ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCES

SCHOOL OF MEDICINE

DEPARTMENT OF EMERGENCY MEDICINE AND CRITICAL CARE NURSING

ASSESSMENT OF KNOWLEDGE AND PRACTICE ON BLOOD TRANSFUSION AND ITS ASSOSCIATED FACTORS AMONG NURSES WORKING AT TIKUR ANBESSA SPECIALIZED HOSPITAL

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A THESIS TO BE SUBMITTED TO, DEPARTMENT OF EMERGENCY MEDICINE, THE SCHOOL OF MEDICINE ADDIS ABABA UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER IN EMEREGENCY MEDICINE AND CRITICAL CARE NURSING (EMCCN)

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Assessment of knowledge and practice on blood transfusion and its associated factors among nurses working at Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia, June 2019

MSc. Thesis

In Partial Fulfillment to the Requirements for the Degree of Master in emergency medicine and critical care nursing

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Advisor's Approval Sheet

This is to certify that the thesis entitled "knowledge and practice on blood transfusion and its associated factors among nurses' working in TASH, Addis Ababa, Ethiopia, is submitted in partial fulfillment of the requirements for the degree of MSc. with specialization in "EMCCN" to the Graduate Program of the College of Health Sciences in Addis Ababa University and has been carried out by zewde ketemaw ID GSR/87/94/10 under my supervision. Therefore, I recommend that the student has fulfilled the requirements and hence hereby can submit the thesis to the Department. _____ _____ _____

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Declaration I hereby declare that this MSc thesis is my original work and has not been presented for a degree in any other university and all sources of material used for this thesis have been accordingly acknowledged. Name: _____ Signature: _____ Date: _____ This MSc thesis had been submitted for examination with my approval as thesis advisor.

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List of acronyms and abbreviations

AA:	Addis Ababa
AAU:	Addis Ababa University
AOR	Adjusted Odd Ratio
BSc:	Bachelor of Science
CE:	Concentrated Erythrocyte
COR:	Crude Odd Ratio
EMCCN:	Emergency Medicine and Critical Care Nursing
ETB:	Ethiopian Birr
FFP:	Fresh Frozen Plasma
HIV:	Human Immune Deficiency Virus
ICU:	Intensive Care Unit
MOH:	Ministry of Health
MSc:	Masters of Science
MW:	Medical Ward
OPD:	Out Patient Department
RH-:	Rhesus factor
SICU:	Surgical Intensive Care Unit
SOHT:	Serious Hazards of Transfusion
SW:	Surgical Ward
TASH:	Tikur Anbesa Specialized Hospital
UK:	United Kingdom
WHO:	World Health Organization

Table of content

Contents pages

List of figures

List of tables

Abstract

Background

Blood transfusion is an important part of day-to-day clinical practice. Blood and blood products provide unique and life-saving therapeutic benefits to patients. The major concern from the point of view of both user (recipient) and prescriber (clinician) is for safe, effective and quality blood to be available when require. This study aimed to evaluate the knowledge and practice of the nurses on blood transfusion and to identify the factors associated with such knowledge and practice.

Objective: To assess knowledge and practice on blood transfusion and its associated factors among nurses working at TASH, 2019.

Method: A descriptive cross-sectional study was used. Accordingly, study was conducted on a total of 234 nurses. An interview administered pretested structured questionnaire was used to collect information on sociodemographic data, knowledge and practice on blood transfusion and associated factors. Data was collected by 3 BSc. nurses and 1 MSc. supervisors who have an experience of data collection and was supervised by the investigator. SPSS version 21 software was used for data analysis. Descriptive statistics was used to describe both dependent and independent variables. Binary logistic regression was used to determine association between dependent and independent variables. Confidence interval 95% and $p<0.05$ was considered statistically significant.

Result: On the score of knowledge 57.3% of participants had unsatisfied level of knowledge, and 77.8% of participants had incompetent level of practice on blood transfusion. Factors associated with knowledge included nurses those have not received training (AOR=1.902, 95% CI 1.024, 3.531, P=0.035). And factors associated with practice included, working experience of 1-5 years (AOR)=2.236,95%CI,1.489, 4.230, P=0.011, working experience of 6-10 years (AOR=7.545, 95% CI, 1.659, 9.316, P=0.009), number of blood transfusion 1-3 times per week (AOR= 5.404, 95% CI, 1.417, 7.570, P= 0.006) and knowledge score (AOR=5.185, 95%CI, 1.090, 7.380, p=0.000) were significantly associated.

Conclusion and recommendation: The overall result shows there was unsatisfactory level of knowledge and incompetent level of practice of nurses on blood transfusion. It is importance to increase the opportunities to acquire skills such as training courses and continuing and permanent education for nursing professionals is reinforced, focusing on patient safety and quality of care.

Key words: knowledge, practice, associated factors, blood transfusions, nurses

Chapter 1

1. Introduction

1.1 Background

Blood is a fluid tissue that circulates throughout the body through arteries and veins, providing a vehicle by which an immune variety of different substances are transported between the various organs and tissues (1). Blood group is complex chemical systems found on the surface of blood cells and determined by the gens that are inherited from parents. It is essential to transfuse correct blood type because incorrect blood antibodies destroy transfused red blood cells in circulation, causing hemolysis. There are four main types of blood groups this are A, B, AB and O (2).

Blood transfusion is the transfer of blood or a blood component from one person (a donor) to another (a recipient) (3). Blood transfusions was first recorded in 1492 when Pope Innocent VIII, in Rome, had a stroke and drop into a coma. The Pope's physician advised a blood transfusion as a therapeutic measure for the Pope's illness (4).

In Africa approximately 8 million unit of blood are currently needed to meet transfusion demand for a population of nearly 800 million, according to the world health organization (WHO) guidelines of 10 unit per 1000 population. However, only 3 million unit of blood are collected annually, satisfying a mere 40% of this estimated need. Blood is needed in case of obstetric hemorrhage, road traffic accidents, sickle cell disease, anemia, malnutrition and malaria infection. Blood safety is an important public health concern in Africa where lack of availability or supply of unsafe blood adversely impacts morbidity and mortality in the country (5).

Blood transfusion is a vital and often life-saving procedure. The procedures have its own benefits, risks and complications. Most of the errors occur due to human made (either the health care personnel or the patients by itself). The good orientation and comprehensive guides are in a central role to guarantee a safe blood transfusion (2).

Blood component therapy (red cells, platelets, fresh frozen plasma and cryoprecipitate) are entirely depends on the systematic collection, processing and testing of blood from voluntary, non-beneficent or altruistic donors (6).

The health and safety of both patients and donors are core in blood transfusions. This requires advanced precaution methods, strictly following procedures, regulations and monitoring during the administration. The hospitals and the health care facilities are responsible for effective and correctly indicated use of blood components, the compatibility study and the registration (7).

Generally blood and blood component transfusions are required for acute blood loose, acute hemolysis syndrome, severe decompensated anemia and chronic anemia management anticipated fall in hemoglobin (<8g/dl) and fall platelet level(8). Blood is avital resource that needs to be prescribed, handled, stored and transfused as per guidelines to ensure recipient safety (9).

Investigations revealed that errors in the requesting, supply, and administration have leads to significant risks to patients. Guidelines are inadequate in improving the processes and addressing the deficiencies identified in the whole process of collection of blood samples, labelling, requesting, supply, administration and monitoring of practice (10).

If a nurse gives an incorrect blood component for patient, it may be expose to risk of serious injury or even death. There are many different blood- grouping systems to prevent incorrect blood and blood component transfusion. The most important ones being the ABO and Rh systems. It is crucial that patients are given compatible blood components, that is the donors blood and the patients (receiver) blood must be correctly matched to ensure safe transfusion. Accurate patient identification is vital in ensuring that the right blood is transfused to the right patient (11).

