Effectiveness of an Educational Program on Nurses Knowledge Concerning Complications Prevention of Mechanical Ventilation at Intensive Care Unit in Al- Hussain Teaching Hospital at Nassiryah City

فاعلية البرنامج التثقيفي على معارف الممرضين فيما يخص منع مضاعفات التنفس الاصطناعي في وحدة العناية المركزة في مستشفي الحسين التعليمي في مدينة الناصرية

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الخلاصة:
الهدف: تقييم معارف الممرضين و تأثير فاعلية البرنامج التثقيفي على معارف الممرضين في وحدات العناية المركزة لمنع مضاعفات التنفس الاصطناعي وللتعرف عن وجود علاقة بين العمر وسنوات الخبرة في وحدات العناية المركزة في مستشفى الحسين التعليمي في مدينة الناصرية مع معارف الممرضين.
المنهجية: اختيرت عينة غير عشوائية غرضية تتكون من 50 من الممرضين مقسمين الى 25 من الممرضين في المجموعة الضابطة و 25 ممرض في مجموعة الدراسة من العاملين في وحدة العناية المركزة في مستشفى الحسين التعليمي في الناصرية. تم جمع العينة في 12اذار 2015 ولغاية ال 20 من آب 2015. يتكون الاستبيان من جزأين: الأول يتكون من البيانات والمعلومات العامة (6 فقرات) والثاني لتقييم معارف الممرضين ويتكون من (30 فقرة) والبرنامج التعليمي الذي يشمل الاختبار القبلي و البعدي (40 فقرة) اسئلة متعددة الخيارات. تم استخدام الاحصاءات الوصفية (التكرارات والنسبة المئوية الوسط الحسابي, الانحراف المعياري) والاحصاءات الاستدلالية (معامل الارتباط الخطي اختبارT, تحليل التباين لتحليل النتائج .
النتائج: أن نتائج هذه الدراسة تشير إلى ارتفاع في نسبة معارف الممرضين نحو منع مضاعفات التنفس الاصطناعي في وحدة العناية المركزة وعدم وجود اختلافات ذات دلالة إحصائية بين معارف الممرضين والمعلومات العامة لهم .
الاستنتاج : وخلصت الدراسة إلى أن البرنامج له تأثير واضح على تحسين معارف الممرضين في وحدة العناية المركزة لمنع المضاعفات المتعلقة بالتنفس الاصطناعي والتي أشار اليها الاختبار القبلي والبعدي للبرنامج.
التوصيات: اوصت الدراسة بالتأكيد الكبير الذي يجب ان يوجه نحو الجوانب التثقيفية في وحدات العناية المركزة من خلال توفير الملصقات التعليمية والتوجيهات والنشرات وينبغي توفير الوسائل التعليمية الحديثة لفريق التمريض من قاعات دراسية لأغراض التعليم المستمر في وحدات العناية المركزة لتعزيز معارف الممرضين.

Abstract:
Objective: Assess of Knowledge nurses and the effectiveness of educational program on nurses in intensive care units to prevent the complications of mechanical ventilation and to find the relationship between such as age and years of experience in intensive care units at hospitals in Nasiriyah with knowledge of nurses.
Methodology: a purposive non-random sample consists of 50 nurses divided into 25 control group study of 25 workers in the intensive care unit of Hussein Teaching Hospital in Nasiriyah. The sample collection in the March 12, 2015 until August 20 2015. The questionnaire consists of the first two parts and is made up of demographical data (6 items), and the second part including assessment of nurses knowledge (30 items), the educational program(40 items) that includes the pre-test and post multiple questions.
Descriptive statistics (frequencies and the percentage of the arithmetic mean, standard deviation) and statistics evidentiary (linear correlation coefficient, test T, analysis of variance to analyze the results.
Result : The findings of the present study indicate that the nurses have weak knowledge before application of program but post evaluation revealed high level of knowledge among nurses' at ICU toward prevention complication of mechanical ventilation.
Conclusion: The study concluded that the program has a clear effect on improving the knowledge of nurses in ICU relating to prevent complications of mechanical ventilation which was indicated by the pretest and posttest of the program.
Recommendation: The study recommended the great certainly that should be directed towards the educational aspects in intensive care units through the provision of educational posters and guidance and

leaflets and should provide modern teaching aids for the team nursing classroom study purposes of continuing education in intensive care units to enhance the knowledge of nurses.
Keywords: Educational program, Nurses, knowledge, Complication, Prevention, Mechanical ventilation

