

“Study of a Multidisciplinary Hospital's Blood Bank with a Focus on effect of Blood Transfusion on Adults in the context of Anemia, Surgery, TH, Burn case, Hemophilia, Ex. Trans”.

Guided by: Dr. J.P. Singh
Professor

Submitted by: Shubham Mishra
MBA HM 2nd Year
1406

ACKNOWLEDGEMENT

I want to sincerely thank Dr. J. P. Singh, my faculty advisor, for his unwavering assistance in getting me started on the proper track and helping me throughout my studies. I am appreciative that the management of IIMS&R allowed me to complete my dissertation study in their medical facility.

The hospital's deputy medical superintendent, Dr. S. Bilal, has been a tremendous help in getting my thesis to where it is today, and I would want to express my profound gratitude for that. I am unable to express my gratitude for his unwavering commitment, tolerance, and tenacity and can only recall with admiration the many hours he has invested in going through even the most minute elements of this project at every level.

I want to express my sincere gratitude to all the medical and paramedical staff of IIMS&R Lucknow's Blood Bank who helped me during the dissertation writing process.

Finally, I want to express my gratitude to my family, friends, and everyone else who has helped me succeed academically.

(Shubham Mishra)

Certificate

I hereby certify that the dissertation of Shubham Mishra, titled " Study of a Multidisciplinary Hospital's Blood Bank with a Focus on effect of Blood Transfusion on Adults in the context of Anemia, Surgery, TH, Burn case, Hemophilia, Ex. Trans. was submitted in partial fulfilment of the requirements for the Post Graduate Diploma in Health Management and that no portion of it was submitted for the award of any other degree, diploma, fellowship, or other similar title.

Dr. S. Bilal
Dy. Med Superintendent &
Associate Professor Community Med.
IIMSR, Integral University

ABSTRACT

Blood transfusions are essential in the treatment of many illnesses and surgical operations. In this study, the blood bank of a multidisciplinary hospital will be investigated, and the effects of blood transfusion on adult patients in various situations—including anemia, surgery, solid organ transplantation, burn cases, hemophilia, and exchange transfusion—will be assessed.

The study makes use of clinical data gathered over a certain period and retrospective analysis of medical records from the blood bank. The evaluation will include several blood transfusion-related topics, such as compatibility testing, donor screening, and selection. Understanding the effectiveness, safety, and caliber of the hospital's blood transfusion practices will be the focus.

The specific patient populations under investigation include individuals with anemia, requiring transfusion as part of their treatment plan; surgical patients who receive blood transfusions to manage perioperative blood loss; individuals undergoing solid organ transplantation, where blood transfusion is often necessary; burn patients requiring transfusion due to significant blood loss; hemophilia patients requiring clotting factor concentrates or fresh frozen plasma; and cases of exchange transfusion in conditions such as sickle cell disease or neonatal jaundice.

Blood transfusions play a vital role in the treatment and management of various conditions such as anemia, surgical procedures, trauma, and hemorrhage, burn injuries, hemophilia, and excessive bleeding. The underlying cause of the condition and the unique characteristics of each patient should be considered when determining the need for transfusions and developing suitable treatment strategies. Close monitoring and collaboration between healthcare practitioners are essential for effective transfusion management in these cases.

Adverse transfusion-related events, including transfusion responses, infections contracted during transfusions, and hemolytic complications, are important considerations. The effect of blood transfusions on clinical outcomes, such as mortality, morbidity, hospital stay duration, and patient recovery, will also be evaluated.

Key Words: Blood, Blood Bank, Donor's , Blood Transfusion, Multi-Disciplinary Hospital, anemia, surgery, solid organ transplantation, burn cases, hemophilia, exchange transfusion, transfusion-related adverse events, clinical outcomes.

TABLE OF CONTENT

ACKNOWLEDGEMENT	2
CERTIFICATE	3
ABSTRACT	4
Table of Contents	
1. Introduction	6
1.1. Objective of Study	
2. Review of Literature	9
3. Methodology	10
4. Hospital Profile	11
5. Results, Findings	20
5.1. Analysis	
6. Discussion & Conclusion	28
7. References	30

CHAPTER 1: INTRODUCTION

A multifunctional hospital's blood bank is essential to ensuring that patients in need have access to a sufficient and safe supply of blood products. It is crucial to comprehend how blood transfusions affect people in a variety of medical settings to improve results and patient care. This study aims to evaluate the effects of blood transfusion on people in the context of anemia, surgery, trauma, burn cases, hemophilia, and excessive postpartum hemorrhage.

Anemia is a condition where there are fewer red blood cells or hemoglobin, which reduces the capacity of the blood to deliver oxygen. Blood transfusions are routinely given to adults with severe anemia to improve oxygenation and replenish red blood cells. The effectiveness of blood transfusion in increasing hemoglobin levels, easing symptoms, and enhancing overall health in Anaemic patients will be evaluated in this study. (AC Buelvas,2013)

Blood transfusions may be required during surgical procedures to maintain an acceptable blood volume and oxygen delivery to tissues. Understanding how blood transfusion influences surgical outcomes is vital for delivering the best care to patients. The study will examine how transfusions assist surgical patients in healing more rapidly and reduce their fatality rates. (PE Marik,.)

