

## Effect of an Educational Program about Blood Transfusion on Nurses' Practices at Intensive Care Unit

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### ABSTRACT

**Background:** For implementing the blood transfusion safely, it is very important for health institutions to adopt national transfusion programs and establish blood transfusion protocols because of many hospital transfusion protocols and related nursing competencies have been based on traditions and assumptions than on scientific evidence based. **Aim:** The study aimed to determine the effect of an educational program about blood transfusion on nurses' practices at intensive care units. **Study design:** A quasi-experimental study design was utilized in this study. **Setting:** This study was carried out in the Intensive Care Units of six hospitals affiliated with Egypt Health Care Authority in Port Said Gavernerate. **Subjects :** A purposive sample technique was used to select 108 nurses at the intensive care units were included. **Tools:** one tool was used for the collection of data, Nurses' Observational Checklis. **Results:** The study findings revealed that practice among the majority of studied nurses were satisfactory and improved significantly post- educational program and during follow up period compared to control group. There is a highly positive statistically significant relationship between nurses' practices and demographic data (educational level) at  $p \leq 0.001$ . **Conclusion:** The current study concluded that the educational program implementation about blood transfusion had a positive effect on improving nurses' practices at intensive care units. **Recommendation:** Conduct similar studies in different settings and with different populations to enhance the generalizability of the findings. Also, scientific guidelines, posters, and written instructions about blood transfusion in intensive care units and to be included in the procedures.

**Keywords:** Blood transfusion, Educational program, Nurses, Practices.

## **INTRODUCTION**

Transfusion of blood and blood products is a significant part of standard clinical practice because of the life-saving therapeutic advantages they provide (Adila et al., 2018). Blood may be used for replacement in case of hemorrhage or anemia; platelets for patients on chemotherapy or to stop postoperative bleeding; plasma for clotting factors in patients with hemophilia; and immunoglobulin for passive immunity for individuals at the risk of certain infections (Ahmed, 2019). There is, therefore, a very high need for blood and blood products, and this need may continue to increase as the burden of chronic diseases such as cancer and renal failure continues to rise with increasing life expectancy (Bielby et al., 2018).

The healthcare system must not only ensure the availability of the needed blood products but also must pay close attention to appropriate management of patients during administration. Facilities must therefore have established safe blood transfusion practice guidelines so that the entire process involved in availability and transfusion of blood is well monitored, managed, and coordinated (Miao, 2019).

The process of transfusion consists of five interrelated phases: blood grouping and cross-matching, patient preparation before blood bag collection, blood pack collection, pretransfusion initiation of nursing responsibilities, and post transfusion nursing care. Four of these phases are relevant to routine nursing practice. The safety and adequate management of transfusion of blood and blood products, therefore, depends largely on the knowledge and skills of nurses. One of the undesirable yet common associations with transfusion of blood and blood products is adverse transfusion reactions (Hsieh et al., 2018).

Since blood transfusion is a crucial procedure, it requires knowledge and qualified specialists to ensure patient safety. Nursing personnel provide hands-on care for patients who are hospitalized to the hospital for blood transfusions. Blood transfusion therapy or blood replacement is the intravenous (IV) administration of whole blood, its components, or plasma-derived product for therapeutic purposes. Blood transfusion restores intravascular volume with whole blood or albumin, restores oxygen-carrying capacity of blood with red blood cells (RBCs), and provides clotting factors and/or platelets (Perry & Potter, 2019).

A transfusion reaction is an immune system reaction to the transfusion that ranges from a mild response to severe anaphylactic shock or acute intravascular hemolysis, both of them can be

fatal (Harmening, 2019). In addition, these can be placed into two general categories: acute and delayed. First, acute reactions may occur during the infusion or within minutes to hours after the blood product has been infused. Second, delayed reactions may last for days or longer. Moreover, these reactions can be preventable through nursing education which includes the appropriate procedures for the safe and effective transfusion and is considered the highly important goal of patient's safety (Nettina, 2018).

For implementing the blood transfusion safely, it is very important for health institutions to adopt national transfusion programs and establish blood transfusion protocols because of many hospital transfusion protocols and related nursing competencies have been based on traditions and assumptions than on scientific evidence based. Furthermore, it can be achieved through collaboration, developing multidisciplinary strategies, and implementing standards based on evidence-based practice (Encan & Akin, 2019).

Nurses must therefore have acceptable knowledge and competencies in transfusion of blood and blood products. Blood transfusion-related problems remain high despite the existence of guidelines for safe blood transfusion practices by the National Blood Service. A study on adverse transfusion events at Komfo Anokye Teaching Hospital (a tertiary facility which transfuses approximately 17,000 units of blood and blood products annually) reported that adverse transfusion events were as high as 213 per 1000 transfusions (WHO, 2020). The role of nurses is crucial for proper management of transfusion reactions to achieve desirable results, for two main reasons: the process of transfusion is dominated by nursing-related responsibilities, and nurses constitute the last link in the chain of the transfusion proc (Freixo et al., 2017).

Nurses are primary handlers in the process of blood transfusion because they are involved at every step of transfusing blood. Adverse reaction during blood transfusion can be caused by the error of doctors, nurses and blood bank technicians (Panchawagh et al., 2020). A Nurse plays a vital role in certifying blood transfusion safety as the nursing team is accountable for perceiving the blood transfusion indications, inspection of data to avoid errors, providing information about blood transfusion, identifying transfusion reactions and documentation of the procedures.

Nursing team is responsible for exact blood storage and its identification without any mistake (Tavares et al., 2015). Standard guidelines and policies are available in different countries. These guidelines explain major processes of practice of blood transfusion including donor's blood screening for infectious diseases, exploring the need of transfusion, ABO compatibility tests, patient

identification (name, blood group, hospital admission number and ward name etc.). These guidelines tell that a patient should be closely observed for the first 15 minutes as transfusion started (Sapkota et al., 2018) .

### **Significance of the study**

The safety and effectiveness of the transfusion process are dependent on the knowledge and skills of nurses who perform the procedure. Poor practice may result in avoidable complications that may threaten patients' safety. Published work indicated that nurses' practice varied across contexts and highlighted that patients received suboptimal care and incorrect transfusion culminated in death or morbidity (Bielby et al., 2018; WHO, 2020; Michael et al., 2020). According to Serious Hazards of Transfusion program about (62.6%) of all reported adverse reactions were related to unsafe practice by individual staff members (SHOT, 2018).

Furthermore, in Port Said city, there are not updated policies and procedures regarding blood transfusion at the general hospitals and blood banks from 2006 and there are limited training courses affiliated to Ministry of Health held on blood safety or blood transfusion. So, this study is designed to determine the effect of an educational program about blood transfusion on nurses' practices at intensive care units

### **AIM OF THE STUDY**

The present study aimed to determine the effect of an educational program about blood transfusion on nurses' practices at intensive care units.

### **Research objectives**

1. Assess nurses' practice regarding care of patients undergoing blood transfusion.
2. Design an educational program about nurses' practices for patients undergoing blood transfusion.
3. Implement an educational program about nurses' practices for patients undergoing blood transfusion.
4. To evaluate the effect of an educational program a about nurses' practices for patients undergoing blood transfusion.

## **Research Hypothesis**

Nurses' practices of who were exposed to the educational program regarding the care of patients undergoing blood transfusion was higher in the post-assessment phase than pre-assessment phase compared to the control group.

## **SUBJECTS AND METHOD**

### **A. Technical design**

The technical design for the study includes four main categories, study design, setting, subjects, and tools for data collection.

### **Study Design**

Quasi-experimental study design was utilized in this study.

### **Study Setting**

This study was carried out at the Intensive Care Units of six hospitals affiliated to Egypt Health Care Authority including the following hospitals (Al Hayat Port-Foaad Hospital has one ICU with 8 beds), Al Salam Port-Said Hospital has two ICUs with (10 beds and 7 beds), Al Shefaa Medical Complex Hospital has three ICUs with (7 beds, 5 beds, and 5 beds), Al Mobarra Hospital has one ICU with 10 beds, Al Nasr Hospital has two ICUs with (8 beds and 5 beds) and Al Zohor Hospital has one ICU with 10 beds).

