

Effect of Clinical Guideline Concerning Cardiopulmonary Bypass on Nurses' Knowledge in Open Heart Surgery Center.

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Abstract

Open-heart surgery is considered a major surgery with potential risks and complications, but it is a life-saving operation that can treat a variety of diseases such as heart valve disease, heart birth defects, and coronary artery disease. A Quasi- experimental design has been used in the existing study to evaluate the effect of clinical guideline concerning cardiopulmonary bypass on nurses' knowledge in open heart surgery center in AL-Najaf AL-Ashraf city at Al-Najaf center for cardiac surgery and trans-catheter therapy through the period October 1th, 2020 to, April 19th, 2021. The results of the study show there is a high significant effect of the educational program, it also, show that high Significant mean difference among study group concerning pre-test and post-test scores at p-value (0.0001). Also, in this study there is a significant association between posttest knowledge and year of experience as a perfusionists and number of training courses at p-value (0.02) and (0.01). The study concluded that educational program can improve in nurses' knowledge and to produce perfusionists who are able to successfully apply their knowledge and skills to improve patients' outcome. The study recommended a written program for all new nurses working in heart-lung machine department, and improving the expertise of nurses and medical staff through use the finding of the present study to give care for the patient.

Keyword: Guideline, Cardiopulmonary bypass, Nurse, Knowledge, Perfusions.

Introduction

Open-heart surgery is considered a major surgery with potential risks and complications, but it is a life-saving operation that can treat a variety of diseases [1]. Surgical care has become an increasingly important part of global health in recent years due to its ability to save lives, prevent disability, and the need to promote economic growth [2]. The price of such a procedure varies greatly across the globe. The United States had the highest cardiac bypass prices of any country in 2019. In contrast, (India) had the lowest cost for a heart bypass [3].

Study Objectives:

1. To assess nurses' knowledge regarding cardiopulmonary bypass machine pre and post-exposure to guideline.

2. To determine the effect of clinical guidelines regarding cardiopulmonary bypass on nurses' knowledge about cardiopulmonary bypass machine.

3. To find out the relationship between Socio-demographic data and nursing knowledge regarding cardiopulmonary bypass machine.

Methodology

Study Design

The present study was using a quasi- experimental design to evaluation the effect of clinical guidelines on nurses' knowledge of cardiopulmonary bypass in the open heart surgery center in AL-Najaf AL-Ashraf city at Al-Najaf center for cardiac surgery and trans-catheter therapy from October 1st, 2020 to April 19th, 2021.

Setting of the study:

The study is conducted in Al-Najaf City/Al-Najaf Al-Ashraf Health Directorate / Al-Najaf center for cardiac surgery and trans-catheter therapy.

Study Sample:

The researcher study is being conducted directly in the Al-Najaf center for cardiac surgery and trans-catheter therapy, Probability (purposive) study

sample consist of 15nurses.All samples are exposed to an educational program and there are no control groups are found because the 15 nurses represent all available samples that work on the cardiopulmonary bypass machine

Statistical Analysis

Through the use of excel and statistical package of social sciences (SPSS) version 25 the data of present study are analyzed.

Result**Table (1): Socio-Demographic Characteristic of the Study Sample**

Demographic Data	Rating and Intervals	Frequency	Percent
Age / Years	20-24	2	13.3
	25-29	7	46.7
	30-34	5	33.3
	35-39	1	6.7
	Total	15	100.0
Gender	Female	7	46.7
	Male	8	53.3
	Total	15	100.0
Levels of Education	Nursing college	15	100.0
	Total	15	100.0
Year of Experience in Hospital	1-5	8	53.3
	6-10	5	33.3
	11-15	1	6.7
	16-20	1	6.7
	Total	15	100.0
Years of Experience in Perfusion	1-5	14	93.3
	6-10	1	6.7
	Total	15	100.0
Training Course	No	12	80.0
	Yes	3	20.0
	Total	15	100.0
Number of Training Courses	1	2	13.3
	3	1	6.7
	Total	3	20.0

Table (1) reveals that the high percentage of nurse that participant in this study is at age group (25-29) years, (46.7%). In addition, the table shows that the high percentages of male participant in the study was (53.3%). Regarding the level of education, the highest percentage is (100%) of the sample in study graduated from nursing college. In regards to years of experience in hospital, the table shows that (53.3%) of the sample

in the study is at group of (1-5) year. In regards to years of experience in perfusion, the results show that the majority of study sample (93.3%) has (1-5) years. while (80%) of the sample in the study have no training session regarding cardiopulmonary bypass machine .In relation to number about cardiopulmonary bypass machine there is only one person who have two session of training at (13.3).

