

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

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ABSTRACT

Background: Adherence to standards and policies and ongoing education are essential to maintain the quality of patient care and reduce potential negative transfusion outcomes. **Aim:** The study aimed to determine the effect of blood transfusion educational program on nurses' knowledge 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 the Egypt Health Care Authority in Port Said Gavernerate. **Subjects:** A purposive sampling technique was used to select 108 nurses at the intensive care units were included. **Tools:** Two tools were used for the collection of data, (I) Nurses' data and (II) Nurses' Knowledge Assessment Questionnaire. **Results:** The study findings revealed that knowledge among the majority of studied nurses was satisfactory and improved significantly post-educational program and during the follow-up period compared to the control group. There is a highly positive statistically significant relationship between nurses' knowledge 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' knowledge 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, Knowledge, Nurses.

INTRODUCTION

Blood transfusion can be a lifesaving intervention or a life-threatening and is often a vital need for many therapeutic and surgical procedures to manage hematologic diseases. Nonetheless, blood component therapy only temporarily supports the patient until the underlying problem is resolved. Further, transfusions are not free from hazards, blood transfusion should be used only if needed and with caution (Harding, Kwong, Roberts, Hagler, & Reinisch, 2020).

According to the WHO Report of the Regional Office for the Eastern Mediterranean (2017), there is no complete and accurate data on clinical transfusions, and utilization of blood or its products is limited. In addition, information collected from some countries suggests that national guidelines are often not adhered to be applied by clinicians or may not be effectively distributed and updated. Quality systems and management for the clinical transfusion process are not well-developed in many countries.

Blood transfusion therapy or blood replacement is the intravenous (IV) administration of whole blood, its components, or plasma-derived products for therapeutic purposes. Blood transfusion restores intravascular volume with whole blood or albumin, restores the 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 which 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 a safe and effective transfusion and is considered a highly important goal of patient safety (Nettina, 2018).

Adherence to standards and policies and ongoing education are essential to maintain the quality of patient care and reduce potential negative transfusion outcomes. Therefore, nursing care for patients receiving blood transfusions is a nursing priority. As

well, the role of nurses is critical, articular, and imperative and one of the most important aspects of that role is to demonstrate accurate and careful attention to detail (e.g., preparation, administration, and monitoring) to prevent life-threatening transfusion outcomes (Perry, Potter&Ostendorf, 2018).

To implement blood transfusion safely, health institutions need to use national transfusion guidelines and establish blood banks, transfusion laboratories, and blood transfusion protocols. Developing high-quality and safe blood transfusion services can be achieved through collaboration, developing multidisciplinary strategies, and implementing standards based on evidence-based practice (WHO,2020).The knowledge and skills of healthcare professionals are fundamental to developing and strengthening the quality of blood transfusion procedures. A lack of knowledge by health care professionals may lead to an increased risk of mortality and morbidity associated with blood transfusion. For the safety and quality of blood components and transfusion, determining healthcare professionals' knowledge is necessary for developing educational programs (Hijji, Oweis, & Dabbour, 2018)

Healthcare facilities should establish blood transfusion protocols and adopt national blood transfusion programs to perform blood transfusions safely, because transfusion protocols and related nursing competencies at many hospitals have been based on traditions and assumptions rather than on scientific evidence. Furthermore, it can be achieved through collaboration, developing multidisciplinary strategies, and implementing standards based on evidence-based practice (Encan & Akin, 2019).

Nurses play an essential role in the blood transfusion process by referring patients pre- and post-transfusion, undertaking patient assessment and blood sampling, and administering the blood transfusion.Nurses with evidence-based knowledge of the principles of safe blood transfusion are likely to administer safer blood transfusions and help prevent transfusion-associated morbidities and mortalities (Panchawagh, 2020). Nurses are required to know each step of a safe blood transfusion procedure thoroughly. Results of studies evaluating nurses' blood transfusion knowledge reveal a need to improve nurses' knowledge, skills, and competence. Their knowledge levels and blood transfusion practices can be assessed using questionnaires and observations. Some studies have shown that nurses did not have sufficient knowledge concerning blood transfusion

standards, prevention of possible reactions, and safe blood transfusion practices (WHO, 2020).

Significance of the study

Lack of knowledge may cause nurses to implement unsafe blood transfusion practices or to administer the wrong blood components. According to the Annual Serious Hazards of Transfusion (SHOT) Report (2018), stated that there are 3326 incident reports and 87.3% of them are transfusion errors related to incorrect blood component transfused, handling, and storage errors. Moreover, Egypt is one of seven countries in the Eastern Mediterranean that does not transfusion committee in all of its hospitals (WHO Report of Regional Office for the Eastern Mediterranean, 2017).

Blood components become safer but clinical practice of blood is not safe and can result in fatal outcomes. Bolton-Maggs and Watt (2019) stated that nurses require in-service training to improve their knowledge of safe blood transfusion practices and transfusion errors can be preventable through continuous monitoring, clinical guidelines, standard operating manuals, and regulation.

