

**YANGON UNIVERSITY OF ECONOMICS  
MASTER OF PUBLIC ADMINISTRATION PROGRAMME**

**A STUDY ON THE FACTORS AFFECTING VOLUNTARY  
BLOOD DONATION IN NATIONAL BLOOD CENTER,  
YANGON**

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EMPA – 6 (14<sup>th</sup> Batch)**

**AUGUST, 2018**

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MASTER OF PUBLIC ADMINISTRATION PROGRAMME**

**A STUDY ON THE FACTORS AFFECTING VOLUNTARY  
BLOOD DONATION IN NATIONAL BLOOD CENTER, YANGON**

This thesis is submitted as a partial fulfillment towards the requirements for the degree of  
Master of Public Administration (MPA)

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**MASTER OF PUBLIC ADMINISTRATION PROGRAMME**

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## **ABSTRACT**

Secure supply of safe blood components from voluntary non-remunerated blood donation is an important national goal to prevent blood shortages. The objective of this study is to find out the factors affecting voluntary blood donation among the public who came to National Blood Center (Yangon) for blood donation. The data was collected by well structured self administered questionnaire. Among the total 385 participants, male respondents were found to be more likely to donate blood than female respondents. The older the respondents were, the higher the knowledge about voluntary blood donation they had. The level of education increases, participants' knowledge towards voluntary blood donation also increases. The overall level of knowledge of the respondents in this study is comparable with the prevalence of adequate knowledge towards blood donation in developing countries which is estimated to be (60.0%). Almost all of the respondents had favorable attitude towards voluntary blood donation and also were willing to donate in the future. Male participants had more sense of social responsibility than female participants. The commonest reason for voluntary blood donation was altruism and the moral factor was the weakest motivator for all respondents.

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## **LIST OF ABBREVIATIONS**

ABO	Blood type A, B, AB and O
AIDS	Acquired Immune Deficiency Syndrome
BTS	Blood Transfusion Service
FFP	Fresh Frozen Plasma
Hb	Hemoglobin
HBV	Hepatitis B Virus
HCV	Hepatitis C Virus
HIV	Human Immune Virus
ISBT	International Society of Blood Transfusion
KAP	Knowledge, Attitude and Practice
MRCS	Myanmar Red Cross Society
NBC	National Blood Center
NGO	Non Governmental Organization
PRC	Packed Red Cell
PRP	Platelet Rich Plasma
RBC	Red Blood Cell
VD	Voluntary Donor
VFI	Volunteer Functions Inventory
VNRBD	Voluntary Non-Remunerated Blood Donation
WBC	White Blood Cell
WHO	World Health Organization
YGH	Yangon General Hospital

# **CHAPTER I**

## **INTRODUCTION**

Blood is a little bit thick and sticky red fluid that circulates in our blood vessels. It is one of the most vital components of the body. According to blood facts by Wiki, July 2018, depending on the size and weight of the body, a man has the amount of blood of about 4 lit to 6 lit (8 to 12 units). Of many important functions, mainly the blood delivers nutrients and oxygen to cells and carries the metabolic waste products and carbon dioxide away from same cells to the lungs. It maintains the right body temperature by flowing throughout the blood vessels from our head to our toes.

Blood donation is the process that a healthy person has his blood voluntarily drawn for transfusion to the needy. Donating blood to save lives of unknown patients requires a generous will without receiving any payment for it.

First blood transfusion therapy occurred in the mid-1660 in England from dog to dog and the first human transfusions were conducted both in Paris and London in 1667 (Elizabeth Y, 2015). After the great discovery of ABO blood groups in early 20<sup>th</sup> century, blood transfusion could be made as a safe and routine medical practice and then during 2<sup>nd</sup> world war, the concept of blood banks and blood preservation were introduced (Sarkar S, 2008).

Millions of people need blood transfusions each year. Some may need blood during surgery. Others depend on the accident they met or a disease they have that requires blood components. Blood donation makes all of this possible. There is no substitute for human blood; all transfusions use blood from donors.

The potential for misuse of blood transfusion system still exists, although the magnitude has significantly reduced. The emphasis has now rightly moved from merely depending on replacement blood donors to voluntary blood donations. Voluntary non-remunerated blood donor (VNRBD) means that a person gives blood, plasma or cellular components with his/her own free will and receives no payment for

it, either in the form of cash, or in kind which could be considered a substitute for money. Small tokens, refreshments and reimbursements of direct travel costs are compatible with voluntary non-remunerated donation (WHO, 2010).

The blood demand for transfusion continuously increases and blood reserves are sometimes in short supply as a result of the increasing amount of surgeries being performed and large disasters and emergency events.

World Health Organization advocates that 3-5% of the population should donate blood every year, which would be the ideal rate for maintaining a country's stock of blood and blood products at acceptable level. The collection of blood should only be from voluntary donors (low risk population), that is one of the four components of WHO's integral strategy to promote global safety and minimize risk associated with transfusion (Devi H S, Laishram J, Shantibala K. & Elangbam V, 2012).

WHO also insist countries to focus on young people to achieve 100 per cent voluntary unpaid blood donation because they are healthy, active, dynamic and receptive and constitute a greater proportion of population. They have to be encouraged, inspired and motivated to donate blood voluntarily. Considering the importance and significance of voluntary blood donation this study has carried out to understand knowledge, attitude and practice about blood donation among blood donors in NBC.

There were wide variations in blood donation rates among countries, ranging from 0.3 to 56 per 1000 population. WHO estimates that blood donation by 1% of the population is generally the minimum needed to meet a nation's most basic requirements for blood; the requirements are higher in countries with more advanced health care systems. Based on samples of 1000 people, the blood donation rate is 32.1 donations in high-income countries, 14.9 donations in upper-middle-income countries, 7.8 donations in lower-middle-income countries and 4.6 donations in low-income countries (WHO, 2017).

In Myanmar, a blood donation rate is less than 0.1% (less than 1 donation per 1000 population) and Yangon NBC has been continuously trying to maintain the regular voluntary blood donors, carry out educational campaigns on importance of blood donation, put up adverts on TV, radio, Website on blood donation and make contact with universities and social organizations including philanthropic

organizations. That's why it is necessary to establish factors that are associated with voluntary blood donation to help make the populace donate blood.

### **1.1 Rationale of the Study**

A blood donation occurs when a person voluntarily has blood drawn where the whole blood was separated into components (called fractionation) and used for transfusions. Donation may be of whole-blood, or of specific components directly (the latter called aphaeresis).

In developing countries, blood supplies are limited and chronic blood shortages are common and blood banks usually rely on replacement donors who give blood when family or friends need a transfusion. Well organized health care provision may be available in major urban, but large amount of the population in rural areas have access only to more limited health services in which blood transfusion may be unsafe or not available at all. In the developed world, most blood donors are voluntary non-remunerated repeat donors who donate blood for a community supply. Generally, many donors donate blood due to altruism, but some may be paid donors and some may desire incentives other than money such as paid time off from work.

Donating is relatively safe, but some donors have bruising where the needle is inserted or may feel faint. Safe blood is blood that does not contain any viruses, parasites, drugs, alcohol, chemical substances or other extraneous factors that might cause harm, danger or disease to the recipient. Voluntary blood donors are the first line of defense to prevent the transmission of blood born infections such as HIV, Hepatitis, Parasites, etc. Voluntary blood donors are also the safest donors because they are motivated by the desire to help others and a sense of moral duty of social responsibility. In a well-organized blood donation programs, voluntary donors are well-informed about donor selection criteria and are more likely to self-defer if they are no longer eligible to donate. This also leads to less wastage of donated blood, with all its associated costs, because fewer blood units test positive for infection and need to be discarded. In family replacement and paid donors who are seeking to help their families and to get income respectively, leads to increased risk of the transmission of infection and higher volume of donated blood that has to be destroyed because of infectious disease.

The need for blood demand may arise at any time in both rural and urban areas around the world, but just 3% of the eligible persons donate blood. The hospitals

unnecessarily rely on replacement and paid donors and many countries encounter the challenge of blood shortage.

Those include Myanmar, where there has been no balance between blood supply and demand and a blood donation rate is less than 0.1% (less than 1 donation per 1000 population). Blood shortages overwhelmingly exist throughout the country. The reason for my interest of this study comes from the current situation of blood and blood donation in Myanmar.

Providing safe and adequate blood should be an integral part of every country's national health care policy and infrastructure. To ensure safe, adequate and sustainable blood supplies all over the country, not only the health workers but also people who are eligible for blood donation and in good health with their own free will to give their blood, play a significant role. However, there is no sufficient data throughout Myanmar including the study area to determine the factors that affect voluntary blood donation among the general public and this study will find the present situation of knowledge, attitude, practice and motivational factors related to voluntary blood donation in people who came to donate blood.

A study on the knowledge, attitude and practice of the donors and motivational factors to be a voluntary blood donor may prove to be useful in the successful implementation of the blood donation programme. Although there are lots of international publications assessing the knowledge, attitude, and practice of voluntary blood donation in many other countries, literatures on knowledge, attitude and practice of voluntary blood donations are hardly available in our country. Therefore, this research would help to fulfill the existing gaps in this regard and would be beneficial for community, health personnel, planners and policy makers and NGOs to use of it and to determine appropriate strategies to enhance voluntary blood donation practice and others who are engaged in blood donation activities.

## **1.2 Objective of the Study**

The objective of the study is to identify the knowledge, attitude and practice of voluntary blood donation and to determine the motives for voluntary blood donation.

### **1.3 Method of Study**

Descriptive cross-sectional survey design was used to collect the primary data at NBC, Yangon. A total of 385 respondents were randomly selected during two weeks period in Dec 2017. Average 30 respondents per day were interviewed. Questionnaire -based study including demographic data, knowledge, attitude, practice, and reasons and motivation for donation was used to obtain the required data for the analysis of the survey results. The questionnaires were validated by the officials of the blood bank. The secondary data were collected from related papers and reports received from NBC and international papers from the Internet.

### **1.4 Scope and Limitations of the Study**

This study includes regular donors, first time donors and deferrals that are not eligible for blood donation. The sample size estimation was done using the simple population proportion formula and the sample population was 385 with the eligible age between 18 years and 60 years. This study mainly focuses on the people who came to NBC for donation and not people at other places or donation camps. Therefore this study may not be representative of the whole country and needs further study for more information.

### **1.5 Organization of the Study**

This study is composed of five chapters. The first chapter is Introduction of the study and it has five subtitles; Rationale of the Study, Objective of the Study, Study Design and Method, Scope and Limitation and Organization of the Study. The second chapter outlines the Literature Review in which related international studies including knowledge, attitude, practice and motivations of the voluntary blood donation are included. In chapter three, Overview of Myanmar Blood Transfusion Services with the role of NBC and blood donation criteria are described. The Survey is conducted in chapter four with participants' socio-demographic data and their related KAP about voluntary blood donation. This chapter also explores the influencing factors on the respondents to donate blood. Chapter five is the Conclusion of the study and it reveals the Findings of survey analysis and presents the discussion and recommendation of the study.

## **CHAPTER II**

### **LITERATURE REVIEW**

This chapter reviews the critical elements to increase voluntary unpaid regular blood donors. The chapter is organized into themes relevant to the voluntary blood donation in literature worldwide, the importance of blood and blood donors, blood donation and socio-demographic factors which are closely related to survey analysis of the study and the review on previous studies about the level of knowledge on voluntary blood donation, attitudes towards voluntary blood donation and factors influencing voluntary blood donation.

Literature worldwide shows that socio-demographic characteristics, knowledge, attitude and reasons and motivational factors affect the opinion of the general public about voluntary blood donation and reflect the problems encountered in blood donor recruitment, particularly with the emphasis and shift from replacement to voluntary blood donors.

WHO recognized the existence of a significant dependency on family/relative replacement and remunerated donors in developing countries in the Melbourne Declaration and advocates the establishment of national blood transfusion services that functions on the basis of voluntary non-remunerated donation by member states (WHO, 2009).

According to the WHO (2014), out of (108) million blood donations collected from (179) countries globally, about half of them are collected in high-income countries, which are the home of 18% of the population in the world. The literature also indicates that there is a clear variation among high income countries and low income countries with regards to level of access to blood. About 65% of blood transfusions are given to children under 5 years of age in low-income countries, while the most frequently transfuse group of people in high-income countries is over 65 years of age, which accounts for up to 76% of all transfusions. The median rate of blood donation in high-income countries is 36.8 donations per 1000 population while

that of middle-income and low-income countries are 11.7 donations per 1000 populations and 3.9 donations, respectively.

## **2.1 Importance of Blood and Blood Donors**

Blood is a complex red fluid that circulates in our blood vessels. The main function of blood is to transport the nutrients and oxygen through the whole body and to carry back to dispose of waste and carbon dioxide through the lungs. It also has a major role in the body's defense against infection. Nearly half the volume of blood consists of cells and the remainder is fluid called plasma. The blood cells comprise a mixture of red cells (erythrocytes), white cells (leukocytes) and platelets (thrombocytes). The plasma contains many different proteins, chemical substances, clotting (coagulation) factors and numerous metabolic substances. Blood cells are produced in bone marrow.

Blood donation is important for not only saving people lives but also for the pursuit of a better social and living environment, and voluntary blood donation is of great social importance. It is important that voluntary non-remunerated blood donations should be promoted, accepted and practiced for safe blood supply.

Almost all serious health issues use blood donated by people to save lives. Blood that is donated lasts a little more than 40 days. Then it must be disposed of. That means it is necessary to constantly replenish the blood so it is there when someone needs it. One cannot make blood. It is a gift all people have inside of them to give to those who are injured, sick, or in need. Those are the best reasons to donate blood.

Generally, only individuals in good health should be accepted as blood donors. As a voluntary blood donor, a person must have been declared fit after a medical examination and fulfilling a donor questionnaire with related criteria. According to the WHO guidelines, the usual lower and upper age limits for blood donations are 18 years and 65 years, respectively. Prospective donors of whole blood donations should weigh at least 45 kg to donate 350 ml and 50 kg to donate 450 ml. A normal pulse rate should be 60-100 per minute and a core oral temperature should not be more than 37.6 degree Celsius. A normal blood pressure (systolic 120–129 mmHg, diastolic 80–89 mmHg) is generally regarded as an indicator of good health. A hemoglobin level is not less than 12.0 g/dl for females and not less than 13.0 g/dl for males. The minimum interval between donations of whole blood should be 12 weeks



for males and 16 weeks for females. Providing 500 ml drinking water to donors should be made before donation to minimize the risk of vasovagal reactions.

