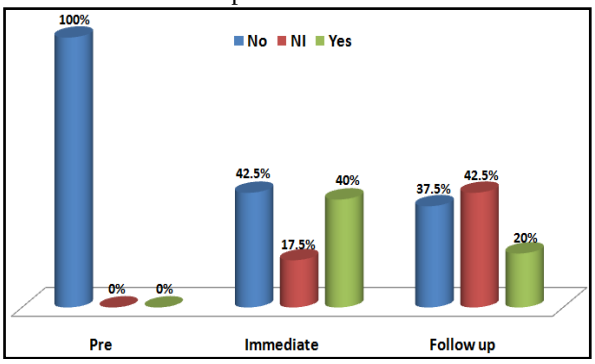

Table (6): Comparison between socio-demographic data and mean score of total knowledge score throughout periods of study among studied nurses.**(n=40)**

Categories	Total knowledge score Mean±SD					
	Pre	F P	Immediate	F P	Post	F P
Age in years						
▪ 18-29 y	14.43±4.456	**28.449**	27.14±3.425	**3.88**	24.71±4.406	**3.752**
▪ 30-40 y	24.94±4.090	**0.00***	30.44±3.983	**0.03***	28.19±2.903	**0.033***
▪ 41-50 y	20.00±1.732		29.00±0.000		26.00±3.606	

Education level						
▪ Diploma	21.87±5.655	2.741	29.47±4.068	0.703	27.73±2.890	1.818
▪ technical education	17.00±6.873	0.078	27.95±3.897	0.502	25.18±4.625	0.177
▪ baccalaureate degree	20.00±1.732		29.00±0.000		26.00±3.606	
Occupation						
▪ practical nurse	16.79±5.918	**10.112**	27.86±3.777	2.302	25.38±4.144	3.012
▪ clinical supervisor	26.00±3.317	**0.00***	30.89±3.689	0.114	29.00±2.598	0.061
▪ head nurse	20.50±2.121		29.00±0.00		25.50±4.950	
Years of experience						
▪ Less than 5 y	12.38±2.419	**70.805**	26.31±2.960	**8.955**	23.38±3.879	**14.064**
▪ 5-10 y	24.68±3.637	**0.00***	30.84±3.610	**0.001***	28.95±2.345	**0.00***
▪ more than 10 y	19.00±2.121		27.40±2.191		24.80±3.347	
Years of experience in chest tube ward						
▪ Less than 5 y						
▪ 5-10 y	16.81±6.425	**11.033**	28.27±3.853	0.548	25.42±4.310	2.814
	23.21±4.423	**0.002***	29.21±3.847	0.464	27.64±3.296	0.102
Past training						
▪ Yes	26.50±0.707	2.878	28.00±2.828	0.05	27.00±4.243	0.079
▪ No	18.66±6.457	0.098	28.63±3.900	0.823	26.16±4.130	0.780

* Significant at P < 0.05

There are significance difference between pre and post program implantation in relation to age and years of experience

Table (7): Comparison between sociodemographic data and mean score of total performance score throughout periods of study among studied nurses.**(n=40)**

Categories	**Total performance score Mean±SD**					
	Pre	**F P**	**Immediate**	**F P**	**Post**	**F P**
Age in years						
▪ 18-29 y	41.76±13.939	1.048	76.33±26.127	2.526	69.33±22.595	0.092
▪ 30-40 y	35.44±14.908	0.361	78.50±23.048	0.094	72.75±27.295	0.912
▪ 41-50 y	43.67±11.060		43.00±35.791		69.67±16.563	
Education level						
▪ Diploma	38.53±15.570	0.156	77.33±24.939	2.489	68.27±25.675	0.141
▪ technical education	39.36±14.114	0.856	77.23±24.838	0.097	72.55±24.003	0.869
▪ baccalaureate degree	43.67±11.060		69.67±16.563		43.00±35.791	
Occupation						
▪ practical nurse	38.10±15.646	0.409	75.31±26.054	1.081	67.31±24.697	1.935
▪ clinical supervisor	42.67±8.803	0.667	78.56±23.928	0.35	83.89±18.644	0.159
▪ head nurse	43.00±15.556		48.50±48.790		61.00±9.899	
Years of experience						
▪ Less than 5 y	42.75±13.015	0.745	78.19±26.438	1.816	75.06±21.016	0.434
▪ 5-10 y	37.26±15.673	0.482	77.21±24.186	0.177	67.63±28.241	0.651
▪ more than 10 y	36.60±12.442		54.00±31.678		68.60±11.803	
Years of experience in chest tube ward						
▪ Less than 5 y						
▪ 5-10 y	40.35±14.894	0.341	71.35±26.448	1.192	69.73±25.828	0.127
	37.57±13.218	0.563	80.93±26.546	0.282	72.57±20.179	0.724
Past training						
▪ Yes	49.50±6.364	1.069	70.50±17.678	0.051	82.00±0.000	0.647
▪ No	38.84±14.361	0.308	74.92±27.081	0.822	70.13±24.260	0.499