### **Study Subjects**

A Purposive sample of 108 nurses who working at intensive care units, and met the following criteria

Inclusion criteria:

- Nurses give direct care to patients undergoing blood transfusions.
- Nurse has experiane one year and more in intensive care units.

The sample was divided into two equal groups:

- a) Control group: 54 nurses who were providing direct care to patients undergoing blood transfusion.
- b) Study group: 54 nurses who were providing direct care to patients undergoing blood transfusion.

### Sample Size

The sample was the total population of nurses as obtained from employees' affairs of six hospitals affiliated Egypt Health care Authority on the first of March 2020 was one hundred and fifty (150) nurses. A sample size of one hundred and twenty (120) nurses was selected randomly. The appropriate sample size for the current study mustn't be less than one hundred and eight (108) nurses according to Krejcie and Morgan's formula for determining sample size for a definite population (**Krejcie & Morgan, 1970**).

*Krejcie and Morgan's Formula*

$$S = \frac{X^2 NP(1 - P)}{d^2 (N - 1) + X^2 P(1 - P)}$$

**S** = required sample size.

**X<sup>2</sup>** = the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841)

**N** = the population size.

**P** = the population proportion (assumed to be 0.50 since this would provide the maximum sample size).

**d** = the degree of accuracy expressed as a proportion (0.05).

**X<sup>2</sup>** = table value of chi-square at degree of freedom =1 for desired confidence level 0.10 = 2.71, 0.05 = 3.841, 0.01 = 6.64, 0.001 = 10.84.

Using

$$S = \frac{(3.841) (150)(0.5)(1 - 0.5)}{(0.05)^2 (150 - 1) + (3.841) (0.5)(1 - 0.5)}$$

$$S = 107.51 \quad \text{nurses}$$

The minimum sample size of the current study must be  $\geq 108$

All the eligible participants from nurses who accepted participation and matched the criteria (120 nurses) were involved in the study. The nurses who participated in the study (108 nurses).

## **Tools for data collection**

One tool was used for the collection

### **TOOL (I): Nurses' Observational Checklists**

This tool was developed by the researcher based on the recent related literatures (Lynn, 2015; Perry & Potter, 2019). It was developed and written in English language to assess nurses' practices regarding care of patients undergoing blood transfusion (needed equipment, pre-transfusion nursing care, during and post-transfusing nursing care).

### **Scoring system**

Nurses' total practices score were distributed as the following: complete done was scored two point, incomplete done was scored one point and not done was scored zero point and were converted to percentage as follows:

- The total score of  $\geq 70\%$  was considered a satisfactory level of practice.
- The total score of  $< 70\%$  was considered an unsatisfactory level of practice (Amer, 2020).

## **B. Operational design**

The operational design included the preparatory phase, content validity, reliability, pilot study, and fieldwork.

### **Preparatory phase**

It was included reviewing relative and recent literature related to the research topic, different studies, and theoretical knowledge of various aspects of the problems using all official websites such as PubMed, Google Scholar, Medline database, CINAHL, EBESCO, Cochrane Database and Scopus, Scientific books, Articles, Periodicals, and Magazines.

### **Content validity**

Data collection tools were developed and tested based on reviewing of relevant literature. A jury of 13 medical experts and nursing experts in the fields of Medical-Surgical Nursing, Critical Care, Emergency Nursing, and Hematology evaluated the study tools.

**Reliability**

Reliability of pretest was carried out to test the reliability: The Cronbach's alpha value (internal consistency) of the Nurses Observational Checklist is 0.901.

**Pilot study**

It was done on 10% (12 nurses) who were given direct care of patients undergoing blood transfusion at the Intensive Care Units in six hospitals affiliated with Egypt Health Care Authority. It was carried out to test the clarity, validity reliability, feasibility, and applicability of tools. According, to the necessary modifications that were performed must be excluded.

**Fieldwork**

- The researcher attended the study setting three days weekly (Saturday, Monday and Thursday) until the calculated sample size was obtained. This study was carried out in the period from January 2022 to November 2022.
- The researcher introduced himself to the nurses, checked their legibility for the study by filling the structured interview sheet and obtained the consent to participate in the study after explaining the aim.
- The study was carried out through the following phases:-
- **Preparatory phase**:-during this phase, data collection tools was developed based on reviewing of recent relevant literature. The researchers reviewed the current and past available literature the available textbooks, articles, magazines, and internet searches to develop the tools for data collection and prepare the teaching package.
- **Assessment phase** (pre- test): -After finalization of the tool, the researcher was assess nurses' practices regarding blood transfusion.
- **Implementation phase** (nursing educational program):- developing an educational program regarding practices about blood transfusion based on the results of the assessment phase (pre-test) through distributing an illustrated booklet on all nurses who participated, using PowerPoint presentations at the training rooms and demonstration of blood transfusion procedure on job training at their units. The schedule of teaching sessions was implemented as one session weekly for each hospital during the day and night shifts.
- The researchers designed the nursing educational program package based on initial assessment information and pertinent literature. The nursing educational program package



addressed nurses' practices regarding care of patients undergoing blood transfusion as follow (nursing care pre-transfusion, during and post-transfusion nursing care).

- Sessions were performed in the Arabic language to ensure that all study subjects were understood, which included (five practical sessions). The duration of sessions for each practical session ranged from 45-55 minutes.

**The content of the educational program is presented in the following table**

Session NO	Subject content	Teaching methods
1	An introductory session that emphasized establishing rapport between the researchers and the studied nurses participating in the study and explanation of the purpose of the program	Discussion
2	Education about pre-preparation of blood transfusion. <ul style="list-style-type: none"> <li>• Blood transfusion preparation</li> <li>• Blood transfusion procedures</li> <li>• Measures taken before, during, and after the blood transfusion</li> </ul>	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Discussion</li> </ul>
3	Education about during blood transfusion. It included, vital sign monitoring, and nursing care procedures pre, during, and post-blood transfusions	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Discussion</li> </ul>
4	Education about post-transfusion nursing care of blood transfusion. Safety measures used during blood transfusions and infection prevention techniques after receiving blood transfusions.	<ul style="list-style-type: none"> <li>• PowerPoint presentation</li> <li>• Teaching videos</li> </ul>
5	Summary of the program and the studied nurses were asked to answer the questionnaire post educational program and during follow up (3 months).	<ul style="list-style-type: none"> <li>• Discussion</li> </ul>

### **Evaluating the educational program**

The educational program instructions were evaluated by a jury of 13 nursing and medical experts in the fields of Medical-Surgical Nursing, Critical Care, and Emergency Nursing and Hematology fields. The research experts in the fields ensured clarity and appropriateness by reviewing the educational program and contents regarding blood transfusion.

**The general aim** of the educational program were to improve nurses' practices in intensive care units regarding blood transfusion.

**Specific objectives:** At the end of the educational program the studied nurses were able to:

- Mention Blood transfusion preparation
- Discuss nursing considerations taken before the blood transfusion process
- Discuss nursing considerations taken during the blood transfusion process
- Discuss nursing considerations taken after the blood transfusion process
- **Evaluation phase** (immediate post-phase):- The effectiveness of educational program on nurses' practices was examined by researcher as he reevaluated nurses' transfusion practices by comparing post-test findings with pre-test results.
- **Follow-up phase** (after three months):- The impact of the nursing program on nurses' practices was determined by reevaluating nurses' transfusion practices and comparing follow-up test results with pre-and post-test findings.

### **C. Administrative design**

For conducting the study, an official letter from the Dean of the Faculty of Nursing, Port-Said University was issued to the administrative authority of the study setting to obtain permission and cooperation to conduct the study after explaining the aim of the study.

