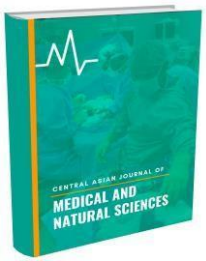

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Article

Intensive Care Unit Nurses' Knowledge Regarding Chest Physiotherapy

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Abstract: Chest physiotherapy is a critical interventional technique used in intensive care units to manage respiratory complications, improve lung function, and prevent potential respiratory-related complications in critically ill patients. Nurses play a vital role treating patients in the intensive care unit. Chest physiotherapy is often administered by nurses. as it requires nurses to have specialized knowledge and skills in chest percussion, vibration, deep breathing, postural drainage, and manually-assisted cough techniques. This study aims to assess nurses' knowledge regarding chest physiotherapy at Kirkuk city Hospitals. A non-experimental cross-sectional design was utilized in this study from December 2024 to April 2025. A non-probability (purposive) sampling technique was used to collect data in the intensive care unit at Azadi Teaching Hospital and Kirkuk Teaching Hospital in Kirkuk, Iraq. There were 77 nurses in the study. The researcher constructed a questionnaire form to gather data on nurses' knowledge of chest physiotherapy. The questionnaires were sent to a panel of ten experts in various fields to ensure the tool's validity, and they were modified according to with their recommendations. The study results were analyzed using statistical data analysis methods in the Statistical Package for Social Sciences (SPSS) version 22.0. Frequencies, percentages, mean scores (MS), and standard deviation (SD) were used for descriptive data analysis. Inferential data analysis was also used to draw logical conclusions. Results show that a substantial portion of nurses are in the age group of 25-29 years old, and most of them are female. The nurse's knowledge of the "Chest Percussion and Vibration Technique" was mostly high level. About three quarters of nurses (71.43%) had assessed a high level concerning "Deep Breathing Technique." Finding nurses' knowledge of "Manually Assisted Cough Technique," results showed that (57.14%) had assessed at a high level; also, "Postural Drainage," results showed that (57.14%) had assessed at a moderate level. Finally, the finding of the study shows that the nurses' knowledge had a highly significant relationship with nurses' experience in the intensive care unit. Most of the nurses possess a high level of knowledge regarding chest physiotherapy. And there is a highly significant relationship between nurses' knowledge concerning chest physiotherapy and their experience in the intensive care unit.

Keywords: Intensive Care Unit, Nurse, Knowledge, Chest Physiotherapy

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1. Introduction

Chest physiotherapy (CPT) is one of the best combinations of physical therapies that improve lung efficiency, strengthen lung muscles, promote lung expansion, and drain secretions from the lung airways to prevent aspiration pneumonia. Chest physiotherapy mainly aims to help patients breathe easily, allowing the body to receive more oxygen [1]. Coughing and the normal breathing cycles are the basic mechanisms for clearing secretions

from the lungs in normal mucociliary activity of the lung [2]. In the intensive care unit, patients with critical illnesses are at risk of diverse complications due to their medical condition and prolonged immobility, for example, physical deterioration or respiratory complications. The body of evidence suggests that, as well as being achievable and safe, chest physiotherapy techniques are beneficial for ICU patients and are recommended by guidelines [3]. Chest physiotherapy is a common treatment method for managing respiratory diseases [4]. The main goals of chest physiotherapy are to remove bronchial secretions, improving ventilation, and reduce breathing effort. It is especially useful for patients with acute and chronic lung diseases [5]. To move the secretions from the alveoli into the bronchi, chest physiotherapy (CPT) is used; these secretions are then cleared by coughing and suctioning. During CPT, the patient should inhale deeply and then exhale slowly [6]. Patients who receive chest physical therapy can enhance lung elasticity, minimize lung collapse, lessen comorbidities, and decrease the buildup of airway secretions. Several studies have investigated the relationship between chest physiotherapy and respiratory clearance [7]. In the intensive care unit, the physical therapy treatments include percussion, vibration, mobilization, postural drainage, manual hyperventilation, suctioning, coughing, inspiratory muscle training, and breathing exercises [8]. Because they are with patients during their entire ICU stay, nurses often play an important role in diagnosing and managing distressing symptoms [9]. In the Iraqi healthcare system, nurses are primarily responsible for performing some critical procedures, providing chest care, and performing chest physiotherapy [6]. Nurses are the most important healthcare professionals in every hospital. A critical patient is treated in a specialized area called the Intensive Care Unit (ICU). Nurses play an important role in intensive care units around the world. Critical care nurses must possess specialized knowledge to ensure that critically ill patients receive safe and optimal treatment. [10]. In order for nurses to provide patients safe, efficient, and evidence-based care, knowledge is essential to their work. Nurses assess patients' requirements, evaluate symptoms, and provide correct treatments by applying their knowledge of anatomy, physiology, pharmacology, and clinical guidelines [11]. Thus, the aim of the study is to assess nurses' knowledge about chest physiotherapy in hospitals in Kirkuk City, Iraq.