* Significant at P < 0.05

Mean scores of knowledge domains and their total among studied nurses The mean posttest knowledge scores of studied nurses regarding chest tube had significantly higher than their mean pretestand there was no significance difference between pre and post program implementation .

IV. Discussion

The breathing pattern was improved by chest tube that removing accumulation of air and fluid from the pleural space, permitting the lungs to return to normal expansion. (Delaune and Ladner,(2011)[(14)]In the management of patient with chest tube drainage nurse plays a vital role. Health care personnel should be given an opportunity to update their knowledge periodically. Care of chest tube drainage should be emphasized by the educators.

Regarding to socio-demographic characteristics, the current study included 40 nurses. Slightly more than half of them were aged less than 30years. Also, more than half of the studied nurses had technical education. This result showed that the nursing staff who provided caring to patients with chest tubes which are a serious field had a very little experience and poor knowledge, that may be causing serious complication**.** It was important that appropriate training in the management of chest drainsshould be given to the nurses toensure that patients are cared for safely and competently.

According to their years of experience it was found that less than two thirds of them had experience less than five years, the result also indicated that the all of them had no previous training program about chest tube.This is in an agreement with Lit et al. (2010) [(16)]whose studied the need for nurses to have an in-service education of chest drain management, at Queen Elizabeth Hospital emphasized that that more than half of the nurses had at least5 years medical experience. And the majority of nurses had not attended an educational lectures or workshops concerning chest drainage management. Otherwise Hutton et al., (2008) [(17)]stated that Mistakes in dealing with the chest tube and its system are commonly being practiced, mainly by the residents and the nurses due to insufficient knowledge and poor experience. Therefore training courses for both the residents and the nurses should be obligatory in any hospital dealing with patients with chest tube.

Concerning the effect of the present teaching program that there were significant differences between nurses' knowledge before and after the program. The majority of nurses before education were decreased knowledge and skilled related to the all items in chest tub care procedure.

The improvement due to the present teaching program using information, adequate sessions and increased motivation.In this respect, Johnny et al., (2010)[(18)]reported that a comprehensive educational session relating to chest drain management should beheld regularly. An appropriate evidenced-base clinical guidelines and protocols should be developed for safe clinical practices. Moreover Lit et al., (2010) [(19)]asserted that the identification of nurse's educational needs regarding chest drains care is urgently requiredto improve clinical practice and reducing unnecessary complications. Also Laws et al.,(2003)[(20)]mentioned that it is important that appropriate training in the management of chest drainsshould be received by nurses to ensure that patients are cared safely and competently.Furthermore Vanway et al., (2004)[(21)]suggested that patients are more likely to develop complications when there is lack skills and knowledge in dealing with chest drains from the practitioners.

In relation to nurses' assessment of knowledge about care of patient with chest tube, the present study showed that the majority of studied nurses had inadequate knowledge about chest tube. This result may be due to that the years of experience of most studied nurses were less thanfive years, and the nurse didn't attend any inservice training program especially related to chest tube. Other explanations were the less than one half of the studied nurses was diploma graduates, and their knowledge was obtained during school study years might be unsatisfactory for such a specialized service or forgotten. In addition the supervision and evaluation system for nurses during their workingare inadequate. This finding is supported by **Shokier** (1996)[(22)]who stated that whatever is knowledge and practice which were learned in nursing school tends to be forgotten if not applied or stressed on. Therefore, lack of continuing education programs, in-service training and proper supervision, may also contribute to the problem. This result is in line with **Frantz et al**., (1995)[(24)]found that nurses had poor knowledge related to chest tube care there is a urgent need for giving information to nurses related to nursing care of the patients who have chest tube drainage. Also emphasized that utilization of research validated knowledge in clinical setting should be focused by the nurses to improve their clinical practice .The practice of nurses was unsatisfactory in more than two thirds of the studied in relation to assessment of nurses'practice for patients with chest tube, This result is contradicted with **Lynn,** (2008)[(25)]who stated that interpretation alleviate anxiety . The finding of the present study showed that more than half of theparticipants nurses had unsatisfactory level of practice regarding to patient's assessment. This might be related to that the nurses thought that the responsibility of the physician is the assessment. Otherwise, **Shaheen,** (2003)[(26)] stated that the successful nursing care plan is the first and important step in assessment. As regard practice of nurses related to assessment of chest drainage system, it was found that more fifty percent of nurses had unsatisfactory level of practice. This result might be due to lack of knowledge related to importance of assessment of chest drainage system and also lack of supervision. So **Mallet and Dougherty**, (2000) [(27)]recommended that a careful assessment is required to consider the whole system thoroughly and to ensure that there are no loose connections through the tubing or circuit. Great care needs to be taken when checking the drain.Unluckily, the more highly inadequate areas of performance was documentation. This finding is in agreement with **Davis et al.,** (1994)[(28)]who found that documentation of assessment, missing information on non-physical problems and in the use of the nursing processhaven't adequatelydocumented,showed this by the fact that the written communication who depend on the contribution of rich verbal and to promote the of quality patient care didn't value by the nurse. It was concluded that improvement the attitudes about documentation should be obtained by the nurse. There is significant relation between degree of qualificationsand nurses'knowledge and practice.So nurses graduated from faculty of nursing or nursing institute were better than nurses with nursing diploma may