The most safest and suitable blood donor is a healthy person who is eligible with the requirements to be a blood donor and he donates his blood regularly with his own free will without receiving any payment. Such a voluntary unpaid blood donors are the safest group of blood donors and they could be the source of sustainable national blood supplies sufficient for the countries blood demand. Voluntary blood donors are the cornerstone of a safe and adequate supply of blood and blood products from low-risk populations (Woldemichae, 2016).

## **2.2 Voluntary Blood Donation and Socio-demographic Factor**

A voluntary non-remunerated blood donor is a person who gives blood, plasma or cellular components of his or her own free will and receives no payment, either in the form of cash or in kind which could be considered a substitute for money (Keown J, 1997).

Voluntary blood donors are the cornerstone of a safe and adequate supply of blood and blood products. The safest blood donors are voluntary, non-remunerated blood donors from low-risk populations. A person who gives blood, plasma or other blood components of his/her own free will and receives no payment for it, either in the form of cash or in-kind which could be considered a substitute for money. This includes time off work, other than reasonably needed for the donation and travel. Small tokens, refreshments and reimbursement of the direct travel costs are compatible with voluntary, non-remunerated blood donation.

Low rates of voluntary blood donation by the general public have been attributed to a variety of socioeconomic, medical and attitudinal factors. Lack of awareness of the need for donation, fear of donating blood related to perceived risk of contracting human immunodeficiency virus and loss of physical vitality after donation have been proposed as potential reasons for ethnic and racial disparities in blood donation.

An analysis of socio-demographic determinants conducted by Nur Zainie Abd Hamid, Rohaida Basiruddin & Narehan Hassan (2013) surprisingly found that 28.1% from respondents have a high qualification of master degree and Ph.D, 41.4% have at least a diploma and 30.5% hold a minimum education background. He remarked that this is a false believed that people who come from rural areas were uneducated.

The descriptive type of cross sectional study conducted by Begum S A, Nihar S, Saieda F, Reshma A& Golam R (2016) showed that the mean age of the donors was 28.4 years with a range of 18 to 57 years. The number of female donors was found to be very few as compared to males. The reason may be due to the fact that a high turnover of female donor and temporary deferral conditions due to low hemoglobin values, low weight, and fear of pain. Other factors such as their frequent menstrual cycles, pregnancy, and lactation may prevent them from donation. From the demographic data, they also observed that more than half (56.7%) of blood donors' educational qualification was graduation and above.

Higher donation of blood was found among males (94.6%) than females in a study conducted by Ali Neamah Hassan Al-Aaragi (2017). He remarked that women generally tend to donate blood less of men because of the factors like anemia, prevalent customs, beliefs and lifestyle, multiple pregnancies, etc. He also found that majority of the participants were from urban areas which may be due to the fact that people in urban areas have more intentions to donate blood and mostly, the blood banks were located in urban areas. As regards the occupation, student donors were the highest participants among blood donors.

### **2.3 Review on Previous Studies**

Review on previous studies is divided into three parts. They are published articles downloaded from Internet regarding the knowledge about voluntary blood donation followed by attitude and practice, and reasons and motivations towards voluntary blood donation. It is useful to examine each elements of the study during analysis.

#### **2.3.1 Knowledge about Blood Donation**

Generally, in developing countries, donors tended to be more interested in the knowledge about specific donation criteria like age, weight, time between donations and donor screening tests than non donors. In developed countries there are also still some problems on the ignorance of the conditions and criteria applying to the blood donation. Most people had little knowledge about blood donation and lack of knowledge about the social benefits from blood donation.

Uma S, Arun R & Arumugam P (2013) studied Knowledge, Attitude and Practice towards Blood Donation among Voluntary Blood Donors in Chennai. They

found that 50% of respondents knew the donation period of a regular donor and 79.4% donors knew that minimum age eligible for blood donation. There was a lack of knowledge among blood donors with regard to the mandatory tests which were done after the blood collection, the amount of blood which was donated, minimum hemoglobin level for blood donation and whether people could get infected by receiving blood. That means, to create awareness, a clear simple and constant message must be delivered by using health education materials to the target groups.

. The finding of M H Mamabolo (2012) regarding information about the blood donation matters was that the respondents involved in his study displayed a fair knowledge. But the majority of respondents (81%) understood what blood donation is all about and (85%) also acknowledged that blood donation is very important in saving lives. This was a positive and promising response.

The knowledge about blood donation has also been stated in a research paper conducted by Abderrahman B H and Mohammad Y N Saleh (2014). They found that Jordanian blood donors had inadequate knowledge about blood donation. Authors believed that these findings showed that the need for educational program and blood donation campaigns specific to blood donation. By doing so, there could encourage and motivate Jordanian population to donate blood and establish safe blood supply based on voluntary unpaid regular blood donors.

Begum S A et al. (2016) studied the Awareness about Blood Donation among Donors at a Specialized Tertiary Level Public Hospital in Dhaka, Bangladesh. They found that more than half of the participants had knowledge about the eligibility criteria of blood donation including age limit to start blood donation, interval between each donation. But there was a lack of knowledge in donors, almost half (47.3%) did not know the volume of donated blood, more than half (57.3%) did not know the required Hb level to donate blood. That means, to develop awareness, a clear simple and constant message must provide by using health education materials to the target groups.

### **2.3.2 Attitude and Practice towards Blood Donation**

A cross sectional study conducted by Uma S. et al. (2013) in Chennai, India on voluntary blood donation showed that among a total of 530 voluntary blood donors, 57% donors felt that creating an opportunity for the donation was one of the important factors to motivate blood donors. 55% donors, fear of pain was the main reason for the hesitation of the donors in donating blood. According to the practice of the donors, 47.8% donors who were willing to become regular donors and they were ready to donate blood once in a year. More than half of the donors had a feeling of satisfaction after the blood donation and also had a good perception that blood donation would not harm their body. Vast majority of the donors emphasized that voluntary donation was the best option. Generally, half of the donors opined that the main reason for the hesitation in donating blood was the fear of pain. 74.7% of the donors felt great satisfaction after the donation and just 3.4% showed negative effects like dizziness and tiredness.

A study on Knowledge, Attitude and Practices of Blood Donors toward Blood Donation in India conducted by Karobi Das, Geetanjali, Suchet S, Baljeet K, Charan I S & Daiamonlang N (2014) revealed that 90% of donors showed their positive opinion that blood donation saves life and it is a good moral activity. A total of 42 (70%) of the donors strongly believed that every person should always disclose correct information about his/ her health in a screen test before donating blood. Donors in their study had different opinions on blood donation that 25% believed that the best way to donate blood is at the request of relatives while 76.6% were strongly against it and 16.7% had a negative opinion that the best way to donate blood is paid donation. Regarding the practice of blood donation, majority (75%) of the donors had 1 to 5 blood donated times and 5% had more than 25 times. Nearly half (46.7%) of donors donated blood only when they were asked to donate. Generally, their study revealed that 86% participants had a positive attitude toward blood donation.

Begum S A et al. (2016) found in their study that more than half (56.0%) of the donors had ever donated and (86.9%) were willing to become regular donor. Regarding the impact of blood donation, 68.6% of donors had a positive feeling of satisfaction after blood donation, 31.2% showed negative effects like tiredness/ fatigue, fear and pain. More than half (56.0%) had past history of blood donation and majority of donors (86.9%) were willing to become regular donor. With regards to the impact of the blood donation, 68.6 % of the donors showed positive effects like a

feeling of satisfaction after the donation, 31.2 % of the donors showed negative effects like tiredness/ fatigue, fear. On the positive side, a majority of the donors was willing to be regular donors. That means, most of the donors were aware about the blood donation and they had a good attitude towards it.

Positive attitude towards blood donation was observed among (82%) of respondents in a study conducted by Ali Neamah Hasan Al-Aaragi (2017). Most of the respondents disclosed that the best way to increase blood donors is delivering the information regarding blood donation through blood campaigns, newspapers and books, friends and relatives. Vast majority of the donors (85.9%) agreed with the screening test before donation and the fact that blood donation is good for health. These donors felt that blood donation is a noble act. But few donors (14.1%) believed that blood donation is harmful to the donor. That means, decreasing the perception that the blood donation is harmful can lead to an increase in the pool of blood donors. In his study, majority of the donors (86.3%) had donated in the previous year; few donors (13.6%) had not donated blood in the past. There may be many reasons for the former type including donors' understanding about the important of blood donation, their belief in the benefits of blood donation and their willingness to help other people.

Umakant G S, Subitha L, Suman S & Gautam R (2015) studied Knowledge and Attitude Regarding Blood Donation in Rural Puducherry, India and found that (77%) of donors, with positive attitude, would donate in future if somebody asked to do it or if there was emergency case. It showed that an emergency condition could be one of the motivating factors to a person to be a voluntary blood donor. That reason should be taken into consideration in donor recruitment programs. They reported that although the participants had good knowledge of blood donation, just a few donors had donated in past. Education level was one of the important factors that determines awareness and attitude of the people and practice of the donors. Authors remarked that health education and motivation on blood donation through various media in rural areas is essential.

### **2.3.3 Reasons and Motivation to Voluntary Blood Donation**

There are many factors that influence motivation and reasons towards voluntary blood donation. Khurram A F, Kaleem A, M Ahmad Tauqur, Anam Khan & Sidra Mehboob (2008) conducted an Investigation of Influencing Factors of Blood Donation Motivation, Blood Donors: a survey-based questionnaire study. They explained that, to motivate people towards voluntary blood donation, as a first factor, blood bank's collection campaigns and advertisement play an important role. The second factor is the donors' heartfelt sympathy to the patients. The third factor, a support of second factor, is a positive emotional attachment or altruism to help others. Another finding in their study was that 83% of donors were from the youth segment (less than 30 years). That may be due to the fact that such donors are young and energetic and feel fit and healthy to donate blood. Their education also a creating factor to get awareness for them to donate blood and the young persons are attracted by the emotional collection campaigns conducted by the blood banks. Another interesting finding was that people more than forty years are found to be hesitant and reluctant to donate blood and they fear old age diseases and weaknesses.

Another study conducted by Ali Neamah Hasan Al-Aaragi (2017) found that majority of the donors (77.9%) donated blood as a religious or humanitarian duty. (13.6%) donated blood for family members or friends (replacement donors) and (8.5%) donors good for health. That showed that the reason of donating blood for religious or humanitarian duty largely influenced on donors and other reason of donating blood voluntarily was a low priority. The main motivating factor that mobilizes prospective donors was their awareness of the patients' need which is connected to their presumption that they may also need blood in future for themselves or their families or relatives.

It was found in a study on (KAP) regarding voluntary non-remunerated blood donation (VNRBD) among the students of colleges of Jammu, India conducted by Sonam Kumari & Tilak R. Raina (2015) that social causes were the major motivational factors for blood donation. Altruism, doing good to others, sense of social responsibility and for helping friends or relatives was the major reasons for blood donation. But for non donors including students, the factors like fear of needle, sight of blood, fear of ill effects, fear of being rejected, objection from elder and never been asked for blood donation were reason for not donating blood. Those findings showed that sufficient steps should be taken into consideration to create opportunities

for them to donate blood and parents in human society should not have wrong concept that blood donation causes weakness that discourages their children's attitude towards blood donation. Pleasant or unpleasant experience of blood donation for a first time donor is an important factor in future to return back to be a regular donor or not to return for repeat blood donation. Authors expressed that in their study, 92.38% of donors had pleasant experience of blood donation while 7.61% felt if unpleasant.

According to the WHO (2017) report, demographic information about blood donors is important for formulating and monitoring donor recruitment strategies to meet blood requirements. This may include the strategies to address the barriers to blood donation that specific populations may face. Low levels of knowledge and practice were observed in a number of published studies across the developing world. Globally, it has been found that 80% of first time donors every year give up the practice of blood donation.

## **CHAPTER III**

### **OVERVIEW OF THE BLOOD TRANSFUSION SERVICE IN MYANMAR**

The quality status of transfusion service in Myanmar has not developed yet and has struggled with improving the blood transfusion services in resource-limited setting. Adequate and safe blood supply has remained a challenge in developing countries including Myanmar. Taking into account the big demand for safe blood and blood products across the nation and understanding the role of blood centers in the improvement of blood transfusion services, this chapter offers the overview of the blood transfusion service in Myanmar including background and current status of BTS in Myanmar, role of MRCS, Yangon National Blood Bank (NBC) and blood transfusion services and criteria for blood donor acceptance to ensure safe blood for both donors and recipients.

#### **3.1 Blood Transfusion Service in Myanmar**

Blood transfusion is a procedure whereby blood or its specific components, whether they are red cell, white cells, plasma or clotting factors, are infused into the vascular system for replacement of loss from the body. The blood transfusion service, or in simple terms, the blood bank is a place where blood is collected, stored, processed and issued whenever there is need for it.

Blood transfusion was initiated at Yangon General Hospital in 1899. Nearly 40 years later, blood transfusion services were started with paid blood donation program at YGH. In the year 1945, the blood bank facility, now it is known as National Blood Center (NBC), was set up and carried out broad services on blood transfusion. In 1962, a central national blood bank committee was established and made plans for voluntary blood donation program with the support of Myanmar Red Cross Society (MRCS) which has nationwide network of volunteers as blood donors.



Every day, millions of people in the country require blood transfusion (Thida Aung, 2009).

A national coordinated blood transfusion service is managed by government and National Blood Center is responsible for development of the BTS in the country. Blood and blood product law was enacted in 2003 for implementing regulatory mechanism in the country. The National Blood Policy is in the stage of finalization and subsequent implementation. NBC distributes blood components only in the capital Yangon and more than 20,000 blood units are distributed per year. NBC in cooperation with MRCS has carried out health education training programme regarding voluntary donation, donor deferral and risk behavior within all universities and social groups using various methods with public video spots, pamphlets, posters and formal training. As per the WHO report of 2017, 100% blood units are tested for HIV and syphilis infections (Choudhury N, 2011).