Trauma and burn cases present unique difficulties because of the significant blood loss and fluid changes that occur. Blood transfusions are routinely utilized as part of the resuscitation effort in these circumstances. The effect of blood transfusion on hemodynamic stability, tissue perfusion, and wound healing in burn and trauma patients will be examined in this study. (P Kaur, 2011)

A genetic condition called hemophilia causes problems with blood clotting. To replenish the inadequate clotting factors, hemophiliacs frequently need blood transfusions (P Salen, 2021). The goal of the study is to determine how well transfusions work in preventing and controlling bleeding episodes, minimizing joint injury, and enhancing quality of life for hemophiliacs (A Rocino, 2017).

Postpartum hemorrhage, or excessive bleeding after childbirth, poses a serious health risk (KC Wormer · 2022 · Cited by 39). In these circumstances, blood transfusions are commonly used to treat substantial blood loss. The project will investigate how blood transfusions affect postpartum hemorrhage outcomes for mothers by reducing complications, increasing blood volume, and enhancing maternal outcomes. (DA Kolin, 2020)

This research intends to improve our comprehension of the advantages, hazards, and optimal utilization of blood products by thoroughly examining the impact of blood transfusion on people in these many medical contexts. The research will support evidence-based transfusion practices and assist healthcare workers in making decisions that will improve patient outcomes and care. (JJ Francis, 2009)

The study underscores the significance of blood transfusions in improving patient outcomes, managing various medical conditions, and supporting critical care interventions (LT Goodnough, 2019). It highlights the need for healthcare professionals to carefully assess the risks and benefits of transfusions, tailor treatment approaches, and provide individualized care to ensure optimal outcomes for adult patients. (A Eeles, 2017)

JUSTIFICATION OF STUDY

A frequent medical procedure with major effects on patient care is blood transfusion. It is essential to comprehend how blood transfusion affects people in a multidisciplinary hospital context to optimize transfusion procedures and improve patient outcomes. This research will add to the body of knowledge and offer evidence-based recommendations to aid healthcare practitioners in making knowledgeable decisions about blood transfusions.

Risks associated with blood transfusion can include negative reactions, infections from the transfusion, and consequences. This study intends to discover possible areas for transfusion practice improvement to increase patient safety by examining the impact of blood transfusion on individuals. The research findings can help with the creation of protocols and approaches to prevent negative outcomes and reduce transfusion-related hazards.

The acquisition, processing, and storage of blood products are all time- and resource-consuming steps in the blood transfusion process. This study can find chances to maximize resource allocation, minimize wastage, and save healthcare expenses without sacrificing patient care by investigating blood usage patterns and inventory management procedures. Such optimization is essential, particularly considering the scarcity of blood products.

The acquisition, processing, and storage of blood products are all time- and resource-consuming steps in the blood transfusion process. This study can find chances to maximize resource allocation, minimize wastage, and save healthcare expenses without sacrificing patient care by investigating blood usage patterns and inventory management procedures. Such optimization is essential, particularly considering the scarcity of blood products.

OBJECTIVES

GENERAL OBJECTIVES

Study of a Multidisciplinary Hospital's Blood Bank with a Focus on the Impact of Blood Transfusion on Adults will be the study's overarching goal.

SPECIFIC OBJECTIVES

- To estimate the extent of Blood Transfusion among adults.
- To estimate the in which Blood Transfusion is highly required in the context of Anemia, Surgery, TH, Burn case, Hemophilia, Ex. Trans.
- To estimate the extent of Blood Transfusion in Life Supportive, Therapeutic & Life Saving Activity.

CHAPTER 2: REVIEW OF LITERATURE

S.no	Title	Author(s)/ Year	Description
1.	Blood Transfusion Practices and Outcomes in Adult Patients: A Systematic Review"	Smith A, et al. / 2012	This systematic review provides an overview of blood transfusion practices and outcomes in adult patients across various medical specialties. The study highlights the importance of adhering to evidence-based transfusion guidelines and identifies areas for improvement in transfusion practices. It emphasizes the need for further research to investigate the impact of transfusion strategies on patient outcomes.
2.	Adverse Reactions to Blood Transfusion: A Retrospective Analysis of Adult Patients"	X Zhang / 2021	This retrospective analysis examines the occurrence and types of adverse reactions to blood transfusion in adult patients. The study identifies common adverse events, such as febrile reactions, allergic reactions, and transfusion-associated lung injury. It emphasizes the importance of proper surveillance, monitoring, and management of transfusion-related complications to ensure patient safety.
3.	Blood Utilization and Inventory Management in a Multidisciplinary Hospital: A Quality Improvement Study"	SHW Stanger / 2012	This quality improvement study evaluates blood utilization and inventory management practices in a multidisciplinary hospital. The research identifies areas for optimization, such as reducing blood product wastage, improving inventory control, and implementing evidence-based transfusion protocols. The study highlights the potential for cost savings and resource allocation improvements through efficient blood management.
4.	Effect of Blood Transfusion on Clinical Outcomes in Adult Surgical Patients: A Prospective Cohort Study	TE Purvis / 2017	This prospective cohort study investigates the effect of blood transfusion on clinical outcomes in adult surgical patients. The study examines factors such as postoperative complications, length of hospital stays, and mortality rates in transfused and non-transfused patients. It provides evidence on the association between blood transfusion and adverse outcomes, emphasizing the need for judicious transfusion practices.
5.	Educational Interventions to Improve Blood Transfusion Practices: A Systematic Review"	LJJ Soril / 2018	This systematic review focuses on educational interventions aimed at improving blood transfusion practices among healthcare professionals. The study analyzes the effectiveness of various educational strategies, such as workshops, e-learning modules, and simulation-based training. It emphasizes the positive impact of education and training in enhancing transfusion knowledge, skills, and adherence to transfusion guidelines.