### **Ethical Considerations**

Permission for the research study and data collection process was obtained from the director of each setting including the nurses who participated in the study. Furthermore, ethical approval was obtained from the Research Ethics Committee at the Faculty of Nursing – Port Said University as well as from the Head of Medical Surgical Nursing Department Code: NUR(11/5/2020)(17). Informed verbal consent was obtained from each participant after explaining the study's aim. as well as, participation in the study was voluntary and each participant had the right to withdraw from the study at any time without any consequences. Also, ensuring the confidentiality of the information collected and anonymity was guaranteed. The process of data collection did not disturb the harmony of the work of the above-mentioned setting.

## Statistical design

All statistical analyses were performed using SPSS for Windows version 20.0 (SPSS, Chicago, IL). Continuous data were normally distributed and were expressed in mean standard deviation (SD). Categorical data were expressed in numbers and percentages. One-way analysis of variance (ANOVA) test was used for comparison among more than two variables with continuous data. The chi-square test (or Fisher's exact test when applicable) was used for comparison of variables with categorical data. The correlation coefficient test was used to test for correlations between two variables with continuous data. The reliability (internal consistency) test for the questionnaires used in the study was calculated. Statistical significance was set at  $p < 0.05$ .

## RESULTS

**Table (1):** Shows the distribution of demographic characteristics of studied nurses (control & study groups). It was revealed that the highest percentage in both groups age ranged between 20 to less than 30 years old, the majority of the two groups (control & study groups) (68.5% & 70.4% respectively) were females. Concerning the educational level of the studied nurses, less than half of the two groups (control & study groups) (42.6% & 48.1% respectively) had Institute education, and among studied nurses of the control and study groups (55.6% & 40.7% respectively) were single. Finally, the majority of nurses (77.8% & 70.4%) in both groups had a period of ICU experience of less than 10 years. There were no statistically significant differences between the study and control group nurses regarding all aspects of demographic characteristics.

**Table (2):** Shows the distribution of professional characteristics of studied nurses (control & study groups). It was revealed that the majority of the two groups (control & study groups) (88.9% & 87.0% respectively) had not received previous training. Concerning the frequency of blood transfusion practice during the last 6 months among the studied nurses, (52.1%) in the control group had 1 – 4 times compared to (54.0%) in the study group which had had 5 – 8 times. Finally, there were no statistically significant differences between the study and control group nurses regarding all aspects of professional characteristics.

**Table (3):** Illustrates the comparison of the nurses' observational checklist for nurses' practice regarding nursing care of patients undergoing blood among control and study groups at pre-test and post-test, it was noticed that there was no statistically significant difference between control and study group nurses pre- educational program implementation regarding pre, during, and post

practices of blood transfusion. While there was a highly statistically significant difference between control and study groups pre and post-three months pre, during , and post practices of blood transfusion after educational program implementation regarding practices with ( $p \leq 0.001$ ).

**Table (4):** Illustrates the comparison of the nurses' observational checklist for nurses' practice regarding nursing care of patients undergoing blood among control and study groups post-test and follow-up, it was noticed that there was a statistically significant difference and improvement between control and study group nurses post educational program implementation regarding pre, during , and post practices of blood transfusion. Also, there was a highly statistically significant difference between control and study groups post-three months pre, during , and post practices of blood transfusion after educational program implementation regarding practices with ( $p \leq 0.001$ ).

**Figure (1):** Portrays the comparison of the nurses' observational checklist total level for nurses' practice regarding nursing care of patients undergoing blood among control and study groups between pre and post-test, and shows that there was no statistically significant difference between control and study group nurses' pre-educational program implementation regarding practices total level pre, during, and post of blood transfusion. There was a highly statistically significant difference between the nurses' practices total level pre, during, and post of blood transfusion among control and study groups post-educational program implementation with a p. value =  $<0.001$ . It was observed also, that 22.2% of nurses in the control group had a satisfactory practices total level compared to 85.2% in the study group.

**Figure (2):** Portrays the comparison of the Nurses' Observational checklist total level for nurses' practice regarding nursing care of patients undergoing blood among control and study groups between post-test and follow-up, and shows that there was a highly statistically significant improvement between the nurses' practices total level pre, during, and post of blood transfusion among control and study groups immediately post-test of educational program implementation with a p. value =  $<0.001$ . It was observed also, that 22.2 % of nurses in the control group had a satisfactory practices total level compared to 58.2 % in the study group immediately post-test of educational program implementation with a p. value =  $<0.001$ . The same figure illustrates that there was a highly statistically significant difference among nurses in the control and study groups regarding practices total level pre, during, and post of blood transfusion post-three months during follow-up of educational program implementation and a slight decrease where 18.5% of nurses in the control group had a satisfactory practices total level compared to 83.3% in the study group

immediately post-test of educational program implementation with a p. value =  $<0.001$  ( $p \leq 0.001^{**}$ ).

**Table (5):** Shows the association between the nurses' practices and socio-demographics among control and study groups between pre-test and post-test and it was illustrated that there was no statistically significant relationship between nurses' practices and all demographic data during the pretest intervention. Also, there was a highly positive statistically significant relationship between nurses' practices and demographic data as regards educational level at  $p \leq 0.001$  among control and study groups between pre-test and post-test. However, there was no statistically significant relationship between nurses' practices and demographic data as regards age, gender, marital status, and ICU experience after the intervention.

**Table (6):** Shows the association between the nurses' practices and socio-demographics among control and study groups between post-test and follow-up and it was illustrated that there was a highly positive statistically significant relationship between nurses' practices and demographic data as regards educational level among control and study groups between post-test and follow-up at  $p \leq 0.001$ . However, there was no statistically significant relationship between nurses' practices and demographic data as regards age, gender, marital status, and ICU experience at follow-up.

**Table (1):** The socio-demographic characteristics of nurses between Control and Study groups

	Control (n=54)		Study (n=54)		Chi-Square / Fisher's exact test	
	N	%	n	%	X <sup>2</sup>	P
<b>Age (Years)</b>						
20 – 30	39	72.2	32	59.3		
31 – 40	12	22.2	17	31.5		
40 and more	3	5.6	5	9.3	2.052	0.358
<b>Mean ±SD<sup>#</sup></b>	<b>28.8 ±5.4</b>		<b>30.6 ±5.7</b>		<b>0.748</b>	<b>0.455</b>
<b>Gender</b>						
Male	17	31.5	16	29.6		
Female	37	68.5	38	70.4	0.044	0.835
<b>Educational Level</b>						
School	7	13.0	7	13.0		
Institute	23	42.6	26	48.1		
Bachelor	16	29.6	12	22.2		
Postgraduate	8	14.8	9	16.7	0.814	0.846
<b>Marital Status</b>						
Single	30	55.6	22	40.7		
Married	24	44.4	32	59.3	2.374	0.123
<b>Years of experience ICU</b>						
Less than 10	42	77.8	38	70.4		
10 < 20	9	16.7	11	20.4		
20 and more	3	5.6	5	9.3	0.900	0.638

**Table (2):** The professional characteristics of nurses between Control and Study groups

	Control (n=54)		Study (n=54)		Chi-Square / Fisher's exact test	
	N	%	N	%	X <sup>2</sup>	P
<b>Previous training</b>						
Yes	6	11.1	7	13.0		
No	48	88.9	47	87.0	0.087	0.767
<b>Availability of the department's booklet</b>						
Yes	2	3.7	3	5.6		
No	52	96.3	51	94.4	0.210	0.647
<b>If yes, did you read the booklet?</b>						
	(n=2)		(n=3)			
Yes	2	100.0	1	33.3		
No	0	0.0	2	66.7	2.222	0.136
<b>Availability of brochures</b>						
Yes	6	11.1	9	16.7		
No	48	88.9	45	83.3	0.697	0.404
<b>the frequency of blood transfusion knowledge during the last 6 months</b>						
1 – 4 times	25	52.1	18	36.0		
5 – 8 times	18	37.5	27	54.0		
9 – 12 times	5	10.4	9	16.7	3.742	0.154

#: Student's t-test

**Table (3):** Nurses' practice regarding nursing care of patients undergoing blood among control and study groups pre and post program implementation

