Knowledge and Attitude towards Blood Donation among the General Population in Gangtok, East Sikkim

Dr. Namgay Shenga

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Achutha Menon Centre for Health Science Studies
Sree Chitra Tirunal Institute for Medical Sciences and Technology
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Kerala (India)
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DECLARATION

I hereby certify that the work embodied in this dissertation entitled **"Knowledge and Attitude towards Blood Donation among the General Population in Gangtok, East Sikkim"** is the result of the original research and has not been submitted for any degree in any other University or Institution.

Thiruvananthapuram
June 2004.

Dr. Namgay Shenga

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“ You never know when you’ll make transition from blood donor to blood receiver – one day, your life may depend on the blood donations of others” - Ms A. Gardner Nummer

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Abstract

Background: Millions of lives are saved each year through blood transfusion, yet the quality and safety of blood transfusion is still a concern particularly in developing countries. Non-availability of sufficient blood units is a problem in Sikkim.

Objective: The objective of this research was to assess the knowledge and attitude of general population towards blood donation and to identify the reasons for people donating and not donating blood voluntarily.

Methods: A community based cross sectional survey of 300 adults; men (75%) were carried out by two-stage cluster sampling technique. The subjects were selected randomly and interviewed using pre tested structured interview schedule. Information on knowledge and attitude towards blood donation, and socio-economic and demographic variables were collected. In-depth interview of 10 blood donors at the Blood Bank, Government Hospital, Gangtok was conducted to complement the findings of quantitative study.

Results: More than 90% of respondents had heard about blood donation**.** In the multivariate analysis knowledge about blood donation was 1.7 times higher among those with education level more than junior school compared to less than junior school (OR 1.7; 95%CI 1.3 – 2.12). Compared to the unemployed the employed respondents had 2.5 times more knowledge about blood donation (OR 2.5; 95%CI 1.2 – 5.4). Forty six percent of the participants showed positive attitude towards voluntary blood donation. The positive attitude was 1.5 times more among better educated compared to less educated respondents (OR 1.5; 95% CI 1.2 – 1.9). The main reasons for not donating were health problems, fear, inconvenience and certain beliefs that blood donation makes one weak and harm physically. Forty nine percent showed willingness to donate for a future blood assurance as an incentive.

Conclusion: The finding of the research indicates that the attitude towards blood donation could be influenced to a large extent by knowledge about blood donation. The important factors responsible for negative attitude were health problems, fear and certain beliefs and misconceptions about blood donation. The general public must be motivated by providing some form of incentives and the misconceptions about blood donations must be cleared by conducting awareness programs.

Contents

CHAPTER 1

Introduction

1.1 Introduction:

Blut Ist Ein Ganz Besonderer Saft!

GOETHE

The words of Goethe quoted above reflect a profound physiologic truth – that blood is indeed a most wonderful sap. At the time these words were written, that fact had scarcely begun to be appreciated. The multitudinous functions of blood as an oxygen carrier, as a transport medium full of nutrients and waste, as a vehicle for humeral, cellular, and immune agents for the maintenance of the cellular environment were still unknown. Indeed, it is not more than a century and a half since the letting of blood was one of the principal remedies for a host of medical disorders *(1).*

In most cases, blood transfusion is considered necessary and indispensable, since from medical point of view, it may be impossible for a particular patient to survive without it. It is well known that blood cannot be prepared artificially as it consists of living cells, which scientific research remains unable to synthesize. Nor can any use be made of animal's blood in this respect; only the blood of a human being can be used to save the life of another. Blood transfusion does not exist in isolation. It is an integral and indispensable part of the health care system. Without blood transfusion, effective management of severe trauma, major elective surgery and serious obstetric complications is not possible. To plan a National Health Service without planning the transfusion is to overlook an essential part of the infrastructure. To run a hospital without a blood bank or proper arrangements for blood supply is to invite severe difficulties in the daily operations of that institution. The reality is that no hospital can function effectively without an efficient blood supply. If such a supply does not exist, then the

physicians and the patients' families will find ways often uncontrolled and dangerous, to make blood available. Such is the life giving capability of blood and the unavailability of blood is not acceptable *(2).*

Blood collection is the most important and essential function of blood transfusion service. The source of blood for transfusion is from the blood donors. There are three types of blood donors:

Voluntary blood donors: They are the people, who donate their blood without any pressure and monetary benefit, for unknown patients (recipients). Such donors are important for blood transfusion service because they belong to low risk category. They are mostly willing to be on the panel of regular blood donors and mostly respond to appeals during emergencies.

