

Factors Affecting Nursing Care Provided for Patients undergoing Blood Transfusion at Intensive Care Units

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Abstract

Background; Blood transfusion is the transfer of blood or blood components from one person to another. It is a potentially life-saving procedure that helps replace blood lost due to surgery, illness, bleeding or severe injury, **Aim and objectives;** to assess factors affecting nursing care provided for Patient undergoing blood transfusion, **Subjects and methods;** This descriptive study design was conducted in Medical Units at Medical Hospital affiliated to Tanta University Hospital Including All nurses (150) who were working in the above mentioned setting intensive care units (ICU) who provided direct care for critically ill patients undergoing blood transfusion, **Result;** More than two third (83.3%&80%&78%&78%) of studied Nurse's had Correct& complete answers about the causes of transfer of frozen fresh plasma, the reasons for the transfer of concentrated red blood cells, meaning of blood function and the rules of matching the patient's blood with the donor respectively, There had highly statistically significant with 73.3% high knowledge regarding blood transfusion and p-value was <0.001*, **Conclusion;** Majority of nurses had satisfactory knowledge regarding to different aspects of management of patient undergoing blood transfusion and majority of them showed satisfactory level of practice regarding to management of patients undergoing blood transfusion.

Key words: - Medical Surgical Unit.

INTRODUCTION

Blood transfusion is the transfer of blood or blood components from one person to another. It is a potentially life-saving procedure that helps replace blood lost due to surgery, illness, bleeding or severe injury⁽¹⁾

Blood is fluid that transports oxygen and nutrients to the cells and carries away carbon dioxide and other waste products. Technically, blood is a transport liquid pumped by the heart to all parts of the body, after which it is returned to the heart to repeat the process. Approximately 8% of an adult's body weight is made up of blood. Females have around 4-5 litres, while males

have around 5-6 litres. This difference is mainly due to the differences in body size between men and women. Also, blood transfusion is a crucial and often life-saving procedure and it is a common care method. The procedure is not without risk but the most of the errors occur due to human error⁽²⁾

Injury Blood transfusion is the process of transferring blood or blood products from one person into the circulatory system of another person. Transfusions of blood and blood products may be necessary to treat severe thrombocytopenia, leukopenia, and anaemia resulting from a disease process or

from treatment. Whole blood, packed red blood cells platelets, plasma and concentrated clotting factors and other blood products replenish volume, oxygen carrying capacity, platelet volume, and clotting factors. This life-saving procedure can be life threatening if not carefully performed in accordance with facility policy and safe nursing practice. ⁽³⁾

Nursing has an important role in ensuring transfusion safety, because the nursing team is responsible for knowing the indications for transfusions, checking data to prevent errors, guiding patients on blood transfusion, detecting and acting in compliance with transfusion reactions and documenting the procedure. Due to the complexity of the transfusion process and the need for expertise during its development, this process requires skilled and trained professionals to achieve transfusion safety. Nursing professionals are directly involved in the care of patients submitted to blood transfusion. Therefore, the correct storage of blood and its identification without failures depends largely on the performance of the nursing team, which highlights the importance of the scientific knowledge on blood transfusion and the technical skills of the nursing staff, in order to prevent the occurrence of complications and patient ⁽⁶⁾.

Moreover, serious transfusion reactions generally occur within the first 5 to 15 minutes of the infusion, many health care agencies require that a nurse remains with and monitors the client during this critical time, however, nurses monitor clients frequently throughout a transfusion for signs of a reaction or other complications associated with receiving blood. ⁽⁷⁾

Transfusion reactions are unintended responses in a patient which are associated

with the transfusion of blood or blood component. These reactions may be fatal, life-threatening, incapacitating and result in prolonged hospitalization and morbidity. A transfusion reaction requires immediate recognition and prompt nursing action to prevent further complication if patient is unconscious or so heavily sedated that he/she can't report the common symptoms ⁽⁴⁾

There are many adverse effects of blood transfusion and reactions. Risk for adverse effect exists in every transfusion, and many of these reactions occur as a result of errors made during preparation, collection or the actual administration of blood. The adverse reactions can be classified based on the severity of the symptoms, mild or severe, or the time of onset as acute or delayed. ⁽⁵⁾

The adverse reaction of blood transfusion includes the following: - there are many adverse effects and reaction of blood transfusion. This adverse reaction of event is undesirable response of effect in patient temporally associated with the administering blood or blood component.