Furthermore, in Port Said city, there have been no updated policies and procedures regarding blood transfusion at the general hospitals and blood banks since 2006 and there are limited training courses affiliated to the 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' knowledge in intensive care units.

AIM OF THE STUDY

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

Research objectives

1. Assess nurses' knowledge regarding the care of patients undergoing blood transfusion

2. Design an educational program for nurses regarding the care of patients undergoing blood transfusion
3. Implement an educational program for nurses regarding the care of patients undergoing blood transfusion
4. Evaluate the effect of an educational program for nurses regarding the care of patients undergoing blood transfusion on nurses' knowledge.

Research Hypothesis

Nurses' knowledge regarding the care of patients undergoing blood transfusion of who were exposed to the educational program 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 Mobara 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.

X² = 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).

X² = 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

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

$S = 107.51$ nurses

The minimum sample size of the current study must be ≥ 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 of data:

TOOL (I): A Structured Interview Questionnaire

Part (I): Nurses' personal and professional characteristics

It included (e.g., hospital name, gender, age, level of education, years of experience, marital status, and attending previous training courses concerning blood transfusion)

Part (II): Nurses' Knowledge Assessment Questionnaire

This tool was developed by the researcher based on reviewing the recent related literature (Burton & Ludwig, 2015; Harmening, 2019). It was developed and written in Arabic language. It is composed of open and closed-ended questions to assess the nurses' knowledge regarding the care of patients undergoing blood transfusion as follows (definition of blood transfusion, its indications, blood components, pre-transfusion, during and post-transfusion nursing care).

Scoring system

Nurses' total knowledge score was distributed as follows: the complete correct answer was scored two points; the incomplete correct answer was scored one point and the incorrect answer was scored zero point and was converted to percentage as follows:

- A total score of $\geq 70\%$ was considered a satisfactory level of knowledge.
- A total score of $< 70\%$ was considered an unsatisfactory level of knowledge (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' knowledge Assessment Questionnaire was 0.889.

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 out the structured interview sheet and obtained consent to participate in the study after explaining the aim.
- The study was carried out through the following phases:-
- **Preparatory** during this phase, data collection tools were developed based on reviewing 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 tools, the researcher has assessed nurses' knowledge regarding blood transfusion.
- **Implementation phase** (nursing educational program):- develop an educational program regarding knowledge about blood transfusion based on the results of the assessment phase (pre-test) by distributing an illustrated booklet to all nurses who participated, using PowerPoint presentations in the training rooms and demonstrating blood transfusion procedure on the 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 researcher designed the educational program package based on initial assessment information and pertinent literature. The educational program package addressed nurses' knowledge regarding the care of patients undergoing blood transfusion as follows (definition of blood transfusion, its indications, blood components, pre-transfusion, and during and post-transfusion nursing care.
- Sessions were performed in the Arabic language to ensure that all study subjects were understood, which included (six theoretical sessions). The duration of sessions for each theoretical session ranged from 40-50 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 nurses participating in the study and an explanation of the purpose of the program	<ul style="list-style-type: none"> • Discussion
2	Education about blood transfusion definition, indications, blood components, and complications.	<ul style="list-style-type: none"> • Powerpoint presentation • Discussion
3	Education about pre-preparation of blood transfusion and precautions of blood transfusion	<ul style="list-style-type: none"> • Teaching videos
4	Education about during blood transfusion and Blood transfusion principles.	<ul style="list-style-type: none"> • Powerpoint presentation • Discussion
5	Education about post-transfusion nursing care of blood transfusion.	<ul style="list-style-type: none"> • Powerpoint presentation • Teaching videos
6	Summary of the program and the studied nurses were asked to answer the questionnaire post-educational program and during follow-up.	<ul style="list-style-type: none"> • Discussion

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' knowledge in intensive care units regarding blood transfusion.

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

- Define blood transfusion
- List indication and contraindication of blood transfusion
- Mention blood transfusion principles
- Determine precautions for blood transfusion
- Identify risks of blood transfusion

- **Evaluation phase** (immediate post-phase): The effectiveness of educational program on nurses' knowledge was examined by researcher as he reevaluated nurses' transfusion knowledge by comparing post-test findings with pre-test results.

- **Follow-up phase** (after three months):- The effect of educational program on nurses' knowledge was determined by reevaluating nurses' transfusion knowledge 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' knowledge 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 pre-educational program implementation regarding knowledge about blood transfusion. There was a highly statistically significant difference between control and study groups pre and post-three months of educational program implementation regarding knowledge with ($p \leq 0.001$).

Table (4): Illustrates the comparison of the nurses' knowledge among control and study groups between post-test and follow-up, it was observed that there was a highly statistically significant improvement among nurses in the studied groups regarding knowledge about blood transfusion immediately post and post-three months of educational program implementation ($p \leq 0.001^{**}$).