### **3.2 Role of Myanmar Red Cross Society (MRCS)**

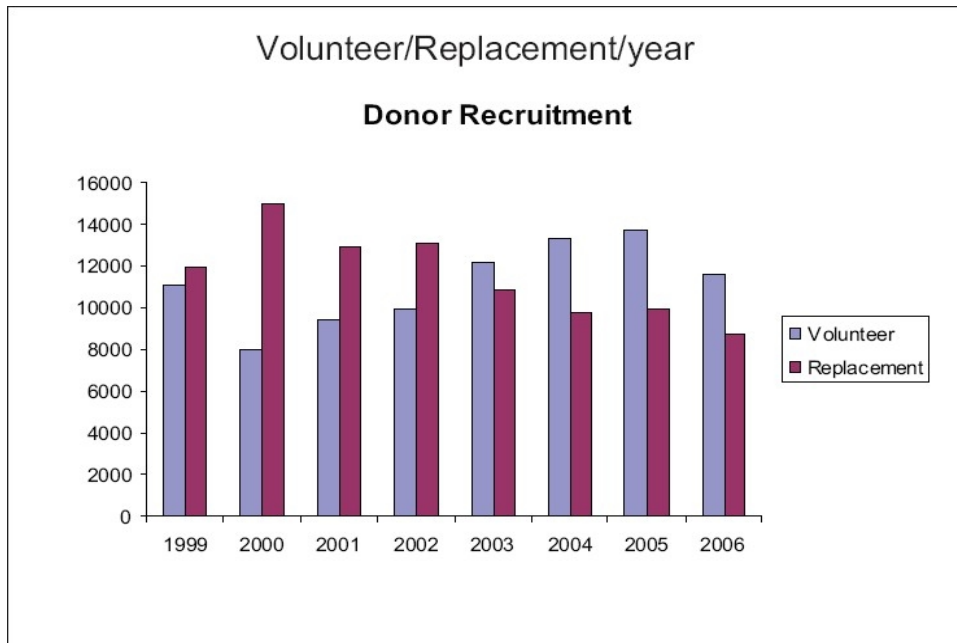
Since Myanmar Red Cross Society (MRCS) was established in 1920 and initiated blood donation activities in 1961, its commitment to Voluntary Non-remunerated Blood Donation (VNRBD) is one of the important role to various programs including donor motivation, recruitment and retention coordination of voluntary blood donors. The objective of MRCS has been to improve the amount of safe blood available through increased recruitment and retention of voluntary non-remunerated blood donors in coordination and collaboration with NBC (Thida Aung, 2009).

As one of the major activities, MRCS has been creating public awareness programme by meeting with local administrative authorities and communities, usually at the states/divisional level and branches, and disseminating on the value of volunteer blood donors. Efforts are made to explain the importance of safe blood supply and to promote healthy lifestyle among general public. Also, about the risk factors and the transmission of transfusion-transmissible infections are explained. These type of meetings help identify the low-risk groups as potential blood donors.

The Myanmar Red Cross Society has an ongoing partnership with the National Blood Center in Yangon including training of volunteers as trainers in voluntary non-remunerated blood donor recruitment, organizing mass blood donations in townships in Yangon division and universities, and by hosting regional voluntary blood donor

recruitment workshop. Blood donor day was celebrated by MRCS with a programme recognizing the outstanding individual volunteer blood donors and voluntary blood donor associations. Effect of continuous efforts of MRCS and NBC toward promotion of VNRBD is very supportive. Figure (3.1) shows volunteer/ replacement pattern of blood donation changing year-by-year because of community education.

**Figure (3.1) Volunteer/Replacement Pattern of blood donation from 1999 to 2006**



Source: Thida Aung (2009)

It was clearly found that in Figure (3.1), the blood donation relying on replacement donors were significantly decreased and at the same time voluntary blood donation rate was increased year by year.

### **3.3 National Blood Center (NBC) and Blood Transfusion Services (BTS)**

Blood services in Myanmar have been mainly provided by NBC since 1945. Blood bank and transfusion services include collection, processing, storage and provide human blood intended for transfusion. NBC has been the one who took the lead and initiative in developing blood banking services in the country, blood transfusion services in Myanmar are still relying upon family and replacement donors.

There are two national blood banks in Myanmar; one at Yangon General Hospital and the other at Mandalay General Hospital, There is a nationwide network of 359 hospital-based banks with a demand of 200,000 units of blood. Yangon

National Blood Center provides safe blood and blood products to 11 government hospitals in Yangon. Along with the increasing usage of blood units by hospitals, the quality status of blood and blood products is a challenge for NBC. In terms of blood component preparation, fresh frozen plasma (FFp), packed red cells (PRC), cryoprecipitate, and platelet rich plasma (PRP) became available in the NBC. Usage of component blood has been gradually increasing in line with the improvement of health service (Thida Aung, Htein Win & Thida Htoon, 2016).

According to the WHO regional figures, in South East Asia there are around 2 million units of blood missing each year out of the 18 million units required. WHO calls on all countries to achieve 100% voluntary, unpaid donations by 2020 to satisfy national blood requirements and ensuring that this life-saving resource can be readily available at all levels of the health system. In Myanmar, there are many voluntary organizations that assist in donor recruitment and blood donation. Voluntary blood donations have grown noticeably and considerably from 35% in 2003 to 98% in 2016 at National Blood Center, Yangon. This is a satisfactory recruitment of voluntary donors, very close to the objective of 100% by 2020 but in nationwide, voluntary blood donation is 75%.

Blood transfusion service has been considered to be an integral part of the health care system in every country. National Blood Center tried to collaborate with the Myanmar Red Cross Society (MRCS), which had access to blood transfusion service of neighboring countries and local universities. In addition to the collaboration with local and international agencies for technical issues and fund raising, training for healthcare staffs has involved in blood transfusion service became essential.

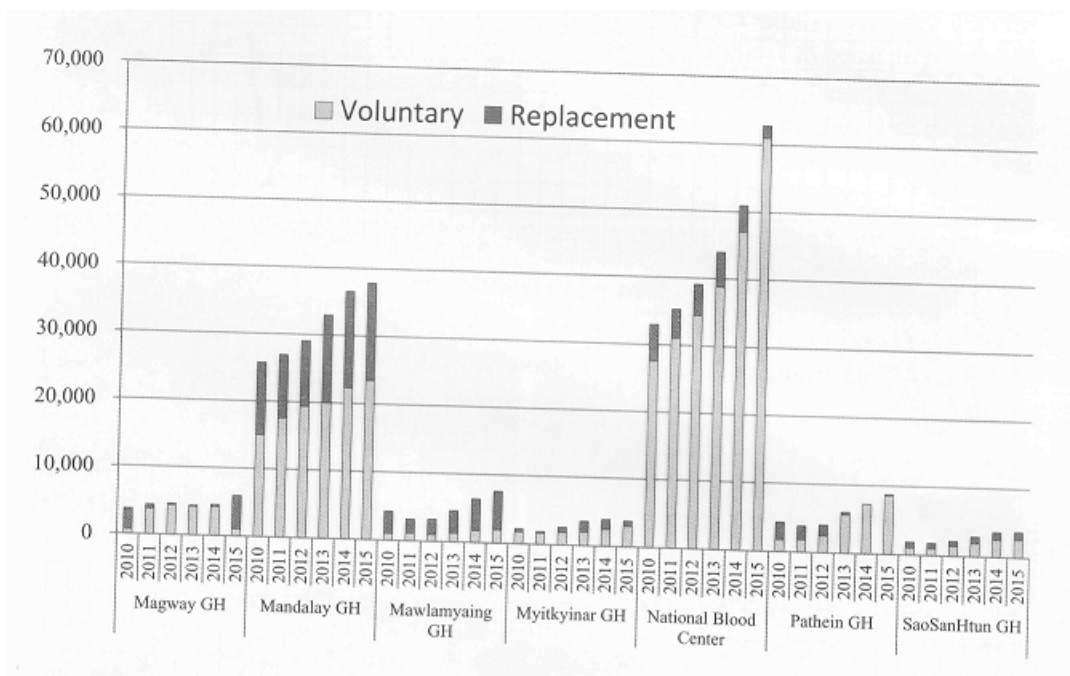
In 1995, the transfusion services were integrated into hospital pathology laboratories where ABO typing and cross-matching of replacement blood donors were performed. In order to get overall safe and success of blood transfusion, the guidelines for handling and usage of blood and blood components was published in 2011 and revised again in 2015 with the participation of national and international experts of blood transfusion services. This guideline is very helpful to solve the problems in making decision and taking relevant responsibility of blood transfusion therapy and get rid of danger of transfusion as much as possible (NBC Report, 2015).

NBC in Yangon has won the International Society of Blood Transfusion (ISBT) award for developing countries 2014 for the development and improvement of the Blood Transfusion Service in Myanmar. The ISBT Award for Developing

Country can be conferred only on an outstanding institute or individual related to blood services in a developing country. The Award is to witness an institute/individual, who has made significant contributions to strengthening of blood transfusion practices within his/her country and has played an important role in improving of blood transfusions regionally and globally. There are many voluntary organizations assisting in donor recruitment and blood donations across Myanmar.

According to discussion with Officer-in-Charge of NBC during study period, the total number of blood donations continuously increased from 23, 002 in 2000 to 43, 859 in 2013 and 45, 742 in 2014. Voluntary blood donations were also increased from 8, 035 (34.9%) in 2000 to 38, 814 (88.5%) in 2013 and 40, 480 (92.3%) in 2014 as shown in Figure (3.2). The daily demand in Yangon NBC is between 150 and 200 blood units. However, the number of blood donators declines during the hot season. Progress is being made through an improved screening system and a more reliable network of donors, monks and laypeople alike. The Myanmar blood bank reduced the transmission of HIV, hepatitis B and C and syphilis through blood transfusions by 80 percent over the past 10 years and earned an award from the International Blood Transfusion Society in June. NBC received one-third of its daily blood donation target last fiscal year and could not meet patient demand.

**Figure (3.2) Number of Voluntary and Replacement Blood Donations in 7 Blood Banks from 2010 to 2015**



### **3.3.1 Encouragement to be Voluntary Blood Donor**

Every year, millions of people rely on the generosity of another person to donate blood. Yet, blood donation rates vary considerably and the demands for blood and blood products are increasing worldwide. To meet these needs, more people must come forward to give blood voluntarily, and regularly, says the WHO on World Blood Donor Day.

The factors that influence an individual's decision to give blood is a collection of an individual's specific observable characteristics such as socio-demographic factors and unobservable characteristics such as the degree of altruism. It is noteworthy that not all persons who have once donated their blood become repeat donors. Thus it is really crucial to focus donor recruitment strategies on the transformation of the first timers' into the repeat ones as well as the retention of the latter.

To promote non-remunerated donation, it is essential to build a positive image of the donor in the public and further develop donation as an act of charity. Thus good public relation is a crucial promotional means in blood donor recruitment and retention management. Community participation and involvement in blood donation could also be encouraged by paying public honor to the most active donors and charity events. Another possibility would be to employ mass media in providing information on blood donation and its positive effect on human health as well as the national supplies of blood and its components at national blood collecting centers.

Retention of donors is also largely dependent on donor satisfaction with blood collection services. So it is vital to help them feel at home at blood centers. Another crucial aspect is making donors feel that their blood donations are useful for the community and appreciated by it.

In order to get safe and sustainable blood from voluntary blood donors, the NBC encourage faith groups and private and public sectors to contribute to the blood safety program and has supported the formulation of blood donor group with a motivation program. At the same time, NBC appreciate and gave certificates of honors to honorable voluntary unpaid repeat donors who donate 40 times and above in order to encourage first time donors to become regular donors and persuade individuals to be voluntary non-remunerated regular donors.

Every year on 14th June, countries around the world including Myanmar celebrate Blood Donor Day not only to raise awareness of the need for safe blood and

blood products and to thank blood donors for their voluntary life-saving gifts of blood but also to motivate people for voluntary blood donation. Mass blood donation on this day is done with a reminder letter for the blood recruiters and Red Cross volunteers. Awards and recognition badges and appreciation certificates are presented. Transportation charges were given to mass blood donation group and NBC supplied with refreshments and iron supplements.

The National Blood Donor day is also celebrated in a similar manner in the month of December every year. On that day the outstanding blood donors were awarded certificates of honor. On 14th December 2017, 41th National Blood Donor day was held at National Blood Center, Yangon. 466 honorable blood donors attended the ceremony. 31 monks of repeated blood donors, 87 donors who had donated more than 100 times, 379 donors who had donated up to 100 times were given certificates of honor (NBC Report, 2015).

### **3.3.2 Blood Donor Deferral**

Although the need for blood transfusion may arise at any time in both urban and rural areas around the world, there are non-donors who are in good health and eligible for blood donation in many countries, the hospitals unnecessarily rely on the replacement and paid donors so that many countries face the challenges of blood shortage that could not fulfill the increase demand of blood in time.

Recruitment, selection, and retention of voluntary non-remunerated donors from low-risk populations are the cornerstones of a safe, sustainable, and adequate national blood supply. At the same time the donor screening process is very critical to protect the safety of the blood supply. Screening, however, can lead to either temporary or permanent deferral, resulting in lower donation rates that could further limit the donor pool (Ngoma A M, Goto A, Kenneth E Nollet, Sawamura Y, Ohto H & Yasumura S, 2014).

In particular, in developing countries, where nutritional imbalance and higher risk of transfusion transmitted infections among the general public highlight the need for donor deferral for ensuring the safety of blood transfusion services. In Myanmar, blood donor deferral was more prevalent among females and first-time donors. Low Hb level and hypertension were the major causes for deferral of female donors and male donors aged more than 30 years, respectively. Iron supplements and health education providing information about Hb are given to donors with low Hb. Donors

with high blood pressure are expected to have an opportunity to obtain medical care at the asymptomatic stage before complication occur (New Nwe Oo, Thaw Zin Aung, Nozaki I & Thida Aung, 2014).

The data shown in Tables (3.1) were analyzed from all volunteers who were deferred from donating blood in NBC, Yangon, by Nwe Nwe Oo, Wada K, Ikuma N, Thaw Zin Aung, Yoshihara N & Thida Aung (2014) from the beginning of January 2014 to February 27, 2014. Deferred donors were categorized by age and gender, and the proportion of deferrals was calculated for these categories. Volunteers are measured body weight, hemoglobin (Hb) level, and blood pressure to assess the eligibility of blood donors at the site. Low Hb level was defined as <12.0 g/dl in males and <11.5 g/dl in females. Hypertension was defined as systolic blood pressure >150 mmHg or diastolic blood pressure >100 mmHg, and hypotension, as systolic blood pressure <100 mmHg or diastolic blood pressure <60 mmHg. Low body weight was defined as <49.8 Kg for males and <45.3 Kg for females. It also required all donors to fill a questionnaire declaring their current health status and high-risk behaviors for transfusion-transmitted diseases such as HIV and HBV, to assess blood donor safety.