	Pre – Test				Significance Test <sup>s</sup>	Post – Test				Significance Test <sup>s</sup>
	Control (n=54)		Study (n=54)			Control (n=54)		Study (n=54)		
	n	%	N	%		N	%	n	%	
<b>Pre-transfusion</b>										
Unsatisfactory Practice	46	85.2	44	81.5	X <sup>2</sup> =0.266, P=0.605	43	79.6	10	18.5	X <sup>2</sup> =40.347, P<0.001**
Satisfactory Practice	8	14.8	10	18.5		11	20.4	44	81.5	
<b>During transfusion</b>										
Unsatisfactory Practice	45	83.3	46	85.2	X <sup>2</sup> =0.069, P=0.791	42	77.8	9	16.7	X <sup>2</sup> =40.458, P<0.001**
Satisfactory Practice	9	16.7	8	14.8		12	22.2	45	83.3	
<b>Post transfusion</b>										
Unsatisfactory Practice	47	87.0	45	83.3	X <sup>2</sup> =0.293, P=0.588	44	81.5	7	13.0	X <sup>2</sup> =50.860, P<0.001**
Satisfactory Practice	7	13.0	9	16.7		10	18.5	47	87.0	
<b>Total practice</b>										
Unsatisfactory Practice	46	85.2	43	79.6	X <sup>2</sup> =0.574, P=0.448	42	77.8	8	14.8	X <sup>2</sup> =43.051, P<0.001**
Satisfactory Practice	8	14.8	11	20.4		12	22.2	46	85.2	

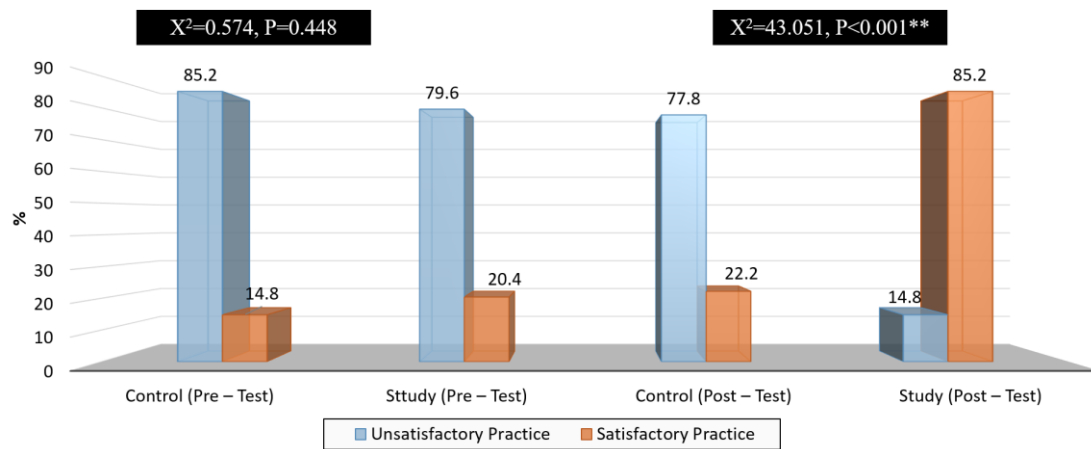
§: Chi-Square Test

**Table (4):** Nurses' practice regarding nursing care of patients undergoing blood among control and study groups at post-test and follow-up

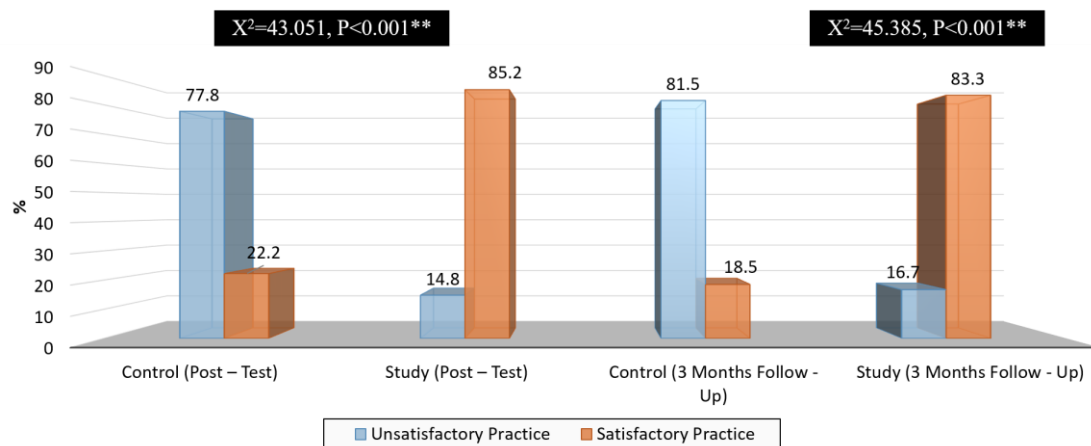
	Post – Test				Significance Test <sup>§</sup>	Follow – Up (3 Months)				Significance Test <sup>§</sup>
	Control (n=54)		Study (n=54)			Control (n=54)		Study (n=54)		
	n	%	N	%		N	%	n	%	
<b>Pre-transfusion</b>										
Unsatisfactory Practice	43	79.6	10	18.5	X <sup>2</sup> =40.347, P<0.001**	45	83.3	8	14.8	X <sup>2</sup> =50.721, P<0.001**
Satisfactory Practice	11	20.4	44	81.5		9	16.7	46	85.2	
<b>During transfusion</b>										
Unsatisfactory Practice	42	77.8	9	16.7	X <sup>2</sup> =40.458, P<0.001**	44	81.5	11	20.4	X <sup>2</sup> =40.347, P<0.001**
Satisfactory Practice	12	22.2	45	83.3		10	18.5	43	79.6	
<b>Post transfusion</b>										
Unsatisfactory Practice	44	81.5	7	13.0	X <sup>2</sup> =50.860, P<0.001**	45	83.3	10	18.5	X <sup>2</sup> =45.385, P<0.001**
Satisfactory Practice	10	18.5	47	87.0		9	16.7	44	81.5	
<b>Total practice</b>										
Unsatisfactory Practice	42	77.8	8	14.8	X <sup>2</sup> =43.051, P<0.001**	44	81.5	9	16.7	X <sup>2</sup> =45.385, P<0.001**
Satisfactory Practice	12	22.2	46	85.2		10	18.5	45	83.3	

§: Chi – Square Test





**Figure (1):** Total nurses' practices level regarding nursing care of patients undergoing blood among control and study groups between pre and post-test



**Figure (2):** Total nurses' practices level regarding nursing care of patients undergoing blood among control and study groups between post-test and follow-up

**Table (5):** Association between nurses’ observational checklist for nurses' practice regarding nursing care of patients undergoing blood and socio-demographic among control and study groups between pre-test and post-test