2. Materials and Methods

The present study utilized a non-experimental (cross-sectional) design constructed a participant group strategy from December 2024 to April 2025. The study was conducted in intensive care units at Azadi Teaching Hospital and Kirkuk Teaching Hospital in Kirkuk City, Iraq. A non-probability (purposive) sampling method was used to ensure a representative sample. Based on the subsequent sampling method, 77 nurses in total were chosen as the study sample size. The researcher constructed a questionnaire form to gather data on nurses' knowledge of chest physiotherapy. The questionnaire has three parts: the first focuses on sociodemographic characteristics, involving four items: age, gender, marital status, and level of education; the second part focuses on professional background, which involves three items: experience in intensive care, working shifts, and participating in chest physiotherapy training; and the third part focuses on nurses knowledge, which contains 35 items that are subdivided into four subdomains: chest percussion and vibration technique, deep breathing technique, manually assisted cough technique, and postural drainage. The questionnaires were sent to a panel of ten experts in various fields to ensure the tool's validity, and they were modified according to with their recommendations. The study's reliability was then determined to be 0.94. This was done to assess the validity of the research instruments, verify the clarity and adequacy of the instrument's structure through participants' understanding, and identify any necessary modifications. After permission was granted from the respective hospitals' authorities, the data were collected through the constructed questionnaire and interview technique; each interview is carried out individually and took approximately 20-30 minutes. All elements of the questionnaire

were measured on the two rating scales (True and False). The study results were analyzed using statistical data analysis methods in the Statistical Package for Social Sciences (SPSS) version 22.0. Frequencies, percentages, mean scores (MS), and standard deviation (SD) were used for descriptive data analysis. Inferential data analysis was also used to draw logical conclusions.

3. Results

Table 1. Distribution of socio-demographic characteristics of studied sample (n=77).

Socio-demographic	Classes	No.	%
Age in years	20 - 24	17	22.1
	25 - 29	52	67.5
	30 - 35	8	10.4
	Mean ± SD	26.2± 2.56	
Gender	Male	25	32.5
	Female	52	67.5
Marital Status	Single	41	53.2
	Married	36	46.8
Educational Level Status	Diploma	2	2.6
	Bachelor	74	96.1
	Master'	1	1.3

Table 2. Distribution of the studied sample professional background.

Professional background	Classes	No.	%
Experience in Intensive Care	1 _ 2	58	75.3
	3 _ 4	13	16.9
	> 4 yrs.	6	7.8
Working Shifts	Morning	31	40.3
	Evening	46	59.7
	Total	77	100
Have you participated in chest physiotherapy training?	No	58	75.3
	Yes	19	24.7

Table 3. Nurses' Knowledge regarding of Chest Physiotherapy.

Sub & Main Domains	No.	Min.	Max.	PGMS	PPSE	PPSD	Ev.
1. Chest Percussion and Vibration Technique	77	42.86	100	76.99	1.49	13.09	H
2. Deep Breathing technique	77	28.57	100	72.17	2.29	20.05	H
3. Manually assisted cough technique	77	42.86	100	63.45	1.68	14.75	M
4. Postural drainage	77	14.29	100	57.14	2.23	19.53	M
Nurses' Knowledge for Chest Physiotherapy's main domain	77	41.07	89.29	67.44	1.32	11.60	H

Ev.: Evaluated by: (0.00 – 33.33) Low (L); (33.34 – 66.66) Moderate (M); (66.67– 100) High (H).