These studies include information on a range of blood transfusion practices for adult patients, including transfusion procedures, adverse reactions, blood usage, clinical results, education and training, and cost factors. They add to the body of knowledge and lay the groundwork for additional investigation and advancement in transfusion medicine.

CHAPTER 3: METHODOLOGY

The methodology for the Study of a Multidisciplinary Hospital's Blood Bank with a Focus on effect of Blood Transfusion on Adults " may include:

Study Design: Descriptive & Retrospective Study.

Data Collection: Primary Data & Secondary Data.

Primary Data- Observation & Medical Record of Patients.

Secondary Data – Hospital Record, Department records.

Sample Size: 3 Month (From 01st March'22 to 15th May'2023)

Data Analysis: Data is analyzed with the help of Excel Package.

Variables: The patient's age, gender, underlying medical issues, and blood transfusion information, such as the need for transfusion, frequency of transfusion, and kind of blood product transfused, may all be independent factors. Clinical outcomes include mortality, morbidity, length of hospital stay, and unfavorable transfusion responses are examples of possible dependent variables.

Limitations: The study's shortcomings may include its retrospective design, the potential for missing data, the possibility of confounding factors, and the generalizability of the findings to other contexts.

ORGANOGRAM



Chancellor

Pro Chancellor

Vice Chancellor

Executive Director

Registrar

Superintendent

Dy Medical Superintendent

Controller of Examinations

Department HOD

DEPARTMENTAL PROFILE (BLOOD BANK)

Blood Bank is situated on the Ground Floor near the Emergency Department.

Total Area: - 3.10*4.16 (12.89 square meter)

PREMISES OF THE BLOOD BANK:

- DONOR'S ROOM
- QUALITY CONTROL LAB
- SEROLOGY LAB
- MEDICAL OFFICER ROO
- STORE & RECORD ROOM
- WASHING & CLEANING ROOM
- TRANSMISSIBLE DISEASE LAB
- REFRESHMENT ROOM

REQUISTION PROCESSING FOR BLOOD /COMPONENTS

Requisition form is a yellow color Form. Which contains all the necessary information related to:

1. Patient Identity
2. Type of Product
3. Date & Time
4. Reason for Transfusion
5. Registration No.
6. Name of the Consultant
7. Name of the Hospital, etc.

OBSERVATION

○ **HEMOGLOBIN ESTIMATION**

Purpose & Scope: - Using the hemoglobin (Hb) level to identify healthy donors. The technician on duty does this before approving the donation.

Determination of Hb by automatic analyzer

- Collect blood in EDTA vial.
- Start the machine for priming & washing.
- Shake the vial properly.
- Aspirate the Sample.
- Determine Hb by the analyzer as per the instructions of Machine.

Reporting the results: Both the register and the blood donor form contain the results for this purpose. Donor form and analyzer output slip are both stapled together.

SELECTION / PHYSICAL EXAMINATION OF BLOOD DONOR

Scope and purpose: The objective is to select an appropriate donor who will not have any side effects from providing blood and whose blood will be safe for the recipient. Prior to the donation, the medical official does the examination and predonation counselling in his chamber. The donor form contains a complete record of M.O.'s results. This form is retained for three years.

Procedure:

The medical officer provides predonation counselling to the donor. During the counselling procedure, HIV testing will be done. Would he be curious to learn his test outcomes. A medical officer assesses the donor based on the following criteria.

Criteria for Selection of Donor:

- A. Age between 18 to 60Yrs.
- B. Weight not less than 90 pounds (50Kg)
- C. Hb should not be less than 12.5 grams or Hematocrit = 38%
- D. Physical examination –
 - a. Pulse – 50 to 100 per min,
 - b. B.P. Systolic Not more than 180 mmHg.
 - c. Diastolic Not more than 100mmhg.

Criteria for determent of Refusing for Bleeding

- 1. People with heart issues ought not to bleed.
- 2. It is best to exclude anyone who has an infectious disease, such as hepatitis, syphilis, malaria, or any other contagious illness. People who claim to have experienced jaundice in the past ought to be avoided at all costs. There shouldn't have been any malaria history during the prior year.
- 3. Specifying any allergies, particularly bronchial asthma, you may have had.
- 4. It is not a good idea to mention any operations or mishaps that took place in the past six months.
- 5. Localized skin lesions fall within this category.
- 6. Blood donations must be postponed for three weeks following rabies and tetanus shots.
- 7. It was improper for you to donate blood in the three months prior.

Question to be asked for Screening.

1. The donor is a voluntary or replacement donor.
2. When and if the donor already donated?
3. Have you put off giving blood for any reason?
4. Did he consume breakfast or not?
5. Does the donor consume alcohol, tobacco, or any other stimulants?
6. Has the past year included any medicine or medical treatment? Does the drug contain aspirin.
7. Getting any test (such as an X-ray, a chest x-ray, an ECG, etc.)
8. Had jaundice within the past two years.
9. Previous TB history.

TEST CONDUCTED ON EACH BLOOD UNIT'S

Each blood unit provided by the donor is subjected to several tests to ensure a safe blood transfusion.

- ❖ A test to check for the malaria parasite.
- ❖ Test for Screening for Syphilis.
- ❖ For Hepatitis B Surface Antigen testing.
- ❖ Test for HIV-1 and HIV-2 Antibodies Screening.