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INTRODUCTION

Mechanical ventilator is a machine that helps people breathe when they are not able to breathe enough on their own. Itis also called a ventilator, respirator, or breathing machine. Most patients who need support from a ventilator because of a severe illness are cared People who need a ventilator forlonger time may be in a regular unit of a hospital, a rehabilitation facility, or cared for at home the goal of mechanical ventilation is to improve ventilation, oxygenation, lung mechanics and patient comfort while preventing complications the goal of the program to improve nurses 'knowledge and improve nursing care provided for children under mechanical ventilation **(1).**

Caring for patients on mechanical ventilation has begin to be an essential part of the nursing care in critical care or general medical surgical units, extended care facilities and at home the nurses, physicians and the respiratory therapist must possess good knowledge and understand each patient's specific pulmonary need and work together to set to be achieved goals**(2).**

Nurses in critical care unit are be required to provide expertise care to patients on ventilator as patients in critical care unit are confined to bed nurses have to assist or carry out various activities of daily living of the patient, until he/she regains his/her independence in addition ventilator complications a nurse also has to see that the patient does not develop complication of immobility like bed sores, deep vein thrombosis, hypostatic pneumonitis, etc. the nurses that require to have adequate knowledge patience and empathy for patient's conditions when he/she is on ventilator an efficient nurse should also see that she acts as a liaison between the patients his/her relatives and the health care team members, in order to help the patients to progress towards recover. In developed countries, mechanical ventilators are no longer limited to the Intensive care unit but are now a part of long-term and home care support system **(3)** .The ventilated patient should be monitored pulse rate, rhythm and blood pressure (invasive or non- invasive) in every cases and central filling pressure (CVP), cardiac and urine output because in some cases positive ventilationcan affect venous return and impair output and tissue perfusion, thus nurses must be aware and knowledgeable in such situations**(4).**

Throughout the work experience observed that many nurses especially have minimal knowledge about caring for a patient on mechanical ventilation therefore, in the light of the above facts and the experiences of the researcher, she felt that if we strengthen the knowledge base of nurses regarding care of a patient on mechanical ventilator, by reinforced teaching and testing, we can create more efficient nurses for the society.

OBJECTIVES OF THE STUDY:

1. To assess the nurses knowledge about prevention complication of mechanical ventilation.
2. To determine theeffectiveness of educational program on nurses knowledge to prevention complication of mechanical ventilation.
3. To find out the relationship between socio-demographical data (age, years of participation in intensive care units).

METHODOLOGY

A quasi-experimental design of study was carried out from 28 December 2014 to 20 August, 2015,a purposive sample was randomly divided into two groups of 25 nurses each (25) nurses study group and (25) control group working at intensive care units in AL-Hussain Teaching hospitals at Niassiriyah city.

To construct the education program the researcher depend on the results of nurses' needs assessment (Initial assessment) reviewing the related scientific literature and previous studies,. The content of the program evaluated by experts in different fields for the purpose of validty. To evaluate the effectiveness of education programs on nurses' knowledge concerning prevention complications of mechanical ventilation, the researcher constructed a questionnaire for administering interviews, which consisted of three parts:

Part I: Questionnaire Related to Demographic Characteristics of The Nurses. Which concerned with the collection of basic socio-demographic data obtained from the nurses from interview questionnaire sheet including [age, sex, education level, years of experience, years of experience in ICU, and course participation].

A knowledge checklist for nurses was given prior to performing educational program. The knowledge checklist for nurses was composed of (40) items divided into (4) parts:

Part one: Anatomy and physiology of the respiratory system. It was composed of (10) Items

Part two: The mechanism of mechanical ventilation. It was composed of (10) Items

Part three: Complications of mechanical ventilation. It was composed of (10) items.

Part four: Nursing intervention for patients on mechanical ventilation. It composed of (10) items. The items of the first and second parts were multiple choice questions of four choices for each. These scored as (2) for correct choice and (1) for the wrong choice.