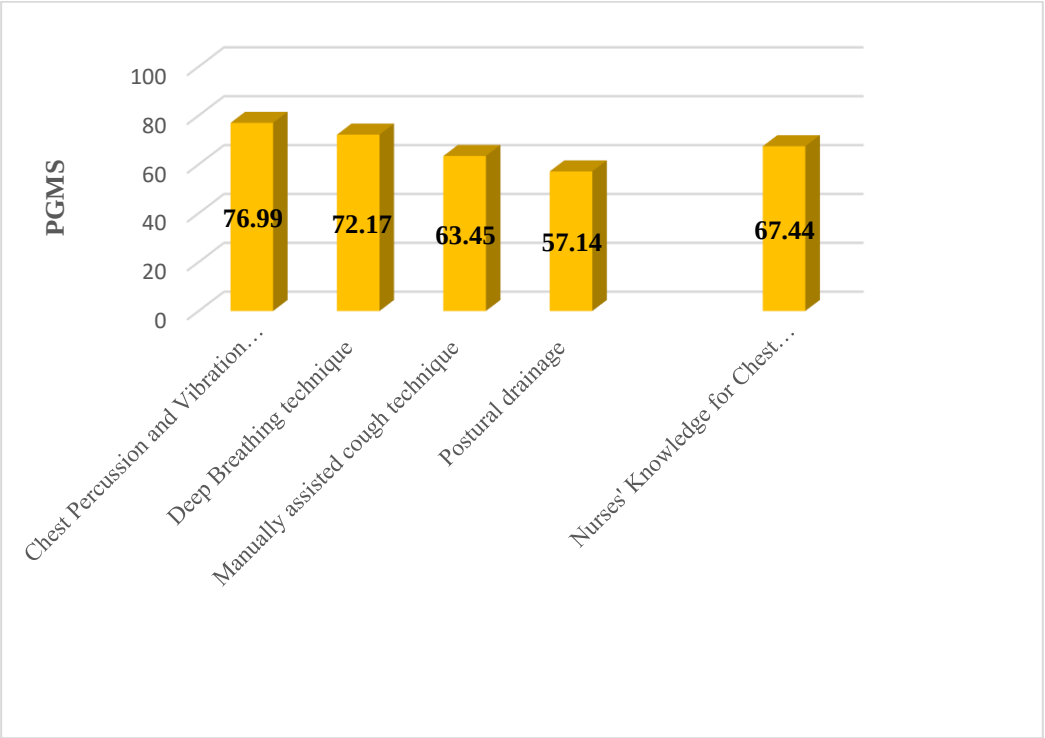

Figure 1. Grand mean of score concerning nurses' knowledge regarding chest physiotherapy at Kirkuk city Hospitals.

Table 4. Relationships between "Nurses' Knowledge regarding Chest Physiotherapy and their socio-demographic characteristics.

Socio-Demographical Characteristics variables	Groups	Knowledge				C.S.
		Under		Upper		
		No.	%	No.	%	P-value
Gender	Male	13	33.3	12	31.6	CC = 0.019
	Female	26	66.7	26	68.4	P=0.869
	Total	39	100	38	100	NS
Age Groups	20 _ 24	11	28.2	6	15.8	CC = 0.160
	25 _29	25	64.1	27	71.1	P=0.362
	30 _ 35	3	7.7	5	13.2	NS
	Total	39	100	38	100	
Educational Level	Diploma	0	0.00	2	5.3	CC = 0.200
	Bachelor	39	100	35	92.1	P=0.202
	Master	0	0.00	1	2.6	NS
	Total	39	100	38	100	
Marital Status	Single	22	56.4	19	50	CC = 0.064
	Married	17	43.6	19	50	P=0.573
	Total	39	100	38	100	NS

(*) HS: High Sig. at P<0.01; S: Sig. at P<0.05; NS: Non-Sig. at P>0.05; Testing is based on a contingency coefficient.

Table 5. Relationships between "Nurses' Knowledge regarding Chest Physiotherapy and their professional background.