1. Test for Screening for Malaria Parasite: -

Every donated unit is subjected to this test to check for malarial parasites. Under the direction of the on-duty medical officer, the technician on duty screened the slides.

Results: - Record the findings in the computer and the register.

"Positive for malaria parasite" or "negative for malaria parasite" are the results that are given.

2. Test for Screening for syphilis: -

This test is used to check each donation for syphilis reagent antibodies. In this technique, VDRL shakers, a timer, and a reposted kit are employed.

Results: Both on the computer and in the register, the results are logged. The emergence of clearly discernible clusters of carbon particles in the centre or at the test circle's edge indicates a "Reactive" result, which must be reported.

If there are no aggregates visible and the carbon particles stay in a homogeneous dispersion, the result must be reported as "non-Reactive."

The medical officer on duty will release the final report.

3. Test for Hepatitis -B Surface Antigen

Every donated unit will be examined for Hepatitis-B Surface Antigen.

Equipment & Reagent:

1. ELISA Reader and Washer/BRIO
2. HBs-Ag ELISA Kit
3. Pipettes & Tips.

Results:-

- (a) Both the register and the computer record the outcome.
- (b) The measurement should be reported as "+ve for Hepatitis -B Surface Antigen" if it is higher than the cut-off value.
- (c) Readings that fall below the cut-off value should be noted as "negative for hepatitis -

B surface antigen."

Note: - The blood unit is not appropriate for transfusion if it tests positive for Hbs-Ag. The blood unit is subsequently thrown away.

4. Test for Screening for HIV-1 & HIV-2 Antibodies: -

Purpose & Scope: Every donated unit is subjected to a test to check for HIV-1 and HIV-2 antibodies.

Equipment & Reagent:

1. HIV-1/HIV-2 ELISA test
2. ELISA Reader & Washer/BRIO
3. Pipettes & Tips.

Result:

- (a) Both the register and the computer record the outcome.
- (b) The reading should be reported as "positive for HIV-1 & HIV-2" if it is higher than the cut-off value.
- (c) The reading should be reported as "negative for HIV-1 or HIV-2" if it falls below the cut-off value.

Note: If HIV-1 or HIV-2 is present in the blood unit. It is not safe to transfuse this blood unit. The blood unit is subsequently thrown away.

5. Test for Hepatitis -C Virus Antibodies: -

Purpose & Scope: This test's objective is to check each given unit for antibodies to the hepatitis C virus.

Equipment & Reagent:

1. HCV ELISA test
2. ELISA Reader & Washer/BRIO
3. Pipettes & Tips.

Result:

- (a) Both the register and the computer record the outcome.
- (b) The reading should be reported as "positive for HCV-antibody" if it is higher than the cut-off value.
- (c) The reading should be reported as "negative for HCV-antibody" if it falls below the cut-off value.

Note: If the blood sample has HCV-antibody in it. It is not safe to transfuse this blood unit. The blood unit is subsequently thrown away.

CROSS MATCH- MAJOR AND MINOR

Purpose & Scope: As it determines which blood is compatible and can be transfused to a patient, this is crucially important. Any mistake at this point could cause a deadly transfusion reaction. It will be carried out in the serology lab.

Responsibility: The operation shall be completed by the on-duty technician.

Result

- Inspect each tube for signs of hemolysis or agglutination.
- No agglutination is compatible with macroscopy.
- agglutination is incompatible.

Note: When a minor cross match is incompatible, such as when Group O is transfused to A, AB, or B Group, blood may occasionally need to be transfused. Consult the on-duty medical officer for a decision.

ISSUE OF BLOOD FROM THE BANK FOR THE PATIENTS

Purpose & Scope: The SOP outlines the procedure to be followed to ensure that the supply is safe and delivered to the correct patient.

Materials- Register of receipts and issues.

Procedure

- Verify the receipt register to see what was ordered and whether it corresponds with the supply. Enter cross references.
- Enter the appropriate information in the issue register.
- The issue register must include the date and time that Blood was released.
- Verify the bag label and tag cross-matches for the patient's name, patient ID number, tests performed, and expiration date.
- Check the plasma in the supernatant before releasing the blood to ensure that it is clean and free of hemolysis.
- Record the nurse's or blood-taker's signature in the issue register.
- The technician who releases the blood unit also logs their signature in the record.
- The transport container must contain the blood bag.

IMPLICATION OF THE RESEARCH

The study "Study Of Blood Bank of A Multidisciplinary Hospital With Special Emphasis On Impact Outcome" has several implications:

- a. **Improved patient outcomes:** To improve clinical practice and patient care, the study attempts to discover variables that affect patients' outcomes after receiving blood transfusions.
- b. **Quality improvement:** The study can result in changes in policies and procedures that can enhance the quality of blood transfusion services by looking at blood bank processes and identifying areas for improvement.
- c. **Better resource allocation:** The study can point out places where funding can be distributed more effectively to enhance patient outcomes and blood transfusion services.
- d. **Cost-effectiveness:** To enhance patient outcomes and blood transfusion services, the study can help identify locations where resources can be distributed more effectively.
- e. **Regulatory compliance:** The study can ensure that blood bank practices adhere to the necessary laws and guidelines, hence enhancing patient safety.
- f. **Knowledge advancement:** The study can add to the amount of knowledge already available on blood transfusion and related topics, which can guide future study and clinical practice.