Table (2) Mean Difference (paired t-test) in the Nurses’ knowledge Between Different Periods of Measurements (Pre-test and Post-test)

Main studied domain	Periods of measurements	Mean	N	Std. Deviation	t-value	d.f.	p-value
Overall Nurses’ Knowledge	Pre-test	1.37	15	.167	16.387	14	.0001 HS
	Post-test	1.88	15	.059			

The results of this table show that high Significant mean difference among study group concerning to their pre-test and post-test scores at p-value (0.0001)

Table (3) Analysis of Variance (ANOVA) in the Nurses’ Knowledge (post-test) according to their Age, Experience in Hospital, and Number of Training Courses

Demographic data	Rating and intervals	N	Mean	Std. Deviation	F	p-value
Age / Years	20-24	2	1.84	0.04	4.117	.035 S
	25-29	7	1.85	0.05		
	30-34	5	1.91	0.04		
	35-39	1	2.00	0.0		
	Total	15	1.88	0.06		
Year of Experience in Hospital	1-5	8	1.85	0.05	5.602	.014 S
	6-10	5	1.91	0.03		
	11-15	1	1.84	0.0		
	16-20	1	2.00	0.0		
	Total	15	1.88	0.06		
-Number of Training Courses	No training Courses	12	1.86	0.05	6.974	.010 S
	1	2	1.94	0.00		
	3	1	2.00	0.0		
	Total	15	1.88	0.06		

Table (3) shows that there is significant association between post-test knowledge and some variables in demographic data of the study. Regarding age there is a significant association with knowledge at p-value (0.035) was at rating of (35-39). In addition

this table show at rating (16-20) year of experience in hospital there is a significant association with nurses' knowledge at p-value (0.014). While the number of training courses explain a significant association with nurses' knowledge at p-value (0.010)

Table (4) Mean Difference (Independent Sample t-test) in the Nurses' Knowledge (post-test) according to their Gender and Experience as a nursing perfusionist

Demographic data	Rating	N	Mean	Std. Deviation	t-value	d.f.	p-value
Gender	Female	7	1.88	0.03	.283	13	.782 NS
	Male	8	1.88	0.08			
Experience as a perfusionist	1-5	14	1.87	0.05	2.485	13	.027 S

Table (4) shows that there is no significant difference in nurses' knowledge at post-test regarding gender. While regarding to year of experience as a perfusionist there is a significant difference at p-value (0.027).

Discussion

According to (table 4.1) in the results, the study shows some variation difference regarding the Socio-demographic data of the study sample.

Concerning their age, the majority of the study sample are in the age group of (25-29) years. This result matches with the result of [4] who finds in his study that the largest group of age was between (24-30) years. While our result disagree with [5] which found that the highest percentage of age was (55%) above (50). This difference, according to researchers, occurs due to the Iraqi cardiac centers being newly established centers and the number of staff in these centers was at a young age, while cardiac centers in Europe and America were old centers and staff were at middle age.

About the gender of the study subjects, the highest percentage were males in the study sample, which is in consistency with [5] in his thesis about "The relationship between self-efficacy and employee commitment among perfusionists", he mentioned that males are the dominant gender in his study (63%). While our findings contradict [6]. This difference, according to researchers, occurs due to the Iraqi ministry of health suffering from a shortage of female sex because an old Iraqi family refused any female members to participate in the nursing field, while in other countries there is no idea like this.

Regarding the level of education, the largest group sample of the study graduated from the nursing college for the study sample. Many previous studies were in agreement with this result. They found that the majority of the nurses working in the heart-

lung machine department are graduate from nursing college [7,5,8].

Concerning the year of experience, the result of the present study revealed that the majority of nurses in the study sample are between (1-5) years of experience. This result is supported by [8,1], as their results indicated that the higher percentage of the study groups for years of experience in nursing is less than (5) years.