1.2 Statement of the problem

Before the blood component is collected from the hospital blood refrigerator, the health care professional should take the required documentation of containing the patient's core identifications and should check with the label on the blood component and should be safely delivered in an appropriate transport box without delay (12).

Vital signs must be taken before starting transfusion, at the first 5 to 10 minutes, 30 minutes and subsequent hours and after ending of transfusion (13). The duration of transfusion for one unit of red cell concentrate should not exceed 4 hours. Plasma transfusion will depend on the patient's cardiac status and may vary between 30 minutes to 4 hours. Cryoprecipitate is transfused over a period of 5 minutes, and platelets are transfused from 15 minutes to 30 minutes (12).

Complications of blood and blood component transfusions occur during transfusions or after hours of being transfused. The complications are acute or delay, ranging from the development of acute hemolytic reaction, febrile reaction, volume over load, impaired oxygen delivery, anaphylaxis and septic reaction. And also it carries the risk of transfusion-transmissible infections including HIV, hepatitis viruses and malaria disease(14).

Each year, millions of people worldwide needed blood transfusions. In the United Kingdom alone, around 3-4 million blood components were transfused every year. From that acute non-hemolytic febrile or allergic reactions are a common complication of transfusion (15).

Studies in UK reported that unsafe blood transfusion practice, mainly with regard to patient identification, administration of wrong blood and monitoring of vital signs (16). World Health Organization (WHO,2011), reported that over nine million patients in 90 different countries receive blood in a year. According to SHOT about 70% of all reported adverse events are recognized to the improper transfusion of blood and blood products (17).

A study in Texas shows that ABO-incompatible transfusions were due to error:(62%) of errors occurred at the patients' bed side. Sixty four percent manifested signs and symptoms related to the incompatible transfusion, and (17%) were died. Only 25% of patients who received incompatible blood had associated signs and symptoms but non-died. Hypotension, hemoglobinuria and hemoglobinemia were the most frequent findings in survivors and patients who died (18).Another study in India shows that transfusion related lung injury though a serious blood transfusion reaction

with a fatality rate of 5–25 % presents with acute respiratory distress with hypoxemia and noncardiac pulmonary edema within 6 hours of transfusion (19). Another study in Pakistan shows that 2/3 of acute blood transfusion results allergic reaction, and 11.11% of acute blood transfusion results transfusion related acute lung injury (20).

A study in Nepal shows a total of 3,288 cases were reported in the serious hazard of blood transfusion (SHOT). Of the total SHOT cases, 77.7% of errors resulted from mistakes and only 10% were not preventable (mostly allergic/febrile reactions). The number of cases with major morbidity was 166 and the total deaths reported were 26. The reported major morbidities were hemolytic transfusion reactions, transfusion-transmitted infection, volume overload and ABO incompatible transfusion (14).

Similar studies in Africa shows blood transfusion transmittable infection risk for human immune deficiency virus, hepatitis B virus, and hepatitis C virus was estimated as 1, 4.5, and 2.5 infections per 1000 transfused units, respectively, corresponding annually to approximately 28,595, 16,625, and 6,650 infections of human immune deficiency virus, hepatitis B virus, and hepatitis C virus respectively (5). And another study in Egypt an error occurred in 18.2% of the 576 blood compatibility tests were performed at the bedside (21).

Despite of the above-mentioned problems, in Ethiopia, there is no published study regarding knowledge and practice on blood transfusion and its associated factors among nurses. Therefore, the aim of this study is to assess knowledge and practice on blood transfusion and its associated factors among nurses working in Tikur Anbessa Specialized Hospital.

1.3 Significance of the study

As nurses are the primary providers who perform blood component administration, their knowledge and skills are crucial for them to administer blood components safely and efficiently. Poor knowledge and practice may result in avoidable complications that may threaten patients' safety. There is no published study related to knowledge and practice on blood transfusion and its associated factors among nurses in Ethiopia. Thus, this study will help to show gaps of knowledge and practice on blood transfusion and its associated factors among nurses. Also, the findings from this study will provide information about the existing knowledge and practice of nurses. It will also help as an input for designing appropriate and context-based training as well as for policy and decision makers to develop appropriate national policies and guide lines in response to knowledge and practice gap on blood transfusion. Moreover, it would help as a reference material for future researchers interested on this issue.

Chapter 2

2. Literature review

2.1 Knowledge of nurses on blood transfusion

According to WHO the appropriate use of blood and blood products means the transfusion of safe blood products only to treat a condition leading to significant morbidity or mortality that cannot be managed effectively by other means. Transfusion carries the impact of adverse reactions and transfusion transmissible infections. Plasma can transmit most of the infections present in whole blood and there are very few indications for its transfusion (22).

The administration of blood has five phases, directly related to nursing performance which include (i) preparation before collecting blood units from the storage site: during this phase nurses must check a written prescription, provide sufficient information to patients about indication of blood transfusion, its risks and benefits, (ii) blood bag collection: including blood component level compatibility slip, (iii) pre transfusion activities: pre transfusion vital sign should be taken, initiate infusion rate of blood slowly during the first 15 minutes to prevent reactions that occur during this period, and (iv) post transfusion activities: in this phase nurse must follow the patient for the first 10 -15 minutes and record vital signs. Each transfusion should be finished within four hours from its beginning. (v) while transfusing a patient monitoring is important maintain patients safety: nurse should be aware of any signs and symptoms of reaction and how to deal with this condition to save patient life (23).

Professionals who received training or guidance to carry out the transfusion process attended specific training for blood transfusion were post graduated, followed some rule or guideline and had higher knowledge scores than the other professionals (24).

A study conducted in Brazil Minas Gerais, the average number of times that the professionals carried out blood transfusion was 3.6 times/month. Sixty-two-point five percent of the professionals were participated in specific training programs of blood transfusion. Fifty-two-point eight percent of professional category of nurses are participated in training and specific courses for professional enhancement, post-graduate degree and blood transfusions performed per month

(25). Study in Nellore shows that 53.3% of participants have inadequate level knowledge regarding to blood and blood component administration/transfusion (1).

Study conducted in Turkey revealed that 79% of respondents are taking training on blood and blood product transfusion. From all, 78% of respondents identified crossmatching as the final check for ABO compatibility. Ninety percent of the respondent's states that they return blood if the label of blood bag is not reading. While 98% of study participant may reject if the blood bags are open and color change or foamy appearance. In the event of a patient experiencing fever and shock, 96% of the survey participant indicates that they consider it may be a reaction to a blood transfusion. The need to confirm patients' identity and the type of blood products was confirmed by 91%, and 85% agrees that no other medication be add to the blood to be transfused (26).

Study conducted in Niger shows that half of the respondents 45.8% got less than 50% correct answers (27). Similar studies done in Ghana shows that 51.6% of respondents have good level knowledge (3). Another study in Egypt at Menoufia University revealed that more than half of (61.2%) of nurses have poor knowledge regarding to blood transfusion (23).

2.2 Practice of nurses on blood transfusion

According to studies conducted in Southern Asia Nepal revealed that a total of 86 blood transfusion were done. Out of 86 observations, one blood transfusion is cancelled due to mismatch in the blood bag number mentioning in the cross-match sheet and blood unit itself. Only 8.2% of the patients or the relatives are informed about the reasons, associated problems or risks and the benefits of transfusion (14). Another study done in Pakistan shows 36.44% of the study participants had good practices(28) .

Another study conducted in North Africa Morocco among 42% of nurses, only 25% have appropriate practice with no negative consequences for the patient safety. In another study conducted in Ghana revealed that only (53%) of participants recognized as a transfusion reaction by the nurses and reported to the physician. (3).

2.3 Factors associated with blood transfusion knowledge and practice

Study conducted in Brazil Minas Gerais shows that the variables participation in specific training for blood transfusion and participation in post-graduation course was statistical significance with level of knowledge ($p < 0.05$). And also number of blood transfusions carried out in a month were marginally significant with the level of knowledge ($p = 0.077$) (25). Another study in Pakistan shows that factors related to knowledge were received training and/or guidance to accomplish the transfusion process ($p<0.01$) (21).