be due to the diploma nurses did not receive any cognitive or psychomotor learning related to this topic. In addition to nurses with high educational level canobtain knowledgefrom press, books and other mass media. Also they may obtain knowledgesufficiently and correctly.So the nurses have to learn more to improve their knowledge and skills. This is in agreement with ***Timmins F. and Lehwaldt D*** *(2005)* [(12)]revealed that a lack of unanimity among nurses on the basic steps of chest drain management. This inconsistency of treatment regimes, together with inadequate of evidence-based nursing care, lead to improper care of patients withchest drains.These findings were in line with **Kowalsk**i, (2003)[(30)]who stated that nursing is a combination of a body of knowledge and the application of that knowledge through nursing practice. Moreover **Lit et al.,** (2010)[(31)] asserted thatidentification of nurse's should satisfy educational needs regarding chest drains care to improve clinical practice and reducing unnecessary complications. Also **Laws et al.,** (2003) [(32)]mentioned that it is important that nurses receive appropriate training in the management of chest drains and the patients should be cared for safely and competently. **FurthermoreAylwin C.J. et al** (2008) [(33)]stated that In-hospital chest tube placement complication rates remain uncomfortably high, and attention must be placed on training and assessment of staff in this basic procedure

Furthermore, Zaky, (1990)[(34)];Kadry, (1992) [(35)]; Zahran, (1991)[(36)]; El-Said (1996)[(10)] reported that the lack of nurses' knowledge and skills, improper environment are reasons for nurses improper performance, moreover lack of perseverance and in-service training of the nursing staff, lack of supervision from head nurses increasing of patient's ratio.

The result of the present study revealed a general unsatisfactory level of knowledge and practice related to care of patient with chest tube. This result agree ,**Ahmed**,2003) [(38)]who stated that an education perspective, clinical skills are an important aspect of competence development.

V. Conclusion

The study concludes that planned teaching 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 and skill regarding care of patient with chest tube drainage.

VI. Recommendations

From the foregoing conclusion, the following recommendations are suggested:

(I) In services:

- Finding out the factors that hinder the nurses in providing care for patients with chest tube drainage among staff nurses should be maintained in anexploratory study to find out the difficulties experienced by the nurses in providing care to the patient with chest tube drainage.
- Developing periodical nurses' evaluation system of to determine their knowledge and enhancing their practice.
- Developing procedure bookletby simple language for nurses who provide care for patient with chest tube.
- Development in-service training programs to maintain efficient performance of nurses
- The knowledge and practices of nurses working in government hospitals versus private hospitals in providing care to the patient with chest tube drainage among staff nurses can be done in a comparative study.

(II): In Education

- Periodically updating the knowledge of Health care personnel
- The Planned teaching program could be maintained periodically for nurses who provide care for patients with chest tube

(III): In Research

- The findings of the study have added to the existing body of the knowledge in the care of patient with chest tube drainage.
- The suggestions and recommendations for conducting further study can be utilizedby other researchers.
- Nurse's educational needs regarding chest drains care should be assessed to improve clinical practice and reducing unnecessary complications.

(IV): Recommendations for Future Studies

- The study on a large sample required from different hospitals should be maintained,in different geographical area in Egypt.

The impact of chest tube training program on nurses, knowledge and practice should be studied.

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