Many of this reactions :-

Acute non-infectious blood transfusion, acute haemolytic transfusion reactions, Febrile non haemolytic transfusion reactions, Allergic reactions, urticarial, Anaphylaxis, Transfusion related acute lung injury, Acute non-immune mediated adverse reactions, Non immune haemolytic reactions. Also transfusion associated circulatory overload, Transfusion associated dyspnoea, acute hypotensive transfusion reaction, Metabolic and haemostatic derangement, Citrate toxicity, Hyperkalaemia, Hypokalaemia, Coagulopathy, Hypothermia, Air embolism, Delayed reactions (occurring

after 24 h Or up to month/years after transfusion), and Post transfusion purpura.⁽⁸⁾

Significance of the study:

The constant updating of knowledge of team members responsible for blood transfusion, especially the nursing team, is required to maintain patient safety during the process. Nurses have a central role in performing blood transfusions. Their skills and knowledge are crucial for them to transfuse blood safely and efficiently. Nurses play a fundamental role in blood transfusions and have an important role in prevention of blood transfusions' complications. So this study will be conducted to assess knowledge, practice and associated factors in intensive care units for patients undergoing blood transfusion.

Blood transfusions are a life-sustaining and life-saving treatment. It is a procedure conducted frequently in hospitals, especially in Intensive Care Units (ICUS). However, it can result in immediate or late complications, requiring qualified personnel who are knowledgeable in the procedure to carry out the transfusion safely.

Aim Of The study

The aim of the study is to:

Assess factors affecting nursing care for Patient undergoing blood transfusion at intensive care unit.

Research Questions:

1. What's the nurses' level of knowledge regarding blood transfusion?

Subjects and Method

Research layout

A descriptive examine layout had been used.

Setting:

The examine had been performed in Medical Units at Medical Hospital affiliated to Tanta University Hospital.

Subjects:

The pattern of this examine had been consisted of all nurses (150) who had been operating with inside the above referred to placing of in depth care devices (ICU) and offer direct take care of sufferers present process blood trans-fusion allotted as the subsequent: (50) nurses in Anaesthesia Intensive Care Units, (35) nurses in in depth care devices in Medical Hospital, (35) nurses in cardiac and (30) nurses in neurological in depth care devices affiliated to Tanta University Hospital. .

The inclusion standards had been included: nurses operating with inside the ICU of hospitals used on this examine; folks that supplied direct affected person care; and people who had been at the obligation roster with inside the months in the course of which the records become amassed.

Tools of data collection:-

Two equipment could be used on this examine:-

Tool I: Structured interview schedule, it is going to be advanced via way of means of the researcher after reviewing applicable literature⁽⁹⁾ to gather records. It had been consisted of 3 parts

Part A: Nurses Socio-demographic records associated with age, sex, marital status, residence, years of experience, stage of education, preceding and latest education approximately blood trans-fusion

Part B: Nurses' information concerning blood trans-fusion

To investigate nurses' information approximately blood trans-fusion and position of nurse before, in the course of

and after implementation of blood transfusion procedure. The questions are divided into foremost classes as the subsequent: definition of blood and blood transfusion, features of blood and sorts of blood agencies, sorts of blood additives and its indication for transfusion, nursing take care of sufferers present process blood transfusion (before, in the course of and after) and nursing take care of damaging reactions of blood transfusion.

Scoring system

The studied nurses' solutions could be in comparison with a version key answer, wherein ratings are given for absolutely accurate answer, one for incompletely accurate answer, and 0 for now no longer understanding the solution or wrong answer. According to the nurses' responses, there portal stage of information rating is categorised as the subsequent:

-Knowledge rating same and extra than 75% could be categorised as excessive stage

- Knowledge rating same to 60% to much less than 75% could be categorised as mild stage.