The items of the third and fourth parts were true and false questions, these scored as (2) for correct answer and (1) for the wrong answer. The time of practice check list for each nurse took about (20-30) minutes. Data were analyzed through the use of SPSS (Descriptive statistics (frequencies and the percentage of the arithmetic mean, standard deviation) and statistics evidentiary (linear correlation coefficient, test T, analysis of variance to analyze the results.

RESULTS:

Table (1): distribution the demographic data to the study and control groups in intensive care unit.

Variables	Groups	Study		Control		C.S.	
		Freq.	Percent	Freq.	Percent		
Age (years)	20-27	14	56.0	12	48.0	t-test	p=0.840

	28-35 years	7	28.0	10	40.0	NS
	36-43 years	4	16.0	3	12.0	
	$\bar{x} \mp S.D.$	$1.60^{\mp}$ 0.764		$1.64^{\mp}$ 0.700		
Gender	Male	12	48.0	11	44.0	FEPT
	Female	13	52.0	14	56.0	P=0.714NS
Level of Education	High School	7	28.0	8	32.0	t-test p=0.862 NS
	Institute	14	56.0	15	60.0	
	College	4	16.0	2	8.0	
Years of experience in nursing field	1-9 years	12	48.0	13	52.0	t-test p=0.703 NS
	10-19 years	7	28.0	9	36.0	
	20-29 years	6	24.0	3	12.0	
Years of experience in I.C.U.	1-4 years	17	68.0	15	60.0	t-test p=0.647 NS
	5- 9 years	6	24.0	8	32.0	
	10- 14 years	2	8.0	2	8.0	
Participation in courses	No	4	16.0	8	32.0	P=0.570 NS
	Yes	21	84.0	17	68.0	
	Total	25	100.0	25	100.0	

Freq.=Frequencies, %=Percentages, C.S.: Comparison Significant, $\bar{x} \mp S.D$ =Arithmetic Mean and Std. Dev. (S.D.)., P= Probability, FEPT=Fisher Exact Probability Test N.S.= Non Significant , ≥ = more Than or Equal .

Table 1 revealed that the majority (56%) of nurses in the study group are within the age group (20 – 27 years) while (48%) of nurses in the control group. Regarding gender, the study shows that females was high in both groups, they were (52%) study group were and (56%) in control group.

Concerning to the level of educational, (56%) were graduated from institutes in the study and while (60%) of nurses were also graduated from institute in control group. In relation to the number of years of experience in nursing field (48%) of nurses in the study and (52%) of nurses in the control groups had experience from (1-9 years) in the in nursing field. Concerning number of years of experience in intensive care unit both groups had (1-4 years) represented (68%) of nurses in the study group and (60%) of nurses in the control group. Concerning participation in training courses concerning complication prevention of mechanical ventilation, (84%) of nurses in the study group and (68%) of nurses in the control groups had training courses.

Statistically, there is no significant difference between study and control groups related to age group, gender, level of educational, years of experience in nursing field, years of experience in intensive care unit, participation in courses .

Table (2): Comparison Significant Between Both Groups Related to Nurses' Knowledge Concerning Complication MV at a Pretest .

Main Domain	Questions Related To Nurses' knowledge	Study			Control			P_{-value}	C.S.
		M.S.	S.D.	Ass.	M.S.	S.D.	Ass.		
Anatomy and physiology	1-One of choices is not the functional process of respiratory system	1.12	0.332	L	1.12	0.332	L	1.000	NS
	2-Nose functions are all except	1.12	0.332	L	1.08	0.277	L	0.664	NS
	3-Air movement from lungs due to pressure changes inside lungs	1.12	0.332	L	1.20	0.408	L	0.491	NS
	4-Pressure inside lung is	1.08	0.277	L	1.12	0.332	L	0.664	NS