**Table (3.1) Proportion of Reasons of Deferral**

<b>Reasons</b>	<b>Deferred cases (%)</b>	
	<b>Male</b>	<b>Female</b>
<b>Low Hb Level</b>		
First-time	24 (1.9)	193(14.1)
More than twice	63(2.0)	190(10.3)
<b>Hypertension</b>		
First-time	34(2.7)	19(1.4)
More than twice	140(4.5)	43(2.3)
<b>Hypotension</b>		
First-time	34(2.7)	58(4.2)
More than twice	29(9.2)	32(1.7)
<b>Low Body weight</b>		
First-time	119(9.3)	190(13.9)
More than twice	57(1.8)	36(1.9)

Source: Nwe Nwe Oo. et al. (2014)

According to the data in Table (3.1), donor selection or deferral system plays an important role in the practice of blood transfusion not only for safety but also for health of donor. Among females, low Hb level was the major cause of donor deferral for both first-time donor (14.1%) and those donating more than twice (10.3%). Among first-time donor, low body weight was prevalent among both men (9.3%) and women (13.9%). For men, hypertension was prevalent for aged over 30 years old. Few persons were deferred because of high risk behavior.

### **3.4 Criteria for Blood Donor Selection**

Blood transfusion services have a process of donor selection based on criteria of subjecting donors to a questionnaire, physical examination, and hemoglobin testing before blood donation, and only those who meet the requirements qualify as blood donors. Blood donor suitability criteria are based on science, informed medical opinion and regulatory rules designed to protect both the blood donors and blood recipients from harm. The criteria are also important for blood safety (microbiological safety of the blood), and there is a need to defer blood donors to protect the recipients from getting transfusion-transmitted infections. The process of donor selection before the donation is an important, effective, and economical tool for ensuring blood safety.

Virtually all living humans are potential candidates for blood donation. However, it is practically not possible to extract blood from every human being since it would be inappropriate and unethical to just let blood be transfused and turn a blind eye to its potential hazards. Patients must be protected from harm in the process. Thus, list of potential candidate presented to the transfusion service must be carefully filtered down through in order to achieve a clean healthy blood pool fit for transfusion. According to the Guideline for BTS (2011), the following routine must be exactly followed to achieve that goal.

A selection of donors from a compiled list of candidates must be assessed to approve fitness for donation. This is a job of the medical officers. The process will include the following components.

- (1) History
- (2) Physical examination
- (3) Laboratory investigations



### **(1) History**

Taking a background medical history is important since it would be prior to actual donation. Standardized and revised set of questionnaires are available to be filled out by the candidates. It consists of certain rules on conditions leading to permanent deferral, conditions leading to temporary deferral (suspension), Immunization; conditions require individual assessment, Infection, Malaria and drugs.

### **(2) Physical Examination**

Before going through the blood donation process, particulars of the potential donors must be checked out as a physical examination as follows:

**Age** - The donor shall be in the age group of 18 to 60 years. Between 17 and 18, consent of parents or guardian must be taken before blood donation. Elderly donors over 60 years of age, fitness for donation will be decided by the physician.

**Body weight** - Individuals are weighed before going through selection process. For both male and female donors, minimum acceptable body weights are 100 lb for 350 ml and 110 lb for 450 ml blood collection.

**Blood pressure** - This is assessed by medical officers. Variations between 180/100 mmHg and 100/60 mmHg can be accepted.

### **(3) Laboratory investigations**

Minimum limit of Hemoglobin concentration for male donors shall be 12 G/L and minimum limit of Hemoglobin concentration for female donors shall be 11.5 G/L.

**Time Taken in Donation** - It should take 15 to 30 minutes including the time for rest in chair and then take one glass of liquid with some light food. After donation up to 3 hrs it is better not to smoke, consume alcohol and to take other drugs. After donation liquid part will be replaced within an hour and others will slowly replaced within a few days. It is not necessary to have any special diet after blood donation.

As in general condition, persons who are searched for and filtered out weaker in his/her body or mind by medical officer cannot donate blood. Healthy persons without any problems with liver, lungs, heart and without diseases like jaundice, malaria, typhoid, HIV/AIDS and not using medicines can donate blood. There should be 4 months gap from previous blood donation. Persons with diseases like TB,

venereal disease, diabetes, asthma, high BP, kidney disease, heart disease, jaundice, malaria, typhoid, AIDS, using medicines and drug addicts and alcohol along with women in menstruation, breast feeding mother and pregnant women cannot donate blood.

## **CHAPTER IV**

### **SURVEY ANALYSIS**

This study is the first conducted in Myanmar to determine the factors that affect voluntary blood donation among the general public who came to NBC to donate blood. It takes into account the knowledge, attitude, practice and perspectives of the donors and deferrals that were temporally deferred from donating blood in order for ensuring the safety of blood transfusion. This study was able to explore the survey analysis about knowledge, attitudes, practice and associated factors towards voluntary blood donation and the cross-sectional survey was conducted among people who came to NBC to donate blood voluntarily. Before presenting survey results, the profile and design of the survey were described below.

#### **4.1 Survey Profile**

National Blood Center (NBC) is the biggest blood transfusion unit in the country and is situated in downtown Yangon. The location is No. (97), Corner of BogyokeAungSan Road and ShweDagon Pagoda Road, Latha Township. It is the main provider of safe blood and blood products to government hospitals in Yangon city.

NBC has established in 2003, for promoting the nationally coordinated blood transfusion service, based on the Blood and Blood Product Law. NBC has three major roles as the central blood center; (1) to establish the service model and set up the national standard of blood transfusion service which is feasible and affordable in the country's situation, (2) to supply safe blood products to hospitals in Yangon about 90% of their needs, (3) to train and support the BTUs in the countries to meet the national standard of the blood transfusion services (NBC Report, 2015)

As of end of 2014, NBC has been providing the blood products for 11 hospitals in Yangon city, namely YGH, NYGH, Mingaladon Specialist Hospital, Thaketa Specialist Hospital, Yangon Orthopaedic Hospital, Workers' Hospital, Wai Ba Gi Infectious Disease Hospital, Ear Nose Throat Specialist Hospital, Thin Gyan

Kyun Hospital, 550 Bedded Yangon Specialist Hospital and ZiWiTADaNaSanga Hospita. Before 2002, whole blood pack cells and Platelet rich plasma were prepared by blood bank. After 2004, fresh frozen plasma, cryo precipitates and single donor platelet become available for patients. Since 2012, Leucocyte depleted product has been produced (NBC Report, 2015).

NBC in cooperation with MRCS has carried out health education training programme regarding voluntary donation, donor deferral and risk behavior within all universities and social groups using various methods with public video spots, pamphlets, posters and formal training. These activities were very effective to disseminate the concept of blood donation among youth, business groups and social and religious associations. NBC has focused on safe blood transfusion service by screening the donors and at the same time it has introduced motivation and retention programme for safer donors in order to promote the voluntary blood donation.

#### **4.2 Survey Design**

The survey was conducted for 2 weeks during December 2017. A total of 385 respondents were available during the study period. An exit interview of the participants including donors and non-donors was conducted at the rest room of NBC using a well structured validated questionnaire (Appendix). The draft questionnaire was based on the WHO standard questionnaire (WHO, 2009) and other literature review about blood donation and then modified slightly in line with the context according to Blood Donor Guideline of Myanmar through the consultation with the NBC Officer-in-Charge. The English version of the questionnaire was translated into Myanmar.

Questionnaire consists of four sections; socio-demographic data, knowledge, attitude and practice, and reasons and motivation towards voluntary blood donation. The study variables included age, sex, religion, residence, marital status, education, occupation, knowledge, attitude, practice, reasons and some motivational factors. Regarding their residence, townships under Yangon City Development Committee (YCDC) were considered as urban area and the rest were rural area. Knowledge on blood donation was assessed through questions covering benefits, requirements and restrictions of blood donation. The attitude for blood donation was assessed through ten questions with 'yes' and 'no' options. A scoring mechanism was used to understand overall knowledge level; a score of one has given for each correct

response and zero for wrong response. Blood donation practice was assessed through six questions addressing the nature of donation, frequency of donation, reasons for not donating blood etc.

The statements on motives were primarily based on the volunteer functions inventory (VFI), elaborated by Misjeet et al (A H Misjee, V Bosnes, O Gasdal & H E Heier, 2005). The VFI was designed with the dual purpose of providing researchers with a useful measurement of volunteerism and helping the administrators of voluntary organizations to manage human resources. Although the original inventory measures six primary factors that serve as motives for individuals to volunteer, only five VFI factors of motivation such as value, social, esteem and understanding were included in the questionnaire of this study. Value motives refer to altruistic and empathic reasons for volunteering (helping others, compassion). Social reasons reflect the normative influence of friends, family, or a social group that motivates people to volunteer. Esteem represents reasons for volunteering in order to feel better about oneself (feel better about myself, feel important) by helping others. Understanding refers to positive experiences associated with volunteering (explore own strengths, learn from experience). Moral refers to the moral obligation to donate blood.

The exclusion criteria are the incomplete questionnaire result and participant's age less than 18 years and more than 60 years. Sample size estimation was done using the single population proportion formula developed by Cochran (1963) at 95% confidence interval and prevalence of 50% because the exact proportion of blood donors is not well known (cited by Isreal Glenn D, 1992).

$$n = \frac{Z^2 P(1 - P)}{d^2}$$

where,

n = minimum sample size required

d = absolute precision (5%)

Z = standard normal deviate corresponding to 95% confidence interval (1.96)

P = assumed proportion of the population that donates blood (this is not known hence it is assumed to be (50%))

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

Therefore, n = 385

### **4.3 Survey Findings**

The survey findings of the study are based on the structured questionnaire and these contain some basic quantitative data accompanied by tables and figures. In this section, demo-graphic characteristics, knowledge, attitude and practice, and reasons and motivational factors for voluntary blood donation and for not donating blood regularly as well as the respondents' opinion on the blood bank to encourage more people to be blood donors were presented.

#### **4.3.1 Socio-demographic Characteristics of Respondents**

Out of the total 385 study respondents participated in the survey, questionnaires from all respondents were considered for analysis making the response rate 100%.

Table (4.1) represents the socio-demographic characteristics of the respondents.

**Table (4.1) Socio-demographic Characteristics of Respondents**

<b>Variable</b>	<b>n</b>	<b>%</b>
<b>Sex</b>		
Female	190	49
Male	195	51
Total	385	100.0
<b>Age (Years)</b>		
18-25	176	45.7
26-35	123	31.9
36-45	53	13.8
45-60	33	8.6
<b>Marital Status</b>		
Married	94	24.4
Unmarried	291	75.6
<b>Education</b>		
Matric	92	23.9
Diploma	25	6.5
Graduate	190	49.3
Post Grad	30	7.8
Others	48	12.5
<b>Occupation</b>		
Civil Employee	56	14.6
Self Employed	39	10.0
Company	175	45.5
Student	56	14.6
Others	59	15.3
<b>Respondent Type</b>		
1 <sup>st</sup> time Donor	106	27.6
Repeat Donor	235	61.0
Non-donor	44	11.4

Source: Survey Data (2017)

In the above table, out of total participants, female respondents were 190 (49.0%) and male respondents were 195 (51.0%). Of the total 385 respondents, the highest percentage were youths 176 (45.7%) with their age ranges from 18 to 25 years followed by nearly (32.0%) of the respondents who belonged to the age group of (26-35) years. About (14%) respondents fell into the age group (36-45) years. There also had (8.6%) adult donors who belonged to the age group of (46-60) years. Just over one-third (75.6%) of the respondents were unmarried and the rest one-fourth were married. According to Table (4.1), bachelor educations were found in the highest percentage (49.3%) followed by (23.9%) respondents who had passed matric. (7.8%) respondents were postgraduates and (6.5%) of the respondents got diploma. Others (12.5%) included some monks, nuns and mostly school-age young persons who had not passed matric. As shown in Table, assessment of occupations revealed that a higher proportion of the respondents (45.5%) were company employees. A fair number of civil employees and students each with a proportion (14.6%) were also found in the participants. Others (15.3%) included monks, a few number of nuns, housewives, and people who are currently not employed. According to the respondent type, population of repeat donors (61.0%) is highest followed by first-time donors (27.6%) and then non-donors is (11.4%).



Table (4.2) shows the frequency of religion, ethnicity and the distribution of residential areas for participants by gender.

**Table (4.2) Religion, Ethnicity and the Distribution of Residential Areas**

	<b>Variables</b>	<b>n (%)</b>
Religion	Buddhist	372(96.6)
	Christian	8(2.1)
	Islam	2(0.5)
	Hindu	2(0.5)
	N/A	1(0.3)
Ethnicity	Burma	331(86)
	Rakkhine	15(4)
	Chin	3(0.8)
	Mon	4(1.0)
	Shan	4(1.0)
	Kayin	12(3.1)
	Htawae	1(0.3)
	Gawrakha	1(0.3)
	Hindu	3(0.8)
	Muslim	2(0.5)
	Chinese	9(2.3)
Resident	Within area	315(81.8)
	Out of area	37(9.6)

Source: Survey Data (2017)

According to Table (4.2), majority of the participants (96.6%; 372) were noted to be Buddhist. Christians comprised of 2%, Islam 0.5% and Hindu 0.5%. Majority of the participants were Burma (86%) followed by Rakkhine (4%). The residential area of Yangon was divided into two regions such as within the municipal area and out of the municipal area. The majority (81.8%) of the respondents lived within the areas, while 9.6% lived in out of the areas.

#### 4.3.2 Operational Definitions and Measurement of Variables

**Level of knowledge:** This is the understanding level of respondents on benefits, risks, and eligibility criteria's of blood donation. Knowledge about blood donation was assessed using a number of general questions which are deemed to be known by general population like about blood donation and blood group, source of information for blood donation, source of blood supply, about the voluntary blood donation, diseases which can be acquired by blood transfusion and 20 questions of donor's eligibility for blood donation. Based on total score, knowledge level on voluntary blood donation was categorized into adequate knowledge and inadequate knowledge. Those who answered 50<sup>th</sup> percentile and above classified as adequate knowledge and those whose score are less than 50<sup>th</sup> percentile were inadequate knowledge.

**Attitude:** Attitude is intention of participants towards blood donation practice and is measured through ten questions with 'Yes' and 'No' items; comprises of questions on respondent's attitude towards publicizing the importance of blood donation and willingness to donate blood, attitude towards donation needs incentives, misconception that donation leads harm, result weakness and anemia etc. Those who answered 50% and above was labeled as having favorable attitude and those who answered less than median was labeled as having unfavorable attitude.

**Practice:** This denotes whether a particular participant has experienced blood donation or not, the reason and frequency of blood donation for those who donate blood. The practice was assessed by asking about history of previous donation and the frequency of donation among donors.

**Altruism:** In this case study participants who donate or will donate blood to benefit another without anticipation of rewards from external sources.

**Social Responsibility:** In this context the participants has an obligation/duty to act/donate blood as their responsibility for benefit of others.