Regarding years of experience in the cardiopulmonary bypass department, the present study shows that the majority of the study sample are between (1-5) years. These results disagree with another study done by [9] discovered in his study "Fundamental clinical skills of adult cardiopulmonary bypass" that the majority of the study sample had more than (25) years of experience in cardiopulmonary bypass machine, and (Long & Matthews, 2016) discovered that the majority of the nurses in the study groups had more than (30) years. This variation, I think as a researcher, occurred due to the oldest building of these centers with staff at the same time as these centers while our centers were assembled later.

About training sessions toward cardiopulmonary bypass machine, the study show that few number of the sample in this study had training sessions. This result disagrees with several studies that indicate in their results that the majority of the study sample had good numbers of training sessions [10] These differences, I think, are related to the weak interest of the health governorate and the low budget of these centers.

Concerning the number of training courses, the study shows that a very small study sample has training courses, while other studies have results that disagree with this study as the sample has more than 1000 hours of training course [4]

The current study's findings indicated that the study sample's knowledge is lacking in the pre-test, with approximately 53% of the study sample failing

the pre-test and approximately 40% of the study sample having a fair level of knowledge. Many studies support this result where they found pre-test knowledge was poor [11]

[12] also shows that in her study on knowledge of nurses' care for patients connected to extracorporeal membrane, they discovered that nurses' knowledge of educational programs improved compared to before the educational program.

[13] In their study "impact of an evidence-based educational program about pediatric open-heart surgery care on both nurses and patients' outcomes" they concluded there a deficit knowledge of nurses about cardiopulmonary bypass machine before participation in the educational intervention.

In regarding to the result in the above tables show that nurses knowledge regarding management of cardiopulmonary bypass machine has been improved after exposure to educational program on guideline. This indicates by the significant difference between pre-test and post-test result, which is supported by a previous study, which indicated that there is a high significance difference between pre-posttest [12]

Present study is supported by many studies that mentioned there are highly significant differences for nurses' knowledge in pre and post-test of the study sample [13]

This result is in agreement [14,15], who indicates that providing postoperative education classes to nurses can be successful in increasing nurses' knowledge. Therefore, the implemented educational program is effective and has an impact on nurse's knowledge about cardiopulmonary bypass machine. Concerning the result related to associations between post-test and demographical data in

Regarding to the age, the result of the present study show that a significant association between age and nurses' knowledge at p-value (0.035). This result is agreed with [5] who stated in their study that there

is a significant association between age and nurses' knowledge toward cardiopulmonary bypass machine.

According to year of experience in hospital, the study explains that is a significant association with nurses' knowledge about clinical guide line of cardiopulmonary bypass machine as the study explain that highest mean was (2) at rating (16-20) at P-value (0.014).

Regarding years of experience in heart lung machine department, the present study show that a significant association between years of experience as a perfusionist and nurses' knowledge at p-value (0.027). This result is agreed with [9]

The study reveals that there is no significant association between post-test and gender. The results of the present study are supported by other studies that indicated no significant association between gender and knowledge. [16]

Conclusion

1. The level of nurses' knowledge towards cardiopulmonary bypass machines in open-heart surgery was a deficit in different domains. Also, there was a significant relationship between nurses' knowledge and experience in the hospital as well as nurses as a perfusionist in Al-Najaf center for cardiac surgery and trans-catheter therapy.

2. Because patients are exposed to several complications undergoing extracorporeal circulation, therefore the improving in nurses' perfusionist knowledge that occur during educational program can have favorable effect on the incidence of these complications..

3. The study concluded that educational program can improve in nurses' knowledge and to produce perfusionists who are able to successfully apply their knowledge and skills to improve patients' outcome.

Recommendations:

1. There is a need for a written program for all

new nurses working in heart-lung machine department. Moreover, there is a need for implement an active updated educational activities through seminar and symposium to all nurses concerning cardiopulmonary bypass machine.

2. Further study with larger sample to include other Iraqi governorates is necessary in nurse's knowledge concerning cardiopulmonary bypass machine in order to demonstrate more clearly

3. The study recommended a written program for all new nurses working in heart-lung machine department, and improving the expertise of nurses and medical staff through use the finding of the present study to give care for the patient.

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Conflict of Interest: None to declare.

Ethical Clearance: "All experimental protocols were approved under the College of nursing and carried out in accordance with approved guidelines".

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