Figure (1): Portrays the comparison of nurses' knowledge total level 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 knowledge total level about blood transfusion. There was a highly statistically significant difference between the nurses' knowledge total level among control and study groups post-educational program implementation with a p. value = <0.001 . It was observed also, that 25.9% of nurses in the control group had a satisfactory knowledge total level compared to 83.3% in the study group.

Figure (2): Portrays the comparison of nurses' knowledge total level among control and study groups between post-test and follow-up, and shows that there was a highly statistically significant improvement between the nurses' knowledge total level among control and study groups immediately post-test of educational program implementation with a p. value = <0.001 . It was observed also, that 25.9 % of nurses in the control group had a satisfactory knowledge total level compared to 83.3% 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 knowledge about blood transfusion post-three months during follow-up of educational program implementation and a slight decrease where 24.1% of nurses in the control group had a

satisfactory knowledge total level compared to 79.6% 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' knowledge 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' knowledge and all demographic data during the pretest intervention. Also, there was a highly positive statistically significant relationship between nurses' knowledge 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' knowledge and demographic data as regards age, gender, marital status, and ICU experience after the intervention.

Table (6): Shows the association between the nurses' knowledge 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' knowledge 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' knowledge 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 ²	P
Age (Years)						
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
Mean ±SD[#]	28.8 ±5.4		30.6 ±5.7		0.748	0.455
Gender						
Male	17	31.5	16	29.6		
Female	37	68.5	38	70.4	0.044	0.835
Educational Level						
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
Marital Status						
Single	30	55.6	22	40.7		
Married	24	44.4	32	59.3	2.374	0.123
Years of experience ICU						
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) : Professional characteristics of nurses between Control and Study groups

	Control (n=54)		Study (n=54)		Chi-Square / Fisher's exact test	
	N	%	N	%	X ²	P
Previous training						
Yes	6	11.1	7	13.0		
No	48	88.9	47	87.0	0.087	0.767
Availability of the department's booklet						
Yes	2	3.7	3	5.6		
No	52	96.3	51	94.4	0.210	0.647
If yes, did you read the booklet?	(n=2)		(n=3)			
Yes	2	100.0	1	33.3		
No	0	0.0	2	66.7	2.222	0.136
Availability of brochures						
Yes	6	11.1	9	16.7		
No	48	88.9	45	83.3	0.697	0.404
the frequency of blood transfusion knowledge during the last 6 months						
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' knowledge among control and study groups between pre and post-test

	Pre – Test					Post – Test				
	Control (n=54)		Study (n=54)		Significance Test [§]	Control (n=54)		Study (n=54)		Significance Test [§]
	N	%	N	%		N	%	N	%	
Blood transfusion' overview										
Unsatisfactory Knowledge	44	81.5	39	72.2	X ² =1.301, P=0.253	38	70.4	11	20.4	X ² =27.233, P<0.001**
Satisfactory Knowledge	10	18.5	15	27.8		16	29.6	43	79.6	
Blood groups										
Unsatisfactory Knowledge	41	75.9	43	79.6	X ² =0.214, P=0.643	37	68.5	8	14.8	X ² =31.327, P<0.001**
Satisfactory Knowledge	13	24.1	11	20.4		17	31.5	45	85.2	
Indications of blood transfusion										
Unsatisfactory Knowledge	45	83.3	43	79.6	X ² =0.245, P=0.620	43	79.6	10	18.5	X ² =40.347, P<0.001**
Satisfactory Knowledge	9	16.7	11	20.4		11	20.4	44	81.5	
Nursing Care regarding blood transfusion										
Unsatisfactory Knowledge	46	85.2	44	81.5	X ² =0.266, P=0.605	42	77.8	7	13.0	X ² =44.925, P<0.001**
Satisfactory Knowledge	8	14.8	10	18.5		12	22.2	46	87.0	
Total Knowledge										
Unsatisfactory Knowledge	44	81.5	42	77.8	X ² =0.228, P=0.632	40	74.1	9	16.7	X ² =35.900, P<0.001**
Satisfactory Knowledge	10	18.5	12	22.2		14	25.9	45	83.3	

§: Chi-Square Test

Table (4): Nurses' knowledge among control and study groups between post-test and follow-up

	Post – Test					Follow – Up (3 Months)				
	Control (n=54)		Study (n=54)		Significance Test [§]	Control (n=54)		Study (n=54)		Significance Test [§]
	N	%	N	%		N	%	N	%	
Blood transfusion' overview										
Unsatisfactory Knowledge	38	70.4	11	20.4	X ² =27.233, P<0.001**	37	68.5	14	25.9	X ² =19.653, P<0.001**
Satisfactory Knowledge	16	29.6	43	79.6		17	31.5	40	74.1	
Blood groups										
Unsatisfactory Knowledge	37	68.5	8	14.8	X ² =31.327, P<0.001**	40	74.1	10	18.5	X ² =33.517, P<0.001**
Satisfactory Knowledge	17	31.5	45	85.2		14	25.9	44	81.5	
Indications of blood transfusion										
Unsatisfactory Knowledge	43	79.6	10	18.5	X ² =40.347, P<0.001**	43	79.6	13	24.1	X ² =33.379, P<0.001**
Satisfactory Knowledge	11	20.4	44	81.5		11	20.4	41	75.9	
Nursing Care regarding blood transfusion										
Unsatisfactory Knowledge	42	77.8	7	13.0	X ² =44.925, P<0.001**	43	79.6	12	22.2	X ² =35.604, P<0.001**
Satisfactory Knowledge	12	22.2	46	87.0		11	20.4	42	77.8	
Total Knowledge										
Unsatisfactory Knowledge	40	74.1	9	16.7	X ² =35.900, P<0.001**	41	75.9	11	20.4	X ² =33.379, P<0.001**
Satisfactory Knowledge	14	25.9	45	83.3		13	24.1	43	79.6	

