

## Knowledge of Nurses Regarding Blood Transfusion at Public Hospitals in Sana'a City-Yemen

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### Abstract

**Background:** Blood transfusion has a positive effect on patient life, so nurses' plays an integral role to maintain patient safety related to blood transfusion. **Aim of the study:** The present study was aimed to assess knowledge of nurses regarding blood transfusion at public hospitals in Sana'a City-Yemen **Method:** A descriptive cross-sectional design study was utilized in this study; 93 nurses were employed in public hospitals in Sana'a–Yemen. Self-administered questionnaire was used to collect data from October 2020 to November 2020. **Results:** The most of study participants were employed labor room department 44.1%, belonged to age group (26 to 30 years) 33.3%. The Diploma degree was the most available qualification 69.9%, 83.7% had 6 to 10 years' experience as nurses, while 85.60% of them h <1-5 years' experience in an ICU. The most 71%of nurses were not trained. Knowledge regarding blood transfusion was fair 59.1%, while 25.8% had good knowledge. **Conclusion:** The most of nurses had fair knowledge regarding blood transfusion. **Recommendation:** Transfusion training and evidence-based guidelines are needed to reduce inappropriate transfusions and improve patient care.

**Keywords:** *Blood Transfusion, Knowledge & Nurses.*

### Introduction:

Blood transfusion is a critical and common therapeutic procedure in which patients are given blood and its components in order to preserve their lives. Preparation before collecting blood units from the storage location, blood bag collection, pre-transfusion activities, and post-transfusion activities are the five interlaced phases or stages of blood transfusion administration, four of which are connected to nursing performance. (Abd Elhy & Kasemy 2017). Blood transfusion has a well-established clinical effect in the treatment of anaemia, where it improves oxygen delivery to tissues. (Sapkota et al., 2018).

The issues connected with transfusion errors can be reduced by monitoring transfusion processes. Standard guidelines or rules addressing important procedures of blood transfusion management, such as screening donor blood for infectious diseases, establishing the necessity for transfusion, and determining ABO compatibility, are utilized in many countries (Sapkota et al. 2018). The majority of transfusion errors are caused by human factors, which can be avoided with proper training and transfusion procedure updates (Dasaraju & Subraya 2017).

The most of errors happen in clinical wards, such as using the wrong blood units at the bedside and misidentifying the patient or the sample. Nurses play a critical part in these tasks, with more than half of

the transfusion chain's steps relying on the nurse's knowledge and abilities (Freixo et al., 2017).

### Significance of the Study:

Blood transfusion has certain risks to recipients, including the transmission of transfusion-transmitted infections, acute or delayed transfusion reactions, all immunization and immunomodulation, blood transfusion errors can cause serious morbidity or even death in recipients. According to serious hazards of transfusion, per 13,000 infusions, one incorrect blood transfusion occurs. The majority of transfusion errors are caused by human factors, which can be avoided with proper training and transfusion procedure updates (Lim et al., 2019).

Nurses should have a broad range of theoretical and practical knowledge. To deliver an adequate level of care for patients, they will require a significant quantity of new knowledge. The quality of nursing care has an impact on patient outcomes. Improvements in nurse performance can be made to improve patient safety (Khalaf et al., 2017).

As well as the research will be aimed to assess nurses' knowledge toward blood transfusion the research recommendation will be essential to increase their awareness about important nursing procedures for blood transfusion to improve patient outcomes and decrease hospital stay and community cost.

**Aim of Study:**

The aim of this study was to assess knowledge of nurses' regarding blood transfusion at Public Hospitals in Sana'a City-Yemen.

**Research Question:**

- Do nurses have knowledge about blood transfusion?
- What is the relationship between demographic characteristics of nurses and their knowledge level regarding blood transfusion?

**Subjects and Method:**

**Study Design:** Cross-sectional research design study was utilized in this study.

**Subjects:** The study sample consisted of 93 nurses that working at Public Hospitals in Sana'a City (Al-Thawra General Hospital Model, Al-Sabeen Maternity & Child Hospital, Republican Teaching Hospital Authority, Al-Kwit University Hospital, and Zaid Ben Sultan hospital) on a permanent or contract basis during the study period that provided direct nurse care practice.

**Tools of Data Collection:**

Two tools were used in this study to collect data

**Tool I:** Self-administration structured interview questionnaire (Appendix I):

A self-administered study questionnaire was developing to collect data. This questionnaire consists of two parts:

**Part I:** Sociodemographic Characteristics: was covered age, sex, marital status, educational level, Years of experience, etc...