Study conducted in Nellore shows that age, gender, educational qualification, professional experience and attended any training shows non-significant association with level of knowledge regarding administration of blood transfusion ($p=0.050$) (1). Another study in Turkey revealed that there was no statistically significant difference was found in the distribution of responses between those who received or did not receive training with level of knowledge regarding of blood transfusions ($p>0.05$) (24).

According to a study conducted in Niger there were significant difference between subjects who received transfusion training and those who have not. Indeed, the quality of responses was higher in the trained groups ($P < 0.0001$), and the quality of responses is better ($P < 0.05$) in subjects with more seniority or experience in the field with level of knowledge (27).

A study conducted in Mozambique showed that the most potentially influential factors for transfusion practice were education about transfusion indications and training to assess perfusion. ($p < 0.01$) (29).

Another study in Egypt showed that there was statically significant difference with level knowledge related to age, sex, level of education, number of performing blood transfusion and experience regarding to blood transfusion P (<0.001) (20).

2.4 Conceptual frame work

Source: (Mayaki *et al.*, 2016), (Molon *et al.*, 2016), (Elhy, 2017), (Ms G Betty Lebona G, Ms Chanambam Sanjota Devi, 2016).

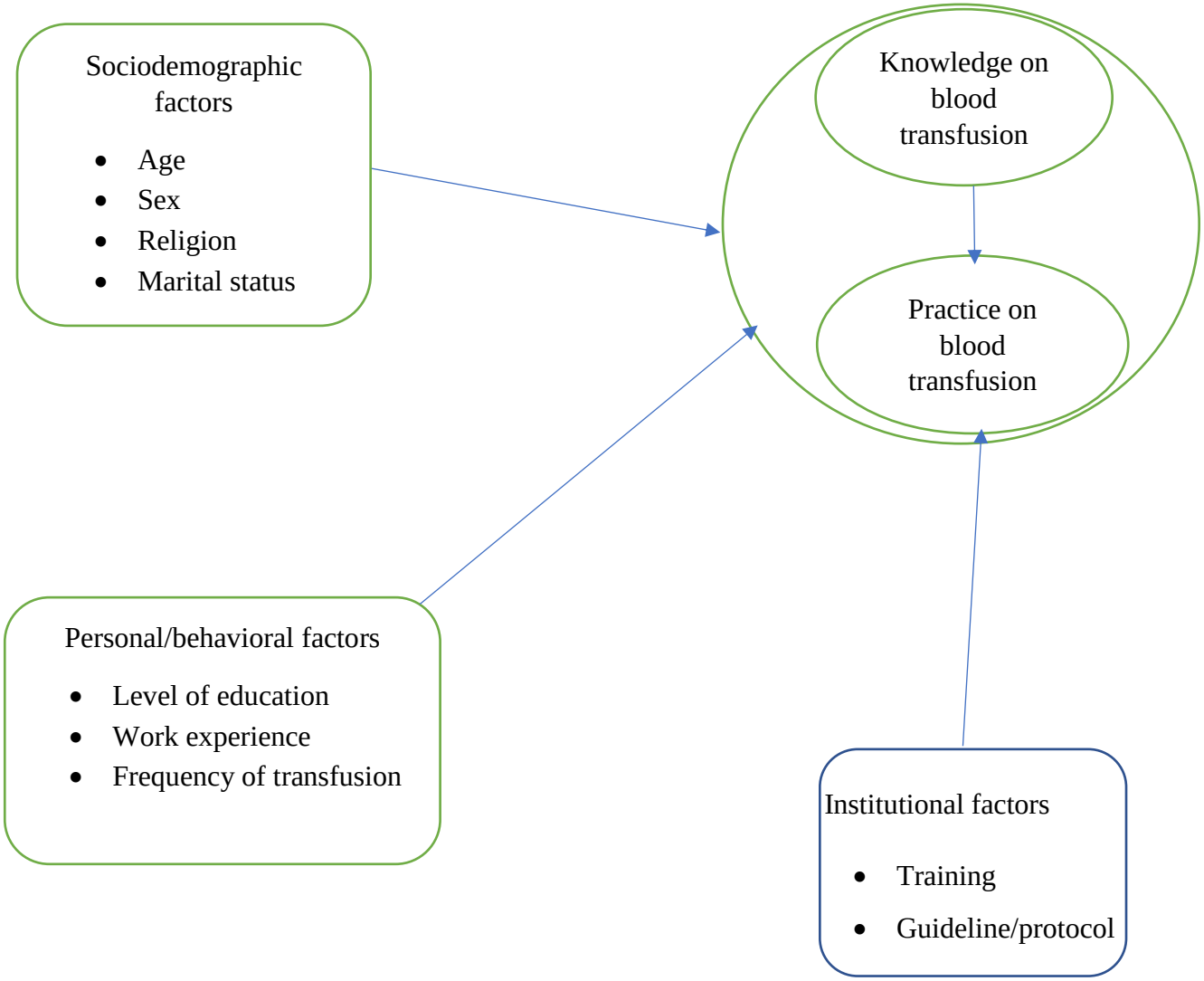

Figure 1 Conceptual framework on assessment of knowledge and practice on blood transfusion and its associated factors

Chapter 3

3. Objectives

3.1 General objectives

- To assess knowledge and practice on blood transfusion and its associated factors among nurses working at TASH 2019

3.2 Specific objectives

- To determine the knowledge of nurses on blood transfusion
- To determine the practice of nurses on blood transfusion
- To identify factors associated with knowledge and practice on blood transfusion

Chapter 4

4. Methods and Materials

4.1 Study area and Study period

The study was conducted in Tikur Anbessa Specialized Hospital, Addis Ababa university. Addis Ababa university (AAU) is the oldest school in Ethiopia and has thirteen campuses, twelve of this are situated in Addis Ababa and one is located in Bishoftu about 45 kilometers away. TASH is both of largest general and referral public hospital. Among all in Ethiopia providing teaching for about 300 medical students and 350 residents every year, and also it offers diagnosis and treatment for approximately 370,000-400,000 patients a year. The hospital had 800 beds with 130 specialst,50 non-teaching doctors, and 771 nurses.

The study period was conducted from April 1-May 29,2019

4.2 Study design

Institutional based descriptive cross-sectional study design was used.

4.3 Population

4.3.1 Source population

All nurses' working in Tikur Anbessa Specialized Hospital

4.3.2 Study population

The study populations were nurses who are working in emergency, intensive care unit and inpatient units

4.4 Eligibility Criteria

4.4.1 Inclusion criteria

All nurses who are available at the time of data collection

4.4.2 Exclusion criteria

Nurses those are on maternal, annual and sick leave during data collection.

Nurses who are not at the bedside or who are in direct clinical care such as nurse administrators, coordinators, supervisors.

4.5 Sample size determination

The actual sample size for the study was determined by using the formula of single population proportion formula.

$$n = \frac{(Z\ \alpha/2)^2 * p\ (1-p)}{d^2}$$

Where n = estimated sample size

Z = Confidence level (alpha, α)

P = prevalence

d = margin of error

To determine sample size the following assumption was used. Since the actual proportion of knowledge or practice on blood transfusion is unknown 50 % were used.

A 95% confidence level, margin of error (0.05)

$$n = \frac{(1.96)^2 * 0.5\ (1-0.5)}{(0.05)^2} = 384.16 \approx 384$$

Since the target population was less than 10,000, the sample size was adjusted using the formula

$$nf = \frac{n}{(1+\left(\frac{n}{N}\right))}$$

Where:

nf =the desired sample size (when population was less than 10,000)

n =the desired sample size (when the population was more than 10,000)

N= the estimate of the population size

Health care in the university hospitals was provided by 771 nurses (from statistical administrative records of hospitals 2010), but after excluding nurses those are on maternal, annual and sick leave, nurse administrators and supervisors during data collection 531 nurses were targeted population.