	Pre – Test								Post – Test							
	Control (n=54)				Study (n=54)				Control (n=54)				Study (n=54)			
	Unsatisfactory (n=46)		Satisfactory (n=8)		Unsatisfactory (n=43)		Satisfactory (n=11)		Unsatisfactory (n=42)		Satisfactory (n=12)		Unsatisfactory (n=8)		Satisfactory (n=46)	
	n	%	n	%	n	%	N	%	n	%	n	%	n	%	n	%
<b>Age (Years)</b>																
20 – 30	32	69.6	7	87.5	27	62.8	5	45.5	31	73.8	8	66.7	7	87.5	25	54.3
31 – 40	11	23.9	1	12.5	12	27.9	5	45.5	9	21.4	3	25.0	1	12.5	16	34.8
More than 40	3	6.5	0	0.0	4	9.3	1	9.1	2	4.8	1	8.3	0	0.0	5	10.9
<b>Fisher’s exact test</b>	<b>X<sup>2</sup>=1.225, P=0.542</b>				<b>X<sup>2</sup>=1.301, P=0.522</b>				<b>X<sup>2</sup>=0.334, P=0.846</b>				<b>X<sup>2</sup>=3.208, P=0.201</b>			
<b>Gender</b>																
Male	15	32.6	2	25.0	10	23.3	6	54.5	14	33.3	3	25.0	2	25.0	14	30.4
Female	31	67.4	6	75.0	33	76.7	5	45.5	28	66.7	9	75.0	6	75.0	32	69.6
<b>Chi-Square / Fisher</b>	<b>X<sup>2</sup>=0.183, P=0.669</b>				<b>X<sup>2</sup>=4.113, P=0.043*</b>				<b>X<sup>2</sup>=0.300, P=0.584</b>				<b>X<sup>2</sup>=0.097, P=0.756</b>			
<b>Educational Level</b>																
School	7	15.2	0	0.0	5	11.6	2	18.2	4	9.5	3	25.0	4	50.0	3	6.5
Institute	21	45.7	2	25.0	24	55.8	2	18.2	20	47.6	3	25.0	4	50.0	22	47.8
Bachelor	11	23.9	5	62.5	7	16.3	5	45.5	12	28.6	4	33.3	0	0.0	12	26.1
Postgraduate	7	15.2	1	12.5	7	16.3	2	18.2	6	14.3	2	16.7	0	0.0	9	19.6
<b>Chi-Square</b>	<b>X<sup>2</sup>=5.358, P=0.147</b>				<b>X<sup>2</sup>=6.241, P=0.100</b>				<b>X<sup>2</sup>=2.953, P=0.399</b>				<b>X<sup>2</sup>=13.597, P&lt;0.001**</b>			
<b>Marital Status</b>																
Single	25	54.3	5	62.5	20	46.5	2	18.2	21	50.0	9	75.0	4	50.0	18	39.1
Married	21	45.7	3	37.5	23	53.5	9	81.8	21	50.0	3	25.0	4	50.0	28	60.9
<b>Fisher’s exact test</b>	<b>X<sup>2</sup>=0.183, P=0.668</b>				<b>X<sup>2</sup>=2.912, P=0.088</b>				<b>X<sup>2</sup>=2.362, P=0.124</b>				<b>X<sup>2</sup>=0.333, P=0.564</b>			
<b>ICU Experience</b>																
Less than 10	37	80.4	5	62.5	31	72.1	7	63.6	33	78.6	9	75.0	8	100.0	30	65.2
10 – 20	7	15.2	2	25.0	8	18.6	3	27.3	7	16.7	2	16.7	0	0.0	11	23.9
More than 20	2	4.3	1	12.5	4	9.3	1	9.1	2	4.8	1	8.3	0	0.0	5	10.9
<b>Chi-Square</b>	<b>X<sup>2</sup>=1.488, P=0.475</b>				<b>X<sup>2</sup>=0.413, P=0.814</b>				<b>X<sup>2</sup>=0.230, P=0.892</b>				<b>X<sup>2</sup>=3.954, P=0.138</b>			

§: Chi – Square Test

**Table (6):** Association between Nurses' Observational checklist for nurses' practice regarding nursing care of patients undergoing blood and socio-demographic among control and study groups between post-test and follow-up

	Post – Test								Follow – Up (3 Months)							
	Control (n=54)				Study (n=54)				Control (n=54)				Study (n=54)			
	Unsatisfactory (n=42)		Satisfactory (n=12)		Unsatisfactory (n=8)		Satisfactory (n=46)		Unsatisfactory (n=44)		Satisfactory (n=10)		Unsatisfactory (n=9)		Satisfactory (n=45)	
	n	%	n	%	n	%	N	%	n	%	n	%	n	%	n	%
<b>Age (Years)</b>																
20 – 30	31	73.8	8	66.7	7	87.5	25	54.3	32	72.7	7	70.0	6	66.7	26	57.8
31 – 40	9	21.4	3	25.0	1	12.5	16	34.8	9	20.5	3	30.0	3	33.3	14	31.1
More than 40	2	4.8	1	8.3	0	0.0	5	10.9	3	6.8	0	0.0	0	0.0	5	11.1
<b>Fisher's exact test</b>	<b>X<sup>2</sup>=0.334, P=0.846</b>				<b>X<sup>2</sup>=3.208, P=0.201</b>				<b>X<sup>2</sup>=1.024, P=0.599</b>				<b>X<sup>2</sup>=1.112, P=0.574</b>			
<b>Gender</b>																
Male	14	33.3	3	25.0	2	25.0	14	30.4	11	25.0	6	60.0	3	33.3	13	28.9
Female	28	66.7	9	75.0	6	75.0	32	69.6	33	75.0	4	40.0	6	66.7	32	71.1
<b>Chi-Square / Fisher</b>	<b>X<sup>2</sup>=0.300, P=0.584</b>				<b>X<sup>2</sup>=0.097, P=0.756</b>				<b>X<sup>2</sup>=4.627, P=0.031*</b>				<b>X<sup>2</sup>=0.071, P=0.790</b>			
<b>Educational Level</b>																
School	4	9.5	3	25.0	4	50.0	3	6.5	6	13.6	1	10.0	5	55.6	2	4.4
Institute	20	47.6	3	25.0	4	50.0	22	47.8	21	47.7	2	20.0	4	44.4	22	48.9
Bachelor	12	28.6	4	33.3	0	0.0	12	26.1	11	25.0	5	50.0	0	0.0	12	26.7
Postgraduate	6	14.3	2	16.7	0	0.0	9	19.6	6	13.6	2	20.0	0	0.0	9	20.0
<b>Chi-Square</b>	<b>X<sup>2</sup>=2.953, P=0.399</b>				<b>X<sup>2</sup>=13.597, P&lt;0.001**</b>				<b>X<sup>2</sup>=3.495, P=0.321</b>				<b>X<sup>2</sup>=19.345, P&lt;0.001**</b>			
<b>Marital Status</b>																
Single	21	50.0	9	75.0	4	50.0	18	39.1	23	52.3	7	70.0	3	33.3	19	42.2
Married	21	50.0	3	25.0	4	50.0	28	60.9	21	47.7	3	30.0	6	66.7	26	57.8
<b>Fisher's exact test</b>	<b>X<sup>2</sup>=2.362, P=0.124</b>				<b>X<sup>2</sup>=0.333, P=0.564</b>				<b>X<sup>2</sup>=1.037, P=0.309</b>				<b>X<sup>2</sup>=0.245, P=0.620</b>			
<b>ICU Experience</b>																
Less than 10	33	78.6	9	75.0	8	100.0	30	65.2	33	75.0	9	90.0	8	88.9	30	66.7
10 – 20	7	16.7	2	16.7	0	0.0	11	23.9	8	18.2	1	10.0	1	11.1	10	22.2
More than 20	2	4.8	1	8.3	0	0.0	5	10.9	3	6.8	0	0.0	0	0.0	5	11.1
<b>Chi-Square</b>	<b>X<sup>2</sup>=0.230, P=0.892</b>				<b>X<sup>2</sup>=3.954, P=0.138</b>				<b>X<sup>2</sup>=1.245, P=0.537</b>				<b>X<sup>2</sup>=1.981, P=0.371</b>			

\$: Chi – Square Test

## **DISCUSSION**

In the blood transfusion process, by becoming educated practitioners, nurses can demonstrate their skills and competency in this field. This led to increased compliance, in high risk areas, of the transfusion process, such as patient identification procedures and record keeping. Further, it will improve patient outcomes, and reduce procedure risk and error rates (Palmer, 2015).

One of the most important medical procedures is the appropriate blood transfusion method, which is dangerous without adequate and specific skills (Yousefian et al., 2015). According to Serious Hazards of Transfusion (SHOT) program about less than three quarters of all reported adverse events are recognized to the improper transfused blood component. Developing blood transfusion policy and strategy, including appropriate guidelines as well as, providing training programs for nursing staff is an essential domain for a successful transfusion, improving the quality of health care, and acquiring new knowledge and skills (Illingworth & Gray, 2013). Training programs should be given in conjunction with a guided clinical practice, where nurses can apply blood transfusion and develop skills safely and competently (Tavares et al., 2015).