§: Chi-Square Test

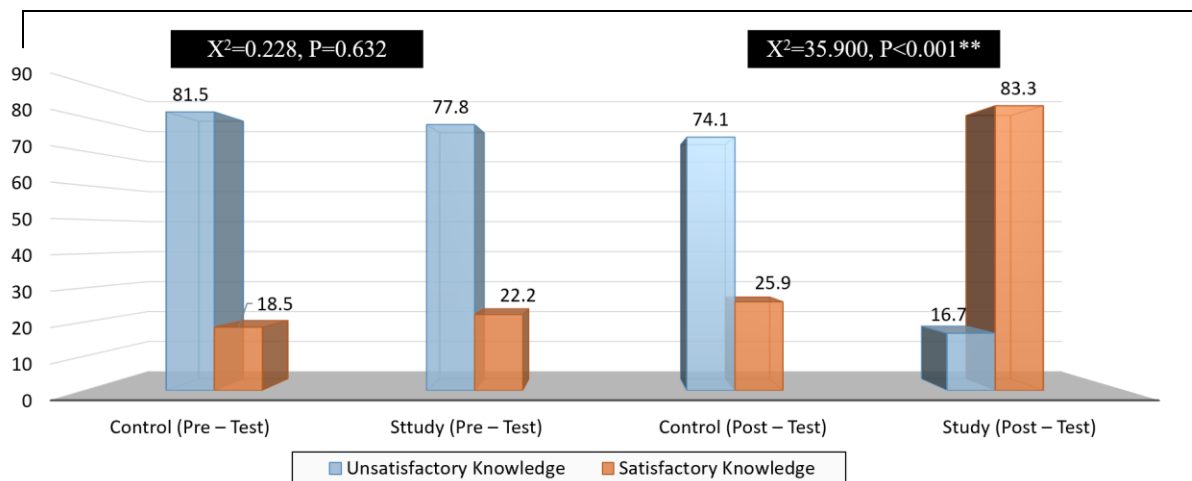


Figure (1): Total nurses' knowledge level among control and study groups between pre and post-test

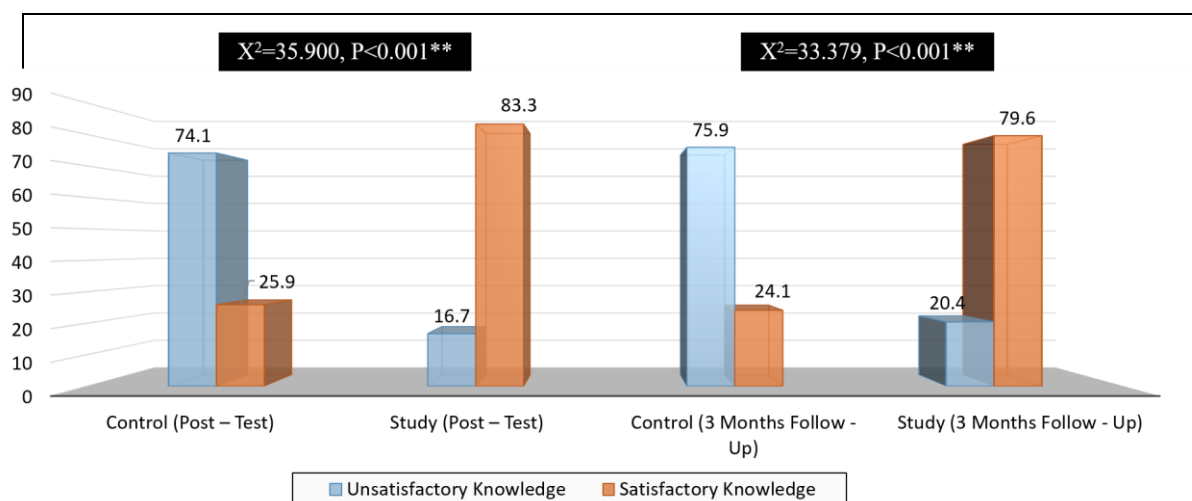


Figure (2): Total nurses' knowledge level among control and study groups between post-test and follow-up