Hence $nf = \frac{384}{(1+\left(\frac{384}{531}\right))} = 222.8 \approx 223$nurses

Taking None-response rate to be 10% =223*10%=22.3 ≈22

22+223=245

So, the total sample size were **245** nurses.

4.6 Sampling technique and procedure

For recruiting the study participants, a systematic random sampling method was applied, list of nurses working in the study area was obtained from administrative records. Nurses were taken from three units based on their proportion allocation that is 67 nurses from emergency,27 nurses from ICU and 151 nurses from inpatient unit. Then nurses were selected by using the formula K= N/n (dividing the population size "N" by required sample size "n") 531/245=2.1≈2 based on their monthly list of programs, so the selection was on every two nurses.

4.7 Operational definition

Knowledge: This refers to knowledges and skills acquired through education or experience, and the theoretical or practical understanding of blood transfusion. Based on the research done in Egypt the response categories were coded 3 for always true, 2 sometimes true and 1 not at all, Total items =8. Evaluation of nurses' knowledge considered to be satisfactory level was ≥70%, while unsatisfactory level was 70% (22).

Practice: This describes the nurses 'habitual, or expected procedure or way of methods of blood transfusion. The response categories were coded as 3 to 1 for yes always, yes sometimes, and not at all respectively. And total items = 20. Evaluation of best nurse practice considered to be competent level was ≥80%, while incompetent level 80% (22).

4.8 Study variables

4.8.1 Dependent variable

- Knowledge and practice

4.8.2 Independent variable

- **Sociodemographic factors**: Age, sex, marital status, religion, year of experience
- **Personal factors**: Frequency of transfusion, working experience, level of education
- **Institutional factors**: Training, guideline (protocols)

4.9 Data collection tool

English version with interview administered questionnaire was used to collect data. It was adapted from similar study conducted in Ghana (3).

4.10 Data collection procedure

Data was collected by 3 BSc. nurses and supervised by 1 MSc. nurses. Before the actual work, a one-day training was given to data collectors on the objectives of the study, data collection tool, methods of reporting to supervisors and principal investigator. The interview guide was prepared in the English language, and developed based on the study objectives. The questionnaire consists of 4 parts. Part I: information on sociodemographic data of participant, Part II: information regarding knowledge, Part III: information regarding practice, Part IV: information regarding associated factors.

4.11 Data processing and analysis

Data was entered into Epi-info version 7 software to minimize data entry error and exported for analysis to SPSS version 21, and then analyzing was done. To explain the study population in relation to relevant variables, descriptive statistics such as means, standard deviation frequency and percentage was used to describe sociodemographic variables. Binary logistic regression was used to determine association between dependent and independent variables.

4.12 Data quality assurance

The quality of data was assured through careful designing and pretesting of questionnaires. Before the actual data collection, the questionnaires were pre-tested on populations which are not part of the main study at Menelik hospital. Pre-testing was conducted on (5% of study population). Based on the findings of the pre-test some modification and developments of the tool done. Data collectors was instructed to check the completeness of each questionnaire whether each and every question is completely answered and also the supervisor was rechecking the completeness of the questionnaire after submission. Confidentiality of participants was assured by assigning a code identification number instead of their names during data collection and analysis, these code numbers was used in all reports of the study findings. Name or physical address of participants was not used during report sharing and communication of findings. Participants also assured that all their personal information such as their name was protected from public and secured by the researcher.

4.13 Ethical consideration

Ethical approval for the study was obtained from College of health sciences ethical review committee. A support letter was taken from department of emergency medicine for permission to conduct the study. An information sheet on the purpose and procedure of the study, benefits of the study, privacy and confidentiality issues, voluntary participation and their right to withdraw from the study was provided to the participants.

4.9 Dissemination of result

Main findings of the study will be presented and reported to responsible bodies. It will be presented to Addis Ababa university, college of health sciences, school of medicine, department of emergency medicine and reported to ministry of health. The hard and soft copy of findings will also be available in the library of Addis Ababa University Tikur Anbessa. It will be also published on international scientific journals.

Chapter 5

5 Results

5.1 Sociodemographic characteristics of participants

A total of 245 study subjects were initially determined by systematic random sampling method to be included and targeted for the study completed and returned their copies of the questionnaire. Resulting in the study attaining a 95.5% retrieval rate. However, 11 nurses were not participated willingly. Finally, a total of 234 study subjects were the actual study participants from which data were collected and analyzed.

The gender of study respondents 132 (56.4%) were females. And also, the average age of nurses was 28.50 ±4.291 with a minimum 21 and a maximum of 54. In the study population 155 (66.3%) of the participant belongs to orthodox followed by protestant 49(20.9%). Of the total participant 138 (59.0%) were single. More than three third 207(88.5%) were first degree holders.

On the number of years of working experience in blood transfusion, it was revealed that majority of them 172 (73.5%) had between 1-5 years, and the average working experience was 4.33 with a minimum of 1 and a maximum of 35. Regarding the frequency with which professionals administered transfusions 116 (49.6%) reported administering a weekly average of 5.26 transfusions/week, with a minimum of 1 and a maximum of 26 times/week.

In the study population 173(73.9%) were not received any training. Regarding to guideline/protocol 138(59%) were said there were not aware any guideline/protocol.

Table 1 Frequency of Socio-Demographic characteristics of respondents in TASH, Addis Ababa, Ethiopia, June 2019

Variable		Frequency	Percent
Sex	Male	102	43.6
	Female	132	56.4
Age	<25	47	20.1
	25-30	136	58.1
	>31	51	21.8
	Mean ±SD	28.50±4.291	
Religion	Orthodox	155	66.3
	Muslim	27	11.5
	Protestant	49	20.9
	Catholic	3	1.3
Marital status	Married	95	40.6
	Single	139	59.0
Number of BT in a week	1-3	116	49.6
	4-6	58	24.8
	7-9	10	4.3
	>10	50	21.4
	Mean ±SD	5.26±5.032	
Level of education	First degree	208	88.5
	Master's degree	26	11.1
Duration of experience	1-5	172	73.5
	6-10	51	21.8
	>10	11	4.7
	Mean ±SD	4.33±3.524	
Participating any training/educational program	No	173	73.9
	Yes	61	26.1
Is there a unit protocol guideline for BT	No	138	59.0
	Yes	96	41.0

5.2 knowledge status of participants on blood transfusion

Knowledge assessment part of the questionnaire contains 8 items. Score of ≥70% of the items were considered as having satisfactory knowledge. Therefore, according to the response obtained from study participants, more than half 134(57.7%) of the nurses working in the study area had unsatisfactory level of knowledge on blood transfusion while the rest 100(42.3%) had satisfactory knowledge.