- Knowledge rating much less than 60% of overall rating could be categorised as low stage.

Part C: Factors affecting blood transfusion management questionnaire:

This component had been advanced via way of means of the researcher rely upon associated literature (10) those elements might also additionally

Associated with nurses, sufferers, and environment.

Nurses' elements include: years of experience, stage of education, preceding and latest education approximately blood

trans-fusion, and belief of personal stage of information on transfusion safety.

Patients' elements include: sufferers bodily status, prognosis and Psychological status.

Environmental elements as: availability of the system, lab investigation.

Scoring system

The nurses' responses had been on 3 factor Likert scale starting from conform to disagree (2-zero), agree (2), neutral (1), disagree (zero) the elements' rating could be labelled into 3 tiers High <70>60%.

Tool II: Observation take a look at listing sheet for blood transfusion management: this device is tailored from (Saif Al-Nas M, 2016) (11) and changed via way of means of the researcher. This device includes the subsequent approaches: training of system wanted for blood transfusion; pre-transfusion nurses' practices towards care of sufferers present process blood transfusion; in the course of transfusion nurses' practices towards care of sufferers present process blood transfusion; post-transfusion nurses' practices towards care of sufferers present process blood transfusion; and nursing control of blood transfusion reactions.

Result

Table (1) shows the distribution of the study nurse according of their socio-demographic characteristic at intensive care unit. Showed that 62% of nurses aged 20- > 30 years, 70% were male and 43.3% of them were have Diploma Nursing/specialized. 46.7% of them was have 5- > 10 years of experience in the Department of intensive care unit. The same table clarified that the

Highest percent (90%) happened trained in internal nursing in general and nursing care to give blood in particular.

Table (2) Showed that more than two third (83.3% & 80% & 78% & 78%) of studied Nurse's had Correct & complete in the causes of the transfer of frozen fresh plasma, the reasons for the transfer of concentrated red blood cells, meaning of blood function and the rules of matching the patient's blood with the donor respectively

Table (3) shows level of knowledge among nurses. This table show highly statistically significant with 73.3% high knowledge regarding blood transfusion and b-value was $> 0.001^*$.

Table (4) shows distribution of nurse's practice toward care regarding blood transfusion.

This table showed that (82% & 80% & 78% & 76.7% & 74.7%) of studied had done correctly & completely level in post-transfusion nurse's practices toward care, preparation of equipment needed for blood transfusion, pre-transfusion nurse's practices toward care, During transfusion nurse's practices toward care and nursing management of blood transfusion reactions respectively.

Table (5) show level of practice among nurses. This table show highly statistically significant with 85% satisfactory in practice regarding blood transfusion and b-value was $> 0.001^{**}$.

Table (6) shows correlation between knowledge with practice and factors. This table shows highly statistically significant difference between Total knowledge with Total practice and Total factors when b-value was 0.001^*

Table (7) shows distribution of the factors affecting blood transfusion administration regard Nursing, Patient and environmental factors.

This table showed that more than two third (71.3%) high about level of education, trend in internal nursing in general and nursing care to give blood in particular and perception of own level of information on transfusion safety, and self confidence in nursing factors, 70% previous experience, level of education in patient's factors and include an (61.7%) availability and lab investigation in environmental factor

Table (1) Socio-demographic characteristics of the studied nurses at intensive care unit.

	N	%
Age		
20- <30	93	62
30 or more	57	38
Mean±SD	26.57±3.94	
Sex		
Female	105	70
Male	45	30
Qualified		
Diploma Nursing	128	85.3
Technical Institute	18	12
B.A	4	2.7
Experience in the Department of intensive care unit		
<5	53	35.3
5- <10	70	46.7
10 or more	27	18
Mean±SD	6.15±4.11	
Have they been trained in internal nursing in general and nursing care to give blood in particular		
Yes	15	10
No	135	90

Table (2) shows the distribution of the Nurse's Knowledge regarding blood transfusion .