**Part II:** A knowledge questionnaire to assess the nurse's knowledge about blood transfusion in the deferent departments. It was categorized under three items covered by 18 questions; such knowledge relating to patient preparation, blood pack collection, pre-transfusion initiation nursing activities, post transfusion initiation nursing activities and complications related to blood transfusion

The scoring system of the nurse knowledge questionnaire was done as follows: Each correct answer scored one point and each incorrect answer scored a zero. A higher score indicated greater nurse knowledge. The score obtained for each question summed up to get the total score for the nurse's knowledge. The total score was computed out of (26 grades). According to the nurse responses, their level of knowledge is categorized as the following: Good knowledge (>75%), Moderate knowledge (50% to 75%) and (<50%) Poor knowledge (Abd Elhy, Kasemy 2017 & Lebona et al. 2016).

**Method:****Administrative process:**

Approval was obtained from the ethical committee of AlRazi University. An official written permission to conduct the study was obtained by the investigators

from responsible authorities. A verbal explanation of the nature and aim of the study was performed to nursing staff. The data for this study was collected during a one-month period, from October 2020 to November 2020, five days per week for five hours from 9 a.m. to 2 p.m. Oral consent was taken from all nurses in the study, and they have the right to refuse to participate or to withdraw from the study without any effect on the study. The subjects who agree to participate in the study were interviewed by the investigators to collect the necessary data regarding blood transfusion after explaining the purposes of the study. It took an average of 15-20 minutes to finish all the tool.

**Ethical Considerations:**

Approval of the study was obtained before carrying out this study from the ethical committee of the faculty of Medical Sciences, Al-Razi University, Sana'a City-Yemen. Formal permission was obtained from the authorities for the collection of data. The data was collecting from Public Hospitals in Sana'a City (Al-Thawra General Hospital Model, Al-Sabeen Maternity & Child Hospital, Republican Teaching Hospital Authority, Al-Kwit University Hospital, and Zaid Ben Sultan hospital). The investigator first introduced her and explained the need and purpose of the study. The knowledge level assessing after obtaining permission from all nurses.

**Validity and Reliability:**

The content validity was established by a panel of in AlRazi University, who reviewed the tools for clarity, relevance, comprehensiveness, and applicability for implementation and according to their opinion, some modifications were applied.

**Questionnaire reliability :**

was verified by Cronbach's Alpha; It was 0.690

**Pilot Study:**

A pilot study was conducted on 9 (10) nurses' to test the feasibility and applicability of the tools. The analysis of the pilot study revealed that minimal modifications are required. These necessary modifications were done, and the pilot study subjects were excluded from the actual study. The study sample consisted of 93 nurses.

**Statistical Design:**

Using a statistical software package for social sciences (SPSS-24), collected data were checked prior to computerized data entry and analysis. The demographic data was tabulated, and percentages were found by using number, percent, and mean. The association between the demographic characteristics and knowledge was analyzed by the chi-square test. The 0.05 level was used as the cut off value for statistical significance.

**Results:****Table (1): Distribution of the nurses regarding their demographic data.**

Demographic characteristics	No	%
<b>Age group:</b>		
• ≤ 25 years	13	14.0
• 26-30 years	31	33.3
• 31-35 years	26	28.0
• More than 35 years	23	24.7
<b>Mean ± SD</b>	31.52 ± 5.54	
<b>Department name:</b>		
• Emergency for Gynecology department	19	20.4
• Operation department	5	5.4
• Labor department	41	44.1
• Critical care units	7	7.5
• Gynecological department	21	22.6
<b>Marital status:</b>		
• Single	42	45.2
• Married	49	52.7
• Divorcee	2	2.2
<b>Level of education:</b>		
• Diploma degree	63	67.7
• Bachelor's degree	30	32.3
<b>Years of experience:</b>		
• 1-5 years	26	28.0
• 6-10 years	36	38.7
• 11-15 year	21	22.6
• 16-20 year	10	10.8
<b>Mean ± SD</b>	9.19 ± 5.44	
<b>Training courses in blood transfusion:</b>		
• Yes	27	29.0
• No	66	71.0
<b>A written policy for the administration of blood:</b>		
• Yes	36	38.7
• No	57	61.3

**Table (2): Distribution of nurses' knowledge regarding blood transfusion**

Knowledge scores	(N=93)		
		No	%
Knowledge relating to patient Preparation	Good	34	36.6
	Fair	50	53.8
	Poor	9	9.7
Blood pack collection	Good	35	37.6
	Fair	40	43.0
	Poor	18	19.4
Pre-transfusion initiation Nursing steps	Good	8	8.6
	Fair	38	40.9
	Poor	47	50.5
Post transfusion initiation Nursing steps	Good	5	5.4
	Fair	44	47.3
	Poor	44	47.3
Complications related to Blood transfusion	Good	54	58.1
	Fair	36	38.7
	Poor	3	3.2
<b>Overall knowledge</b>	Good	24	25.8
	Fair	55	59.1
	Poor	14	15.1