Overall, the study has the potential to raise the standard and security of blood transfusion services, which would result in improved patient outcomes, more effective use of resources, and more affordable healthcare.

CHAPTER 4: Results, Findings & Recommendations

(A) BLOOD REQUIREMENT & BED STRENGTH: -

Based on the consumption of blood & bed strength, blood bank is categorized into 3 types: -

1. **CATEGORY I-** Hospital consuming 3-7 units of Blood /Bed/Year. Bed strength 100-400.
2. **CATEGORY II-** Hospital consuming 8-15 units of Blood/Bed/Year. Bed strength 400-1000.
3. **CATEGORY III-** Hospital consuming >16 units of Blood/Bed/ Year. Bed Strength >1000.

IIMS&R Hospital Blood Bank falls in **Category II** with Bed Strength of 700- and 5600-6500-unit's Blood/Year.

(B) MIN. AREA REQUIRED FOR DIFFERENT CATEGORIES OF BLOOD BANK: -

Based on area required for setting up a blood bank, Blood Bank are categorized into 3 group's: -

CATEGORY I – 100 sq m

CATEGORY II- 300 sq m

CATEGORY III- 895 sq m. (Applicable for IIMS&R)

Results

(A) Details of Blood Unit's Collected & Voluntary Donation Camps: - March-2023

Types of Donors	No. of Donor's During the Internship			Details
	Male	Female	Total	
V.D	80	9	89	0
Replacement Donor	1026	17	1043	0
Total Donor's	1106	26	1132	0
Are Donor's Counselling Services provided at Blood BANK?				Yes
No. of Donor's Counseled?				1132
No. of Blood Unit's Supplied during the Month?				1079
No. of Voluntary Blood Donation Camp organized during the Month?				2
No. of Donor's From whom Blood was collected?				86

During the internship period, the hospital organized two Blood Donation camps, resulting in the collection of 86 units of blood. This additional blood was acquired through voluntary donations from individuals participating in the camps. Including this donation, the total blood supply during the specified time amounted to 1079 units out of the total 1132 units collected, with 89 units contributed by voluntary donors and 1043 units from replacement donors.

(B) STATUS OF TESTING OF BLOOD UNIT'S –

INTERNSHIP						
TEST CONDUCTED	VOLUNTARY COLLECTION UNIT'S		REPLACEMENT COLLECTION UNIT'S		Total	
	TESTED	POSITIVE	TESTED	POSITIVE	TESTED	POSITIVE
HIV	89	0	1043	1	1132	1
HEPATITIS - B	89	0	1043	18	1132	18
HEPATITIS - C	89	0	1043	11	1132	11
VDRL	89	0	1043	9	1132	9
MALARIA	89	1	1043	12	1132	13

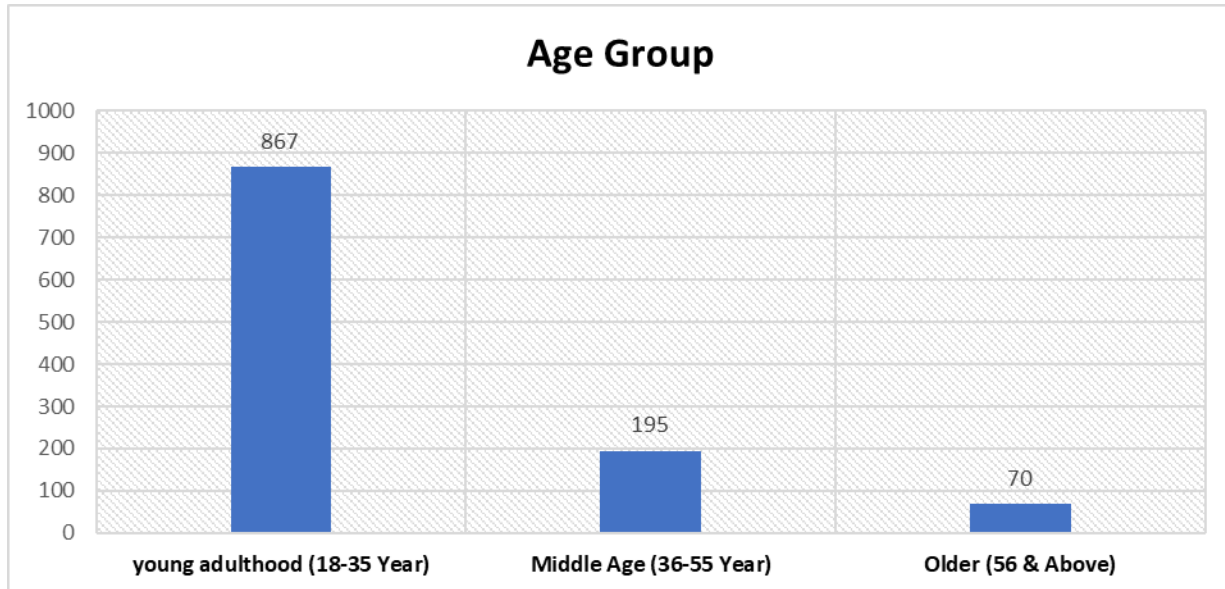
Out of the total collected blood units (1132), the hospital performed tests for HIV, Hepatitis-B & C, VDRL, and Malaria before any blood transfusion activities. The results showed that there was 1 unit positive for HIV, 18 units positive for Hepatitis-B, 11 units positive for Hepatitis-C, 9 units positive for VDRL (syphilis), and 13 units positive for Malaria.