Table (5): Association between the nurses' knowledge and socio-demographics 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=44)		Satisfactory (n=10)		Unsatisfactory (n=42)		Satisfactory (n=12)		Unsatisfactory (n=40)		Satisfactory (n=14)		Unsatisfactory (n=9)		Satisfactory (n=45)	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Age (Years)																
20 – 30	32	72.7	7	70.0	26	61.9	6	50.0	30	75.0	9	64.3	5	55.6	27	60.0
31 – 40	9	20.5	3	30.0	11	26.2	6	50.0	7	17.5	5	35.7	3	33.3	14	31.1
More than 40	3	6.8	0	0.0	5	11.9	0	0.0	3	7.5	0	0.0	1	11.1	4	8.9
Fisher's exact test	X²=1.024, P=0.599				X²=3.332, P=0.189				X²=2.763, P=0.251				X²=0.077, P=0.962			
Gender																
Male	12	27.3	5	50.0	10	23.8	6	50.0	11	27.5	6	42.9	4	44.4	12	26.7
Female	32	72.7	5	50.0	32	76.2	6	50.0	29	72.5	8	57.1	5	55.6	33	73.3
Chi-Square / Fisher	X²=1.951, P=0.162				X²=3.070, P=0.080				X²=1.134, P=0.286				X²=1.137, P=0.286			
Educational Level																
School	6	13.6	1	10.0	6	14.3	1	8.3	4	10.0	3	21.4	7	77.8	0	0.0
Institute	21	47.7	2	20.0	23	54.8	3	25.0	19	47.5	4	28.6	2	22.2	24	53.3
Bachelor	10	22.7	6	60.0	7	16.7	5	41.7	10	25.0	3	21.4	0	0.0	12	26.7
Postgraduate	7	15.9	1	10.0	6	14.3	3	25.0	7	17.5	1	7.1	0	0.0	9	20.0
Chi-Square	X²=5.566, P=0.134				X²=5.240, P=0.155				X²=3.784, P=0.285				X²=40.708, P<0.001**			
Marital Status																
Single	24	54.5	6	60.0	19	45.2	3	25.0	20	50.0	10	71.4	4	44.4	18	40.0
Married	20	45.5	4	40.0	23	54.8	9	75.0	20	50.0	4	28.6	5	55.6	27	60.0
Fisher's exact test	X²=0.098, P=0.754				X²=1.583, P=0.208				X²=1.929, P=0.165				X²=0.061, P=0.804			
ICU Experience																
Less than 10	33	75.0	9	90.0	30	71.4	8	66.7	31	77.5	11	78.6	9	100.0	29	64.4
10 – 20	8	18.2	1	10.0	7	16.7	4	33.3	6	15.0	3	21.4	0	0.0	11	24.4
More than 20	3	6.8	0	0.0	5	11.9	0	0.0	3	7.5	0	0.0	0	0.0	5	11.1
Chi-Square	X²=1.245, P=0.537				X²=2.731, P=0.255				X²=1.309, P=0.520				X²=4.547, P=0.102			

Table (6): Association between the nurses' knowledge and socio-demographics 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=40)		Satisfactory (n=14)		Unsatisfactory (n=9)		Satisfactory (n=45)		Unsatisfactory (n=41)		Satisfactory (n=13)		Unsatisfactory (n=11)		Satisfactory (n=43)	
	N	%	n	%	N	%	n	%	N	%	n	%	N	%	n	%
Age (Years)																
20 – 30	30	75.0	9	64.3	5	55.6	27	60.0	30	73.2	9	69.2	5	45.5	27	62.8
31 – 40	7	17.5	5	35.7	3	33.3	14	31.1	8	19.5	4	30.8	4	36.4	13	30.2
More than 40	3	7.5	0	0.0	1	11.1	4	8.9	3	7.3	0	0.0	2	18.2	3	7.0
Fisher's exact test	X²=2.763, P=0.251				X²=0.077, P=0.962				X²=1.535, P=0.464				X²=1.737, P=0.420			
Gender																
Male	11	27.5	6	42.9	4	44.4	12	26.7	11	26.8	6	46.2	1	9.1	15	34.9
Female	29	72.5	8	57.1	5	55.6	33	73.3	30	73.2	7	53.8	10	90.9	28	65.1
Chi-Square / Fisher	X²=1.134, P=0.286				X²=1.137, P=0.286				X²=1.709, P=0.191				X²=2.795, P=0.095			
Educational Level																
School	4	10.0	3	21.4	7	77.8	0	0.0	5	12.2	2	15.4	4	36.4	0	0.0
Institute	19	47.5	4	28.6	2	22.2	24	53.3	20	48.8	3	23.1	7	63.6	19	44.2
Bachelor	10	25.0	3	21.4	0	0.0	12	26.7	10	24.4	6	46.2	0	0.0	12	27.9
Postgraduate	7	17.5	1	7.1	0	0.0	9	20.0	6	14.6	2	15.4	0	0.0	9	20.9
Chi-Square	X²=3.784, P=0.285				X²=40.708, P<0.001**				X²=3.190, P=0.363				X²=20.761, P<0.001**			
Marital Status																
Single	20	50.0	10	71.4	4	44.4	18	40.0	21	51.2	9	69.2	3	27.3	19	44.2
Married	20	50.0	4	28.6	5	55.6	27	60.0	20	48.8	4	30.8	8	72.7	24	55.8
Fisher's exact test	X²=1.929, P=0.165				X²=0.061, P=0.804				X²=1.297, P=0.255				X²=1.038, P=0.308			
ICU Experience																
Less than 10	31	77.5	11	78.6	9	100.0	29	64.4	31	75.6	11	84.6	11	100.0	27	62.8
10 – 20	6	15.0	3	21.4	0	0.0	11	24.4	7	17.1	2	15.4	0	0.0	11	25.6
More than 20	3	7.5	0	0.0	0	0.0	5	11.1	3	7.3	0	0.0	0	0.0	5	11.6
Chi-Square	X²=1.309, P=0.520				X²=4.547, P=0.102				X²=1.071, P=0.585				X²=5.816, P=0.054			