The current study found that there were no statistically significant differences between the study and control group nurses regarding all aspects of demographic characteristics. This is supported by Islami, (2018) who made sure that the data were reliable and had good randomization.

In the present study, the socio-demographic characteristics of the studied nurses revealed that the highest percentage in both groups age ranged between 20 to less than 30 years old, and the majority of them were females. This finding may due to that nursing education in the past was specialized only to females. These findings are similar with Abd Elhy & Kasemy (2017) showed that the majority of the studied sample was female. Moreover, Kavaklioglu et al., (2017) mentioned that less than three quarters of nurses were aged  $\leq 29$  years, and 94% of them were female.

The current study found that the majority of the two groups of nurses were not received previous training related to blood transfusion. This finding is in agreement with Abolwafa et al., (2018), who reported that all of the studied nurses didn't receive any training courses about blood transfusion, Khalaf et al., (2017), who indicated that only

about one-third of the studied nurses had received training courses related to transfusion. While this finding not agrees with Kavaklioglu et al., (2017), who mentioned that more than three quarters of participants had received training about the transfusion of blood and blood products. Kabinda et al., (2014) added that traineeship and teaching are paramount for all staff involved in the transfusion operation and as they diminish transfusion mistakes. Similarly, this gave support to the rationale of the present study result.

Concerning educational level of the studied nurses and related qualifications, the current results showed that the high percentage of studied nurses had a nursing technical institute. This finding reflected a shortage of high graduated nurses attached and working at Port Said Hospital who were always busy with administrative duties. While this result not proportionate with Yesilbalkan et al., (2019), who reported that the plurality of the nurses had a bachelor's degree and was not members of a professional association.

Regarding nurses' experiences in the ICU field, the majority of nurses in both groups had a period of ICU experience less than 10 years. This finding consistent with Abolwafa et al., (2018), who found that more than half of nurses had from 1:5 years of experience. Also, Khalil et al., (2013) revealed that the plurality of nurses had 5 - 10 years of experience in the medical department.

Regarding frequency of practicing of participant nurses in blood transfusion during last 6 months, the present result illustrated that more than half of them were sharing in blood transfusion in the control group for 1 – 4 times and in the study group was had 5 – 8 times. From the researchers' view that the longer duration of experience in blood transfusion and the number of transfusions per week. These findings agree with Hijji et al., (2018), clarified that more than three quarters of nurses administered blood transfusions with a hesitancy that ranged from 1-4 times.

In the same issue, the studied nurses in different settings of their work were having a competent level of practice post-educational program versus pre-education program, where they couldn't get a passing level as regards preparatory, procedure and nursing intervention of blood transfusion phase. In this point Hijji et al, (2018) added that the safety and effectiveness of the transfusion process is dependent on the knowledge and skills of nurses who perform the procedure. These findings may reflect the positive effect

of educational program to achieve main goal of this study, and may help increase self-confidence of studied nurses to make right decisions during urgent situations such as blood transfusion reaction.

The current study revealed that an improvement in the practice score obtained by nurses after implementation of nursing program immediately and after three month of follow up. This has been concluded by the presence of significant differences between results of pre-test and post-test. This may be attributed to lack of continuous education and in-service training program. In the present study high percent of nurses done low level of error immediately post-program and after three month. This due to the continued nursing education programs will increase practice. This agrees with Dey, & Singhn (2016) who stated that Transfusion of blood saves life. Nurses being responsible for the final bedside check before transfusion, have the final opportunity to prevent a mis-transfusion. An understanding and knowledge of the pathophysiology of transfusion reactions, symptoms and treatment is essential to safely administer and monitor transfusion.

Regarding participant nurses' practice of safe blood transfusion pre and post nursing educational program of the educational bundle, the current results showed that there were a highly statistically significant difference and improvement of nurses' practices in all phases of blood transfusion procedure post nursing educational program compared to pre- nursing educational program. From the researcher's point of view, it reflected the positive effects of the nursing educational program.

Concerning overall satisfactory nurses' practice of blood transfusion, pre- nursing educational program was two thirds that improved to the majority in post- intervention of nursing educational program. This finding goes in line with Encan, and Akin (2019), who stated that nurses require evidence-based professional knowledge and skills to improving their competency, and need adequate practice to, improves therapeutic effects of blood transfusion and decreases transfusion-related adverse reactions. So, in the process of ensuring safe blood transfusion, monitoring and safe practices have huge importance. Moreover, Sapkota et al., (2018) noticed that the plurality of the sample had scanty information related to blood transfusion and clarified that lacking education, traineeship programs lead to weak nurses' knowledge regarding transfusion. Meanwhile, Islami (2018) reported that most of the nurses in his study had insufficient knowledge and

intermediate performance, and concluded that there was necessary to improve nurses' level of performance to ensure the safety of blood transfusion and suggested that an intervention can be improved; update nurses' acquisition competent practices related to such topic.

Moreover, this finding congruent with Khalaf et al., (2017), who exhibited that the majority of the studied nurses, had inefficient practices before the enforcement of the program as a contrast to after enforcement of the program, where the majority of them had efficient practices. These findings may reflect the positive effect of the educational bundle to achieve the main goal of this study and may help increase the self-confidence of studied nurses to make the right decisions during urgent situations such as blood transfusion reaction.

The current study found that in the comparison of the nurses' practices among control and study groups between pre-test and post-test, it was noticed that there was no statistically significant difference between control and study group nurses' educational program implementation regarding practices of blood transfusion. From the researchers' point of view, it reflected the crucial need of the nurses to implement this program. This may be attributed to, that the highest percentage of the nurses had fewer experience years in blood transfusion and less sharing in blood transfusion weekly. This finding is congruent with Ddungu et al., (2018), who revealed that less than two thirds of the studied sample acknowledged they lacked knowledge and needed training in transfusion medicine. Also, Lee et al., (2016) clarified that about one-third of participants didn't distinguish the timing for measurement of vital signs post-initiated blood transfusion. Too, Tavares et al., (2015) mentioned that the lowest score was recorded for the nursing activities during the transfusion process.

Regarding participant nurses' practices about blood transfusion, the present result showed that there was a highly statistically significant difference between control and study groups pre and post-three months of educational program implementation regarding knowledge. From the researcher's point of view, it reflected the crucial need of the nurses to implement this program. This result supported by Khalaf et al., (2017) demonstrated that nurses' practices about preparation essentials and principles related to blood transfusion, was unsatisfactory in the pre-training phase, but it got better significantly in the post-training phase, This applied to whole associated fields of knowledge.

Also, Saad et al., (2016) mentioned that overall, the nurses had significant knowledge deficits of blood transfusion. Since good awareness of transfusion reactions by nurses enables rapid intervention and management, there was a need for a compulsory ongoing educational program to improve their knowledge.

Regarding participant nurses' practices about blood transfusing post-nursing educational program, the current results indicated that the majority of studied nurses had satisfactory practices post-program, with a highly statistically significant difference and improvement in most nurses' knowledge items post-program compared to pre-program. This result was in agreement with Kavaklioglu et al., (2017) stated that most of the study participants were advised of persistent coaching related to the transfusion of blood and blood products. This improvement may be due to many reasons, knowledge refreshment through the educational program, relevance of the booklet content items and easy language of it, and clarity of educational program materials. These findings agree with Abolwafa et al., (2018), who showed a significant improvement in all items of practice among the studied nurses after the educational program implementation and this led to an improvement in patients' outcomes.

The current findings are in the same line with Encan and Akin (2019), who found that nurses didn't have sufficient knowledge regarding the causes of blood transfusion reactions or the appropriate precautions and interventions required to prevent or manage blood transfusion reactions. Meanwhile, Khalaf et al., (2017) demonstrated that there were very low levels of knowledge among studied nurses before the enforcement of the program.

The results of the current study revealed that there was a highly statistically significant improvement among nurses in the studied groups regarding knowledge about blood transfusion immediately post and after three months of educational program implementation. From the researcher's point of view, it reflected the success of the nursing educational program. Smith et al., (2017) suggested a 6-monthly practical-oriented training program to prevent degradation of knowledge over some time. Focused training of nurses who work in departments where blood transfusion is carried out regularly including the Hematology–Oncology ward, and ICU must be done regularly. Staff training has become an integral part of any successful hospital transfusion program.