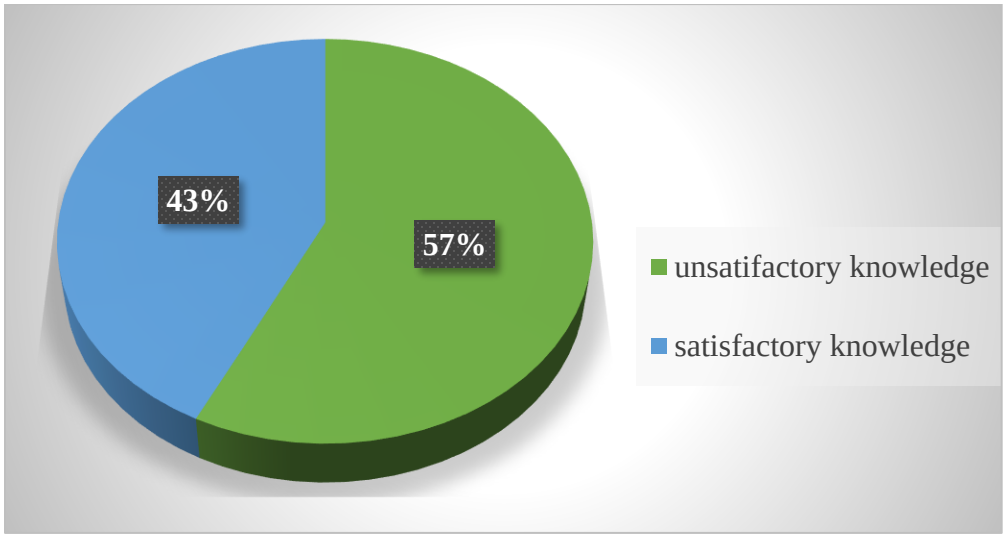

Figure 2 Knowledge status of nurses on blood transfusion

5.2.1 Specific knowledge of study participants towards blood transfusion

The following tables depict that when asked if study participants knew what will done before, during and after blood transfusion, about 189(80.8%) of nurses responded to identifying client identity and confirming blood compatibility, 191(81.6%) to assessment of blood bag tag, label and requisition form to ensure ABO and Rh types compatibility, 166(70.9%) to observing the patient for possible transfusion reaction for the first 10-15 minutes, 168(71.8%) to stopping transfusion and keeping intravenous line open with 0.9% normal saline in case blood transfusion reaction occurs, 148(63.2%) to assessing client for previous reactions to blood transfusions as true always.

However, only 80(36.8%) study participants gave response to starting the transfusion within 20 minutes after collection from blood bank to minimizes complications and 76(32.5%) to transporting blood from blood bank to only one client at a time as true always.

Table 2 Knowledge score of participants for specific knowledge questions

Knowledge statements on blood transfusion	True always N (%)	True sometimes N (%)	Not at all N (%)
The most important phase of the transfusion process is identifying client identity and confirming blood compatibility	189 (80.8)	34(14.5)	11 (4.7)
Client is assessed to determined previous reactions to blood transfusions	148 (63.2)	70 (29.9)	16 (6.8)
The blood bag tag, label and requisition form are assessed to ensure that ABO and Rh types are compatible	191 (81.6)	27(11.5)	16 (6.8)
Blood should be transported from the blood bank to only one client at a time	76 (32.5)	72 (30.8)	86 (36.8)
For the first 10-15 minutes it is essential to physically observe the patient for possible transfusion reaction	166 (70.9)	52 (21.8)	16 (6.8)
Signs of immediate transfusion reactions include chills and diaphoresis, muscle aches, back pain or chest pain, rashes, itching, rapid pulse, apprehension, nausea, vomiting or diarrhea.	165 (70.5)	54 (23.1)	15 (6.0)
Starting the transfusion within 20 minutes after collection from blood bank to minimizes complications	86 (36.8)	109 (46.6)	39 (16.7)
The first two measures following blood transfusion reaction is to stop the transfusion and keep intravenous line open with 0.9% normal saline	168 (71.8)	46 (19.7)	20 (8.5)

5.3 practice of nurses on blood transfusion

Practice evaluation component of the questionnaire contains 20 items. Score of ≥80% of the items were considered as performing competent practice. Accordingly, more than three forth 182(77.8%) of the study participants in the study area had competent practice on blood transfusion while the rest (22.2%) had incompetent practice.

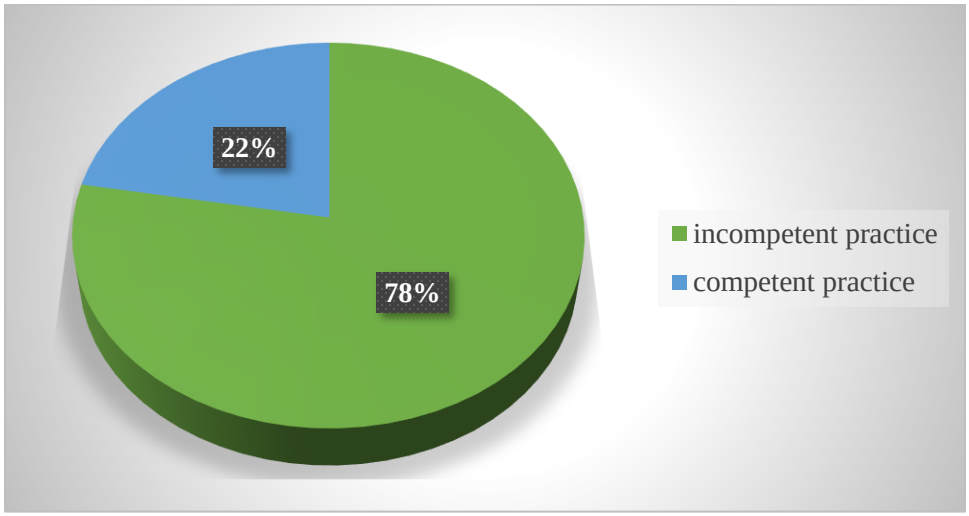

Figure 3 level of practice of nurses towards blood transfusion

5.3.1 Specific practice of study participants

More specifically, the present study showed that about 137(57.7%) of study participants always checked vital signs before transfusing blood to a patient whereas 23(9.8%) of participants didn't check at all, 166(70.9%) of participants was always inspect blood bag for leaks, abnormal color, clots, excessive air and bubbles, and 205(87.6%) of participants identify the right patient before transfusion. On the other hand, 61(26.1%) of participants were totally not return blood to blood bank if blood is not administered longer than thirty (30) minutes. On the present result 107(45.7%) of respondent were check vital signs and lung sounds first fifteen minutes and every hour until completion, but 38(16.2%) of respondents were not at all.

104 (44.4) of respondents were not warm up blood and blood products in microwaves or hot water. Also, majority 163 (69.7%) of respondents were always start transfusion slowly and monitor for signs and symptoms of transfusion reactions especially in the first 15 minutes and 58(24.8%) done sometimes. The score of the participants 150(64.1%) of respondents were always carry out emergency treatment in case of transfusion reaction as order.

Table 3 practice score of participants towards blood transfusion at TASH June 2019

Variables	Yes always N (%)	Yes sometimes N (%)	Not at all N (%)
Check informed consent has been obtained	129 (55.1)	72 (30.8)	33 (13.7)
Check vital signs before transfusion	136 (57.7)	75 (32)	23 (9.8)
Obtain blood sample for grouping and cross-matching	188(80.3)	38(16.2)	8(3.4)
Assess blood bag for expiration date	187 (79.9)	31 (13.2)	16 (6.8)
Inspect blood bag for leaks, abnormal color, clots, excessive air and bubbles	166 (70.9)	45 (19.2)	23 (9.8)
Transport blood in a validated box	110 (47.0)	67 (28.6)	57 (24.4)
Identify the right patient	205 (87.6)	20 (8.5)	9 (3.8)
Maintain standard (universal precaution)	145 (62.0)	73 (31.2)	16 (6.8)
Return blood not administered longer than thirty (30) minutes to blood bank	77 (32.9)	96 (41.0)	61 (26.1)
Check vital signs and lung sounds first fifteen minutes and every hour until completion	89 (38.0)	107 (45.7)	38 (16.2)
Infuse blood via administration sets designed specifically for blood	163 (69.7)	48 (20.5)	23 (9.8)
Warm up blood products in microwave or hot water	58 (24.8)	72 (30.8)	104 (44.4)
Determine rate of infusion by physician order or by facility protocol	139 (59.4)	54 (23	41 (17.1)
Start transfusion slowly and monitor for signs and symptoms of transfusion reactions especially in the first 15 minutes	163 (69.7)	58 (24.8)	24 (10.3)
Encourage client to report any unusual feeling or manifestation	175 (74.8)	35(15.0)	13 (5.6)
Document client's tolerance to the transfusion process	128 (54.7)	69 (29.5)	37 (15.8)
Monitor appropriate laboratory values and document procedure	130(55.6)	76(32.5)	28(12.0)
Document relevant information including vital sign	147 (62.8)	74 (31.6)	13 (5.6)
Observe transfusion reaction	169 (72.7)	53 (22.6)	12 (5.1)
Carry out emergency treatment in case of transfusion reaction as order	150 (64.1)	62 (26.5)	22 (26.5)

5.4 Factors associated with knowledge and practice of participants towards blood transfusion

5.4.1 Factors associate with knowledge

Bivariate logistic regression analysis was done to select a candidate variable at p-value ≤0.25. The variables that showed statistically significant association (at p-value ≤0.25) in the bivariate analysis were transferred and further analyzed in multi variable logistic regressions to adjust.