Items of knowledge	Correct & complete		Correct & incomplete		Incorrect	
	N	%	N	%	N	%
The components of the blood	105	70.0	38	25.3	7	4.7
Blood groups	113	75.3	25	16.7	12	8.0
Blood function	117	78.0	25	16.7	8	5.3
Known blood transfusion	110	73.3	23	15.3	17	11.3
The types of blood transfusions	100	66.7	37	24.7	13	8.7
The causes of full blood transfusion	115	76.7	25	16.7	10	6.7
The causes of the transfer of frozen fresh plasma	125	83.3	10	6.7	15	10.0
The reasons for the transfer of concentrated red blood cells	120	80.0	27	18.0	3	2.0
The causes of platelet transfer	115	76.7	27	18.0	8	5.3
The rules of matching the patient's blood with the donor	117	78.0	23	15.3	10	6.7
Five of the basic rules that should be followed during the blood transfusion	110	73.3	20	13.3	20	13.3
Complications can occur to the patient who is being transferred blood	95	63.3	45	30.0	10	6.7
Diseases can be transmitted through blood	98	65.3	48	32.0	4	2.7
Equipments are used in blood transfusions	115	76.7	35	23.3	0	0.0

Nursing care is provided to the patient before the blood transfusion	105	70.0	35	23.3	10	6.7
Nursing care is provided to the patient during the blood transfusion	108	72.0	38	25.3	4	2.7
Nursing care is provided to the patient after the blood transfusion	105	70.0	38	25.3	7	4.7

Table (3) Level of knowledge among nurses.

Total knowledge	N	%	Chi-square	
			X ²	P-value
High	110	73.3	169.260	<0.001*
Moderate	31	20.7		
Low	9	6		
Total	150	100		

Table (4) Distribution of nurse's practice toward care regarding blood transfusion.

Items of practice	Done correctly & completely		Done correctly & incompletely		Not done incompletely done	
	N	%	N	%	N	%
Preparation of equipment needed for blood transfusion	120	80.0	20	13.3	10	6.7
pre-transfusion nurses' practices toward care	117	78.0	22	14.7	11	7.3
During transfusion nurses' practices toward care	115	76.7	25	16.7	10	6.7
Post-transfusion nurses' practices toward care	123	82.0	20	13.3	7	4.7
Nursing management of blood transfusion reactions	112	74.7	25	16.7	13	8.7

Table (5) Level of practice among nurses.

Total practice	N	%	Chi-square	
			X ²	P-value
Satisfactory	128	85.3	149.813	<0.001*
Unsatisfactory	22	14.7		
Total	150	100a		

Table (6) Correlation between knowledge with practice and Factors (N=150).

	Total knowledge	
	r	P-value
Total practice	0.306	<0.001**
Total Factors	0.415	<0.001**

Table (7) Distribution of the factors affecting blood transfusion administration regard Nursing, Patient and environmental factors.

	High		Moderate		Low	
	N	%	N	%	N	%
Nursing Factors						
Experience in the Department of Public Interior	93	62.0	27	18.0	30	20.0
Level of education	107	71.3	23	15.3	20	13.3
Have They been trained in internal nursing in general and nursing care to give blood in particular	108	72.0	20	13.3	22	14.7
If yes, mention the training courses obtained	105	70.0	18	12.0	27	18.0
Perception of own level of information on transfusion safety, and self-confidence	107	71.3	22	14.7	21	14.0
Patients' factors include						
previous experience, age, level of education	105	70.0	27	18.0	18	12.0
Environmental Factors						
availability of equipment and lab investigation	93	62.0	38	25.3	19	12.7

DISCUSSION

An important issue habitual scientific exercise is transfusion of blood and blood merchandise, because of the existence-saving healing blessings they offer. Blood may be used for substitute just in case of hemorrhage or anemia; platelets for sufferers on therapy or to forestall surgical bleeding; plasma for coagulation parts in sufferers with hemophilia;

And immune globulin for acquired immunity for individuals on the danger of positive infections. There is, consequently, a completely excessive wish for blood and blood merchandise, and this want can even to boot preserve to boom as a result of the burden of continual sicknesses consisting of most cancers and kidney failure keeps to upward thrust with growing existence expectancy⁽¹²⁾.