Professional background	Groups	Knowledge				C.S.
		Under		Upper		
		No.	%	No.	%	P-value
Working Shifts	Morning	18	46.2	13	34.2	CC = 0.121
	Evening	21	53.8	25	65.8	P=0.285

	Total	39	100	38	100	NS
Experience in Intensive Care Yrs.	1 _ 2	36	92.3	22	57.9	CC = 0.371 P=0.002 HS
	3 _ 4	2	5.1	11	28.9	
	> 4 yrs.	1	2.6	5	13.2	
	Total	39	100	38	100	
Have you participated in chest physiotherapy training?	No	28	71.8	30	78.9	CC = 0.083 P=0.468
	Yes	11	28.2	8	21.1	
	Total	39	100	38	100	NS

(*) HS: High Sig. at P<0.01; S: Sig. at P<0.05; NS: Non-Sig. at P>0.05; Testing is based on a contingency coefficient.

4. Discussion

Socio-demographic and professional background characteristics

Two-thirds of the studied samples are from the second age group (25–29 years). According to the report, this is due to the workload in these places. From the researcher's perspective, younger nurses prefer working in intensive care units and are enthusiastic about their work and willing to learn. In contrast, older nurses prefer less stressful jobs. The results of the current study agree with a study conducted in Kirkuk, Iraq, which revealed that the age group of (25–29) was the most common among the different age groups participating in the study [12].

According to the gender of nurses, a substantial portion of the studied sample are females, and they account for 52 (67.5%). These results are due to the policy of the Iraqi government's Ministry of Higher Education and Scientific Research to admit the highest number of female students into nursing colleges/Iraqi universities. For this reason, most of the nurses are female. The study conducted in Iraq was conducted by [13], and this study agrees with the researcher's study as it showed that most nurses are female.

Marital status had distributed similarly between those of a single and married marital status, since they are accounted 41(53.2%), and 36(46.8%) respectively. The result finding is similar to a descriptive study conducted by [14] in Al-Hussein teaching hospitals in Dhi-Qar/Iraq, which states that the percentage of single nurses was 48.8% and married nurses was 51.2%.

In regard to the level of education of nurses, almost all of those working in the intensive care unit held a bachelor's degree, with a percentage of 96.1%. According to the decision of the Iraqi Ministry of Health, nurses working in intensive care units must have at least a bachelor's degree. The study was conducted in Kirkuk General Hospital, Kirkuk City, Iraq, by [15] and this study agrees with the researcher's study as it showed that most nurses are graduates of the College of Nursing at a percentage of 83.3%. Also supported by [16] which stated that the majority of nurses are also graduates of the College of Nursing at a percentage of 83.3%.

The current study's findings show that about three quarters of the nurses (75.3%) had 1-2 years of experience. In the researcher's opinion, this is because after spending two or three years in intensive care, the nurses feel tired and stressed during work, lacks support from the board of directors, and has conflict between nurses and patients' families. This result matches a study conducted at Kirkuk, Iraq, by [17] which was conducted at the critical care unit in Kirkuk Teaching Hospital. Who stated that the majority of nurses experience ranging between 1-2 years with a percentage of 87.0%.

According to "Work Shifts," results showed that most nurses work in the evening shifts with a percentage of 59.7%. In the researcher's view, this is because the number of nurses working in the evening shift is greater than the number of nurses working in the morning shift in Kirkuk city hospitals. Another study conducted in Al-Nasiriya City, Iraq, disagrees with the study results. Who mentions that records the highest study percentage of about 50% of morning shift workers [18].

This study's findings indicate only a small minority of the sample studied (24.7%) participated in a training course in “chest physiotherapy.”. The researcher's explanation for low participation in chest physiotherapy courses may be due to the fact that these courses are not mandatory, are not facilitated by managers, and there is no coordination between the continuing education unit and the intensive care unit in hospitals. This result agrees with that conducted in Erbil, Iraq, by [6], who stated that a few nurses participated in training courses about chest physiotherapy.