Mechanical ventilation	5-The strength of the respiratory incentive to breathe in a healthy person is	1.16	0.374	L	1.08	0.277	L	0.425	NS
	6-The wrong CO_2 concentration is	1.12	0.332	L	1.08	0.277	L	0.664	NS
	7-The exchange of oxygen and carbon carbon dioxide in the lungs and through all cell membranes by	1.20	0.408	L	1.08	0.277	L	0.265	NS
	8-Transmission of oxygen from the lungs to the cells will be by	1.04	0.200	L	1.28	0.458	L	0.031	S
	9-One of the components of the larynx is	1.04	0.200	L	1.16	0.374	L	0.083	NS
	10-lung volume which represents the total volume of air exchange is	1.20	0.408	L	1.20	0.408	L	1.000	NS
	1-Indication of mechanical ventilation is	1.16	0.374	L	1.04	0.200	L	0.185	NS
	2-usually requires mechanical ventilation in each of the following cases except	1.24	0.436	L	1.04	0.200	L	0.057	NS
	3-Mechanical ventilation is given to the patient by	1.44	0.507	M	1.20	0.408	L	0.083	NS
	4-The evolution of the concept and technology ventilator foundation stone in the development of	1.08	0.277	L	1.12	0.332	L	0.664	NS
	5-Factors that help ensure all except for mechanical ventilation include	1.12	0.332	L	1.24	0.436	L	0.265	NS
	6-A lot of health care systems use respirators as part of the intensive care unit so that both require	1.08	0.277	L	1.08	0.277	L	1.000	NS
	7-The first to talk about the ventilator was	1.08	0.277	L	1.12	0.332	L	0.574	NS
	8-Any of the following cases do not require mechanical ventilation	1.16	0.374	L	1.04	0.200	L	0.185	NS
	9-Any of choice more indicated to mechanical ventilation	1.04	0.200	L	1.12	0.332	L	0.327	NS
	10-Determine work respirators pattern depending on the clinical condition of the patient through	1.00	0.000	L	1.16	0.374	L	0.043	S
Complications of mechanical ventilation	1-Pneumothorax its complication of mechanical ventilation	1.20	0.408	L	1.12	0.332	L	0.425	NS
	2-Warning intolerance patient for complication of mechanical ventilation, heart rate about 90 beats per minute	1.24	0.436	L	1.08	0.277	L	0.103	NS
	3-Signs of pneumothorax with complication of mechanical ventilation patients are hearing the wheezy sound in exhaled	1.20	0.408	L	1.04	0.200	L	0.103	NS
	4-Long continue to give O2 a large amount patient risk to oxygen toxicity	1.08	0.277	L	1.04	0.200	L	0.574	NS
	5-Infection of respiratory tract complications for pts complication of MV is pulling Aspiration stream of respiratory fluids	1.16	0.374	L	1.12	0.332	L	0.664	NS
	6-Some complications to affect the mechanical breathing including pneumothorax and pneumonia	1.24	0.436	L	1.08	0.277	L	0.161	NS
	7-Complications affect physiological functions of body estimated failure to cough when exposed to respiratory foreign body	1.16	0.374	L	1.08	0.277	L	0.425	NS
	8-Swelling of the alveoli patients with complication of mechanical ventilation occurs during high Tidal Volume range Size	1.20	0.408	L	1.12	0.332	L	0.491	NS
	9-Complications of hypertension in a patient with MV occurs during swelling due to accumulation of fluid in the body	1.36	0.490	M	1.08	0.277	L	0.016	S

Nursing intervention	10-Tube of the respiratory tract complications include sinus infection	1.28	0.458	L	1.04	0.200	L	0.031	S
	1-The goal of opening the trachea care is to ensure the ability of the patient when swallowing	1.12	0.332	L	1.08	0.277	L	0.664	NS
	2-Role of ICU nurses by prepare the patient put on a respirator device.	1.16	0.374	L	1.12	0.332	L	0.714	NS
	3-It is not one of the functions of the nurse monitoring vital signs of a patient mechanical breathing	1.20	0.408	L	1.08	0.277	L	0.185	NS
	4-One nurse functions during breathing mechanical Care trachea tube put	1.28	0.458	L	1.08	0.277	L	0.096	NS
	5-Assess cause of apnea in a patient mechanical ventilation is by assessing the condition of the patient and ventilator tubes	1.12	0.332	L	1.08	0.277	L	0.664	NS
	6-Reduce the risk of withdrawal of fluids into the sewer is done by changing the status of inpatient patient	1.08	0.277	L	1.16	0.374	L	0.425	NS
	7-Assess cause of apnea in a patient is breathing through mechanical assess the status of the patient and the ventilator tube	1.20	0.408	L	1.12	0.332	L	0.265	NS
	8-Withdraw excess fluid from the chest requires the insertion of a tube where fluid is withdrawn	1.12	0.332	L	1.00	0.000	L	1.000	NS
	9-Avoid injuring the nasal cavity using sterile materials to avoid injury inflammation	1.12	0.332	L	1.16	0.374	L	0.664	NS
	10-The change of oxygen flowing by the nurse	1.20	0.408	L	1.16	0.374	L	0.746	NS