The healthcare machine need to now no longer handiest make certain the supply of the wanted blood merchandise however additionally need to pay near interest to suitable control of sufferers at some stage in administration. Facilities need to consequently have set up secure blood trans-fusion exercise suggestions in order that the complete manner worried in availability and transfusion of blood is properly monitored, managed, and coordinated⁽¹³⁾.

The manner of transfusion includes 5 interrelated stages: blood grouping and cross-matching, affected person education earlier than blood bag collection, blood % collection, pretransfusion initiation of nursing responsibilities, and post transfusion

nursing care. Four of those stages are applicable to habitual nursing exercise. The protection and good enough control of transfusion of blood and blood merchandise, consequently, relies upon in large part at the understanding and talents of nurses⁽¹⁴⁾.

The main results of this study were as following:

More than half of them (62%) of nurses aged 20- <30 years, 70% were male and 43.3% of them had Diploma Nursing/ Specialized. 46.7% of them had 5- <10 years of Experience in the Department of intensive care unit The same table clarified that the highest percent (90%) haven't trained in internal nursing in general and nursing care to give blood in particular. Our results were in agreement of the study **Mohammed S, Marzouk.,**⁽¹⁵⁾ as they reported that about half of nurses' ages were between 20 to < 30 years and occupied on less critical units to tolerate the nature of the work and to acquire more experience. Concerning nurses' qualifications, the study indicates that, more than half of the studied nurses were diploma nurses (secondary school diploma & technical institute diploma), this might elaborate the current condition of nursing qualification on surgical and hematology departments as highly educated nurses are occupied in more critical departments such as intensive care-units and operative theaters.

The study is consistent with **Pacard & Motowidlo,**⁽¹⁶⁾ whose study named subjective stress and job satisfaction in Italy revealed that about half of his studied

subjects were between 20 to <30 years old with years of experience less than 10 years. The present study showed that as regard nurse's knowledge regarding blood transfusion; more than two third (83.3% & 80% & 78% & 78%) of studied Nurse's had Correct & complete in the causes of the transfer of frozen fresh plasma, the reasons for the transfer of concentrated red blood cells, meaning of blood function and the rules of matching the patient's blood with the donor respectively. There was highly statistically significant with 73.3% high knowledge regarding blood transfusion and p-value was <0.001.

In accordance with our results study of **Hossain et al.**,⁽¹⁷⁾ whose study named Knowledge and attitude toward voluntary blood donation in East Africa reported that about three quarters of nurses have satisfactory knowledge about blood transfusion and only one quarter have unsatisfactory knowledge.

In contrary to our results, study of **Hendy et al.**,⁽¹⁸⁾ as they reported that as regard; knowledge before, during and after blood transfusion, they showed that nearly about three quarters of nurses had unsatisfactory level of knowledge regarding caring of patient undergoing blood transfusion. The lack of nurse's knowledge may be due to few training courses were conducted in surgical and hematology departments; diploma was the wide base for nurses' education in Egypt. According to the study by **Bayraktar and Erdil**⁽¹⁹⁾ over fifty percent of nurses had insufficient awareness of all elements of blood transfusion, resulting in improper practice.

In the study done by **Tavares et al.**,⁽²⁰⁾ on the evaluation of blood transfusion

knowledge, it was discovered that the overall average score was generally lower (52.7%), as were the average scores for each of the three Steps. The conclusions of this study are supported by other studies using unique data collection methods. Research done in Mali, West Africa, revealed that 53.9% of participants had inadequate knowledge, with nurses and midwives having the largest knowledge gaps. Different research revealed a range of 6 to 61 points, with a mean score of 20.9 for knowledge.⁽²¹⁾

Aslani et al.,⁽²²⁾ did research with nurses in Shahrekord, Iran, and found that their understanding of the indications and problems of blood transfusion was sufficient, as 16.2 percent had excellent knowledge, 59.2 percent had acceptable knowledge, and 24.8 percent had inadequate information. In Rio Grande do Norte, **Silva et al.**,⁽²³⁾ found a greater understanding of the pre-transfusion and transfusion phases, but insufficient knowledge of the post-transfusion period (62.9%). It must admit that a lack of decision-making information is the most typical hurdle. Therefore, it was established that a comprehensive knowledge of the steps of the process is required to ensure the safety of blood transfusions.⁽²⁴⁾

The number of nurses may be affected by a lack of knowledge on the requirement of blood transfusion, a high turnover rate of nurses, and parental leave.