DISCUSSION

Blood transfusion is one of the high-risk invasive procedures for life-saving practice in various medical conditions. Nurses have a multifunctional role in the blood transfusion process, which requires evidence-based knowledge, various skills, and qualities (Freixo et al., 2017). Even though having adequate knowledge does not always represent good practice, it is necessary to have proper education in blood transfusion to ensure patients' safety and minimize blood transfusion-related hazards (WHO, 2020). So, the researcher did this study to determine the effect of an educational program about blood transfusion on nurses' knowledge in intensive care units.

According to the 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, and the majority of them were females. This may be attributed to that the majority of the nursing force working in Port-Said hospitals is females. These findings agree with Yesilbalkan et al., (2019), who reported in a study in Turkey, about "Assessing knowledge of nurses on blood transfusion" that the mean age of the participants was 27.36, and the majority of the nurses were female. These findings disagree with Abolwafa et al., (2018), who reported that less than the half of nurses aged from 31: to 40 years, but they agree with him on the gender of nurses as more than three quarters of nurses in his study were females.

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 finding may increase the chance of researchers of this study to assess the role of educational programs on the level of knowledge of the studied sample without the interference of different variations or variables. As well, may also help the researchers to compare these variables and others in different study results.

The current study found that the majority of the two groups of nurses had not received previous training related to blood transfusion. These findings similar to Tetteh Ebenezer (2015) found that less than three quarters of the nurses claimed not to have had any training sessions on issues concerning blood transfusion. Moreover, Khalil et al., (2013), revealed that the majority of nurses did not join any preceding teaching program about blood transfusion. Additionally, Hijji et al., (2018) in their study demonstrated that

more than three quarters of nurses reported that they had never received any in-service training in this field. This finding differs from Yesilbalkan et al., (2019), who reported that more than half of the studied nurses were previously trained about transfusion. Moreover, Tavares et al., (2015), assert that a coaching program should be given in incorporation with a guided clinical practice, where new nursing staff to apply blood transfusion can develop skills safely and competently.

Concerning the educational level of the studied nurses and related qualifications, the current results showed that a high percentage of studied nurses had a nursing technical institute. This finding reflected a shortage of highly graduated nurses attached and working at Port Said Hospital who were always busy with administrative duties. These findings agree with Abolwafa et al., (2018), who revealed that the highest percentage of studied nurses have a technical institute education level. This result is not proportionate with Abd Elhy and Kasemy (2017), who reported that a plurality of studied subjects had bachelor's in nursing. Also, Silva et al., (2016) stated that more than two-thirds of the studied subjects were female that had a bachelor's degree in nursing.

Regarding nurses' experiences in the ICU field, the current results showed that the majority of nurses in both groups had a period of ICU experience of less than 10 years. This might be due to, that the most common age group of the studied nurses is the youngest age group ranging between 25 and 30 years. This finding is consistent with Yesilbalkan et al., (2019), who reported that 80 % of the participants' length of service in the profession varied between 0 and 4 years. Furthermore, Kavaklioglu et al., (2017) showed that more than two thirds of participants had been working at the hospital for 2 to 5 years. Otherwise, Shafik & Abd Allah (2015) mentioned that most of the study sample had experience from 5 - < 10 years in hematology units.

Regarding nurses' experience years in blood transfusion practice, the current findings clarified that about two-thirds of nurses had less than or equal to 5 experience years in transfusion, and only one-fifth of them had more than 10 experience years. This outcome correlates with Yesilbalkan et al., (2019), who explored that more than three quarters of the participants' length of service in the clinic varied between 0 and 2 years. Meanwhile, Tetteh Ebenezer (2015) indicated that the highest percentage of studied nurses had between 1-5 years' experience, and only 10.7 of them reported that they had 11 years and more working experience in blood transfusion.