The current study results illustrated that there was a highly statistically significant difference among nurses in the control and study groups regarding knowledge about blood transfusion post-three months during follow-up of educational program implementation and a slight decrease where about quarters of nurses in the control group had a satisfactory knowledge total level compared to the majority in the study group immediately post-test of educational program implementation. The positive feedback of the educational program in the current study on nurses' knowledge may help them in the nursing intervention phase during blood transfusion therapy. Along the same line, other studies supported the result of the current study, such as that of Michael et al., (2020) which reported that in their experimental study on a stratified sample of 48 nurses showed that erroneous decisions occurred in less than one fifth of the 576 blood compatibility tests were performed at the bedside which underscored the importance of continuing efforts to update practices of nurses about this transfusion safety procedure.

There was another study emphasized the importance of developing a guideline to improve personnel's level of practice (Reza et al., 2019). The findings of the present study showed a significant difference between performance scores before and after the intervention. This finding was in agreement with other studies (Aghajani et al., 2019).

The current study results found that there was a highly positive statistically significant relationship between nurses' practices and demographic data as regards educational level among control and study groups between pre-test and post-test. However, there was no statistically significant relationship between nurses' practices and demographic data as regards age, gender, marital status, and ICU experience after the intervention. From the research point of view, it can be explained that the nurses with high educational levels had more information and had more satisfactory level of practices.

## **CONCLUSION**

Based on the results of this study, the current study concluded that implementing an educational program for nurses regarding care of patients undergoing blood transfusion has positive effect in nurses' practices

## RECOMMENDATION

*Based on the findings and conclusion of this study, the following recommendations suggested:*

- Conduct similar studies in different settings and with different populations to enhance the generalizability of the findings.
- Scientific guidelines, posters, and written instructions about blood transfusion in intensive care units and to be included in the procedures.
- Continuous educational and training program for all nurses about blood transfusion to improve their practices
- All nurses must receive training program in blood transfusion.
- Nurses who have been trained and have specific qualifications in blood transfusion method are allowed to practice it.
- Nursing training curricula reflect the requirements of modern transfusion method and other specialized fields of critical care units such as hematological, intensive care and neurosurgical units.
- Implementation and evaluation of continuous training programs is carried out in order to improve the quality and safety of blood transfusion
- In-service training programs based on evidence practice and regular inter-professional meeting that illustrate purposes and guideline procedure of safe blood transfusion administration to nursing staff that have positive effects on patient's safety outcomes should be provided.
- Establishing skills and competencies tools for continuous assessment of nursing knowledge and practices to improve the blood transfusion administration

## References

- Abd Elhy, A.H. & Kasemy, Z.A, (2017). Nurses' knowledge assessment regarding blood transfusion to ensure patient safety. *Journal of Nursing and Health Science*; 6(2): pp.104-111. ISSN: 2320–1940.
- Abolwafa, N. F, Mohamed, H. A. & Hossein, E. Y. (2018). Improving the quality of nursing care among school-age children with thalassemia major as regards blood transfusion. *IOSR Journal of Nursing and Health Science (IOSR-JNHS)*; 7(5): pp.79- 89. ISSN: 2320–1940. Available at: [www.iosrjournals.org](http://www.iosrjournals.org)
- Adila, M., Rooman, N., Ali, A., & Safdar, D. (2018). Practice of Blood Transfusion among Nurses in Public Tertiary Care Hospitals. *Saudi Journal of Nursing and Health Care*, 7921, 184– 189.
- Aghajani, M., Ajorpaz, N.M., Mohammadi, S., & Mohammadi, A. (2019). Designing Multi-media learning software (MLS), Effects on surgical technology students' knowledge, attitude and practice. *Life Science Journal.*;10(SPL. IS):7–11.
- Ahmed, R. (2019). Effects of Intervention Training Module Regarding Hospital Nurse's Preparedness for Patient's Blood Transfusion. 102-116.
- Amer, B. (2020). Assessment of Nurses' Performance Regarding to Children Suffering from Gillian Barre Syndrome Undergoing Plasma Pharesis. Unpublished Master Thesis, Helwan Uni. Fac. Nursing, P.p. 69-71.
- Bielby, L., Peterson, D., & Spigiel, T. (2018). Transfusion Education for Nurses and Transfusion Practitioners in Australia. International Society of Blood Transfusion.

- Ddungu, H., Krantz, E. M., Phipps, W., Naluzze, S., Orem, J., Kiwanuka, N., ... & Kajja, I. (2018). Survey to assess knowledge and reported practices regarding blood transfusion among cancer physicians in Uganda. *Journal of Global Oncology*, 4, 1-12.
- Dey, A. & Singhn, A. (2016). Transfusion transmitted leishmaniasis a case report and review of literature” *Indian Journal med Microbial* . july.24(3):165-70
- Elkattan, B. (2013). Impact of training program regarding for neurological patients in coma upon nurses' performance. Doctoral Thesis in Nursing Science, faculty of Nursing, Ain Shams University; p.120.
- Encan, B. & Akin, S. (2019). Knowledge of Blood Transfusion Among Nurses. *Journal of Continuing Education in Nursing*, 50 (4), 176-177. DOI: 10.3928/00220124-20190319-08
- Freixo, A., Matos, I., Leite, A., Silva, A., Bischoff, F., Carvalho, M., ... & Araújo, F. (2017). Nurses knowledge in Transfusion Medicine in a Portuguese university hospital: the impact of an education. *Blood Transfusion*, 15(1), 49.
- Harmening, D. (2019). Modern blood banking & transfusion practices, (7<sup>th</sup> ed.). Philadelphia: F.A. Davis Company, pp.373-377.
- Hijji, B., Parahoo, K., Hossain, M., & Murray, S. (2018). Nurses' practice of blood transfusion in the United Arab Emirates: an observational study. *Journal of Clinical Nursing*;19 (23-24): 3347- 3357.

- Hsieh, P. L., Chen, S. H., & Chang, L. C. (2018). School nurses' perceptions, knowledge, and related factors associated with evidence-based practice in Taiwan. *International journal of environmental research and public health*, 15(9), 1845
- Illingworth, J., & Gray, A. (2013). Right blood, right patient, right time: RCN guidance for improving transfusion practice. Royal College of Nursing, London W1G 0RN; pp.3-16. ISBN: 978-1-908782-41-0.
- Islami, M. (2018). The impact of an educational program on blood and blood products transfusion on nurses' level of knowledge and performance. *Journal of Medicine and Life*; 11(3):pp.238–242.
- IslamiVaghar, M. (2018). The Impact of an Educational Program on Blood and Blood Products Transfusion on Nurses' Level of Knowledge and Performance. *Journal of medicine and life*, 11(3), 238-242. doi:10.25122/jml-2018-0016
- Kabinda, J.M, Miyanga, S.A, Donnen, P., den Ende, J.V. & Dramaix, M.W. (2014). Knowledge, attitudes and practices of medical and paramedical staff in blood transfusion in the Democratic Republic of Congo. *Open Journal of Preventive Medicine*; 4(3): pp.672-680.
- Kavaklioglu, A. B., Dagci, S. & Oren, B. (2017). Determination of health workers' level of knowledge about blood transfusion. *North Clin Istanbul*; 4(2): pp.165–172. DOI:10.14744/nci.2017.41275
- Khalaf, S.M, Abd El Sadik, B.R. & Bayoumi, M.H. (2017). Effect of training program on nurses' competent practices towards children receiving blood transfusion. *Journal of Nursing and Health Science*; 6(2): pp.54-66. DOI: 10.9790/1959- 0602055466. Available at: [www.iosrjournals.org](http://www.iosrjournals.org).