Replacement or Relative donors: They are the members of family/friends of the patients, who donate their blood in replacement of the blood needs of the particular patients. Such donors come forward mostly for specific purposes of helping their relations/friends. Replacement donation is a common practice in our country. It has been observed that professional/commercial blood donors are brought to donate their blood in guise of being replacement donors. As such, there is a need to ensure that replacement donation does not involve a hidden remuneration system. At times, the donors request that their blood should be given to specific patients. Such donations are called directed donation.

Professional or Commercial paid donors: They are the people, who receive direct or indirect monetary benefit for the blood they donate. These blood donors often conceal the truth about their illness, previous donations and personal life, thus contribute to unsafe blood supply. They donate blood quite frequently than recommended and thus supply substandard units of blood, which may give little or no benefit to the recipient. As

such, it is important that voluntary non-remunerated blood donations should be promoted, accepted, and practiced for safe blood supply *(3).*

Blood donation is not only for saving people's lives, but also for the pursuit of better social and living environment, and voluntary blood donation is of great social importance.

1.2 <u>Back ground of the study</u>:

Blood has always held mysterious fascination for all and is considered to be the living force of our body. Ancient Egyptians recognized the life giving properties of blood and they used it for baths to resuscitate the sick, rejuvenate the old and infirm, and as a tonic for the treatment of various disorders. Today, the use of whole blood is a well-accepted and commonly employed measure without which many modern surgical procedures could not be carried out *(4).* Human blood is an essential element of human life and there are no substitutes *(5).*

A safe blood is a critical component in improving health care and in preventing the spread of infectious diseases globally. Millions of lives are saved each year through blood transfusions, yet the quality and safety of blood transfusion is still a concern particularly in the developing countries. About 5% to 10% of new HIV infections worldwide are transmitted through unsafe blood transfusions. The reason for this includes blood collection from unsafe donors, poor laboratory procedures and inadequate testing of blood. Blood will be safe if there is a nationally coordinated blood transfusion service, collection of blood only from voluntary non-remunerated donors, testing of blood for transfusion transmissible infection and by transfusion of the right blood to the right patient through the appropriate clinical use of blood *(6).* Nearly 7% of AIDS patients that reported to the National AIDS Program in India acquired infection

following transfusion of infected blood and blood products *(7).* As per the report on screening of blood for HIV for the year 1990 to 2000 in Sikkim, 16 blood units were HIV reactive out of 9069 units screened. All these reactive units were from replacement donors *(8).*

1.3 <u>Rationale of the study</u>:

Sikkim is a landlocked state bounded on the north and northeast by Tibet, on the east by Bhutan, on the west by Nepal and on the south by Darjeeling district of West Bengal covering 7,096 square kilometers and a population of 540,493 as per Census 2001 *(9).*

In Sikkim health care services are provided by the government agency only. There is no private nursing home in the state. One private/semi-government medical college by the name of 'Sikkim Manipal College' has been started in the state recently. The state is having three licensed Blood Banks - one at the state level the Central Blood Bank at Gangtok, one at the district Level the Blood Bank at Namchi and one in Sikkim Manipal Medical College, Tadong. Specialized medical and surgical services are available at these three centers. Hence, these centers are provided with blood transfusion services. There is no facility for preparation of blood components or fractionation of blood in the state.

The voluntary blood donation system in the state of Sikkim is 15 % *(10).* There should be enough blood units in a blood bank available for everybody's requirement. But non-availability of sufficient blood units is a problem in Sikkim. The hospitals rely on the relatives of a patient to donate the necessary blood, as there are not enough voluntary blood donations to help the needy patients. The blood is donated maximum on the replacement basis. Blood banks keep their pressure on doctors, nurses and the relatives of the patient and urge them to send replacement donors to maintain their stock. This is

not a good system as the relatives of the patients are pressurized to find donors and it is observed many times that professional blood donors are brought to donate blood in guise of being replacement donors. And it is a well established fact that professional donors constitute a group with high risk behavior leading to greater chances of transfusion transmitted diseases, as these donors tend to lie about their health and past medical history.

Voluntary donation system is by far the best and it needs to be strengthened. Thus, the study of understanding the various factors that could change the perception and awareness about blood donation among the general population may come out to be useful for the successful implementation of blood donation program in the state, especially in improving the voluntary blood donation system. So far there has been no study done in this field in the state.

1.4 Objectives:

1.4.1 General objective:

To assess the knowledge and attitude of the general population towards blood donation.

1.4.2 Specific Objectives:

1. To assess the knowledge about blood donation among the general population.
2. To assess the attitude towards blood donation.
3. To identify the reasons for people donating and not donating blood voluntarily.