It is important to note that these positive cases were identified during the screening process, and appropriate measures should be taken to ensure the safety of patients receiving blood transfusions. The infected units should be properly disposed of, and the donors should be informed and counseled about their test results. Furthermore, strict adherence to transfusion guidelines and protocols should be followed to prevent the transmission of these infections to recipients.

ANALYSIS

Data is Analyze with the help of Excel Package.

1. Age Group



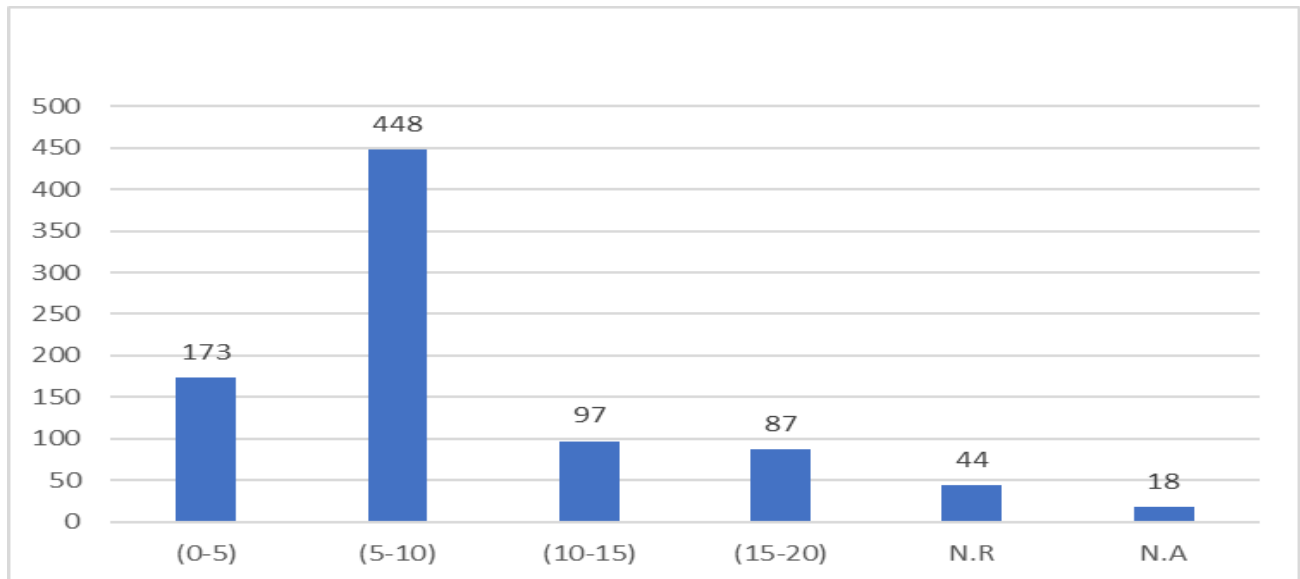
Younger adults: We have found 867 younger adults (18-35 year) who are generally have better overall health and physiological reserves, which may contribute to better outcomes following blood transfusions. They may exhibit a more robust response to transfusions, with faster recovery and fewer complications. Nevertheless, factors should still be taken into account based on each patient's unique medical condition and personal traits.

Middle-aged adults: We located 195. Middle-aged people (36 to 55 years old) may have comorbidities and medical issues to varied degrees. Blood transfusion's effects on this age group will vary depending on the underlying ailment, general health, and reaction to treatment. In this population, it's crucial to carefully weigh the advantages and hazards of transfusion and adjust the treatment strategy accordingly.

Older & Above: Adults over the age of 56 are more prone to problems, have fewer physiological reserves, and frequently have several comorbidities. Frailty, pre-existing cardiovascular issues, and reduced organ function, among other things, may have an impact on how a blood transfusion affects this age group. When giving blood transfusions to older persons, careful observation and individualized care are necessary to minimize potential dangers and guarantee the best results.

Considering the study's adult patient age range (18-35 years). It gives medical personnel the ability to customize transfusion plans and foresee potential age-related difficulties, hence enhancing the security and efficiency of blood transfusions in various adult populations.