Nurses' Knowledge regarding of Chest Physiotherapy

Regarding nurses’ knowledge about chest percussion and vibration techniques, the results indicated that nurses have a high level of knowledge. The present study disagrees with a study conducted by [2]. The study comprised 50 nurses employed in critical care units at Tanta Main University Hospital in Egypt, who state more than three-quarters of nurses had a poor level of knowledge. From the researcher's point of view, the reason may be that most of the nurses in this study graduated from technical nursing institutes, while in my study almost all of the nurses (96.1%) had achieved a college level.

According to the results of the study about nurses’ knowledge related to deep breathing techniques, it shows that nurses have a high level of knowledge. The researcher's explanation, the exchange of information between nurses is one of the most important reasons for raising the level of knowledge among nurses in intensive care units. The study conducted in Jaipur, India, was done by [19]. Titled (A Study to Evaluate the Effectiveness of Structured Teaching Programme on Knowledge Regarding Deep Breathing Exercise with Incentive Spirometry on Respiratory Status of Patients who have Undergone Cardiothoracic Surgery among Staff Nurse in Selected Hospital at Jaipur). This study found that most nurses have sufficient information about deep breathing exercise. This finding supported the present study results.

Concerning the result of the nurses’ knowledge related to “Manually Assisted Cough Technique", the research results showed nurses have a moderate level of knowledge. From the researcher's perspective, the logical reason for these results is that most participants in this study have not participated in chest physical therapy training and had less than two years of experience. This result does not match with a study conducted at Almak Nimer University Hospital and Shendi Teaching Hospital, Shendi City, River Nile State, Sudan, by [20] found that at the pretest, few nurses had good knowledge about coughing exercise.

According to the result in table (3) about nurses’ knowledge related to the “Postural Drainage, it shows that nurses have a moderate level of knowledge. In the researcher's opinion, nurses' moderate level of knowledge in postural drainage is crucial for effective respiratory care. Their expertise in positioning, patient assessment, monitoring, and education ensures safe and successful treatment, ultimately improving patient outcomes. Continuous education and adherence to best practices allow nurses to provide high-quality, evidence-based respiratory care. In the researcher's opinion, postural drainage is not applied in intensive care units and is not used for the purpose of clearing the lungs of secretions, and there are no training courses on postural drainage. For this reason, nurses do not have a lot of information regarding postural drainage. According to the study conducted in Sudan by [21] titled (Assessment of Nurses Knowledge & Practice Regarding Chest Physiotherapy in Elmek Nimer University Hospital). This study agrees with the research study that showed more than half were aware of postural drainage.

Relationships between "Nurses' Knowledge regarding Chest Physiotherapy and their socio-demographic and professional background

The finding of the study shows that the nurses’ knowledge had a highly significant relationship with nurses’ experience in the intensive care unit. While there was no relationship between nurses’ knowledge and their age, gender, marital status, educational level, working shifts, and participation in a chest physiotherapy training course. From the

researcher's point of view, nurses with more experience always have more knowledge than nurses with less experience because they see more cases, read more, work more, interact with patients, and exchange information among nurses in groups. However, educational level has no relationship with knowledge in this study because almost all nurses have the same educational level (graduates from the College of Nursing). As for participation in training courses, they may not be taught and conducted properly or may not be applied properly by nurses. This finding is disagreed with a descriptive design study conducted by [22] in Egypt. The study reported a statistically significant relationship between nurses' knowledge and their qualifications ($P < 0.05$).

5. Conclusion

The current study generated the following conclusions: a substantial portion of nurses are female. Nearly every one of the nurses had a bachelor's degree. The study concluded that nurses have a high level of knowledge regarding chest physiotherapy, and there is a highly significant relationship between nurses' knowledge regarding chest physiotherapy and experience in the intensive care unit. Regardless of the high knowledge levels, moderate chest physiotherapy practices were noted, which may lead to potential problems in patient treatment. It was found that the main factors influencing this are the majority of nurses being young and having fewer than three years of experience and a lack of participation in chest physiotherapy training courses.

Recommendations

A chest physical therapy training program should be conducted periodically and regularly, and the hospital and the concerned party should provide and present this educational program based on new evidence. Conducting more studies on chest physiotherapy techniques performed by nurses in intensive care units in different places.

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