CHAPTER 2

Literature Review

2.1 General Overview:

The ability to transfuse blood and its separated components represent one of the great advances of modern medicine. It has made much of today's surgery possible and safer, and it has saved and prolonged countless lives in war and in peace. But it is not without perils. Every blood transfusion carries with it some calculated risk. It is not now and probably never will be completely safe *(11).*

However, the need for blood is great. The American Association of Blood Banks states that in US, on any given day, an average of 38,000 units of red blood cells are needed. Blood transfusion often are needed for trauma victims, due to accidents and burns, heart surgery, organ transplant, patient receiving treatment for cancer and other diseases, such as sickle cell anemia and thalassemia. And with an aging population, and advances in medical treatment and procedures requiring blood transfusions, the demand for blood continues to increase *(12).*

Persons living in developing countries are commonly anemic and are at high risk for traumatic injuries and obstetrics complications. Blood transfusion in these settings can be life saving *(13).* About 80% of maternal deaths are due to obstetric complications of pregnancy, labor, and puerperium, and the single most cause accounting for a quarter of all deaths is the obstetric hemorrhage (25 %), generally occurring during post partum period, which can lead to death very rapidly in the absence of prompt life saving care, one of which is blood transfusion *(14).* It is a tragic situation as these deaths are not caused by disease but occurred during or after a natural process called pregnancy and childbirth. A significant number of deaths could be avoided if every hospital had consistent access to safe supply of this life saving resource.

Though blood transfusion is regarded as the very essence of life, it is not without problems. Some of them can be prevented while others cannot be prevented. An important preventable complication is the infections transmitted through blood transfusions. One major step that helps to minimize this route of infection is insisting on voluntary blood donations and by creating awareness among the public of the routes of infection and emphasizing on 'window period' when the screening period will be negative, but the donor may be in the infectious stage *(15).* Donation is largely a humanitarian act, whereas non-donation arises largely through fears of pain, and perhaps of the unknown *(16).* Thus the stated aim of many countries is to maximize the unpaid voluntary aspects of blood donation and phase out the practice of replacement or paid donation.

2.2 <u>The Global Scenario</u>:

There is a vast discrepancy in the international distribution of blood donations, with about 78% of all blood being collected in the developed world, even though less than 20% of the global population lives there. In addition, there are major variations in the way that this blood is collected though voluntary unpaid donation is the norm in most developed states. The same can be said to occur for only about 15% of developing countries and about 7% of lesser-developed states that depend instead on the other approaches, such as paid donation to acquire blood. Despite these differences, a common problem is that very few countries have been able to become self sufficient when it comes to reconciling domestic blood usage with local collection efforts *(17).*

Resolution 28.72 of the World Health Assembly established the principle that blood donation should be voluntary and non–remunerated. This policy has been adopted by many countries for the collection of whole blood. A system of voluntary non-

remunerated blood and plasma donation is safer because the incidence and prevalence of transfusion transmissible infections in the voluntary non–remunerated blood donors is invariably lower than among family or 'replacement' donors and paid donors. It also permits the use of donor education and selection procedures that encourage unsuitable donors to self defer or self exclude. It therefore enables more cost effective use to be made of limited resources because fewer units of blood have to be discarded after screening because of evidence of infectious disease markers *(18).*

Today, HIV/AIDS pandemic has greatly increased public awareness of blood transfusion, thereby generating great interest in the safety and adequacy of the nation's blood supply *(19).* Transfusion of blood and blood products accounts for approximately 5-10% of the global HIV infection. In some countries of the South East Region, blood transfusion contributes substantially to HIV infection and AIDS *(6).* Because of the window period phenomenon and other factors such as virus variants and new viruses, however, screening is not 100 percent effective and risk cannot be completely eliminated *(20).* The testing of donated blood for infection that can be transmitted by blood is essential, but the safest donations come from the safest donors. Thus voluntary blood donation is crucial in ensuring blood safety. It will prevent HIV, Hepatitis B transmitted through blood transfusion *(21).*

2.3 <u>The Indian Scenario</u>:

Blood transfusion services in our country are still in its infancy. The need for blood is growing day by day as a result of advancement in the clinical medicine. Depending on the facilities and infrastructure of the different hospitals, requirement of blood vary from 9.6 units of blood/bed/annum in general hospitals to 8–15 units of blood in larger hospitals having specialized departments and more than 20 units per anum in super

specialty hospitals. In India for a population of 900 million and bed strength of little over half a million, blood needs met in relation to population per thousand are less than 10 donations per year. As is seen blood is always in short supply and recruitment of donors is never met fully. This state of affairs could be overcome to a large extent by optimization of blood usage by way of component therapy. Adoption of novel techniques for the recruitment of voluntary blood donors will motivate people at large to donate blood. Apart from the over all shortage of blood, there is still dependency on the professional donors and other problems like inadequate infrastructure and shortage of trained personnel *(15).*