Accordingly, the result of bivariate analysis found that variables: level of education, guideline/protocol and training were factors related to knowledge of nurses towards blood transfusion however, multivariate analysis revealed that those who did not received training related to transfusion were 2 times more likely to have un satisfactory level of knowledge than participants those have received training on blood transfusion (AOR=1.961, 95% CI (1.049, 3.666) P=0.035).

Table 4 bivariate and multivariate analysis of factors associated with knowledge of participant towards blood transfusion at TASH June 2019

Variables		Knowledge		P-value	COR (95% CI)	AOR (95% CI)
		Un Satisfactory	Satisfactory			
Age	<25 25-30 >30	25 52 23	22 84 28	.555 .394	1.327(0.692, 2.544) 0.787(0.356,1.741) 1	
Sex	Male Female	55 80	47 52	0.305	0.760(0.451,1.583) 1	
Religion	Orthodox Muslim Protestant Other	87 18 29	68 9 20	0.447 0.283	1.133(0.227,2.814) 0.725(0.319,4.00) 1	
Marital status	Married Single	57 78	39 60	0.664	1.124(0.663,1.907) 1	
Work experience	1-5 6-10 >11	96 33 6	76 18 5	0.935 0.529	1.053(0.309,3.581) 1.528(0.409,5.710) 1	
Number of BT	1-3 4-6 7-9 >10	96 33 6	76 18 5	0.610 0.284 0.633	0.838(0.425,1.654) 0.657(0.304,1.417) 1.430 (0.329,6.208) 1	
Level of education	BSc MSc	124 11	84 15	.097	2.012 (1.881,4.597) * 1	
Guideline/protocol	No Yes	75 60	63 36	0.215	1.400(0.822,2.383) * 1	
Participation in training program	No Yes	93 42	80 19	0.042	1.902(1.024, 3.531) 1	**1.961(1.049, 3.666) ** **

*Statistically significant at 95% CI, p-value ≤ 0.25

**Statistically significant at 95% CI, P- value ≤ 0.05; COR- Crude odds ratio

5.4.2 Factors associated with practice of participants on blood transfusion

Bivariate logistic regression analysis was done to select a candidate variable at p-value ≤0.25. The variables that showed statistically significant association (at p-value ≤0.25) in the bivariate analysis were transferred and further analyzed in multivariable logistic regressions to adjust.

From total variables included: work experience, number of blood transfusion and knowledge score of participants on blood transfusion were variables associated with blood transfusion (Table-6).

Participants worked for 1-5 years were 2 times more likely (AOR=2.236,95%CI,1.489, 4.230, P=0.011) to have incompetent practice as compared to those worked for greater than 10 years. And also, work experience of 6-10 years were 8 times more likely to have incompetent practice (AOR=7.545, 95% CI, 1.659, 9.316, P=0.009) as compared to those worked greater than ten years towards blood transfusion.

Study participants transfused blood for about 1-3 times per week were five times more likely to have incompetent practice (AOR= 5.404, 95% CI, 1.417, 7.570, P= 0.006) as compared to those transfused blood greater than ten times per week.

Most importantly, knowledge score of participants was strongly associated with practice on blood transfusion than other factors. Participants who were have poor knowledge was five times more likely to have incompetent practice towards blood transfusion (AOR=5.185, 95%CI, 1.090, 7.380, p=0.000).

Table 5 bivariate and multivariate analysis factors associated with practice of participant on blood transfusion at TASH June 2019

Variable		Practice		P-value	COR (95% C.I)	AOR (95%CI)
		Incompetent	competent			
Age	<25	37	14		1	
	25-30	105	31	.253	0.593(1.242,2.454)	
	>30	40	7	.135	0.463(0.168, 1.272) *	
Sex	Male	79	23	0.916	0.967(0.520,1.799)	
	Female	103	29		1	
religion	Orthodox	121	34		1	
	Muslim	22	5	0.690	1.236(0.436,3.508)	
	Protestant	37	12	0.709	0.866(0.408,1.842)	
	Other	2	1	0.642	0.562(0.49,6.386)	
Marital status	Married	71	24	0.395	0.764(0.410,1.421)	
	Single	110	29		1	
Work experience	1-5	134	38	.023	4.232(1.224,14.62)	**2.236(1.489, 4.230) ** **
	6-10	43	8	.009	6.450(1.580,26325)	**7.545(1.659, 9.316) ** **
	>10	5	6	.763	1	
Number of BT/weeks	1-3	96	20	.019	2.473(1.159 ,5.276)	**5.404(1.417, 7.570) ** **
	4-6	44	14	.260	1.619 (.700, 3.747)	
	7-9	9	1	.161	4.636 (.542,39.693) *	
	>10	33	17	.026	1	
Level of education	BSc	162	46	0.911	1	
	MSc	20	6		0.947(0.359,2.495)	
Guide line/protocol	No	111	27	0.242	1.447(0.372,1.284) *	
	Yes	71	25		1	
Participate on training	No	136	37	0.605	1.199(0.603,2.382)	
	Yes	46	15		1	
Knowledge score	Good	62	37	.000	1	
	Poor	120	15	.013	4.774(2.434, 9.365)	**5.185 (1.090, 7.380) ** **

*Statistically significant at 95%CI, p-value ≤0.25

** Statistically significant at 95% CI, P- value ≤ 0.05; 1.00-reference; COR- Crude odds ratio, AOR-adjusted odds ratio

Chapter 6

6.Discussion

Nurses play an integral role regarding to blood transfusion, also nurse must have adequate knowledge and practice to all process of transfusion to maintain patient 'safety.

The current study states that more than half of studied participants (57.3%) have unsatisfactory level of knowledge regarding to blood transfusion. This is comparable with the study done in Egypt that (61.2%) of nurses have poor knowledge regarding to blood transfusion (23). This insufficient knowledge may be due to attributed to deficiency in orientation or training. In contrast studies done in Ghana showed that only 26.2% of respondents have weak level of knowledge (3).The reason for this difference might be the study participants in these areas being might take course/training related to blood transfusion and thus higher knowledge.

With regard to training or guidance from the institution to perform blood transfusion, 73.9% of professionals interviewed stated that they had not received training. In agreement with present study, studies in Ghana revealed that 72.1% of respondents were not receive training (3). Similar studies done in Egypt a substantial majority (87.1%) of the nurses claimed not to have had any training session in issues concerning blood transfusion (3). But this finding differs from results found in studies of other countries, such as Brazil 85.6% received some (25). The reason for this difference may be the study participants in these areas being from developed countries might take course/training related to blood transfusion.

Further to the above, regarding to score of practice the present study shows that only 22.2% of respondents have competent level of practice towards blood transfusion. The finding of present study is in agreement with studies conducted in North Africa Morocco, only 25% of participant have appropriate practice (30). The possible reasons of the prevalence of the present study might be, even though it is recommended that all facilities should provide safe blood transfusion based on guidelines/protocols, in this study 138(59%) of participants were not aware of guideline/protocols.

The present study revealed that training had strongly associated with level of knowledge on blood transfusion. Participants those who had not receive training related to transfusion were 2 times more likely to have un satisfactory knowledge (AOR=1.961, 95% CI 1.049, 3.666, P=0.035) than participants those have received training towards blood transfusion.