- Khalil, S.S., Mohammad, Z.A., Ez el-deen, M.E. & Ahmed, N.M. (2013). Impact of implementing a designed nursing intervention protocol on nurses' knowledge and practice regarding patients undergoing blood transfusion. *Med. J. Cairo University; 81(2)*: pp. 163-171.
- Krejcie, R. V., and Morgan, D. W. (1970). Determining Sample Size for Research Activities. *Educational and psychological measurement, 30(3)*, 607-610. doi: 10.1177/001316447003000308.
- Lee, E., Rahim, N. & Tuan Din, S. (2016). Knowledge of blood transfusion among nurses at hospital pulau pinang: nursing responsibilities and patient management related to transfusion reactions. *Education in Medicine Journal; 8(4)*: pp.47–56.
- Lynn, P. (2015). *Taylor's Handbook of Clinical Nursing Skills*, (2<sup>nd</sup> ed.). China : Wolters Kluwer, P.p.135-141.
- Miao, W. (2019). *Understanding the Nursing Practices and Perspectives of Premedication and Transfusion Reaction Reporting: A Qualitative Description Study*.
- Michael, F. M., Charles, A. V. & Rachel, E.D. (2020). Blood transfusion safety: The potential of the patient.12-23.
- Nemati, F., Maali, A., Ahmadi, M.H., Poorkarim, H., Rahmani, H., Tabatabaei, Z.S. & Azad, M. (2019). The Study of Nurses Knowledge and Performance Quality of Qazvin Hospitals about the Process of Blood Transfusion. *Adv. Nurs. Midwifery, 28*, 14–18.
- Nettina, S. (2018). *Lippincott Manual of Nursing Practice*,(11<sup>th</sup> ed.). Philadelphia: Wolters Kluwer, P.p. 1277-1287.

- Palmer, A. (2015). Blood Transfusion error prevention: Nurses' role. American Society of Registered Nurses. *Journal of Nursing*; 2(3):pp.123-129.
- Panch, S.R., Montemayor-Garcia, C., & Klein, H.G. (2019). Hemolytic transfusion reactions. *N. Engl. J. Med.* 2019, 381, 150–162.
- Panchawagh, S.J., Melinkeri, S., Panchawagh, M. J.& Transfusion, B. (2020). Assessment of Knowledge and Practice of Blood Transfusion Among Nurses in a Tertiary Care Hospital in India. 1-6. Pavenski, K., Stanworth, S., Fung, M., Wood, E. M., Pink, J., Murphy, M. F., ... & Shehata, N. (2018). Quality of evidence-based guidelines for transfusion of red blood cells and plasma: a systematic review. *Transfusion Medicine Reviews*, 32(3), 135-143.
- Perry, A. & Potter, P. (2019). *Mosby's pocket guide to nursing skills and procedures*, (9<sup>th</sup> ed.). China: Elsevier Publisher, P.p. 36-37.
- Reis, V. N. d., Paixão, I.B., Perrone, A. C., Monteiro, M.I. & Santos, K. B. d. J. E. (2016). Transfusion monitoring: care practice analysis in a public teaching hospital. *Einstein (São Paulo)*, 14(1), 41-46.
- Reza, P., Aziz, S., Ali, M., Marjan, M. & Reza, T. (2019). Evaluation of knowledge of healthcare workers in hospitals of Zabol city on proper methods of blood and components transfusion. *Asian Journal of Transfusion Science*; 3(2): pp.78–81.
- Saad, N.H., Mohd, N.H., Ramli, M., & Hasan, M.N. (2016). Knowledge on the complications related to blood transfusion among nurses in HUSM, 15th Annual Scientific Meeting, College of Pathologists, Academy of Medicine Malaysia, Hotel Pullman, Putrajaya.

- Sapkota, A., Poudel, S., Sedhain, A., & Khatiwada, N. J. J. o. b. t. (2018). Blood Transfusion Practice among Healthcare Personnel in Nepal: An Observational Study. 2018.
- SHOT, Serious Hazards of Tansfusion. (2018). SHOT Report 2018 / SHOT-Report-2016\_web\_11th-July.
- Smith, A., Gray, A., Atherton, I., Pirie, E.,&Jepson, R. (2017). Does time matter? An investigation of knowledge and attitudes following blood transfusion training. *Nurse Educ Pract* [serial on the Internet]. Jun 18];14(2):176-182. Available from: doi: <http://dx.doi.org/10.1016/j.nepr..08.016>
- Tavares, J.L, Barichello, E., De Mattia, A., & Barbosa, M.H. (2015). Factors associated with knowledge of the nursing staff at a teaching hospital on blood transfusion. *Rev. Latino-Am. Enfermagem*; 23(4): pp.595-602, DOI: 10.1590/0104-1169.0024.2593.
- Tavares, J.L., Barichello, E., Mattia, A. L. D.,& Barbosa, M. H. (2015). Factors associated with knowledge of the nursing staff at a teaching hospital on blood transfusion. 23(4), 595-602.
- World Health Organization. (2020). Universal Access to Safe Blood Transfusion. 2008. Available online: [https://apps.who.int/iris/bitstream/handle/10665/69747/WHO\\_EHT\\_08.03\\_eng.pdf](https://apps.who.int/iris/bitstream/handle/10665/69747/WHO_EHT_08.03_eng.pdf) (accessed on 12 October 2020).
- Yousefian, N., Nikbakht, R., Fazeli, K., Nootizehi, A., Salehinia, H., Yaghoobi, M.,& Hasanzadeh Sooreh, B. (2015). Awareness of health care staff in hospitals of



Zahedan about blood transfusion. *Scientific Journal of Iran Blood Transfus Organ, 11(1), 71-76.*

## تأثير برنامج تعليمي عن نقل الدم على ممارسات الممرضين في وحدات الرعاية المركزة

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### الخلاصة

**المقدمة:** الخلفية: لتنفيذ عمليات نقل الدم بشكل آمن، من المهم جدًا للمؤسسات الصحية أن تتبنى برامج نقل الدم الوطنية وتضع بروتوكولات نقل الدم لأن العديد من بروتوكولات نقل الدم في المستشفيات والكفاءات التمريضية ذات الصلة استندت إلى التقاليد والافتراضات أكثر من كونها مبنية على الأدلة العلمية. **الهدف:** هدفت الدراسة إلى تحديد أثر برنامج تعليمي عن نقل الدم على ممارسات الممرضين في وحدات الرعاية المركزة. **تصميم الدراسة:** تم استخدام تصميم الدراسة شبه التجريبية في هذه الدراسة. **المكان:** أجريت هذه الدراسة في وحدات العناية المركزة لستة مستشفيات تابعة لنظام التأمين الصحي الشامل في محافظة بورسعيد. **العينة:** تم استخدام تقنية أخذ العينات الهادفة لاختيار 108 ممرضة في وحدات العناية المركزة. **الأدوات:** استخدام أداة واحدة لجمع البيانات، قوائم المراقبة الرصدية (الملاحظة) للممرضين. **النتائج:** كشفت نتائج الدراسة أن الممارسة بين غالبية الممرضين محل الدراسة كانت مرضية وتحسنت بشكل ملحوظ برنامج ما بعد التعليم وخلال فترة المتابعة مقارنة بالمجموعة الضابطة. توجد علاقة ذات دلالة إحصائية إيجابية للغاية بين ممارسات الممرضين والبيانات الديموغرافية (المستوى التعليمي) عند مستوى  $p \geq 0.001$ . **الاستنتاج:** خلصت الدراسة الحالية إلى أن تنفيذ البرنامج التعليمي عن نقل الدم كان له تأثير إيجابي على تحسين ممارسات الممرضين في وحدات الرعاية المركزة **التوصيات:** إجراء دراسات مماثلة في مواقع مختلفة ومع مجموعات سكانية مختلفة لتعزيز إمكانية تعميم **النتائج.** وكذلك الإرشادات العلمية والملصقات والتعليمات المكتوبة حول نقل الدم في وحدات الرعاية المركزة وإدراجها في الإجراءات.

**الكلمات المرشدة:** نقل الدم، البرنامج التعليمي، الممرضين، الممارسات