In India, about three million units (1997) are collected annually against the requirement of seven million for a population of nine million. The blood collection system is still dependent predominantly on replacement family donors. According to the 1997 blood collection figures: 40% donors were voluntary, 30% replacement and 30% were paid donors. An autologous and directed blood donation system is not very prevalent *(22).*

India's health care sector has made impressive strides toward providing health for all by the year 2000. The progress, however, has not been supported by a modern transfusion services network, which continues to improve itself. In India, blood collection, storage, and the delivery occur mainly in blood banks attached to hospitals, most of which are under central and state government controls. A significant portion of blood banking activity is also done by voluntary agencies and private sector blood banks *(23).*

In terms of the need for blood transfusion, it is noted that in the country, the death toll for road accidents has increased due to unavailability of blood transfusion services near the accident site *(24)*

Voluntary non-remunerated blood donation has been universally shown to be the cornerstone of safe blood *(25).* Truly speaking voluntary blood donors are the bricks of

the edifice called blood transfusion. The presence of professional blood sellers, however, cannot be ruled out among the replacement donor in the garb of relatives or friends. This fact is supported by the WHO report, which says, "All the countries admitted that the absence of paid blood sellers are not real. They exist in replacement donor category *(26).* The selling of blood in India has long been seen as a way of making a living for people with low socioeconomic status, with some even attempting to form unions that would protect their members' interest and guarantee a minimum wage for their donation services *(17).* Professional blood donning activities have been completely banned w.e.f. 1st January 1998 in the country *(27).* The National Blood Policy has been endorsed by the parliament in January 2002 and this idealistic policy has made blood even more difficult to get in rural India *(28).* Further, the shortage of blood units is also due to lack of public initiative to donate blood voluntarily.

One of the main objectives of the National Blood Policy is to launch an extensive awareness program for blood bank services including donor motivation so as to ensure adequate availability of safe blood *(29*). And it is also worth mentioning that screened blood does not mean that it is infection free. A donor screening data over 12 years in AIIMS, New Delhi has consistently shown lower infection rates in voluntary donors as compared to replacement donors'. So promoting voluntary donor program and restricting the replacement donors is extremely essential for safe blood *(30).*

2.4 Myths and Misconceptions about Blood Donation:

Considering the voracious demand for blood it is surprising that so little research has been done in this field. There are also many individuals who follow a range of traditional superstitions that blood donation causes the loss of vital life force, whose loss can cause amongst other things impotence, infertility, blindness, or the inability to work. Although

these beliefs may appear irrational to an outsider, it is often hard to convince believers to ignore them especially if they form a fundamental part of their convictions about basic nature of life. Many people avoid blood donation if they are easily upset at the site of blood, have a phobia about medical instrument such as needles, or associate donation with physical sensation of pain and weakness.

In most of the studies conducted in this field it is found that people tended to stress fears, possible ill effects of blood donation, inconvenience of giving time and lack of proper incentive for the donors. Almost similar kind of myths and misconception about blood donation is found in all these studies. And all these studies have concluded that an appropriate motivational campaign be launched to increase voluntary blood donation.

A study conducted among the students of Chulalongkon University, Thailand showed that 80% of the participants knew about blood donation and 11% of the study population had even donated blood voluntarily. The study did not find any significant correlation of gender, age, and educational level with knowledge about blood donation. The findings of the study concluded that greater knowledge about blood donation does not lead to donation and specific campaigns are needed to convert this into actual voluntary donation (*31).*

Another similar study among the students of University of Dhaka, Bangladesh showed that 80% of the participants showed a positive attitude towards blood donation; however, only 16% of the respondents in this study had actually ever donated blood voluntarily. Physical harm and fear were found to be the common reasons for not donating blood. The results also showed that a high number of respondents had a negative attitude towards blood donation *(32).*

Another study in Baltimore, Maryland Metropolitan Area showed that 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 HIV, and loss of physical vitality after donation have been proposed as potential reasons for ethnic and racial disparities in blood donation *(33).*

Several possible reasons have been put forward for donating and not donating blood. A similar study on blood donation and behavior and beliefs among a sample of high school students in Mmabatho showed that donating blood was a health risk or were uncertain if donating blood was safe. The study recommended that public appeals for blood donors should include information to dispel myths about dangers of blood donation *(34).*