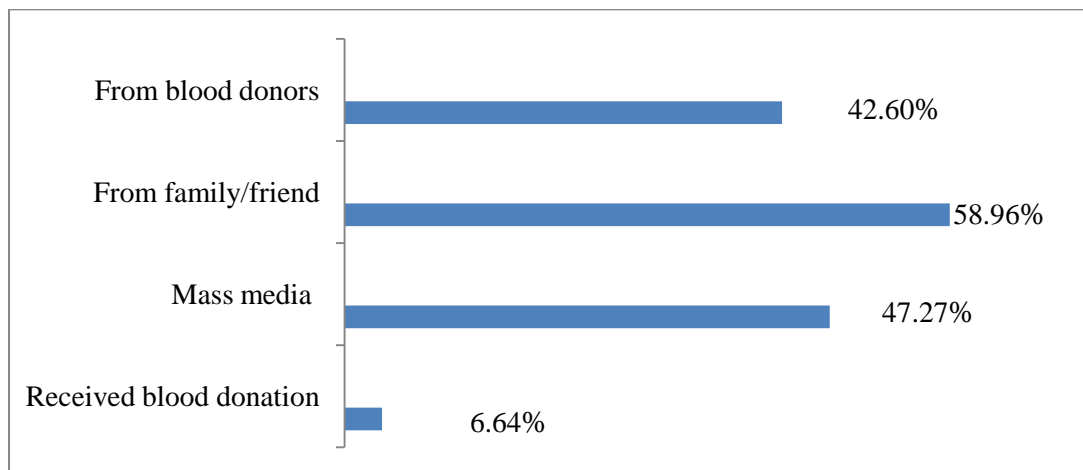
### 4.3.3 Knowledge about Voluntary Blood Donation

Knowledge about voluntary blood donation is the assessing of the understanding level of respondents on benefits, risks, and eligibility criteria's of blood donation. Knowledge about blood donation was assessed using a number of general questions which are deemed to be known by general population like about blood donation and blood group, source of information for blood donation, source of blood supply, about the voluntary blood donation, diseases which can be acquired by blood transfusion and 20 questions of donor's eligibility for blood donation.

Amongst the study participants, nearly all (95.8%) of the respondents expressed that they had heard about blood donation and (72.0%) knew about the blood group. (91.7%) of the participants were aware about that human blood cannot be manufactured artificially till now.

The sources of information about blood donation among participants varied as indicated in Figure (4.1).

**Figure (4.1) Source of Information for Blood Donation**



Source: Survey Data (2017)

As shown in Figure (4.1), the single most important recruitment channel was the influence of relatives. In total (59.0%) of all respondents reported that they got information about blood donation from their family and friends. The second main recruitment channel was media advertising. In total (47.3%) of respondents indicated that they had been recruited via advertisements in newspapers, magazines, leaflets, posters, TV or radio. It was noted that (42.6%) started donating on the recommendation of blood donors.

The knowledge of participants about source of blood supply is displayed in Table (4.3).

**Table (4.3) Knowledge on Source of Blood Supply**

<b>Descriptions</b>		<b>n (%)</b>
Sources for blood supply	Voluntary blood donor	219 (56.9)
	Family donors	148 (38.4)
	Paid donors	33 (8.6)
	From blood bank	294 (76.4)
	Don't know	16 (4.2)

Source: Survey Data (2017)

As shown in Table (4.3), majority 294 (76.4 %) and 219 (56.9%) of the respondents revealed that safe blood could only be received from blood bank and voluntary blood donors, respectively. However, 148 (38.4%) thought that their family and friends were the best source of blood supply. This response reflects a situation in which blood is received largely from relatives in need on replacement basis and implies that donation for any other reason (altruism) is a low priority. Only (8.6%) reported that blood could be received from paid donors.

Table (4.4) shows the knowledge of study participants about donor eligibility and blood transfusion. Taking into consideration of 20 knowledge questions, the cumulative level of knowledge of was assessed.

**Table (4.4) Knowledge Assessment of Participants**

Questions	Correct Answers	
	n	%
Do you know source of blood supply	361	94.5
Age limit	275	71.4
Weight limit	153	39.7
Blood pressure	92	24.0
Amount of blood donated each time	141	36.6
Hemoglobin level to donate	66	17.1
Time taken of actual donation process	138	35.8
Duration of donated red blood cells at 2-40c	29	7.5
Time interval between two donations	252	65.5
Time taken for volume of blood replaced	141	36.6
Regular VD has medical benefit	89	23.1
Can person infected by receiving blood	313	81.3
Can one donate with fever	375	97.4
Person who taking drug for chronic disease	373	96.9
Person with allergy	76	19.7
Smoker can donate	303	78.7
Person with chronic alcoholism	269	69.9
Person with HIV and hepatitis positive	380	98.7
Components separated from a unit of donated blood	98	25.5
Number of live saved from the each unit	90	23.4

Source: Survey Data (2017)

In Table (4.4), it was found that (94.5%) of the respondents knew the source of blood supply. Among the study participants, (71.4%) and (39.7%) of the respondents expressed that they knew the age and weight limit required for blood donation respectively. About one-fourth of the participants knew the blood pressure eligible for blood donation. From the total participants, about one third (36.6%) of the respondents revealed that the correct volume of blood donated at each donation. (17.1%) knew about correct hemoglobin level for blood donation. More than thirty five percent (35.8%) of the respondents knew about the duration of a single donation

process. More than half (65.5%) of the participant reported the correct time interval between two donations. Only (25.5%) of the respondents were aware about the blood components separated from one unit of donated blood and (23.4%) of the respondents were aware about the maximum number of lives saved from each unit of donated blood.

Table (4.5) below summarizes the knowledge regarding diseases which can be acquired via blood transfusion.

**Table (4.5) Diseases which can be acquired via Transfusion**

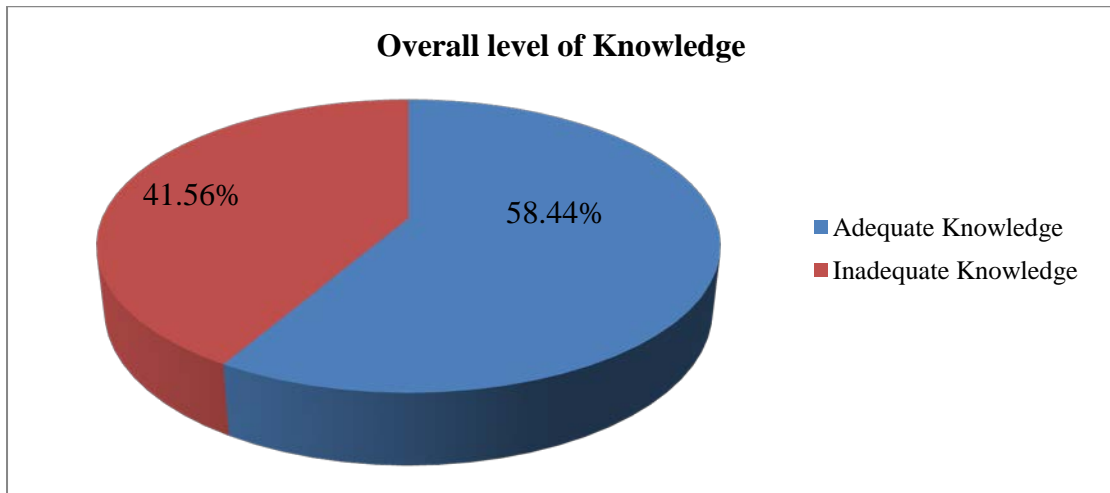
<b>Variables</b>	<b>Female n (%)</b>	<b>Male n (%)</b>	<b>Total n (%)</b>
HIV	145 (50.2)	144 (49.8)	289 (75.0)
HBV	109 (48.2)	117 (51.8)	226 (58.7)
HCV	95 (50.0)	95 (50.0)	190 (49.4)
Syphilis	57 (43.5)	74 (56.5)	131 (34.0)
Malaria	49 (48.0)	53 (52.0)	102 (26.5)

Source: Survey Data (2017)

As shown in Table (4.5), the most common disease identified was HIV by 289 (75.0%) of the respondents, the second common disease was Hepatitis B recognized by 226 (58.7%). About half 190 (49.4%) of the participants were aware that hepatitis C virus (HCV) could be transmitted through blood transfusions. Slightly greater than one-third 131 (34.0%) and about one-fourth 102 (26.5%) of the participants were aware whether Syphilis and Malaria could be potentially transmitted through blood transfusions, respectively.

According to the knowledge level of the respondents, each response was scored as “1” for correct response and “0” for incorrect response. The scoring ranges were set for donor’s eligibility and safe blood transfusion from 20 (largest) to 0 (smallest). Knowledge scores for individuals were calculated and summed up to give the total knowledge score. Participants who correctly responded to more than (50%) of knowledge assessing questions were considered as having adequate knowledge about blood donation, whereas those who scored <50% were considered as having inadequate knowledge about blood donation. Figure (4.2) showed that the distribution of overall level of knowledge about voluntary blood donation among the respondents.

**Figure (4.2) Distribution of Overall Level of Knowledge**



Source: Survey Data (2017)

It was found that in Figure (4.2), (58.4%) of the participants have scored more than or equal to 50 % of the correct answers in which they are labeled as having adequate knowledge. However, the remaining (41.7%) of respondents did not achieve the 50th percentile of the correct answer and hence they are considered as having inadequate knowledge.

Table (4.6) showed the knowledge level of blood donation among study participants related with their socio-demographic characteristics. All the participants were questioned to assess their knowledge about various aspects of voluntary blood donation and blood transfusion. In this Table, the sum of responses was summarized as a knowledge score for age, gender, marital status, education, their occupation, type of respondents and practice of donation of donors.

**Table (4.6) Factors Associated with Knowledge Level of Participants**

<b>Variables</b>	<b>Category</b>	<b>Adequate Knowledge n (%)</b>	<b>Inadequate Knowledge n (%)</b>	<b>Total n</b>
Age (year)	18-25	96 (54.6)	80 (45.5)	176
	26-35	68 (55.3)	55 (44.7)	123
	36-45	37 (70.0)	16 (30.2)	53
	46-60	24 (72.7)	9 (27.3)	33
Gender	Female	113 (59.5)	77 (40.5)	190
	Male	112 (57.4)	83 (42.6)	195
Marital status	Married	62 (66.0)	32 (34.0)	94
	Unmarried	163 (56.0)	128 (44.0)	291
Education	Matric	54 (58.7)	38 (41.3)	92
	Diploma	8 (32.0)	17(68.0)	25
	Graduates	118 (62.1)	72 (37.9)	190
	Post graduates	25 (83.3)	5 (16.7)	30
	Other	20 (41.7)	28 (58.3)	48
Occupation	Govt.	33 (58.9)	23 (41.1)	56
	Employees			
	Self-employed	27 (69.2)	12 (30.8)	39
	Company	100 (57.1)	75 (42.9)	175
	Students	32 (57.1)	24 (42.9)	56
	Other	33 (55.9)	26 (44.1)	59
Type of Respondents	1 <sup>st</sup> time donors	58 (54.7)	48 (45.3)	106
	Repeat donors	143 (60.9)	92 (39.2)	235
	Non-donors	24 (54.6)	20 (45.5)	44
Practice (repeat donors)	2-5 time	67 (48.2)	72 (51.8)	139
	6-10 time	29 (78.4)	8 (21.6)	37
	>10 time	47 (79.7)	12 (20.3)	59
<b>Overall level of knowledge</b>		<b>225 (58.4)</b>		

Source: Survey Data (2017)

As shown in the Table (4.6), majority of respondents had adequate knowledge regarding various aspect of blood donation (58.4%). There was no significant difference in gender regarding voluntary blood donation. The knowledge score of both female and male were nearly the same. However, on the basis of scoring scale, it



is found that the oldest age group (46-60) had high adequate knowledge. There is significant association of level of knowledge of voluntary blood donation with marital status. According to the findings, the married persons had more adequate knowledge than unmarried persons. It was also found that higher educational status i.e., post grads and graduates were significantly associated with adequate knowledge towards voluntary blood donation. Having appropriate knowledge was also associated with occupation. Respondents who were self-employed had adequate knowledge about voluntary blood donation. Level of knowledge was significantly associated with practice of blood donation. It was found that and the repeat donors who had more blood donation practice had more adequate knowledge than less practice donors.

#### 4.3.4 Attitude towards Voluntary Blood Donation

Attitude is intention of participants towards blood donation practice and is measured through ten questions; comprises of questions on respondent's attitude towards publicizing the importance of blood donation and willingness to donate blood, attitude towards donation needs incentives, misconception that donation leads harm, result weakness and anemia etc.

Table (4.7) shows the attitude of the participants about voluntary blood donation.

**Table (4.7) Attitude of Participants towards Voluntary Blood Donation**

Descriptions	Correct Answers	
	n	%
Do you think that donating blood is good habit	376	97.7
Do you think there is a need to give incentives to blood donors	360	93.5
Do you think that voluntary blood donation is best source to make safe blood	332	86.2
Could harm occur to a blood donor after donation	336	87.3
Should patient's relatives be asked to donate blood	73	19.0
Do you think donating blood lower donor's immunity	356	92.5
Does donation makes weak	261	67.8
Could donation leads to anemia	368	95.6
Are you willing to donate in the future	382	99.2
Do you encourage relatives to donate	371	96.4

Source: Survey Data (2017)

According to Table (4.7), about (97.7%) of the participants thought that donating blood is a good habit and about (93.5%) thought that there is no need to give incentives to those who donate blood. Similarly, (86.2%) of individuals responded as voluntary blood donation is the best source of blood donation. (87.3%) of individual participant had favorable attitude that blood donation could not harm their body. Majority (81.0%) of the study participants thought that relatives of patient should be asked for blood donation. However, although most (92.5%) of the participants did not think that blood donation lowers the donor's immunity, over half (67.8%) of the participants did not think that blood donation makes the donor weak. (95.6%) of the respondents believed that blood donation could not lead to anemia. Nearly all (99.2%) of the study participants were willing to donate blood voluntarily in the future and nearly all (96.4%) of them would like to encourage their relatives to donate blood.

Regarding attitude level of the respondents, the responses of each question were scored as "1" for correct response and "0" for incorrect response. The attitude scoring ranges from 10 (largest) to 0 (smallest). Attitude scores for individuals were calculated and summed up to give the total attitude score. Participants who correctly responded to more than 50% of attitude assessing questions were considered as having favorable attitude towards voluntary blood donation, whereas those who scored  $\leq 50\%$  were considered as having unfavorable attitude towards voluntary blood donation.