Study conducted in Brazil shows that the variables participation in specific training for blood transfusion and participation in post-graduation course was statistical significance with level of knowledge (25). More over studies conducted in Niger showed that the quality of responses was better among nurses who received training about blood transfusion (27). And also, in line with studies done in Mozambique, training was the most influential or significantly associated with nurse's knowledge (29). It might be due to the economic status of the countries that could be the cause for not giving appropriate trainings for all staffs about blood transfusion.

The present study shows that participants worked for 1-5 years (AOR)=2.236,95%CI,1.489, 4.230, P=0.011) were 2 times more likely to have incompetent practice as compared to those worked for greater than 10 years And also, work experience for 6-10 years (AOR=7.545, 95% CI, 1.659, 9.316, P=0.009) were 8 times more likely to have incompetent practice as compared to those worked greater than ten years towards blood transfusion. Similar studies done in Niamey showed that seniority is a factor promoting the quality of responses, although there is much to be done (27).This might be due to the fact that as participants has more experience they are exposed for practice on blood transfusion.

Study participants transfused blood for about 1-3 times per week were 5 times more likely to have incompetent practice (AOR= 5.404, 95% CI, 1.417, 7.570, P= 0.006) as compared to those transfused blood greater than ten times per week. Similar study done in India Nellore revealed that Frequency of transfusion were the factors most strongly associated with practice scores (1).
It can be deduced that, the more nurses exposed for repeated blood transfusions per week, they might acquire better understanding of the activities on the various phases of blood transfusion.

Knowledge score of participants was strongly associated with practice on blood transfusion than other factors. Participants those have poor knowledge were five times more likely to have incompetent practice towards blood transfusion (AOR=5.185, 95%CI, 1.090, 7.380, p=0.000).This study is comparable with the study done in Egypt that revealed there was a strong statistically

significant association between level of nurses' knowledge and their practices regarding blood transfusion procedure(21). Studies in Ghana was in agreement with the current findings stated that insufficient knowledge about blood transfusion was reflected in undesirable practice(3).

Chapter 7

7.limitation and recommendations

Limitation

The study design is a cross sectional which has a limitation to establish a causal association as how and when the associations are established.

Recommendations

- For this study have been grouped in relation to the subheadings below:

For ministry of health

- It is recommended to establish a written updated protocol for blood and blood component transfusion to ensure adequate knowledge and safe nursing practice.
- It recommended that the MOH and Ethiopian Health Service should organize more education on blood transfusion practices so as to put nurses in a better stead.
- Nurses should be given the opportunity to further higher education. This is because the finding of the study has shown that the higher the level of one's education the more knowledgeable, he/she is with regards to blood transfusion practices.
- It is again recommended developing and executing an in-service training program for nurses emphasizing the weak points to increase their knowledge and practice and continuously supervise this task.

For hospitals

- Clinical nursing practice must emphasize evidenced based practices and strict adherence to facility protocols to minimize chance of blood transfusion error occurrence.
- Nursing quality assurance units must be established and empowered to periodically reward and reprimand bad nursing practices in blood transfusion units of the hospital to enhance and promote better client healthcare outcome.

Suggestions for Further Research

- Further research should be conducted involving more members in the multidisciplinary team who are directly involved in the blood transfusion process such as physicians, medical laboratory personnel and blood donation organizers.
- Other researchers suggested to carry out prospective studies in the area, including the systematic observation of transfusions

Chapter 8

8. Conclusion

The overall result shows there was inadequate level of knowledge and unsatisfactory level of practice on blood transfusion. Factors associated with knowledge about blood transfusion were: nurse, those were not participated in training and specific courses for professional improvement, and also factors associated with practice were work experience of 1-5years, and 6-10 years number of blood transfusions carried out 1-3 times per week and knowledge score.

Reference

1. Ms G Betty Lebona G, Ms Chanambam Sanjota Devi MKR. Assess the knowledge regarding blood transfusion among staff nurses and nursing students in NMCH, Nellore. Int J Appl Res. 2016;2(2009):226–30.
2. Kangas H, Saarinen A. Blood transfusion for an adult patient – a guide. 2016;(November):1–48.
3. Ebinezer Tetteh, Thesis. Knowledge and practice of blood transfusion among nurses in ghana: experiences from the cape coast teaching hospital, cape coast. 2015;(December).
4. RN.com. Blood Administration and Transfusion Reactions Overview of Blood Transfusions. 2015;1–16.
5. Bloch EM, Vermeulen M, Murphy E. Blood Transfusion Safety in Africa. A Literature Review. Transfus Med Rev. 2013;26(2):164–80.
6. Koh B C M, Chong L L, Goh L G, Iau P, Kuperan P, Lee L H, Lim L C, Ng H J, Sia A THH, Tan L K, Tay K H, Teo L T D, Ting W C YTT. Ministry of Health Clinical Practice Guidelines: Schizophrenia. Singapore Med J [Internet]. 2011;52(7):521–6.
7. René de Vries and Fred Haas C. Blood Trasfuzion Guideline. 2011;402.
8. National Blood Service G. National Guidelines for the Clinical Use of Blood and Blood Products in Ghana. 2013;1–51.
9. Kaur P, Kaur G, Kaur R, Sood T. Assessment of impact of training in improving knowledge of blood transfusion among clinicians in India. Transfus Med Hemotherapy. 2014;41(3):222–6.
10. MOH_ National Blood Transfusion Policy -Pathology CSN_2010. National blood and blood product transfuion policy. 2006;1–26.
11. Oldham J, Sinclair L, Hendry C. Right patient, right blood, right care: safe transfusion practice. Br J Nursering. 2009;18(5):312.
12. Blood Transfusion Working Group. National standards of blood transfustion. 2015;(July 2012):1–44.
13. LimSiewLee E. Knowledge of Blood Transfusion among Nurses in Hospital Pulau Pinang: Nursing Responsibilities and Patient Management Related to Transfusion Reactions. 2016;(June).
14. Sapkota A, Poudel S, Sedhain A, Khatiwada N. Blood Transfusion Practice among Healthcare Personnel in Nepal: An Observational Study. J Blood Transfus [Internet]. 2018;2018:1–7.
15. Tinegate H, Birchall J, Gray A, Haggas R, Massey E, Norfolk D, et al. Guideline on the investigation and management of acute transfusion reactions Prepared by the BCSH Blood Transfusion Task Force. 2012;1(August):143–53.

16. Hijji B, Parahoo K, Hussein MM, Barr O. Knowledge of blood transfusion among nurses. J Clin Nurs. 2013;22(17–18):2536–50.

17. Talati S, Gupta A, Jain A. Knowledge and awareness among nurses regarding the blood transfusion services and practices in a tertiary care teaching hospital. Asian J Transfus Sci [Internet]. 2016;10(2):166.

18. Janatpour KA, Kalmin ND, Jensen HM, Holland P V, Rbc A. Clinical Outcomes of ABO-Incompatible RBC Transfusions. Am Soc Clin Pathol. 2008;276–81.

19. Kumar R, Jaber M, Sunny S, Varghese J, Sharawy OE, Varghese SJ. Transfusion Related Acute Lung Injury (TRALI): A Single Institution Experience of 15 Years. Indian J Hematol Blood Transfus. 2016;32(3):320–7.

20. Punjab S, Akhter N, Samad A, Fayyaz N, Habiba U, Asif M, et al. Acute blood transfusion reaction in a tertiary care hospital in. 2019;6(4):1416–21.

21. Sobeih H, Asmaa S, Mohamed H, Ragheb MM. Evaluation of Teaching Safety Procedure to Acquire Nurses , Best Practice for Patient Receiving Blood Transfusion in Egypt. :1–31.

22. WHO. The Clinical Use of. Clin use blood Handb. 2002;1–221.

23. Elhy AHA. Nurses' Knowledge Assessment Regarding Blood Transfusion to Ensure Patient Safety in Egypt. IOSR J Nurs Heal Sci [Internet]. 2017;06(02):104–11.

