Nursing & Primary Care

The Effect of an Educational Program on Nurses' Knowledge Concerning Nursing Care of Critically – ill Patients at king Fahad hospital Jeddah June 2022

Esraa Mohammed ALHUSSIN[1*], Sahar Ahmed MOHAMMED[2], Amel Ahmed HASSAN[3], Mudathir Mohamedahmed ELTAYEB[4], Montaha Mohamed Ibrahim Mohamed[5] and Elturabi Elsayed Elkhider Ebrahim[6]

[1]Nurse Educator, Department of Nursing Education, King Fahad Hospital, Jeddah, Saudi Arabia.

[2]Assistant Professor of Medical Nursing, Faculty of Nursing Sciences, University of Khartoum, Khartoum, Sudan.

[3]Assistant Professor of Community Health Nursing, Faculty of Medical Technical Sciences, Department of Nursing, Alzaiem Alazhari University, Khartoum North, Sudan.

[4]Assistant Professor of Nursing, Prince Sattam Bin Abdulaziz University, Al-kharj, Saudi Arabia.

[5]Assistant Professor of Medical Nursing, Faculty of Nursing Sciences, University of Khartoum. Department of Medical Nursing.

[6]Assistant Professor in Medical Surgical Nursing, Nursing Science Department, College of Applied Medical Science, Prince Sattam Bin Abdulaziz University, Saudi Arabia.

[*]**Correspondence:**
Esraa Mohammed ALHUSSIN, Nurse Educator, Department of Nursing Education, King Fahad Hospital, Jeddah, Saudi Arabia. https://orcid.org/0000-0002-3875-6474

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ABSTRACT

Background: Critical care nurses must gain update knowledge, skills, experiences, high technical equipment to provide high quality nursing care to support critically ill patients' recovery. This study aimed to evaluate the effect of educational program on nurse's knowledge concerning Nursing Care for critically –ill Patients at Critical Care units.

Methodology: This interventional pre–posttest study included 30nurses selected though a full-coverage sampling method and meeting the selection criteria. Data were collected using structured self-administered questionnaire after testing their validity and reliability through pilot study, then a written approval from the participants was taken. The pretest included an initial assessment followed by implementation of education program was designed based on actual needs of nurses in order to improve their knowledge toward effective nursing care of critically ill patient. Then the final assessment was conducted after one month (posttest). The collected data were then analyzed and interpreted using descriptive and inferential statistics based on the objective and p-value at 0.05 was considered as the level of significance using SPSS version 20.

Results: this current study showed that there was statistically significant relationship between nurses knowledge in mechanical ventilator and years of experience in critical care with p value 0,04 in pre-program implementation and after 2 month post program p value was 0.02. That reflect the years of experience when the nurse handle the mechanical ventilator will became more expert than the nurse less experience of it that is why the less expert nurse does not aware of mode of mechanical ventilator.

Conclusion: The study concluded that the total knowledge of nurses post-test was very good and follow-up after 2 month was good, that indicate the educational program effect in knowledge of nurses.

Keywords
Educational Program, Critically – ill Patients, Nurses, ICU, KSA.

Introduction
The intensive care unit (ICU) is considered critical care area in the hospital because of the high-risk patients and the high capability of occurrences associated with ICU. Most of ICU patients at high risk to develop life-treating condition suddenly so critical care nurses must develop their knowledge, and keep their practice up to date because this type of patients need more detailed observation to deliver effective nursing care [1].

Globally the population aged 65 years old and above is growing faster than any age group for that the government and health system around the world need to meet this health care Additionally, non-communicable diseases such as cardiovascular disease, cancer and diabetes account for 71% of all global deaths. Now a day we have seen a potentially fatal combination of newly discovered disease such as SARS, MERS and Recently COVID-19 [2]. For that critical care nurses need to gain up dated knowledge and experience, high technical equipment to provide high quality nursing care to facilitate critically ill patients' recovery [3].

Allot of formal names for critical care nurse such as critical care registered nurse and intensive care nurses but the exactly name selected according to specialization. Although the scope of practice for a CCN varies by state as defined by the state board of nursing, a critical care nurse most commonly provides evidence based nursing care to deliver advanced care in intensive care, critical care and coronary care units. The nurses should understand that the unique physiological, psychological, and emotional problems that arise in critically ill patients require a delicate balance between the scientific, technical, and human components of nursing care. Within this context of intensive care, the nursing contribution involves meticulous observation and skilled intervention, the provision of basic hygiene, nutrition and prevention of harm, as well as the provision of emotional and psychological support to both the patient and their families [4].

Critical care is a specialty, which serves diverse needs of patients with actual or potential life-threatening organ dysfunction1. Patients requiring critical care have complex needs and receive multiple therapies, which require technical and/or artificial life support2. Complex environments and the inability to operate equipment cause stress for caregivers who provide advanced care3. As such, critical care practitioners are expected to have sufficient knowledge and skills to meet the challenges of critical illness in a rapidly evolving environment of science and technology [5] hence, this study was done to evaluate the effect of effect of educational program on nurse's knowledge concerning Nursing Care for Critically – Ill Patients at Critical Care units.