The current study showed that as regard factors affecting blood transfusion administration (Nursing, Patients and Environmental Factors); more than two third (71.3%) High response about Level of factors related to education, trained in internal nursing in general and nursing care

to give blood in particular and Perception of own level of information on transfusion safety, and self-confidence in nursing factors, (70%) previous experience, age, level of education in Patients' factors include and (61.7%) availability of equipment and lab investigation in environmental factors. There was a highly significant with 68% high in Factors regarding blood transfusion (p-value <0.001).

Our results were in line with the study of **Nunes et al.**,⁽²⁵⁾ as they reported that the overall knowledge score registered an average of 50.4%. The factors associated with knowledge were as follows: Training and/or guidance and monitoring of the protocols/directions to carry out the transfusion process; frequency of blood transfusion procedures carried out by professionals, and the self-confidence factor.

The nursing team is responsible for knowing transfusion indications, guiding patients through the blood transfusion process, checking data to prevent errors, documenting the procedure and detecting and responding to transfusion reactions; thus, nursing plays a crucial role in ensuring transfusion safety.⁽²⁶⁾

The safety of transfusions requires the involvement of informed and competent specialists due to the complexity of the transfusion process and the requirement for information throughout its growth. Nurses give direct care to patients receiving blood transfusions. Therefore, the appropriate storage and identification of blood is heavily reliant on the performance of the nursing staff, stressing the importance of scientific knowledge on blood transfusion and the technical skills of the nursing staff

in minimizing complications and patient harm.⁽²⁷⁾

In the present study, as regard practice for blood transfusion administration; more than two third (88%) Correct& complete answer about prescribed blood product, (86.7%) pr Leukocyte-depleting liter (Note: Agency may irradiate blood products within the blood bank.) and (85%) Pressure bag. More than two third (86.7%) Correct& complete answer about Identify the right patient, (78.3%). Check the doctor's order with another nurse and (78.3%). Provide information to the patient (or family). More than two third (88.3%) Correct& complete answer about Measuring vital signs every 15 minutes, (85%). Note where the canola is and (76.7%) Note the color of urine also early detection of changes in the case of complications. More than two third (86.7%) Correct& complete answer about Type of blood or derivatives (81.7%) Recording the patient's blood type, same percent in any complications if they happen. More than two third (80%) Correct& complete answer about Notify the blood bank, there was a highly significant with 85% Satisfactory in practice regarding blood transfusion (P value <0.001).

The research by **Nemati et al.**,⁽²⁸⁾ validated our findings. As indicated earlier, the mean performance score was 38.96 ± 2.17 and ranged from 30 to 40, with a minimum of 10 and a maximum of 68. The performance of blood and blood product transfusions was judged as excellent by 54% of nurses, with the remaining nurses rating their performance as mediocre.

However, in the study of **Mohammed S, Marzouk** ⁽²⁹⁾, 80.0% of nurses under study have satisfactory practice during pre-transfusion phase (mean=7.2) while 46.7 %

of nurses aren't concerned about verification of patient and blood product identification. There is also unsatisfactory practice during and post blood transfusion phase (83.3% & 76.7%) respectively whenever total nursing practice during blood transfusion is unsatisfactory (80%). According to, **Harris et al.**,⁽³⁰⁾ on administration of blood component in Paris whose study named Guideline, who revealed that only 2% of studied nurses measure vital signs frequently during transfusion phase.

While, **Atterbury & Wilkinson**⁽³¹⁾, whose study named Blood transfusion nursing standard showed that more than half of his study sample measure vital signs first after 15 minutes, then after 30 minutes and hourly until transfusion is finished, vital signs is very important measure that nurse should take care of for early detection and adequate management of any adverse reaction.