24. Tavares JL, Barichello E, Mattia AL De, Barbosa MH. Factors associated with knowledge of the nursing staff at a teaching hospital on blood transfusion in Brazil. Rev Lat Am Enfermagem [Internet]. 2015;23(4):595–602.

25. Duarte RD, Silva KFN da, Félix MM dos S, Tavares JL, Zuffi FB, Barbosa MH. Knowledge about blood transfusion in a critical unit of a teaching hospital Brazil. Biosci J [Internet]. 2017;788–98.

26. Beyazpınar Kavaklıoğlu A. Determination Of Health Employess' Blood Transfusion Direction Knowledge Levels. North Clin Istanbul [Internet]. 2017;4(2):165–72.

27. Mayaki Z, Kabo R, Moutschen M, Albert A, Dardenne N, Sondag D, et al. Knowledge, attitudes and clinical practice of blood products prescribers in Niamey. Transfus Clin Biol [Internet]. 2016;23(2):78–85.

28. Health JN. Practice of Blood Transfusion among Nurses in Public Tertiary Care Hospitals. 2018;7921:184–9.

29. Molon RS De, Shimamoto H, Bezouglaia O, Pirih FQ, Kostenuik P, Boyce RW, et al. Transfusion practice and knowledge in Mozambique. 2016;30(9):1627–40.

30. Lahlimi FZ, Tazi I, Sifsalam M, Bouchtia M, Mahmal L. Assessment of transfusion practice: Assessing nurses' knowledge in transfusion medicine at Mohamed VI Hematology and Oncology Center of Marrakesh, Morocco. Transfus Clin Biol [Internet]. 2015;22(1):12–6.

Annex

Annex 1: English version information sheet

Title: Assessment of knowledge and practice on blood transfusion and its associated factors among nurses working at TASH, Addis Ababa Ethiopia.
Principal investigator: Zewde Ketemaw Alameraw
Name of the institution: Addis Ababa University Tikur Anbessa Specialized Hospital.

Introduction of interviewer

Greetings! My name is Zewde Ketemaw. I am a master's student in Addis Ababa University, school of medicine. Currently I am doing a research on knowledge and practice on blood transfusion and its associated factors among nurses. This information sheet is prepared to enable nurses understand purpose of the study, ask for further explanation and participate voluntarily.

Purpose of study: The purpose of this research is to understand the gaps on blood transfusion and if you agree to take part in this study, you will be occupying the questionnaire for about 20-30 minutes.

Study procedure: Volunteer participants in this study will be interviewed on a few questions regarding the knowledge and practice of blood transfusion. In addition, you will be asked to sign on the consent form for your voluntariness. Findings of this study will be shared through presentation, but your name will not be mentioned with the report.

Possible risks/ discomforts: The study is not associated with any harm.
Possible benefits: At the moment, this study will not be of direct benefit to you, but i hope that findings from this study may help the policy makers to make decisions in designing appropriate programs, strategies and policies that will of advantage indirectly to you and other personnel's and patients.
Data confidentiality: All data will be handled so as to protect your confidentiality. No names will be mentioned and the information will be coded. I would like to assure you that all information about you such as your name will be protected from the public, and all details of your information will be stored and secured in a pass ward protected files in the researcher's personal compute
Voluntary participation and right to leave the research

Participation to this study is voluntarily and you have the right to decide whether to participate or not. You also have the right not to participate in this study or withdraw from the study if you wish without any worry.

Payment: there is no payment for study participants

Contact for additional information

If you need more clarification about this study, you can call or contact the researcher;

Zewde Ketemaw *Mobile: 0923577806, email: zedketemaw235@gmail.com*

Annex 2: Written consent form

The above information sheet describing the study purpose and procedure, benefits, confidentiality issues, voluntary participation and rights to withdraw for the research title **"assessment of knowledge and practice on blood transfusion and its associated factors among nurses"** has been read and explained to me. I have been given an opportunity to ask any question for more explanation about the research. I agree to participate as a volunteer.

_____ _____

Date Name and signature of volunteer

I certify that purpose of the study, potential benefits associated with participating in this study was explained to the above individual.

_____ _____

Date Name and signature of researcher

Annex 3: Blood transfusion knowledge, practice and associated factor questionnaires

Please answer these questions to the best of your ability. You are at liberty not to answer any parts of this questionnaire if you feel uncomfortable. Thank you for your participation.

NB: Please circle the Best Response(S) do not use a tick mark.

Part A: Socio-demographic data

Code number	Variables	Possible response
1	Age	In years ……
2	Sex	a. Male b. Female
3	Religion	a. Orthodox b. Muslim c. Protestant d. Others (Specify)……
4	Marital status	a. Married b. Single c. Divorced d. Other (specify)……
5	How long have you been working on ward(s)	Years --------Months.....
6	How many blood transfusions do you administer in a week	In number…….
8	Level of education	a. Diploma b. First Degree c. Master's degree d. other(specify)…

Indicate whether the statement below is True always (1), True sometimes (2) Not at All (3)

NB: Please tick the best response(S)

	1	2	**3**
Knowledge assessment questionnaire			
1, The most important phase of the transfusion process is identifying client identity and confirming blood compatibility			
2**,** Client is assessed to determined previous reactions to blood transfusions			
3, The blood bag tag, label and requisition form are assessed to ensure that ABO and Rh types are compatible.			
4, Blood should be transported from the blood bank to only one client at a time 5, For the first 10-15 minutes it is essential to physically observe the patient for possible transfusion reaction			
6, Signs of immediate transfusion reactions include chills and diaphoresis, muscle aches, back pain or chest pain, rashes, itching, rapid pulse, apprehension, nausea, vomiting or diarrhea.			
7, Starting the transfusion within 20 minutes after collection from blood bank to minimizes complications			
8, The first two measures following blood transfusion reaction is to stop the transfusion and keep intravenous line open with 0.9% normal saline			
Indicate whether the statement below is Yes always (1), Yes sometimes (2) Not at All (3)			
	1	**2**	**3**
Practice assessment questionnaires			
9, Did you check informed consent has been obtained			
10, Did you check vital signs before transfusion			
11, Do you obtain blood sample for grouping and cross-matching			
12, Did you assess blood bag for expiration date			
13, Did you inspect blood bag for leaks, abnormal color, clots, excessive air and bubbles.			
14, Did you transport blood in a validated blood box			

15, Did you identify the right patient			
16, Did you maintain standard(universal) precautions			
17, Did you return blood not administered longer than thirty (30) minutes to blood bank			
18, Did you check vital signs and lung sounds first fifteen minutes and every hour until completion.			
19, Did you infuse blood via administration sets designed specifically for blood			
20, Did you warm up blood products in microwaves or hot water			
21, Did you determine rate of infusion by physician order or by facility protocol			
22, Did you start transfusion slowly and monitor for signs and symptoms of transfusion reactions especially in the first 15 minutes.			
23, Did you encourage client to report any unusual feeling or manifestation.			
24, Did you document client's tolerance to the transfusion process.			
25, Did you monitor appropriate laboratory values and document procedure			
26, Did you document relevant information including vital signs			
27, Did you observe transfusion reaction			
28, Did you carry out emergency treatment in case of transfusion reaction as order			

Please circle the Best Response(S) do not use a tick mark

29	Have you ever participated in any training program in relation to blood transfusion while working in this unit?	a. Yes b. No
31	Is there a unit protocol guide line for administering blood transfusion	a. Yes b. No

Annex 4 Statement of declaration

I, the undersigned, declare that this is my original work has never been presented in this or any other university and that all source material used for the thesis has been duly acknowledged.

My Name is Zewde Ketemaw

Signature……

Place: Addis Ababa

Date of submission:

This proposal will be submitted for examination with my approval as a University advisor:

Name: ……Signature……

Date: ……

Name: ……Signature……

Date: .....