Factors Associated with Attitude Level were expressed in Table (4.8). According to this table, all (94.6%) of the participants had favorable attitude on voluntary blood donation. Like in factors associated with level of knowledge, participants' attitude towards voluntary blood donation was not significantly associated with gender. Both female and male participants had the same favorable attitude on voluntary blood donation. However, it is found that the oldest age group (46-60) had (100.0%) positive attitude on VBD and unmarried respondents had less favorable attitude than married ones. According to educational status, post-graduate respondents had more favorable attitude than other respondents. Relation with occupation, government employee and self-employed respondents had favorable attitude. Particularly the repeat donors and greater than ten times donors had more favorable attitude than less time donors.

**Table (4.8) Factors Associated with Attitude Level**

<b>Variables</b>	<b>Category</b>	<b>Favorable attitude n (%)</b>	<b>Unfavorable attitude n (%)</b>	<b>Total n</b>
Age	18-25	163 (92.6)	13 (3.4)	176
	26-35	120 (97.6)	3(2.4)	123
	36-45	48 (90.57.0)	5 (9.4)	53
	46-60	33 (100.0)	nil	33
Sex	Female	181 (95.3)	9 (4.7)	190
	Male	183 (93.9)	12 (6.2)	195
Marital status	Married	94 (100.0)	nil	94
	Unmarried	270 (91.4)	21 (7.2)	291
Education	Matric	88 (95.7)	4 (4.4)	92
	Diploma	18 (72.0)	7 (28.0)	25
	Graduates	183 (96.3)	7 (3.7)	190
	Post graduates	29 (96.7)	1 (3.3)	30
	Other	46 (95.8)	2 (4.2)	48
Occupation	Government employees	53 (94.6)	3 (5.4)	56
	Self-employed	36 (92.3)	3(7.7)	39
	Company	170(97.1)	5(2.9)	175
	Students	50 (89.3)	6 (10.7)	56
	Other	50 (84.8)	9(15.2)	59
Respondent type	1 <sup>st</sup> time donors	97 (91.5)	9 (8.5)	106
	Repeated donors	226 (96.2)	9 (3.8)	235
	Non-donors	41 (93.2)	3 (6.8)	44
Practice	2-5 time	131 (94.3)	8 (5.8)	139
	6-10 time	36 (97.3)	1 (2.7)	37
	>10 time	59 (100.0)	nil	59
<b>Overall Attitude Level</b>		<b>364 (94.6)</b>		

Source: Survey Data (2017)

#### 4.3.5 Practices and Reasons towards Voluntary Blood Donation

This denotes whether a particular participant has experienced blood donation or not, the reason and frequency of blood donation for those who donate blood. The practice was assessed by asking about history of previous donation and the frequency of donation among donors.

The practice of voluntary blood donation among donors was explored in Table (4.9).

**Table (4.9) Practice of Voluntary Blood Donation among Donors**

<b>Descriptions</b>	<b>n (%)</b>
<b>Ever donated blood</b>	
Yes	341 (88.6)
No	44 (11.4)
Total	385 (100.0)
<b>If yes, number of times</b>	
Once	106 (31.0)
2-5	139 (40.7)
6-10	37 (11.0)
> 10	59 (17.3)
Total	341 (100.0)
<b>Last time donation</b>	
> 1 year	88 (25.8)
= 1 year	68 (20.0)
< 1 year	185 (54.2)
Total	341 (100.0)
<b>Being a regular donor</b>	
Yes	213 (62.5)
No	128 (37.5)
Total	341 (100.0)
<b>Reasons for donating blood</b>	
Altruism	293 (76.0)
Sense of social responsibility	122 (31.7)
Helping friends/family	92 (24.0)
Spiritual bless	181 (47.0)
Others	13 (3.38)

Source: Survey Data (2017)

According to Table (4.9), out of 385 individuals, 44 (11.4 %) were non-donors and 341 (88.6%) were donors, 106 (31.0%) had donated once, 139 (40.7%) had donated two to five times, 37 (11.0%) had donated six to ten times and 59 (17.3%) had donated more than ten times and among them 213 (62.5%) were donating regularly. The most common reason for donating blood recognized by both groups was altruism 293 (76.0%) followed by spiritual bless 181 (47.0%). Nearly one-fourth of the participants 92 (24.0%) wanted to donate blood for helping their family and friends. About one third 122 (31.7%) of the participants expressed the sense of social responsibility as their reason for donating blood.

Table (4.10) distinguishes the feeling after blood donating among female and male donors.

**Table (4.10) Practice of Voluntary Blood Donation among Donors**

<b>Feeling after donating</b>	<b>Female n (%)</b>	<b>Male n (%)</b>	<b>Total n (%)</b>
Comfortable	83 (24.2)	97 (28.4)	180 (52.8)
Fear	21 (6.2)	3 (1.0)	24(7.0)
Anger	Nil	Nil	Nil
Indifferent	45 (13.2)	92 (27.0)	137 (40.2)

Source: Survey Data (2017)

As shown in Table (4.10), out of 341 donors, 180 (52.8%) of the participants including a bit equal number of female and male responded that they felt comfortable after donating blood while 137 (40.2%) felt blood donation indifferent in which male participants experienced quite normal after they had donated blood compared with female participants. Only 24 (7.0%) were fearful of needle or seeing blood during donation.

Table (4.11) shows that association between gender, age and type of participants and reasons for donating blood.

**Table (4.11) Factors Associated with Reasons for Donating Blood**

Variables		Altruism (%)	Sense of Social Responsibility (%)	Helping Friends/Family (%)	Spiritual Bliss (%)
Gender	Female	38.4	12.2	13.3	23.4
	Male	37.7	19.5	10.7	23.6
Age (year)	(18-25)	75.6	31.3	23.3	48.3
	(26-35)	78.9	24.4	22.0	47.2
	(36-45)	77.4	39.6	30.2	47.2
	(46-60)	66.7	48.5	24.2	39.4
Types of Donor	1 <sup>st</sup> time donors	78.3	34.0	19.8	47.2
	Repeat donors	73.6	34.0	20.4	52.8
	Non-donors	84.0	13.6	52.3	15.9

Source: Survey Data (2017)

In Table (4.11), except the reason sense of social responsibility, gender was not significantly associated with other reasons. It was found that a significant association with male participants had more sense of social responsibility than female participants. Age was also associated with reasons for donating blood with older participants having higher social responsibility than younger ones. According to the type of respondents, deferrals or non-donors were likely to donate to help their family or friends.

The distribution of donors according to their practice was shown in Table (4.12).

**Table (4.12) Distribution of Donors According to Their Practice**

Type of Donor	Female n (%)	Male n (%)	Total n (%)
1 <sup>st</sup> time donors	59 (55.7)	47 (44.3)	106 (31.1)
2-5 times donors	68 (49.0)	71 (51.0)	139 (40.8)
6-10 times donors	18 (48.7)	19(51.3)	37 (10.8)
>10 times donors	20 (34.0)	39 (66.0)	59 (17.3)

Source: Survey Data (2017)

In Table (4.12), distribution of blood donors according to their practice is presented. As shown in the table, out of 341 donors, 139 (40.8%) of donors had donated between 2 to 5 times. 106 (31.1%) were 1<sup>st</sup> time donors. 59 (17.3%) donors had more than 10 times donation frequency and 37 (10.8%) had donated 6 to 10 times.

The data on blood donation practices per age among 1<sup>st</sup> time and repeat donors is shown in Table (4.13).

**Table (4.13) Blood Donation Practice per Age among Donors**

<b>Age (year)</b>	<b>1<sup>st</sup> time</b>	<b>2-5 times</b>	<b>6-10 times</b>	<b>&gt;10 times</b>	<b>Total</b>
18-25	76 (43.2%)	66 (37.5%)	12 (6.8%)	9 (5.1%)	163
26-35	20 (16.3%)	47 (38.2%)	11 (8.9%)	26(21.1%)	104
36-45	6 (11.3%)	14 (26.4%)	11 (20.8%)	11 (20.8%)	42
46-60	4 (12.1%)	12 (36.4%)	3 (9.1%)	13 (39.4%)	32

Source: Survey Data (2017)

Table (4.13) reveals that majority (43.2%) of the donors who were 1<sup>st</sup> time donors belonged to the age group (18-25) and (39.4%) of oldest age group (46-60) donors were more likely to practice blood donation than donors of other age groups. Generally, 2 to 5 times donors were mostly found in all age groups. Between 26 and 35 years old donors, greater than ten times donors were the second most donors and majority (39.4%) of the oldest age group donors had greater than ten time of donation frequency.

#### **4.3.6 Motives for Voluntary Blood Donation**

Nine motivation-related items in the questionnaire were adapted directly from the VFI (Voluntary Functions Inventory). The value factor, the esteem factor; the social factor and the understanding factor are from the VFI. In addition, another two items (statement J and K) were included as moral factor adapted from Misje, et al. (2005). These addressed a broad range of reasons for donating blood that were not covered by the VFI.

a) Esteem

The third variable was formed by correlation between variables A and B which address increased self-esteem associated with giving blood (donating blood makes me feel better about myself). These variables correspond to the VFI esteem factor.

b) Social

The fourth factor was composed of responses to statements C and D. Variable C addresses positive feelings when seeing the blood bank logo or advertisements for blood donation. The latter emphasizes the importance of support from other people as reasons for donation, and corresponds to the VFI social factor.

c) Value

The second factor was composed of the responses to statements E and F, which cite altruistic and empathic reasons for giving blood. These statements correspond to the VFI value factor.

d) Understanding

The first factor was produced by the correlation between Variables G, H, I. Variable G corresponds to the understanding factor. Variables H and I address perceived health benefits from donation (regular health control, and improves health).

e) Moral

The fifth factor was composed of variables J and K, which describe blood donation as a 'moral obligation' and as a duty. This will be labeled the moral duty factor.



The study participants reported more than one motivation. Table (4.14) shows the motivational status of the participants.

**Table (4.14) Motivational Status of Respondents**

	<b>Statements</b>	<b>n (%)</b>
A	Donating blood makes me feel important	95 (24.7)
B	Donating blood makes me feel needed	173 (44.9)
C	Feeling good, seeing the blood bank logo, or ad for blood donation	119 (30.9)
D	Colleagues, and other people, place me high value on volunteering	82 (21.3)
E	Feeling great compassion towards the receivers of blood products	296 (77.1)
F	I donate blood because it is important to help other people	260 (67.5)
G	By donating blood I can explore my own strengths	69 (17.9)
H	I think blood donation benefits my own health	60 (15.6)
I	An important reason for donation is getting a health check for free	52 (13.5)
J	For me blood donation is primarily a moral duty	69 (17.9)
K	If I don't contribute no one else will	21 (11.7)

Source: Survey Data (2017)

According to the Table (4.14), major motivator to donate blood was 'feel great compassion towards the receivers' to which (77.0%) of the participants were assigned, followed by the category 'to help other people' where (67.5%) of the participants contained as an act of altruism, thus broadly corresponding to the value factor. (44.9%) and (24.7%) of the participants were assigned the category feel needed and important themselves for blood donation as an act of self-esteem that corresponds to esteem factor. About (30.0%) of the participants reported that they were motivated to donate blood by seeing the blood bank logo or ad for blood donation and from their friends who place high value on volunteering; thus it is regarded as social factor. Another category that motivates (15.7%) of the participants was I can explore my own strength as a perception of health benefit from donation;

corresponds to understanding factor. Lower percentage of the participant revealed that they donated blood as a moral obligation.

Table (4.15) shows the motivational status related with gender, age and donor type.

**Table (4.15) Motivational Status in Gender, Age Group and Respondent Type**

Variables	Value %	Understanding %	Social %	Esteem %	Moral %
<b>Gender</b>					
Female	70.5	13.3	27.0	33.0	6.4
Male	74.0	18.0	25.1	35.9	15.6
<b>Age (year)</b>					
18-25	74.2	15.2	24.2	32.8	10.8
26-35	74.4	25.0	27.2	36.2	11.8
36-45	76.4	14.5	23.6	33.0	7.6
46-60	63.6	14.1	36.4	44.0	15.2
<b>Respondent Type</b>					
1 <sup>st</sup> time Donors	71.2	12.0	24.0	30.7	7.6
Repeat Donors	76.0	18.4	25.8	38.7	13.8
Non-donors	67.0	9.9	33.0	23.9	3.4

Source: Survey Data (2017)

As shown in Table (4.15), the most influence factor to motivate the participants was value factor. It was noted that there were no significant different between female and male participants who were motivated by value, understanding, social and esteem factors but male participants who were motivated by moral factor were twice higher than female participants. Second most influence factor on both female and male donors was esteem factor followed by social factor. Moral factor was the weakest motivated factor for both female and male participants. It was noted that the moral factor was the weakest motivator for all age groups and all type of the respondents except the older respondents for those the moral duty was taken into consider an important role for voluntary blood donation.

#### 4.3.7 Reasons for not Donating Regularly among Repeat Donors

Table (4.16) shows the reasons for not donating regularly among repeat donors.

**Table (4.16) Reasons for Not Donating Regularly Among Repeat Donors**

Statements	n (%)
Blood donation is time consuming	66(28.0)
The frightening sight of blood	15(6.4)
Fear of being diagnosed HIV positive	25 (10.6)
Parents do not allowed	22 (9.4)
Blood donation causes weakness and fainting	22 (9.4)
The fear of contracting diseases like hepatitis, HIV etc	34(14.5)
The fear of needle pricks	20(8.5)
Fear of being rejected as a donor	24(10.2)
Far from a blood bank	83 (35.3)
Other (specify)	7 (3.0)

Source: Survey Data (2017)

According to Table (4.16), difficulty in accessing blood bank is the common reason for not donating regularly by (35.3%) of the donors. (28.0%) thought that blood donation is time consuming for not donating blood regularly. (14.5%) thought that there was high risk of contracting diseases like hepatitis, HIV etc when donating blood. The fear of having one's HIV status checked was thought to be one of the reasons not to donate blood regularly by (10.6%). Fear of being rejected as a donor due to lack of eligible criteria such as low level of hemoglobin, blood pressure, body weight, etc. was also a reason for not donating blood regularly for (10.2%) of the donors. Other fears considered to be the reasons for not donating blood regularly were fear of pain from needle pricks and frightening sight of blood while donating blood by (8.5%) and (6.4%), respectively. Other reasons for not donating blood regularly were causes of weakness and fainting and were not allowed to donate blood by parents.

#### 4.3.8 Encouragement of more People to be Blood Donors

In Table (4.17), statements to support by blood bank in order to encourage more people to be blood donors are described.