**Table (3): Association between nurses' knowledge and their characteristic regarding to blood transfusion**

Demographic characteristics	Knowledge level			P-value
	Good knowledge (N=24)	Fair knowledge (N=55)	Poor knowledge (N=14)	
<b>Age group:</b>				
• ≤ 25 years	1	10	2	0.517
• 26-30 years	7	20	4	
• 31-35 years	9	14	3	
• More than 35 years	7	11	5	
<b>Department name:</b>				
• Emergency for gynecology department	6	11	2	0.611
• Operation department	2	3	0	
• Labor department	9	26	6	
• Critical care units	2	5	0	
• Gynecological department	5	10	6	
<b>Marital status:</b>				
• Single	8	28	6	0.402
• Married	16	25	8	
• Divorcee	0	2	0	
<b>Education level:</b>				
• Diploma degree	15	37	11	0.589
• Bachelor's degree	9	18	3	
<b>Years of experience:</b>				
• 1-5 years	3	20	3	0.214
• 6-10 years	10	22	4	
• 11-15 years	8	8	5	
• 16-20 years	3	5	2	
<b>Training courses in blood transfusion:</b>				
• Yes	1	20	6	0.007
• No	23	35	8	
<b>A written policy for the administration of blood:</b>				
• Yes	4	25	7	0.035
• No	20	30	7	

Chi-square test.

\*Significant ( $P < 0.05$ )\*\*: highly Significant ( $P < 0.001$ ).

**Table (1):** Illustrated that one third of studied sample at the age between 26–30-year-old, more than half of these sample were married. The most was diploma degree in nursing. More than one third of studied sample had experience between 6-10 years; almost two third of them hadn't training courses of blood transfusion, most of studied sample were not share of any written policy for the administration of blood transfusion.

**Table (2):** Shows that more than half of the study sample had fair knowledge of patient preparation, while 43.0% had poor understanding of blood pack collection. Additionally, the majority of the study sample had no knowledge of pre-transfusion initiation nursing tasks. Only 5.4% of the study sample was

well-versed in post-transfusion nursing activities and concerns. In addition, 58.1% of the sample showed a good knowledge of blood transfusion complications. Most of the sample had a fair knowledge of blood transfusions in general.

**Table (3):** Showed that there was statically significant difference only related to training courses, and written policy for the administration, regarding to blood transfusion ( $P < 0.007$ ,  $0.035$ , respectively).

### Discussion:

The most common therapy to save patients' lives is to transfuse blood and its components; yet, while transfusion improves patients' lives, it is not without hazards. Nurses play an important part in blood

transfusion if they do it well; in addition, nursing performance and transfusion safety are dependent on nurses' knowledge and practice, which reduces the risk (Sayed et al., 2018). The present study was aimed to assess knowledge of nurses' regarding blood transfusion.

The present study as shown in reveal that one third of the nurses age in the study nurses were within (26 to 30) years old, this is due to the fact that most of the old nursing has left the hospital in Yemen to look for other job opportunities because of the war and the failure to pay salary regularly and replace them with volunteers.

This result disagreement with Abd Elhy & Kasemy (2017) who found that more than half of studied nurses at the age above 30 years old. On the line, Al-Nasr et al., (2016) reveals that, more than the half of studied nurse is in age group of 20- < 30 years old. However, our result is inconsistent with the result of another study Yesilbalkan et al., (2019) the mean age of the participants was 72% of them were in the 18-30 age groups.

The current study revealed that more than half of nurses were married, slight elevated two third of the nurses had a three-year nursing diploma and work experience between (6-10) years, as labor department nurses. This could be because studying nursing education is more accessible in many nursing institutes all over Yemen, while there are a limited number of nursing colleges that have opened in the last few years.

The results of this study are in agreement with, Saied et al. (2016) who founded that, more than half of studied nurses were married. Furthermore, Sayed et al., (2018) who revealed that, more than half of nurses were married, while, more than third of nurses had secondary school in nursing. On the line, this finding is agreed with Aslani et al., (2010) they found that, the majority of nurses were married.

Our results contradict the results by Yesilbalkan et al., (2019) who found that, the majority of the nurses were single, and had a bachelor's degree. Also, Lebona et al. (2016) who reported that, concerning the educational qualification of staff nurses, more than half was bachelor's degree in nursing.

As regarding course training, more two third of nurses had did not courses regarding blood transfusion. This might be due to the inadequacy of in-service refreshing training' courses or because hospitals have not a clear and updated guideline protocol that nurses can access and adhere to at work. Our result agrees with Hijji et al. (2012) who reported that only one third of them reporting a perceived need for training in blood administration. On the line, this finding disagrees with Aslani et al.,

(2010) who founded that, the majority had Bachelor of Nursing.