M.S. =Mean of score , SD = Standard , Ass.= assessment. ,C.S. : Comparison, Significant ,p = probability ,NS : Non Significant at P ≥ 0.05 , S : Significant at P < 0.05, Level of assessment: (1-1.33) = Low ;(1.34-1.67) = Moderate; (1.68-2.00) = High, L= Low; M = Moderate, H= High .

The finding of this table shows that there are no significant differences between study and control group at pre test in all items except few items.

Table (3) Comparison Between Both Groups Related to Nurses' Knowledge Concerning Complication Prevention of M V Post Test .

Main Domain	Questions Related To Nurses' knowledge	Study			Control			P-value	C.S.
		M.S.	S.D.	Ass.	M.S.	S.D.	Ass.		
Anatomy and physiology	1-One of choices is not the functional process of respiratory system	1.88	0.332	H	1.16	0.374	L	0.000	HS
	2-Nose functions are all except	1.88	0.332	H	1.16	0.374	L	0.000	HS
	3-Air movement from lungs due to pressure changes inside lungs	1.88	0.332	H	1.16	0.374	L	0.000	HS
	4-Pressure inside lung is	1.76	0.436	H	1.04	0.200	L	0.000	HS
	5-The strength of the respiratory incentive to breathe in a healthy person is	1.84	0.374	H	1.08	0.277	L	0.000	HS
	6-The wrong CO_2 concentration is	1.84	0.374	H	1.08	0.277	L	0.000	HS
	7-The exchange of oxygen and carbon carbon dioxide in the lungs and through all cell membranes	1.84	0.374	H	1.12	0.332	L	0.000	HS
	8-Transmission of oxygen from the lungs to the cells will be by	1.92	0.277	H	1.08	0.277	L	0.000	HS
	9-One of the components of the larynx is	1.92	0.277	H	1.12	0.332	L	0.000	HS
	10-lung volume which represents the total volume of air exchange is	1.88	0.332	H	1.08	0.277	L	0.000	HS
Mech	1-Indication of mechanical ventilation is	1.76	0.436	H	1.08	0.277	L	0.000	HS