**Table (4.17) Blood Bank can do in Order to Encourage More People to be Blood Donors**

<b>Statements</b>	<b>n (%)</b>
Carrying out educational campaigns on importance of blood donation	273(70.9)
Assuring donors of maximum confidentiality after blood samples are tested	77(20.0)
Give incentives to blood donors	46 (12.0)
Put up adverts on TV, radio, Website on blood donation	245 (63.6)
There should be blood banks in accessible hospitals	207 (53.8)

Source: Survey Data (2017)

According to Table (4.17), (70.9%) of the participants thought that public education on importance of blood donation would encourage more people to donate blood. (63.6%) reported that media encourage people to donate blood very well. To encourage more people to donate blood, (53.8%) reported that blood banks should be in accessible hospitals. (20.0%) of the donors would like the blood bank to assure donors of maximum confidentiality after blood samples are tested. Only (12.0%) thought that giving incentives to blood donors was one of the motivating factors to encourage people to donate blood.

## **CHAPTER V**

### **CONCLUSION**

This chapter offers important findings and discussion through a careful overview on the chapters previously presented. In this study, an attempt has been made to assess the level and factors associated with knowledge, attitude and practice and motives towards voluntary blood donation. Recommendations for future research are addressed in the last part of the chapter.

#### **5.1 Finding and Discussion**

The need for blood and blood components is steadily increasing. Millions of people need blood transfusions each year during surgery or therapeutic treatment or having large disaster or emergency events. There is no such thing as artificial blood till now. The availability of blood and blood components totally depends on human being especially on voluntary blood donors so as to get safe and continuous supply of blood and its components. Therefore, it is necessary to take more and more effort to persuade people to become voluntary blood donors and to understand the factors associated with voluntary blood donation.

In this study, an attempt has been made to assess the level and factors associated with knowledge, attitudes, practice of the public who came to NBC to donate blood and their motivational factors on voluntary blood donation so as to enhance voluntary blood donation practice among people.

Analyses to compare the socio-demographic characteristics of the study participants showed that out of total 385, there was nearly equal number of female and male respondents, 190 (49.0%) and 195 (51.0%) respectively. The youngest age group (18-25) had the highest participation (45.7%) in donation followed by nearly (32.0%) of respondents that fell in the age group (26-35). The (13.8%) and (8.6%) respondents that belonged to the age group (36-45) and (45-60) respectively, were underrepresented. These findings are consistent with the report of WHO Global Database on Blood Safety, 2016. It was reported that in the low and middle income

countries most of the blood donations are done by people in age group of 18 to 24 and 25 to 44 years, whereas in high income countries, it is made by people aged over 44 years.

In this study, not all the respondents were eligible for donation. Out of total 385 participants, 341 (57.0%) were able to donate and 44(11.4%) were non-donors. Among the donors, 106 (27.5%) were 1<sup>st</sup> time donors and 235 (61.0%) were repeat donors. Among 385 respondents, there include deferrals who are currently rejected to donate blood due to some reasons. Deferrals might be both non-donors and ever donated persons. The most common reason for deferral was due to high blood pressure; some have hypertension or some others excitement of blood donation. Other significant reasons were low hemoglobin level and low body weight particularly among female participants. The significant number of 1<sup>st</sup> time donors and non-donors shows that there is still lack of awareness among people about voluntary blood donation.

It was found that over one-third of the study participants (75.6%) were unmarried. Male participants who were married were likely to have more chance to donate than female married participants. It was assumed that the more educated the participants the more and better knowledge they would be about blood donation issue in general. The participants of the present study as expected were well educated, with the majority (49.4%) of them having university degrees. About (23.9%) were Matriculation and (7.8%) were post grad as their highest qualification thus translating their knowledge into practice. About 48 (12.5%) respondents did not identify their educational status assuming they had not passed metric yet.

Assessment of occupations revealed that a higher proportion of the respondents (45.5%) were company employees such as banking, services company, production company, seaman etc. That means people who work in companies donate blood more than people in other jobs. It was also found that a fair number of civil employees (14.6%) came to donate and another (14.6%) were students. Others (15.3%) included were housewife, taxi drivers, monks, nun and younger people who were waiting for a job after they had left school or college or university and (10.1%) were self employed.

With regard to religion, as most of the citizens of Myanmar are devout Buddhist, majority of the respondents (96.6%) were noted to be Buddhism. Few (2.0%) belonged to the Christians followed by the Islam (0.5%) and the Hindu

(0.5%). Majority of the participants were Burma (86.0%) followed by Rakkhine (4.0%). The residential area of Yangon was divided into two regions such as within the municipal area and out of the municipal area. The majority (81.8%) of the respondents lived within the areas, while (9.6%) lived in out of the areas.

The overall level of knowledge was (58.4%). This implies that knowledge of the study participants on VBD may be inadequate but according to the WHO Global Status Report (2016), the knowledge level of the respondents in this study is comparable with the prevalence of adequate knowledge towards blood donation which is estimated to be (60.0%) in developing countries. There was no significant difference between males and females with regard to their knowledge on voluntary blood donation. However, on the basis of scoring scale, it is found that the oldest age group (46-60) and the repeat donors were likely to have adequate knowledge of voluntary blood donation when compared to younger age groups and donors of less donation practice. That means the older the participants were the higher the knowledge they had.

Nearly all (95.8%) of the respondents revealed that they had heard about blood donation and (72.0%) were aware of blood group. As a truth till now there is no such thing as artificial blood, majority of the participants accepted it. But out of (8.3%) respondents, some thought that there is artificial blood or some kind of blood components artificially available; and some reported that they did not know about it.

Lack of information on blood donation lowers the prevalence of voluntary blood donation. Regarding sources of information about blood donation among participants, over half of the respondents reported that they received information about blood donation from their family and friends. The importance of social networks as a recruitment channel that reaches a wide range of potential blood donors is noteworthy. It was found that (47.3%) of the respondents were influenced by media advertising such as newspapers, online media, leaflets, posters, TV or radio, etc. Actually active blood donors are probably the ones who are best suited to recruit and to motivate other people to become committed donors. In this study, a fair number (42.6%) of the respondents started their donation on account of the recommendation of blood donors.

Related to the knowledge about source of blood supply, majority of the respondents accepted that safe blood could only be received from blood bank and voluntary donors as a best source of blood supply. However, 148 (38.4%) thought that

their family and friends were the source for blood supply. Only (8.6%) believed that blood could be received from paid donors.

Awareness of the appropriate education for blood donation and the donor deferral criteria were very important factors. Deferral of a donor is not only unpleasant for the donor but it also leads to wastage of precious time and money of the transfusion centre. Therefore, appropriate education of society regarding deferral factors of blood donation both temporary and permanent can lead to decrease in deferral rate. Every individual should know the benefits, risks, and eligibility criteria's of blood donation in order to increase the frequency of repeat blood donations and can turn first time blood donors into regular blood donors. More intensive public awareness campaigns by government with the help of non-governmental organizations are required.

According to the knowledge about blood safety and donor eligibility, (71.4%) had knowledge of the appropriate age for blood donation and less than half (39.7%) of the respondents knew the correct weight limit required for blood donation. Only one-fourth of the respondents knew the blood pressure eligible for blood donation. On knowledge of volume of blood collected in each process, the correct answer 350-450 mls stated by (36.6%) of the respondents expressed inadequate knowledge of it. Only (17.1%) of the respondents had adequate knowledge of the required level of Hb gm% for blood donation. Of the respondents, (65.5%) stated that correct minimum donation frequency was every four months.

With the objective to know the level of awareness about diseases which can be acquired via blood transfusion, majority (75.0%) of the respondents believed that HIV infection could be transmitted through blood transfusion. (58.7%) thought that donating blood can contract Hepatitis B and about half (49.4%) of the respondents were aware that Hepatitis C could be transmitted through blood transfusion. Slightly greater than one-third 131 (34.0%) and about one-fourth 102 (26.5%) of the participants were aware that Syphilis and Malaria could be potentially transmitted through blood transfusions, respectively.

Gender, age, educational status, occupation and practice were found to be explanatory variables of knowledge for blood donation. From the socio-demographic factors, gender was not significantly associated with knowledge of voluntary blood donation. The knowledge level of both female and male was nearly the same. However, on the basis of scoring scale, the age range of the respondents was



significantly associated with knowledge level of voluntary blood donation. It was found that, the oldest age group (46-60), or the old could have more knowledge than the young and the repeat donors had high adequate knowledge. There also was significant association of level of knowledge on voluntary blood donation with marital status. According to the findings, the married participants had more adequate knowledge than unmarried ones. It was also found that higher educational status i.e., post grads and graduates was significantly associated with adequate knowledge for voluntary blood donation. The other associated factor was occupation. Respondents who were self-employed had more adequate knowledge than those with other occupations. Level of knowledge was significantly associated with practice of blood donation. It was found that donors who had more blood donation practice were more likely to have adequate knowledge than less practice donors.

In this study, most (94.6%) of the respondents had favorable attitude towards voluntary blood donation. About (97.7%) of the participants thought that donating blood is a good habit and about (93.5%) thought that there is no need to give incentives to those who donate blood. Although the study participants including donors and non-donors were in the age range 18 to 60 having different educational and occupational status, (86.2%) of individuals accepted that voluntary donor is the best source of blood donation. A few respondents (12.7%) believed that blood donation is harmful to the donors. That means, decreases the perception that blood donation is harmful can lead to an increase in the pool of blood donors. Majority 81.0% of the study participants had wrong perception that relatives of patient should be asked for blood donation. That means more campaigns are needed about voluntary blood donation by blood banks and philanthropic organizations to change public perception of such a misunderstanding. However, although most (92.5%) of the participants did not think that blood donation lowers the donor's immunity, over half (67.8%) of the participants did not think that blood donation makes the donor weak. (95.6%) of the respondents believed that blood donation could not lead to anemia. Nearly all of the study participants were willing to donate blood voluntarily in the future and nearly all (96.4%) of them would like to encourage their relatives to donate blood.

The present study found that gender and type of respondents were not significantly associated with attitude towards voluntary blood donation. However, it was found that the oldest age group (46-60) had 100% positive attitude on voluntary

blood donation and particularly the higher practice donors were likely to have more favorable attitude than those who were less practice of donation. The other significant factor was marital status. Married participants had (100.0%) positive attitude towards voluntary blood donation. The educational status was also associated with attitude towards voluntary blood donation. Except the respondents who had got Diploma qualification, other respondents were favorable attitude towards voluntary blood donation. Occupational status was also a significant factor. It was found that self-employed respondents not only had adequate knowledge but also had more favorable attitude towards voluntary blood donation.

It was found that majority (88.6%) of the respondents have ever donated in their lifetime. This could be because the study site is NBC and all the participants are those who came to NBC with the intention of donating blood. The frequency of blood donation was high among male donors when compared to females in this study. Out of 341 donors, 139 (40.7%) of donors had donated between 2 to 5 times. 106 (31.0%) were 1<sup>st</sup> time donors and 59 (17.3%) were more than 10 time donors. Over one-third 37 (11.0%) of the donors had 6 to 10 time donating frequency. It was also found that majority of the first time donors belonged to the youngest age group (18-25). That may be due to the fact that such donors are young and energetic and feel fit and healthy to donate blood. Young persons are attracted by the emotional collection campaigns conducted by the blood banks. Another interesting finding was that most of the greater than ten time donors belonged to the oldest age group (46-60). Generally, out of 341 donors, nearly 235 (69.0%) were repeat donors. This indicates that the commitment to donate blood is high among donors.

Experience of blood donation is an important factor for determining the future blood donations especially in the first time blood donors. Those blood donors who have a pleasant blood donation experience usually return back for donating blood in future and turn into regular VNRBD while those who experience it unpleasant often do not return for repeat blood donation. In this study, 180 (52.8%) of the participants responded that they felt comfortable after blood donation while 137 (40.2%) felt blood donation indifferent.

In this study, altruism dominated the reasons for donating blood followed by spiritual bliss and the sense of social responsibility with number of male participants higher than that of female participants. Nearly one-fourth of the participants admitted that they wanted to donate blood for helping their family and friends.

As a reason for donating blood, it was not observed any significant difference in altruistic behavior between female and male participants. But altruistic behavior varied greatly by age with younger participants having high percentage. It may be due to the fact that altruism and desire to perform unselfish acts prevalent in younger people who like to participate in community affairs and volunteer works. Social responsibility appears to be another important reason for donation. Although not always labeled as social responsibility per se, an obligation to humanity may be asking about social responsibility. It was found that a significant association with gender where male participants were more likely to have a social responsibility for donating blood than female participants. Social responsibility was also associated with age, with older donors having much higher social responsibility motivation reasons. According to the type of respondents, it was found that participants, who had ever donated, especially repeat donors, realized the sense of social responsibility for blood donation more than those who had never donated blood. High altruistic behavior and spiritual bliss showed that, generally, mass media campaign or recruitment all could modify these characteristics and blood centers will need to conduct more motivational factors and successfully attract a new generation of blood donors.

An important aim of this study was to investigate the motivational profiles of the respondents and the study showed that the respondents were motivated by values (altruistic and empathic), self-esteem (ego enhancement), social influence and understanding (a perception of health benefits from donation). Respondents were also found to be motivated by moral obligation.

Regarding the motivational status related with gender, age and donor type, the study showed that the value motive was the most dominant factor to both female and male donors. The second and third commonest factors that motivate the participants were esteem factor and social factor. There was weak understanding among the participants that blood donation improve one's own health status. It was also found that the non-donors were significantly influenced by social factor that they came to blood bank to donate blood not only due to the value factor but also for seeing a blood bank logo or advertisements. Though moral factor was the least influenced factor on all of the respondents, male donors were found to be motivated by moral obligation more than female donors

There are many factors surrounding the blood donation that makes donors not to donate regularly. Time consuming, long distance to the donating site and transportation difficulties were common reasons for not donating regularly. Other reasons were general fear of needle pricks, sight of blood, fear of being diagnosed HIV positive, fear of being rejected as donor, feeling weak after donation, medical excuses such as iron levels in their blood. Also included were frightening, not allowed by parents, causes weakness and fainting and it leads to infection.

Recruiting a sufficient number of safe blood donors is an emerging challenge especially with the increase in demands as a result of an increase in population size in developing countries like Myanmar. In order to recruit voluntary blood donors and to encourage more people to be blood donors, most of the participants agreed that public education about the importance of voluntary blood donation is a good motivational factor. About (12.0%) of the study participants were likely to have some incentives for blood donation such as donor certificates; some material rewards; announcement of their name in the blood bank website; free blood and blood products if they required transfusion themselves. Over half of the respondents reported that mass media (TV/ Radio/Advertisements, Social networks) is an important recruitment channel to encourage people to donate blood. (20.0%) of the donors would like the blood bank to assure donors of maximum confidentiality after blood samples are tested.