In relation to nurses' knowledge about manifestation of blood transfusion reaction **Murphy et al.**,⁽³²⁾ whose study named Indications of transfusion in Australia revealed that one quarter of his study sample had adequate knowledge about manifestation of acute transfusion reactions may occur in 1% to 2% of patients, this can be fatal.

This difference may be due to nurses not understanding how to use universal precaution in their work, lack of training courses about infection control practice, lack of supervision and lack of awareness with component of infection control program for patient undergoing blood transfusion. Also, this may be due to work over-load and nurse was assigned to care

for more than four patients at the same time.

There was a highly significant difference between total knowledge with total practice and total Factors ($P < 0.001$). Also, a positive correlation between total knowledge with total practice and total factors ($r = 0.415, 0.306$, respectively).

In line with our findings, **Ahmadi MH, Poorkarim H, Rahmani H**,⁽³³⁾ found a strong link between subject performance and topic knowledge, which was supported by our data ($P < 0.05$).

Regarding the relationship between nursing knowledge and practice, **Hendy et al.**,⁽³⁴⁾ discovered a positive correlation between the overall level of nurses' knowledge and their practice ($r < 0.65$).

In addition, **Saied et al.**,⁽³⁵⁾ discovered that nurses' total knowledge and total practice scores were positively correlated.

Our results showed that highly statistically significant difference between total practice and total factors ($P < 0.001$). There was a highly significant difference between total knowledge with qualified and experience in the department of medical surgical unit ($P < 0.001$) and significant difference between total knowledge and age. There was a highly significant difference between total factors with age, qualified and experience in the department of medical surgical unit ($P < 0.001$) and significant difference between total factors and sex ($P < 0.001$).

Parallel to our results, **Barichello E, De Mattia AL, Barbosa**⁽³⁶⁾ found a significant relationship between the total score and the transfusion step and the predictor variables ($p = 0.001$) and "received training and/or instruction for performing the transfusion operation." ($p < 0.001$).

Also, in the study of **Hendy et al.**,⁽³⁷⁾ regarding to the relation between nurses' knowledge and practice, the current study revealed that there is significant relation. Whereas nurses who got unsatisfactory knowledge had unsatisfactory practice, this means that the level of nurses' performance depend on the nurses' knowledge.

This study is consistent with **Hossain et al.**,⁽³⁸⁾ whose study named Knowledge and attitude toward voluntary blood donation in East Africa revealed that there is strong correlation between knowledge and practice.

While, in the study of **Mohd Noor et al.**,⁽³⁹⁾ there was an insignificant difference of knowledge level in different genders, types of wards, educational level, previous training exposure, and working experience (All P values > 0.05). Intriguingly, more

CONCLUSION

Majority of nurses had first-rate understanding concerning to exceptional components of control of affected person present process blood trans-fusion and majority of them confirmed first-rate stage of exercise concerning to control of sufferers present process blood trans-fusion. There became enormously statistically sizable affiliation among general understanding with general exercise. Furthermore, the maximum critical aspect affecting nurses' understanding and overall performance became the experience.

blood transfusion experience in the previous six months was substantially linked with greater knowledge (0 times against 1–4 times, $p = 0.020$ and 1–4 times versus >5 times, $p = 0.035$). By using both simple and multivariate linear regression models, nurses who had done one to four blood transfusions during the previous six months had a 4.13% substantially higher blood transfusion knowledge score ($p = 0.001$).

The majority of nurses have appropriate skills and knowledge for treating patients after blood transfusion. There was a statistically very significant correlation between total knowledge and total practice. Furthermore, the most important factor affecting nurses' knowledge and performance was the experience.

RECOMMENDATIONS

- ❖ Further studies on large geographical scale and on larger sample size to emphasize our conclusion.
- ❖ Further studies for regarding factors affecting blood trans-fusion
- ❖ administration (Nursing, Patients and Environmental Factors).
- ❖ The correct storage of blood and its identification without failures depends largely on the performance of the nursing team, which highlights the importance of the scientific knowledge on blood trans-fusion and the technical skills of the nursing staff, in order to prevent the occurrence of complications and patient injury.

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