	2-usually requires mechanical ventilation in each of the following cases except	1.60	0.500	H	1.00	0.000	L	0.000	HS
	3-Mechanical ventilation is given to the patient by	1.72	0.458	H	1.20	0.408	L	0.000	HS
	4-The evolution of the concept and technology ventilator foundation stone in the development of	1.80	0.408	H	1.04	0.200	L	0.000	HS
	5-Factors that help ensure all except for mechanical ventilation include	1.80	0.408	H	1.04	0.200	L	0.000	HS
	6-A lot of health care systems use respirators as part of the intensive care unit so that both require	1.72	0.458	H	1.00	0.000	L	0.000	HS
	7-The first to talk about the ventilator was	1.76	0.436	H	1.08	0.277	L	0.000	HS
	8-Any of the following cases do not require mechanical ventilation	1.80	0.408	H	1.20	0.408	L	0.000	HS
	9-Any of choice more indicated to mechanical ventilation	1.84	0.374	H	1.08	0.277	L	0.000	HS
	10-Determine work respirators pattern depending on the clinical condition of the patient through	1.72	0.458	H	1.12	0.332	L	0.000	HS
Complications of mechanical ventilation	1-Pneumothorax its complication of mechanical ventilation	1.72	0.458	H	1.12	0.332	L	0.000	HS
	2-Warning intolerance patient for complication of mechanical ventilation, heart rate about 90 beats per minute	1.64	0.490	M	1.08	0.277	L	0.000	HS
	3-Signs of pneumothorax with complication of mechanical ventilation patients are hearing the wheezy sound in exhaled	1.84	0.374	H	1.04	0.200	L	0.000	HS
	4-Long continue to give O2 a large amount patient risk to oxygen toxicity	1.88	0.332	H	1.04	0.200	L	0.000	HS
	5-Infection of resp. tract complications for pts complication of MV is pulling Aspiration stream of respiratory fluids	1.76	0.436	H	1.08	0.277	L	0.000	HS
	6-Some complications to affect the mechanical breathing including pneumothorax and pneumonia	1.76	0.436	H	1.08	0.277	L	0.000	HS
	7-Complications affect physiological functions of body estimated failure to cough when exposed to respiratory foreign body	1.92	0.277	H	1.12	0.332	L	0.000	HS
	8-Swelling of the alveoli patients with complication of mechanical ventilation occurs during high Tidal Volume range Size	1.76	0.436	H	1.20	0.408	L	0.000	HS
	9-Complications of hypertension in a patient with mechanical ventilation occur during swelling due to accumulation of fluid.	1.96	0.200	H	1.12	0.332	L	0.000	HS
	10-Tube of the respiratory tract complications include sinus infection	1.84	0.374	H	1.12	0.332	L	0.000	HS
Nursing intervention	1-The goal of opening the trachea care is to ensure the ability of the patient when swallowing	1.75	0.442	H	1.08	0.277	L	0.000	HS
	2-Role of ICU nurses by prepares the patient put on a respirator device.	1.75	0.442	H	1.04	0.200	L	0.000	HS
	3-It is not one of the functions of the nurse monitoring vital signs of a patient mechanical breathing	1.83	0.381	H	1.04	0.200	L	0.000	HS
	4-One nurse functions during breathing mechanical Care trachea tube put	1.79	0.415	H	1.16	0.374	L	0.000	HS
	5-Assess the cause of apnea in a patient mechanical ventilation is by assessing the condition of the patient and ventilator tube	1.62	0.495	M	1.04	0.200	L	0.000	HS

6-Reduce the risk of withdrawal of fluids into the sewer is done by changing the status of inpatient patient	1.54	0.509	M	1.08	0.277	L	0.000	HS
7-Assess the cause of apnea in a patient is breathing through mechanical assess the status of the patient and the ventilator tube	1.71	0.464	H	1.12	0.332	L	0.000	HS
8-Withdraw excess fluid from the chest requires the insertion of a tube where fluid is withdrawn	1.79	0.415	H	1.04	0.200	L	0.000	HS
9-Avoid injuring the nasal cavity using sterile materials to avoid injury inflammation	1.92	0.282	H	1.08	0.277	L	0.000	HS
10-The change of oxygen flowing by the nurse	1.75	0.442	H	1.12	0.332	L	0.000	HS

M.S. =Mean of score , SD = Standard Deviation , Ass.= assessment ,p: probability, C.S. : Comparison, Significant, , S : Significant at P < 0.05 , HS : Highly Significant at P < 0.01,, Level of assessment: (1-1.33) = Low ;(1.34-1.67) = Moderate; (1.68-2.00) = High, L= Low; M = Moderate, H= High.

Table (3) shows that there are highly significant differences between study and control group at posttest in all items of the nurses' knowledge concerning complication prevention of mechanical ventilation.

Table (4): Distribution and Association of Nurses' Knowledge with Their Age in study group .

Nurses' Knowledge Age (Years)	No.	Pre-test Mean ± S.D.	Post -test Mean ± S.D.
20-27 years	14	1.14± 0.363	2.79 ± 0.579
28-35 years	7	1.00 ± 0.00	3.00 ± 0.00
36-43years	4	1.00 ± 0.00	3.00 ± 0.00
Total	25	1.08± 0.277	2.88 ± 0.440
		F =0.807 P = 0.459	F =0.714 P = 0.501

$\bar{x} \mp$ S.D. =Arithmetic Mean ($\bar{x}$) No. = Number of frequencies, F = Fisher test ,
d.f. = degree of freedom, P = probability value.

Table (4) shows that there is no statistical significant association between nurses' knowledge and their age at (pre and post-tests) educational program follow up(p value >0.05).