According to the findings of this study, half of the nurses were knowledge about patient preparation prior to blood transfusion. This result was in the same line with Abd Elhy & Kasemy (2017) who mentioned that, more than two-thirds of the participants in the study had a fair knowledge of patient preparation issues. In addition to Yaghoobi, et al., (2014), who reported that more than half of the participants in the study had a good knowledge before blood transfusion. Moreover, Tetteh, (2015) who showed that nurses had adequate knowledge related to patient preparation about blood transfusion

The current study showed less than half of nurses had fair knowledge related to blood pack collection. This result was agree with Lee, et al., (2016), who reported that about half of these studied sample had adequate knowledge about blood pack collection. One other hand, our results contradict the results by Abd Elhy & Kasemy (2017) who founded that, the most had poor knowledge according to blood pack collection.

This study showed, there were fifty of the nurses that know had poor knowledge about to pre-transfusion initiation nursing steps. this result was agreement with another study was conducted by Hijji, et al., (2012) who stated that the majority of nurses have the unsatisfactory levels of knowledge regarding types of blood groups and lack knowledge about basic ABO terminology. In addition, Abd Elhy & Kasemy (2017) who founded that, the majority of studied sample hadn't knowledge related to pre-transfusion initiation nursing activities.

The current study showed, the majority of nurses had fair and poor knowledge related to post transfusion initiation nursing steps. This finding is agreed with the study conducted by Khalil, et al., (2013) who reported that inadequate level of knowledge about complications of blood transfusion, this indicates their lack of scientific training. Furthermore, Abd Elhy & Kasemy (2017) who revealed that, more than two third of them had poor knowledge about post transfusion initiation nursing activities.

Concerning nurses' knowledge about nursing care for blood transfusion complications, the result of this study revealed that the most of nurses had marked a good level of knowledge. These results are incongruent with Ibraliim, (2012), who mentioned in her study that all nurses do not know the complication of blood transfusion before the implementation of her nursing guidelines. Likewise, Aslani et al. (2010) reported that, it is recommended to activate the blood transfusion committee in hospitals to increase the quality of this common procedure and prevent side effects by in-service training of nurses. It may be

necessary for nurses to know the pathophysiology of transfusion reactions, symptoms, and management that can improve the patient's monitoring. Moreover, the result disagrees with the result of **Abd Elhy & Kasemy (2017)** who mentioned that the majority of sample had poor knowledge regarding to complication related to blood transfusion. In addition, this finding is disagreement with **Al-Nasr et al., (2016)** who reported that, the majority of the studied nurses have unsatisfactory knowledge regarding nursing care of complication of blood transfusion.

In the present study regarding overall knowledge, the most of nurses had a fair level of knowledge regarding blood transfusion. This due to frequency of blood transfusion. Our result finding agrees with the study was conducted by **Aslani et al., (2010)** who reported that, two third of nurses had average level of knowledge.

This result agrees with the study conducted by **Lebona et al., (2016)** who reported the most nurses have moderate adequate knowledge regarding administration of blood transfusion. Moreover, **Kaur et al. (2014)** who study showed that, the half of nurse acceptable knowledge which strongly emphasized the need for a curriculum to promote knowledge of health care workers about blood transfusion. In addition, the results are consistent with an earlier study **Duarte et al., (2017)** who reported that, the average overall knowledge score was 52.8% about blood transfusion.

On other hand, this result disagreement with the study with **Shakor & Salih (2020)** who reported that, the nurses' knowledge of blood transfusion was insufficient which could be detrimental to patient safety. Furthermore, this finding unaccepted with other study by **Al-Nasr et al., (2016)** who concluded that, the majority of the studied nurses have unsatisfactory level of knowledge. In addition, our results disagree with the results of studies by **Abd Elhy & Kasemy (2017)** who founded that, more than half of studied sample had poor knowledge level related to blood transfusion.

In the present study, show there was a statistically significant difference between knowledge level and demographical characteristics of nurses' regarding training courses, and written policy for the administration ( $p < 0.004, 0.001$ ) respectively.

This result agrees with the study by **Lebona et al. (2016)** who reported that there was a statistically significant association between the levels of knowledge regarding blood transfusion among staff nurses with their socio-demographic variables. Moreover, this result accepted with the study by **Abd Elhy & Kasemy (2017)** showed that there was statically significant difference related to share in program regarding to blood transfusion  $P (< 0.001^*)$

## Conclusion

It has been concluded that, the total knowledge regarding blood transfusion is fair (59.1%) while 25.8% regarding blood transfusion is good knowledge.

## Recommendation

Based on the results of the present study the following cane be recommended:

1. The nurse program of the faculty should pay more attention to blood transfusion and patient safety after blood transfusion.
2. An education program based on evidence related to blood transfusion is of utmost importance for nurses due to the shortage of new evidence-based knowledge and practices and the work overload on the nurse staff most of the time.
3. Replication of the study on a larger probability sample acquired from the different geographical areas in Yemen and private hospitals to figure out the main aspects of these problems.

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