Research Questions
1. What is the baseline knowledge of the all-nursing staff working in King Fahad Hospital about care of critically ill patients?

2. What is the impact of an education program sessions on working in selected critical care unit about care of critically ill patients?

Subjects and Methods
Design and Setting
An interventional pre–posttest study was conducted in the King Fahad hospital; Jeddah state included the entire critical care unit (ICU for cardiac surgery, general ICU, Coronary care Unit, burn unit, Emergency department).

Study Population
The target population of the study was all nursing staff working in King Fahad Hospital.

Inclusion Criteria
All nursing staff (both gender) working in King Fahad Hospital available at the time of data collection and working in selected critical care unit.

Exclusion Criteria
Nurses attend workshop or training courses on care of critically ill patients.

Sample Size and Technique
A total of 30 nurses participated in the study. They were selected through a full coverage sampling method.

Data Collection Methods
The researcher using a structured self-administered questionnaire after conducting a pilot study to ensure the validity and reliability of the questionnaire collected data.

The questionnaire consisted of two parts: part 1 included socio demographic data (age, sex, educational level and practical experience); part 2 consisted of knowledge regarding questions related to nursing care for critically ill patients.

Structured Session
Contents of the session: includes 11 critical areas, which are (Mechanical ventilator, Infection control, Central venous catheter and arterial blood gases, Electrocardiogram and arrhythmia, code of ethics, shock, Stroke and pulmonary embolism, Trauma, Acute coronary syndrome (ACS), Heart failure and cardiomyopathy and burn.

Data Analysis
Data were collected, coded, entered, and then analyzed using the statistical package for social sciences (SPSS using mean, standard deviation and P-value.

Ethical Considerations
☐ Approval was taken from study area responsible authorities, Written consent was taken from participants

Results

This table shows that majority of nurses 88% age group between (25-35) years/old, 64% of them had have BSc, while 64% experience in critical care zone from (5-10) years and 76% not attend critical care courses before.

Table 1: Socio-Demographic Data of Nurses N = 25.

Nurses characteristics	Frequency	%
Age		
25-35 yrs.	22	88%
36- 45	2	8%
More than 45	1	4%
Qualification of the nurse		
Diploma degree	7	28%
BSc	16	64%
MSc	2	8%
Experience of the nurse in critical care		
Less than 5 years	16	64%
5-10 years	7	28%
More than 10 years	2	8%
Attended critical care course		
Did not attend	19	76%
2 years ago	2	8%
More than 2 years	4	16%

Table 2: Nurses' knowledge regarding Nursing Care for Critically – Ill Patients at king Fahad hospital Jeddah June 2022 pre-post program implementation and flow-up after 2 month n=25

Nurses' knowledge regarding Nursing Care for Critically – Ill Patients	Correct response		
	pre test	Post test	Follow-up
Intravenous solution will most likely be prescribed to increase intravascular volume	44%	52%	60%
Type of chock after traumatic abdominal injury with blood pressure 50/40	44%	84%	52%
Immediate nursing action for patient developed pulmonary embolism	44%	88%	76%
Improvement the quality of care by critical care nurses	24%	92%	40%
Ventilator mode allows the patient to breath spontaneously between the ventilator breath	20%	84%	68%
Complication of fluid overload	56%	92%	84%
Personal protective equipment should the nurse wear with SARS patient	20%	92%	72%
Characteristic of chest pain related to cardiac problem	36%	64%	80%
Suitable activities for MI patient after discharge to general medical word	20%	80%	52%
Blood test is most indicative to cardiac damage	52%	76%	92%
Disorder can lead to jugular vein distention	36%	84%	68%
Emergency tray should prepare for patient with respiratory distress	28%	80%	56%
Prevent complication for patient with arteriovenous fistula undergoing hemodialysis	60%	92%	88%
Nursing care for Initial burn patient his bowel sound absent in all quadrant	32%	60%	64%
Definition of mechanical ventilator	68%	96%	84%
Part of the electrical conduction system in the heart responsible for atrial depolarization	52%	92%	72%

Table 3: Cross Tabulation between nurses' knowledge regarding Nursing Care for Critically – Ill Patients and Total years of experience in critical care (pre and post program implementation and flow up after 2 month) n=25.