Table (5): Distribution and Association of Nurses' Knowledge with Their Years of experience in Intensive Care Unit in study group

Nurses' Knowledge Years of experience in I.C.U	No.	Pre-test Mean ± S.D.	Post -test Mean ± S.D.
1- 4 years	17	1.12 ± 0.332	2.88 ± 0.485

5 – 9 years	6	1.00 ± 0.00	2.83 ± 0.408
10 -14 years	2	1.00 ± 0.00	3.00 ± 0.00
Total	25	1.08± 0.277	2.88 ± 0.440
		F = 0.469 P = 0.632	F = 0.100 P = 0.905

$\bar{x} \mp S.D.$ =Arithmetic Mean ($\bar{x}$) and Std. Dev. (S.D.), No. = Number of frequencies, F = Fisher test , d.f. = degree of freedom, P = probability value.

Table (5) shows that there is no statistical significant association between nurses' years of experience in intensive care unit and their knowledge at (pre and posttests).

DISCUSSION:

Throughout the present study there was no significant difference between control and study this result is supported by (Al Fatlawi., 2012) study ,which report that majority of the sample at age group 20-27 years old 36.8[5].Also major sample from medical institute study both study group (56%) and control group, (60%), this result supported by (Alsultani,2006)in his study he mentioned that majority of the sample were institute graduate working in intensive care unit [6] .

Also no significant difference between gender study group 52.0% control group 56.0% female in present study female gender more than half of sample, support by another study who stated that the majority of study sample were female about 72% more than male about 24% According this study the sample were female because most of female had intimate and passion feelings more than male toward ICU patient under mechanical ventilation [7].

In relation to nurses years of experience in nursing field, the result of this study account about 48.0 in study,52,0 in control group at (1-9 years)this result agree with Salah,2013 study that mentioned years of experience >5 years account 45.0 in study, 42.5 in control group[8] .

Also the experience in intensive care unit that the result of this study more half the sample have (1-4) years account 68.0 study, 60,0 control group. This number of year's related nurses has low level of experience in intensive care units.

Concerning the number of participation course 84.0% study, 32.0% control group but this participation not effected of nurses knowledge in study group this result disagrees with (Mohammed et al, 2014) low training Courses participation can effected of nurses knowledge nurses' need more course and participation to improve nurses' knowledge [9] .

There was no significant difference between study and control group in pretest this result support by (Salah, 2013), working in medical department having the minimum level of experience and need specific educational program and training session. Mean of score of assessment level was low in pretest and become high in pretest [8].

Present study show highly significant differences between study and control group at posttest in all items of the nurses' knowledge concerning complication prevention of mechanical ventilation. This result supported by Nurses must be knowledgeable about the function and limitations of ventilatormodes, causes of respiratory distress and

dyssynchrony with the ventilator, andappropriate management in order to provide high-quality patient-centered care.Prompt recognition of problems and action by the nurse may resolve acute respiratory distress, dyspnea, and increased work of breathing and prevent adverse events[10].

Also (Carol and Mike, 2008) who have Intensive Care Nurses' Knowledge of Pressure Ulcers: Development of an Assessment Tool and Effect of an Educational Program A cohort of registered nurses in a tertiary referral hospital in New Zealand had knowledge assessed 3 times: before an educational program, within 2 weeks after the program, and 20 weeks later. Multivariate analysis was performed to determine if attributes such as length of time since qualifying or level of intensive care unit experience were associated with test scores. The content and results of the assessment test were evaluated [11] .Mean of score of assessment was highin study group while was lowin control group.

Table (4) show that no statistical differences association between nurses knowledge and age (p value 0.840) this result support by (Hany et al, 2013) showed that there was no significant relationship between nurses knowledge and age[12] .

Table (5) show no statistical differences association between nurses knowledge and gender (p value 0.647) this result support by (Labeaua, 2008) showed that there was no significant relationship between nurses knowledge and year of experience In ICU[7] .

CONCLUSION:

The study concluded that the program has a clear effect on improving the knowledge of nurses in ICU relating to prevent complications of mechanical ventilation which was indicated by the pretest and posttest of the program.

RECOMMENDATIONS:

1. Great emphasis should be directed toward the educational aspect at intensive care unit by providing educational poster, guidelines pamphlets and manuals.
2. Policy should be initiated in providing a special education courses at intensive care unit.
3. Modern educational facilities, classroom for continuing education for nursing team at intensive care unit should be provided to enhance nurses knowledge
4. ICU nursing staff should be graduated from college of nursing to provide better care and prevent complication of mechanical ventilation.

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