Regarding the frequency of sharing of participant nurses in blood transfusion during the last 6 months, the present result illustrated that more than half of them were sharing in blood transfusion in the control group 1 – 4 times and in the study group had – 8 times. From the researchers' view the longer duration of experience in blood transfusion; the number of transfusions per week, and training are effective factors for improving nurses' knowledge and practice levels. These findings agree with Tetteh Ebenezer (2015), who found that half of the nurses, indicated that they had between 1 and 3 blood transfusions per week, while only less than one quarter reported 7-10 per week.

The current study found that in the comparison of the nurses' knowledge 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 knowledge about 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 more than 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' knowledge 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' knowledge 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. Moreover, Khalil et al., (2013) revealed that the nurses' information before the health program was generally unsatisfactory. 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' knowledge about blood transfusing post-nursing educational program, the current results indicated that the majority of studied nurses had satisfactory knowledge 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 Abd Elhy and Kasemy (2017), who stated that two-thirds of the participants had pauper knowledge related to nursing responsibilities during and after blood transfusion. Furthermore, 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 knowledge and practice among the studied nurses after the educational program implementation and this led to an improvement in patients' outcomes. Also, this goes in the same line with Abd Elhy and Kasemy (2017), who clarified that a larger number of the study had indigent knowledge related to blood transfusion and stated that inadequate teaching, coaching, and inadequate refreshment of knowledge continuously lead to bad nurse' knowledge which put patients at threat through and after transfusion.

The results of the current study revealed that there was a highly statistically significant difference between the nurses' knowledge total level among control and study groups post-educational program implementation. It was observed also, that less than one-third of nurses in the control group had a satisfactory knowledge total level compared to the majority in the study group.

Concerning overall satisfaction nurses' knowledge about safe blood transfusion preintervention of the educational program was more than half that improved to almost all in post-intervention. From the researchers' view, the unsatisfactory knowledge of the studied nurses in the present study before program intervention may be attributed to lack of preparation during the basic education or lack of desire of nurses to acquire new

knowledge, overload in the working situation, and lack of persistent training courses related to safe blood transfusion. 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., (2019) 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 theoretical knowledge of nurses about this transfusion safety procedure.

There was another study emphasized the importance of developing a guideline to improve personnel's level of knowledge (Reza et al., 2019). The findings of the present

study showed a significant difference between knowledge and 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' knowledge 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' knowledge 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 knowledge.

CONCLUSION

Based on the results of this study, the current study concluded that the educational program implementation about blood transfusion had a positive effect on improving nurses' knowledge in intensive care units

RECOMMENDATION

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

- Conduct similar studies in different locations 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 knowledge

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
- Aghajani, M., Ajorpaz, N.M., Mohammadi, S., Mohammadi, A. (2019). Designing Multi-media learning software (MLS), Effects on surgical technology students' knowledge, attitude and knowledge. *Life Science Journal.*;10(SPL. IS):7–11.
- 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.
- Bolton-Maggs, P. and Watt, A. (2019). Transfusion errors can be eliminated. *British Journal of Hematology*, 9 (20), 189-200. DOI: 10.1111/bjh.16256.
- Burton, M. and Ludwig, L. (2015). Fundamentals of Nursing Care Concepts. Connections & Skills, (2nd ed.). Philadelphia: Davis Company, P.p.958-964.
- Ddungu, H., Krantz, E. M., Phipps, W., Naluzze, S., Orem, J., Kiwanuka, N., Wald, A. & Kajja, I. (2018). Survey to assess knowledge and reported knowledges regarding blood transfusion among cancer physicians in Uganda. *Journal of Global Oncology*; pp. 105,199,113,232. DOI: <https://doi.org/10.1200/JGO.18.00143>

- Encan, B. and 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., Monteiro, C., Ferreira, A., Fernandes, S. & Lemos, N. (2017). Nurses knowledge in Transfusion Medicine in a Portuguese university hospital: The impact of an education. *Blood Transfus.* 2017, 15, 49–52.
- Harding, M., Kwong, J., Roberts, D., Hagler, D. & Reinisch, C. (2020). *Lewis's Medical-Surgical Nursing: Assessment and Management of Clinical Problems*, (11th ed.).Canada: Elsevier Publisher, P.p.647-649.
- Harmening, D. (2019). *Modern blood banking & transfusion knowledges*, (7th ed.). Philadelphia: F.A. Davis Company, pp.373-377.
- Hijji, B. M., Oweis, A. E. & Dabbour, R. S. (2018). Measuring Knowledge of Blood Transfusion : A Survey of Jordanian Nurses Philadelphia University Philadelphia University Philadelphia University. *American International Journal of Contemporary Research*, 2(10), 77–94.
- 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 knowledges 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.