2. HB Level

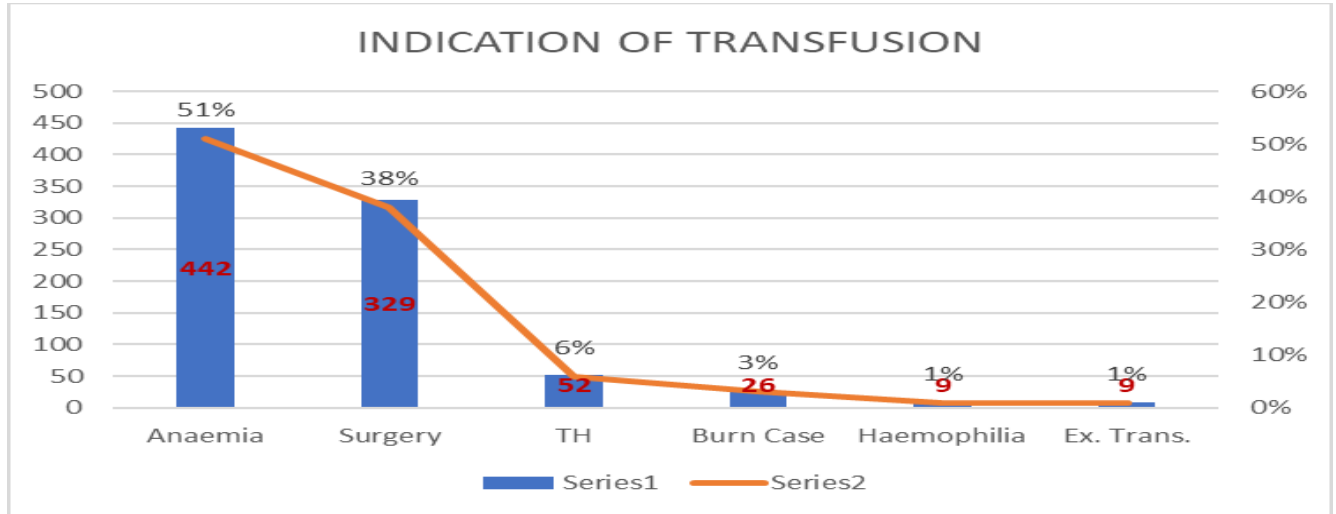


When determining a person's blood condition, hemoglobin (Hb) levels are crucial, especially in relation to anemia and the requirement for interventions like blood transfusions. Age, sex, and underlying medical disorders are only a few of the variables that affect Hb levels.

The graph shows that the Hb level range of 5–10 has the largest patient count, with a total of 448 cases. This implies that a sizable proportion of patients fall within this range and need treatments like blood transfusions to deal with their low hemoglobin levels.

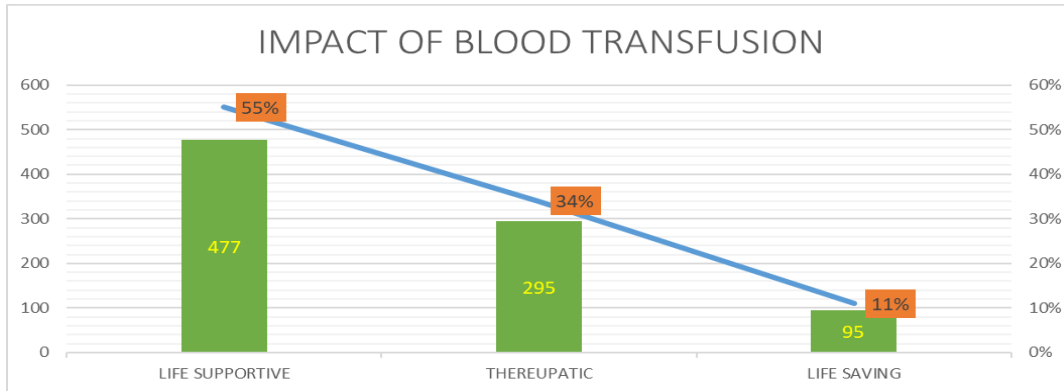
In the Hb range of 0 to 5, there are 173 patients, which is the second-highest patient count. This suggests a subpopulation of patients with extremely low hemoglobin levels, which may signal severe anemia or other underlying medical issues needing rapid attention and possibly blood transfusions.

3. INDICATION OF TRANSFUSION



1. **Anemic cases:** The majority of the blood supplies—about 51%—are needed for anaemic patients. This shows that anaemia is a serious illness that calls for blood transfusions. 574 people out of the total cases need blood transfusions to treat their anaemia.
2. **Surgeries:** 429 patients, or around 38% of the total, need blood transfusions for surgical procedures. Transfusions may be required to replace lost blood and ensure proper oxygenation throughout the procedure because surgeries frequently involve the risk for blood loss.
3. **Trauma and Hemorrhage (TH) patients:** Blood transfusions are necessary in about 6% of patients, or a smaller group, because of trauma or substantial hemorrhage. Transfusions are used to stabilize hemodynamics and restore blood volume in circumstances where there has been an acute blood loss.
4. **Burn cases:** A lesser percentage of patients, or about 3%, need blood transfusions because of burn injuries. Transfusions are necessary to maintain hemodynamic stability and facilitate wound healing in burn patients who may endure significant fluid changes and blood loss.
5. **Hemophilia and excessive bleeding (postpartum hemorrhage):** 1% of the patients have hemophilia, which is a relatively minor percentage, and 1% of the patients have severe bleeding. Individuals with hemophilia require transfusions to restore inadequate clotting factors, whereas individuals with postpartum hemorrhage need transfusions to treat excessive postpartum bleeding.

4. IMPACT OF TRANSFUSION



1. Life supportive activities (55%): These types of transfusions are intended to promote the patient's general health and enhance their quality of life. This could involve transfusions used to treat anemia, improve oxygen transport, and ease symptoms brought on by low hemoglobin levels. Examples might include transfusions to treat persistent anemia or to help individuals with underlying illnesses operate better overall and have more energy.
2. Therapeutic activities (34%): Blood products are often used in transfusions that are categorized as therapeutic activities to treat medical illnesses or consequences. This might involve transfusions given during surgical procedures to replenish lost blood, transfusions given to victims of trauma or burns to replenish lost blood volume and maintain hemodynamic stability, or transfusions given to people with bleeding disorders like hemophilia to replenish missing clotting factors.
3. Life-saving activities (11%): This group includes transfusions that are carried out in urgent or life-threatening conditions with the main objective of saving the patient's life. Transfusions given following a serious hemorrhage or in situations of life-threatening anemia are only a couple of examples. These transfusions work to increase oxygenation and swiftly restore blood volume to avert organ failure and other potentially deadly effects.
4. The percentages given are hypothetical and do not correspond to real statistics or clinical data, which should be noted. Depending on the facility, patient demographic, and therapeutic practices in each situation, the distribution of transfusion activities may change.