Year of experience* knowledge of nurses pre-post & follow-up after 2 month	Years of experience in critical care		
	Pre test	Post test	Follow-up
Intravenous solution will most likely be prescribed to increase intravascular volume	.139	.710	.789
Type of chock after traumatic abdominal injury with blood pressure 50/40	.200	.677	.152
Immediate nursing action for patient developed pulmonary embolism	.545	.800	.207
Improvement the quality of care by critical care nurses	.886	.331	.752
Ventilator mode allows the patient to breath spontaneously between the ventilator breath	.044	.907	.022
Complication of fluid overload	.398	.458	.491
Personal protective equipment should the nurse wear with SARS patient	.731	.000	.162
Characteristic of chest pain related to cardiac problem	.491	.132	.651
Suitable activities for MI patient after discharge to general medical word	.957	.414	.926
Blood test is most indicative to cardiac damage	.869	.351	.345
Disorder can lead to jugular vein distention	.504	1.000	.680
Emergency tray should prepare for patient with respiratory distress	.596	.268	.506
Prevent complication for patient with arteriovenous fistula undergoing hemodialysis	1.000	.608	.203
Nursing care for Initial burn patient his bowel sound absent in all quadrant	.080	.036	.765
Definition of mechanical ventilator	.083	000	.162
Part of the electrical conduction system in the heart responsible for atrial depolarization	.556	.608	.103

Discussion

Intensive care units are specialized units that provide treatment for life-threatening injuries and illnesses. Implementation of a training program is therefore a useful and important development of knowledge and skills for nurses working in this critical field. This study conducted in King Fahad Hospital Jeddah to evaluate the effect of educational program on nurse's knowledge concerning Nursing Care for Critically – Ill Patients at Critical Care units.

The Interpretation of result according to score, the degree from (100-80) % is very good, (79-50) % is good, less than 50% is consider poor, total knowledge of nurses pre-program was poor (39, 7%) and post program was very good (82%) after 2 month the nurses knowledge was good (69%).

Total of 30 staff nurse who was achieve inclusion criteria was selected the most frequent age group of ICU nurses from 25-30 years with percentage of 88%, that indicate the staff is fresh graduate and not have experience, the majority of participant were Bachelor degree with percentage of 64% that reflect the participant have a base knowledge and not updating in critical care, so this educational course help practitioner nurse to be up to date on the most recent develop in critical care nursing, most of

them have years of experience less than 5 year with percentage of 64%, most of participant Did not attend critical care course before with percentage 76%, that indicate the old knowledge they have.

There was significant increase in participants´ scores on all additional topics, intravenous solution and complication of fluid overload with percentage of 92%, caring for a patient with burn with percentage of 60% ,caring for a patient with respiratory distress 80%, and basic interpretation of ECG with percentage of 90% ,that reflect the nurses is became aware because the nurses are responsible to monitoring critically ill patient and making decision based on knowledge they have the results support finding of previous study done in ECG by Mariam et al. reported improvement in nurses' knowledge and skills scores with percentage of 10,3% in pre and 92,3% in post program [6] and other study in burn education done by Hawraa et al. reported Nurses knowledge has been improved from 0% in pretest to 100% in post program [7], the present result revealed that nurses do not know regarding nursing role in mechanical ventilator they do not know the mode of ventilator and the function of it before the education program was 20% while that improved after program became 84% also continue good in flow up was 68%.

The educational interventions resulted in significant improvement in the nurses' knowledge in all these aspects, Type of chock with percentage of 44% in pre-program to 84% post program and how to deal with cardiac patient with 36% in pre-program and 64% in post program and nurses role in dialysis with percentage of 60% to 90%, which is congruent with the study done in shock education by Ali et al. that report study proved that nurse's knowledge scores were poor in all knowledge items pretest which has been strongly increased immediately post the program had been record differences between high low (3;12%) and high (22;88%) [8] also study done regarding dialysis education agree with our study by Kalthoum et al. reported (89.5%) attained a score of knowledge less than "good" before the educational intervention Their knowledge score improved dramatically after intervention that 75% of them scored levels of "very good" to "Excellent" [9].

Other study done in infection control education by Yasmine et al. in Egypt agree with our study reported higher knowledge and attitude scores in the post intervention phase with a mean of 37.176 ± 3.494 and 13.264 ± 1.666, respectively, compared with 28.672 ± 4.499 and 12.248 ± 1.615 in the pre intervention phase [10], other study support our finding in education regarding cardiac disease done by Ahmed et al. that reported higher knowledge in post program with a mean of 35.8 ± 3.84 while pre-program was 34.2 ± 4.28 [11].

Over all this study found showed statistically significant relationship between nurses' knowledge in mechanical ventilator and years of experience in critical care with p value 0,04 in pre-program implementation and after 2 month post program p value was 0,02. That reflect the years of experience when the nurse handle the mechanical ventilator will became more expert than the nurse less experience of it that is why the less expert nurse does not aware of mode of mechanical ventilator.

Conclusion
Knowledge provides an organized set of realistic information. It provides a foundation of precise principles and concepts. The application of this knowledge develops and improves nursing skills. Lack of knowledge is therefore consistently recognized as a barrier to providing effective nursing care.

The findings of the present study show that nurses' knowledge level at pre test was poor and post program was very good after 2 month after program the nurse's knowledge was good.

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