- 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 knowledge 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.
- Michael, F. M., Charles, A. V. & Rachel, E.D. (2020). Blood transfusion safety: The potential of the patient.12-23.
- Nettina, S. (2018). Lippincott Manual of Nursing Knowledge,(11th ed.). Philadelphia: Wolters Kluwer, P.p. 1277-1287.
- Panchawagh, S.,J., Melinkeri, S., Panchawagh, M. J. J. I. J. O. H. & Transfusion, B. (2020). Assessment of Knowledge and Knowledge of Blood Transfusion Among Nurses in a Tertiary Care Hospital in India. 1-6.
- Perry, A. and Potter, P. (2019). Mosby's pocket guide to nursing skills and procedures, (9th ed.).China: Elsevier Publisher, P.p. 36-37.
- Perry, A., Potter, P. and Ostendorf, W. (2018). Clinical Nursing Skills and Techniques, (9th ed.) United States of America: Elsevier Publisher, P.p. 822-829.

- 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.
- Shafik, S. & Abd Allah, E. (2015). Improving the quality of nursing care for patients with leukemia in day care units through nursing education. *American Journal of Nursing Science*; 4(3): pp.63-72.
- SHOT, Serious Hazards of Transfusion. (2018). SHOT Report 2016 / SHOT-Report-2016_web_11th-July.
- Silva, M.A., Torres, G.V., Melo, G.S.M, Costa, I.K.F, Tiburcio, M.P., Farias, T.Y.A. (2016). Knowledge about the transfusion process of the ICU nursing team at a university hospital. *Cienc Cuid Saúde*; 8(4): pp. 571 – 578. Available from: <http://periodicals.um.br/ojs/index.php/CiencCuidSaude/article/view/9676/5389>
- 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] ;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.

Tetteh, E., (2015). Knowledge and knowledge of blood Transfusion among nurses in Ghana: Experiences from the Cape Coast teaching hospital. Master thesis, School of Nursing and Midwifery of College of Health and Allied Sciences, University of Cape Coast.pp.21-52.

World Health Organization (2017). Regional Status Report on Blood Safety and Availability. Report of Regional Office for the Eastern Mediterranean, P.p.12-18. Available at http://applications.emro.who.int/docs/EMROPub_2017_EN_18907.pdf?ua=1 , Accessed in 16\4\2020.

World Health Organization. (2020). Universal Access to Safe Blood Transfusion. Available online: https://apps.who.int/iris/bitstream/handle/10665/69747/WHO_EHT_08.03_eng.pdf.

Yesilbalkan, O.U., Akyol, A., Ozel, F., Kankaya, H., Doğru, B. & Argon. G. (2019). Assessing knowledge of nurses on blood transfusion in Turkey. *International Journal of Caring Sciences*; 12(1): p.521.

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

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¹مدرس مساعد التمريض الباطني الجراحي كلية التمريض جامعة بورسعيد؛ ²أستاذ التمريض الباطني والجراحي كلية التمريض جامعة عين شمس؛ ³أستاذ التمريض الباطني الجراحي كلية التمريض جامعة بورسعيد؛ ⁴أستاذ مساعد التمريض الباطني الجراحي كلية التمريض جامعة بورسعيد

الخلاصة

يلعب ممرض الصحة النفسية دورًا رئيسيًا وقيماً في ضمان إستناد تدخلات الرعاية الصحية النفسية إلى المبادئ الأخلاقية ومبادئ حقوق الإنسان. و لذلك يجب أن يعرف فريق الصحة النفسية وخاصة التمريض الجوانب القانونية والأخلاقية الأساسية للطب النفسي. كما أن إرضاء المرضى النفسيين في المستشفى ليس فقط مسألة ذات أهمية إكلينيكية ولكن بشكل أساسي مسألة أخلاقية. ولذلك، تهدف هذه الدراسة إلى تقييم إدراك ممرضي الصحة النفسية لمسئولياتهم و حقوق المرضى و تأثيره علي رضاء المرضى. تم استخدام تصميم وصفي لإجراء الدراسة بمستشفى الصحة النفسية بمحافظة بورسعيد؛ شملت الدراسة 60 ممرض نفسية و60 مريض نفسي. وقد اظهرت نتائج الدراسة أن 66% من الممرضين النفسيين الخاضعين للدراسة لديهم مستوى تصور منخفض فيما يتعلق بمسئولياتهم، كما أن 86.7% منهم لديهم مستوى إدراك منخفض لحقوق المرضى النفسيين، ايضاً 85% من المرضى النفسيين الخاضعين للدراسة لديهم مستوى منخفض من الرضا. وقد خلصت الدراسة إلى ان معظم الممرضين النفسيين بالدراسة الحالية لديهم مستوى منخفض من التصور لمسئولياتهم وبحقوق المرضى، كم أوضحت أن معظم المرضى النفسيين بالدراسة لديهم مستوى منخفض من الرضا. وأوصت الدراسة بتنفيذ برنامج تعليمي حول مسئوليات الممرضين النفسيين و حقوق المرضى النفسيين لرفع وعي التمريض النفسي وزيادة رضاء المرضى النفسيين عن الرعاية المقدمة بمستشفيات الرعاية النفسية.

الكلمات المرشدة: حقوق المرضى، رضاء المريض، ممرضي الصحة النفسية.