This study showed that over half of the participants had adequate knowledge which is comparable with other developing countries as estimated by WHO and almost all of the respondents have positive attitudes and a great deal of interest in voluntary blood donation. Almost all of the participants were willing to donate blood again in future. This positive feeling should be encouraged with proper knowledge regarding blood safety to meet the demand of blood requirement. The variables such as knowledge, attitude, practice, reasons and motivational factors affected by different socio-demographic characteristics of the participants are needed to think to encourage people to donate more and more blood voluntarily and regularly so as to achieve WHO goal of 100% voluntary blood donation by 2020. In addition, voluntary blood donation should be promoted, especially among youngsters, as they can supply blood continuously.

## 5.2 Recommendations

It is not sure whether you yourself or one of your family member or of friends needs blood at what time. But it is absolutely certain that someone who you do not know needs blood for a certain circumstance.

One of the reasons for not donating blood even though one is eligible for donation may be due to the fact that he could not think there could be someone who needs his blood. Donating blood is different from other kinds of donation like giving money, materials, helping by hand or by saying something good. Nothing but blood could save people in need and such blood could only be received from human being. Need of blood by a citizen is need of blood by its country. Give blood to people in need is doing a kind of duty for the country. Everyone who has grown up and is in good health should donate blood.

Although the continuous supply of safe blood could be received from regular voluntary unpaid donors, low hemoglobin levels and low body weight were the major important reasons for temporary deferral among the 1<sup>st</sup> time and repeat donors in many developing countries and in Myanmar as well. Thus, efforts to increase the hemoglobin and nutrition awareness among the donors should be considered to improve the donor retention and increase overall blood safety.

According to the findings, over half of the participants received information about blood donation from their family and friends rather than from mass media. Educational program on blood donation and blood transfusion should be expanded through various media including the internet to keep the topic of blood donation alive in the mind of the general public. These programs might focus more heavily on the benefits of blood donation and the idea that blood donation does not pose significant health risks, especially it would never cause individuals any harm to their education, business or daily work.

The public should know that all measures besides screening tests implemented by blood bank is to ensure that blood donation is safe for donors and that transfusion of the donated blood is safe for recipients. These efforts need to be carried out not only at blood bank or hospital level but also at national level.

More studies on voluntary blood donation in quantitatively and qualitatively should be carried out and published to persuade more people to be voluntary unpaid donors.

### Calculate the Mean

Calculate the average, or mean of your data points. To do this, **add the values of all data points, then divide by the number of data points.** Say you have four melons, with weights of 2 pounds, 5 pounds, 6 pounds and 7 pounds. Find the sum:  $2 + 5 + 6 + 7 = 20$ , then divide by four, since there are four data points:  $20 / 4 = 5$ . So your potatoes have a mean weight of 5 pounds.

### Calculate Average Deviation

Once you know the mean of your data, calculate the average deviation. Average deviation measures **the average distance of your data points from the mean.**

First, calculate the distance of each data point from the mean: the distance, **D**, of a data point equal to the absolute value of the data point's value, **d**, minus the mean, **m**:  $D = |d - m|$  Absolute value, represented by the  $| |$ , signifies that if the result of the subtraction is a negative number, convert it into a positive number. For example, the 2-pound melon has a deviation of 3, since 2 minus the mean, 5, is -3, and the absolute value of -3 is 3. Using this formula, you can find that the deviation of the 6-pound melon is 1, and the 7-pound melon is 2. The 5-pound melon's deviation is zero, since its weight is equal to the mean.

Once you know the deviations of all your data points, **find their average by adding them, and dividing by the number of data points.** The deviations are 3, 2, 1 and zero, which have a sum of 6. If you divide 6 by the number of data points, 4, you get an average deviation of 1.5.

### Percent Deviation from Mean and Average

The mean and average deviation are used to find the percent deviation. **Divide the average deviation by the mean, then multiply by 100.** The number you get will show the average percentage that a data point differs from the mean. Your melons have a mean weight of 5 pounds, and an average deviation of 1.5 pounds, so:

$$\text{percent deviation} = 1.5 / 5 \times 100 = 30 \text{ percent}$$

So on average, your data points are distant from your mean by 30 percent of the mean's value.

### Percent Deviation From a Known Standard

Percent deviation can also refer to **how much the mean of a set of data differs from a known or theoretical value.** This can be useful, for instance, when comparing data gathered from a lab experiment to a known weight or density of a substance. To find this type of percent deviation, subtract the known value from the mean, divide the result by the known value and multiply by 100.

Suppose you did an experiment to determine the density of aluminum, and came up with a mean density of 2,500 kilograms per meter squared. The known [density of aluminum](#) is 2,700 kilogram per meter squared, so you can use these two numbers to calculate by how much your experimental mean differs from the known mean. Subtract 2,700 from 2,500, divide the result by 2,700, then multiply by 100:

**percent deviation =  $(2,500 - 2,700) / 2,700 \times 100 = -200 / 2,700 \times 100 = -7.41$  percent**

The negative sign in your answer signifies that your mean is lower than the expected mean. If the percent deviation is positive, it signifies your mean is higher than expected. So your mean density is 7.41 percent lower than the known density.

The confidence interval of the mean is a statistical term used to describe the range of values in which the true mean is expected to fall, based on your data and confidence level. The most commonly used confidence level is 95 percent, meaning that there is a 95 percent probability that the true mean lies within the confidence interval you've calculated. To calculate the confidence interval, you need to know the mean of your data set, the standard deviation, the sample size and your chosen confidence level.

Calculate the mean, if you haven't done so already, by adding all of the values in your data set and dividing by the number of values. For example, if your data set were 86, 88, 89, 91, 91, 93, 95 and 99, you would get 91.5 for the mean.

Calculate the standard deviation for the data set, if you haven't done so already. In our example, the standard deviation of the data set is 4.14.

Determine the standard error of the mean by dividing the standard deviation by the square root of the sample size. In this example, you would divide 4.14, the standard deviation, by the square root of 8, the sample size, to get about 1.414 for the standard error.

Determine the critical value for t by using a t-table. You can find one in your statistics textbook or via an online search. The number of degrees of freedom is equal to one less than the number of data points in your set -- in our case, 7 -- and the p-value is the confidence level. In this example, if you wanted a 95 percent confidence interval and you had seven degrees of freedom, your critical value for t would be 2.365.

Multiply the critical value by the standard error. Continuing the example, you would multiply 2.365 by 1.414 and get 3.344.

Subtract this figure from the mean of your data set, and then add this figure to the mean, to find the lower and upper limit of the confidence interval. For example, you would subtract 3.344 from the mean of 91.5 to find the lower limit to be 88.2, and add it to find the upper limit to be 94.8. This range, 88.2 to 94.8, is your confidence interval for the mean.

***Tip***

If you need to brush up on how to calculate the standard deviation of your data set, the information is easily found online or in your statistics textbook.

## Appendix: Questionnaire for Voluntary Blood Donation

### Part 1: Socio- demographic characteristics

1. Age \_\_\_\_\_
2. Sex: male \_\_\_\_\_ female \_\_\_\_\_
3. Marital status:
4. Ethnicity:
5. Religion:
6. Education: Matric/Certificate/Diploma/Degree/Post-grad
7. Occupation: Government organization/Company Employee/Self employed /Student / Housewife/Unemployed /Other (specify)
8. Address

### Part II: Knowledge of blood donation

1. Do you know about blood group? Yes \_\_\_\_ No \_\_\_\_
2. If yes for Q no;1, How many blood groups are there according to your knowledge?  
\_\_\_\_\_
3. Have you ever heard about blood donation? Yes \_\_\_\_ No \_\_\_\_
4. If yes for question No: 3, what is your source of information? (**More than one answer is possible**)
  1. I have received transfusion in the past
  2. Advertisement in TV/Radios/ Internet/ Newspapers/ Journals/ Posters
  3. from Relatives/ Friends
  4. Voluntary Blood Donors
  5. Other(specify)
5. Can human blood be manufactured artificially? Yes \_\_\_\_ No \_\_\_\_
6. Do you know source to give blood for those who need blood supply?  
Yes \_\_\_\_ No \_\_\_\_
7. If yes for question No 6; What are sources for blood supply to the patient who need blood? (More than one answer is possible)
  1. Voluntary blood donor
  2. Family donors
  3. Paid donors
  4. Blood Bank
  5. Not know



8. What is voluntary blood donation?
1. Act of donating blood
  2. Donating blood to relatives, friends
  3. Donation of blood or blood components by a person of his/her free will
  4. Don't know
9. What is the age of eligibility for blood donation?
1. 16-60 yr
  2. 18-60 yr
  3. 18-65 yr
  4. Don't know
10. Minimum weight eligibility for blood donation is
1. 100 lb for 350 ml
  2. 110 lb for 350 ml
  3. 100 lb for 450 ml
  4. 110 lb for 450 ml
  5. Don't know
11. Normal blood pressure to donate blood is
1. 100/60 mmHg -160/90 mm Hg.
  2. 110/60 mmHg -160/95 mm Hg.
  3. 110/65 mmHg -160/90mm Hg.
  4. Don't know
12. Does the blood bank say why you are not allowed to donate blood?
- A. Yes                      B. No
13. If say, why?
1. age not eligible
  2. weight not eligible
  3. hemoglobin not eligible
  4. blood pressure not eligible
  5. other (specify)
14. How many milliliters of blood does a person donate each time?
1. 350-450 ml
  2. 500-600 ml
  3. 800-900 ml
  4. Don't know
15. What should be the hemoglobin level for a person to donate blood?
1. Not less than 11.5 gm%
  2. Not less than 12.5 gm%
  3. Not less than 15.5 gm%
  4. Don't Know
16. How many minutes the actual blood donation process of a pint of whole blood unit takes?
1. 30-50 minutes
  2. Less than ten minutes
  3. 20-60 minutes
  4. Don't know
17. How long donated red blood cells can be stored at 2-40C?
1. 42 days
  2. 80 days
  3. 120 days
  4. Don't Know

18. How often can people donate blood in a year?
1. 1 time
  2. 2 times
  3. 3 times
  4. 4 times
  5. don't know
19. What is the time taken for volume of blood to be replaced after a single donation?
1. 12-24 hours
  2. 24-36 hours
  3. 2-3 weeks
  4. Don't know
20. Does regular voluntary blood donation have medical benefits? Yes\_\_ No\_\_
21. Can a person be infected by receiving blood? Yes\_\_\_\_\_ No\_\_\_\_\_
22. If yes for No 24; What disease are transmissible by blood transfuse? (More than one answer is possible)
1. HIV
  2. HBV
  3. HCV
  4. Syphilis
  5. Malaria
  6. Others (specify)\_
23. What investigation should be done during blood donation?
1. Screening test for disease
  2. No idea
24. Say yes or no for the following questions
1. Can one donate during fever? Yes\_\_ No\_\_
  2. Can a donation be done by a person who is taking medicines for chronic diseases? Yes\_\_ No\_\_
  3. Can a person having allergy donate? Yes\_\_ No\_\_
  4. Can a smoker donate blood? Yes\_\_ No\_\_
  5. Can a person with chronic alcoholism donate blood? Yes\_\_ No\_\_
  6. Can People who are known HIV positive and People with Hepatitis donate blood? Yes\_\_ No\_\_
25. What are the components that can be separated from a unit of donated blood?
1. RBC, WBC, Platelet& Plasma
  2. Platelet, Hemoglobin, Iron
  3. Don't Know
26. Number of live saved from each unit of donated blood? Yes\_\_ No\_\_

### **Part III: Attitude**

1. Do you think that donating blood is good habit? Yes\_\_No\_\_
2. Do you think there is a need to give incentives to those who donate blood?  
Yes\_\_ No\_\_

3. Do you think that Voluntary donor is best source of blood donation to make safe blood? Yes\_\_ No\_\_

4. Could harm occur to a blood donor after blood donation? Yes\_\_ No\_\_

5. Should patient's relative be asked to donate? Yes\_\_No\_\_

6. Do you think that donating Blood lower donor's Immunity? Yes\_\_No\_\_

7. Does donation make weak? Yes\_\_No\_\_

8. Could blood donation leads to anemia? yes\_\_ No\_\_

9. Are you willing to donate blood in the future? yes\_\_No\_\_

10. Do you encourage relatives to donate? yes\_\_No\_\_

**Part IV: practice and motivation towards donation (reasons for donating and not donating)**

1. Have you ever donated blood? Yes \_\_\_No\_\_ (if no go to question no 7)

2. If yes how many times?

1. 1 time      2. 2-5 times      3. 6-10 times      4. above 10 times

3. When was the last time you have donated blood?

- >1year                      =1 year                      >1year

4. Are you regular voluntary donor? Yes \_\_No\_\_

5. How do you feel after donating blood?

1. Comfortable      2. Fear  
3. Anger              4. Indifferent

6. Willingness to donate blood if asked or reminded to do so. Yes --- No-----

7. Motivational statement questionnaire

1. Blood donation is a cause that is important to me
2. Donating blood makes me feel needed
3. I get a good feeling whenever I see the blood bank logo, or an advertisement for blood donation
4. My colleagues, and other people I know, place high value on volunteering as blood donator
5. I donate because I feel great compassion towards the receivers of blood products
6. I donate blood because it is important to help other people
7. By donating blood I can explore my own strengths
8. I think blood donation benefits my own health
9. An important reason for donation is that I get a health check for free

10. For me blood donation is primarily a moral duty
11. If I don't contribute no one else will
8. What are the reasons for donating blood? (more than one answer is possible)
  1. Altruism/doing good to others
  2. Sense of social responsibility
  3. For helping friends/relatives
  4. Spiritual bliss
9. Reasons for not donating blood **regularly**
  1. Blood donation is time consuming
  2. The frightening sight of blood
  3. Fear of being diagnosed HIV positive
  4. Parents do not allowed
  5. Blood donation causes weakness and fainting
  6. The fear of contracting diseases like hepatitis, HIV etc
  7. The fear of needle pricks
  8. Fear of being rejected as a donor
  9. Far from a blood bank
  10. Other (specify)
10. Why do you think some people are not willing to donate blood?
  1. Fear of being tested for HIV
  2. Fear of not having enough blood
  3. Fear of contracting infectious diseases
  4. Ignorance of information on blood donation
  5. Fear of fainting
  6. Others (specify)
11. What do you think your blood bank can do in order to encourage more people to be blood donors?
  1. Carrying out educational campaigns on importance of blood donation
  2. Assuring donors of maximum confidentiality after blood samples are tested
  3. Give incentives to blood donors
  4. Put up adverts on TV, radio, Website on blood donation
  5. Make blood banks clean and nice places to go to
  6. There should be blood banks in accessible hospitals
  7. Other

THANK YOU FOR YOUR TIME

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