All things considered, blood transfusions are essential for sustaining and saving lives as well as offering therapeutic advantages in several medical disorders. To maximize the effects of transfusions and guarantee the best results, it is crucial to use them in the right way depending on the unique requirements of each patient.

CHAPTER- 5 DISCUSSION & CONCLUSION

DISCUSSION:

Anemia: The high percentage of patients (51%) who require blood transfusions for anemia highlights the significance of treating low hemoglobin levels to enhance patients' overall health and quality of life. Transfusions can improve oxygen-carrying capacity and help with anemia-related symptoms. When establishing the need for transfusions and creating suitable treatment strategies, it is imperative to take the underlying cause of anemia and the unique patient characteristics into account.

Surgeries: The likelihood of blood loss during operations is reflected by the large number of patients (38%) who need transfusions. To ensure optimal surgical results, blood transfusions are crucial for replenishing lost blood and ensuring proper oxygenation. To ensure proper transfusion management, healthcare practitioners must examine patients' preoperative hemoglobin levels, assess probable blood loss during surgery, and constantly monitor patients' post-surgical conditions.

Trauma and Hemorrhage (TH) patients: While a smaller subset (6%), patients requiring transfusions due to trauma or significant hemorrhage often experience acute blood loss that necessitates immediate action. Transfusions in these cases aim to stabilize hemodynamics and restore blood volume promptly. Close monitoring of vital signs and coagulation parameters is crucial to guide transfusion decisions and ensure effective management of TH patients.

Burn cases: Although a smaller percentage (3%), patients with burn injuries may experience substantial fluid shifts and blood loss, warranting blood transfusions to maintain hemodynamic stability and support wound healing. Careful assessment of burn severity, estimation of fluid and blood loss, and monitoring of hematologic and hemodynamic parameters are essential in guiding transfusion requirements for burn patients.

Hemophilia and excessive bleeding: Hemophilia cases and excessive bleeding, although representing a smaller proportion (1% each), require specific attention. Transfusions in hemophilia patients aim to replace deficient clotting factors, while postpartum hemorrhage cases require transfusions to address excessive bleeding after childbirth. Close collaboration between hematologists and obstetricians is crucial in managing these situations and ensuring appropriate transfusion support.

CONCLUSION

In conclusion, the study of a multidisciplinary hospital's blood bank with a focus on the effects of blood transfusion on adults in the context of various conditions provides valuable insights into the utilization and impact of transfusions in different patient populations.

The results show that the top conditions requiring blood transfusions in this hospital include anemia, surgical procedures, trauma, and hemorrhage, burn cases, and hemophilia/excessive bleeding. It focuses on how important blood transfusions are for treating bleeding problems, anemia, and replenishing blood lost after operations and traumatic events.

The study emphasizes the need for age-specific transfusion methods as well. Younger persons typically have stronger physiological reserves and overall health, which could improve the results of transfusions. Older people frequently have various comorbidities and diminished physiological reserves, demanding extensive monitoring and individualized care during transfusions. Middle-aged adults may have varying degrees of comorbidities.

Additionally, the distribution of transfusion activities can be divided into activities that support life, activities that are therapeutic, and activities that save lives. These classifications represent the various functions and objectives of transfusions, including promoting general health, treating certain diseases, and saving lives in dire circumstances.

Overall, the study underscores the significance of blood transfusions in improving patient outcomes, managing various medical conditions, and supporting critical care interventions. It highlights the need for healthcare professionals to carefully assess the risks and benefits of transfusions, tailor treatment approaches, and provide individualized care to ensure optimal outcomes for adult patients.

CHAPTER 6: REFERENCES

Here are some references that may be useful for the study "Study Of Blood Bank of A Multidisciplinary Hospital With Special Emphasis On Impact Outcome":

1. Curinga G., Jain A., Feldman M., Prosciak M., Phillips B., Milner S. Red blood cell transfusion following burn. *Burns*. 2011;37:742–752. doi: 10.1016/j.burns.2011.01.016. [PubMed] [CrossRef] [Google Scholar]
2. Posluszny J.A., Gamelli R.L. Anemia of Thermal Injury: Combined Acute Blood Loss Anemia and Anemia of Critical Illness. *J. Burn Care Res*. 2010;31:229–242. doi: 10.1097/BCR.0b013e3181d0f618. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
3. American Association of Blood Banks. Standards for Blood Banks and Transfusion Services, 32nd edition. <https://www.aabb.org/standards-guidance/guidance/Pages/32nd-edition-standards-for-blood-banks-and-transfusion-services.aspx>. Accessed April 30, 2023
4. Carson JL, Grossman BJ, Kleinman S, et al. Red blood cell transfusion: a clinical practice guideline from the AABB. *Ann Intern Med*. 2012;157(1):49-58.
5. World Health Organization. Global Status Report on Blood Safety and Availability 2016. https://www.who.int/bloodsafety/global_database/GSR2016_Report_EN.pdf?ua=1.
6. World Health Organization. Global Status Report on Blood Safety and Availability 2016. https://www.who.int/bloodsafety/global_database/GSR2016_Report_EN.pdf?ua=1. Accessed April 30, 2023.