Researchers have found that if people have strong positive attitude about blood donation they may be willing to donate blood even if they have strong negative feeling. (John Cacioppo, Professor of Psychology at Ohio State University.) In this context, the results of a study in Umea, Sweden concluded that majority of effects elicited in blood donors by blood donation were positive like feelings of satisfaction, greater alertness, increased well being, The positive effect did not differ from the negative regarding the time of onset, yet their duration was reported to be significantly longer. The important finding in this study namely high frequency of positive long-lasting effect elicited in blood donors by blood donation is of great importance for the recruitment of new blood donors; there by blood donation can be made less frightening and perhaps even attractive *(35).*

CHAPTER 3

Research Methodology

3.1 Study Design:

Community based cross sectional survey.

3.2 Study area:

The area of study was Gangtok, the capital of Sikkim, which is in the east district. There are two referral hospitals in the east district: State Referral Hospital, Sir Thutop Namgyal Memorial Hospital at Gangtok and Manipal Medical College at Tadong. These two referral centers have the facilities of blood banking services. The total population of Sikkim is 540493. The population of east district is 244,790 and the population of Gangtok is 29,162. *(36).*

3.3 Study period:

01.01.2004 to 30.03.2004.

3.4 Study population:

The study was done among the adults between the ages of 18 to 55 years. This age group was taken because of the fact that the blood donors are usually within this age group. The sample had 75% men and 25% women taken purposely. The list of the study population was taken from the electoral roll of 2002 Sikkim, 31- Gangtok Assembly Constituency from the Office of District Collectorate East Sikkim, which has a total number of 12199 voters. And it is assumed that at least ninety five percent of the target populations are included in the electoral list of this area.

3.5 Study sample and Sample selection procedure:

A total of 300 adults were recruited for the study. The sample for the study was selected by two-stage cluster sampling technique. There are fifteen polling stations under the Gangtok Assembly constituency with a total of 12199 voters. Each polling station has a total of 500 to 1200 voters. In the first stage, ten polling stations were selected randomly through draw of lots. In the second stage, a total of thirty adults were selected from each polling station randomly. The subjects were selected in such a way that after every three men one woman was selected from the serial numbers given in the electoral list to get a total of 225 men and 75 women. The house number was matched with the name and the serial number of the subject. The house number was traced and then the subject randomly selected was identified and interviewed.

3.6 Data Collections:

3.6.1 Research tool:

The data collection tool used for the study was an interview schedule that was developed at the institute with the assistance from the faculty members and other experts. A pilot study was carried out at the central blood bank STNM Hospital among blood donors and non-donors following which some of the questions from the interview schedule were modified.

In-depth interview of the blood donors at the central blood bank STNM Hospital was conducted to complement the findings of the quantitative study.

The interview schedule had three parts: -

The first part of the interview schedule was on socioeconomic and demographic characteristics. This included the variable – age, sex, marital status, occupation, religion, community status, and literacy status and per-capita monthly income. The second part of

the interview schedule was on the knowledge about blood donation and the third part of the schedule was on the attitude toward blood donation.

3.6.2 Data collection:

The collection of the data was from the 15th of January till the 30th of March 2004. On an average 5 to 6 interviews were conducted in a day.

3.7 Dependent variables:

3.7.1 Knowledge about blood donation:

The lack of knowledge could be an important barrier for people not donating blood voluntarily. The knowledge blood donation and voluntary blood donation were measured by asking questions related to the subject.

3.7.2 Attitude towards blood donation:

Attitudes are acquired characteristics of an individual. They are more or less permanent way of behaving. Attitude is defined as a relatively enduring organization of beliefs around an object, subject or concept, which predisposes one to respond in some preferential manner (14). The attitude was measured by asking questions related to people's way of thinking towards blood donation.

3.8 Independent Variables:

3.8.1 Age:

The age at which young people may begin to give blood is not universally agreed. Worldwide the minimum age for blood donation varies from sixteen to twenty one years; Australia and Hong Kong have good results from setting the minimum age at sixteen *(2).*

The most usual age for blood donation is eighteen years. It is legally the age of consent in India at which young people can reasonably be expected to be sufficiently matured to decide to be blood donors *(37).* The information on age was collected and recorded as age in completed years and for analytical purpose is grouped into three categories: < 30, 30 to 39 and >=40.

3.8.2 Sex:

While there is no explicit discrimination according to gender, greater proportion of donors are men in part, because many women especially those of child bearing age suffer from iron deficiencies that limit their hemoglobin levels resulting in their inability to tolerate frequent donation (*38).* The sex has been categorized into male and female.

3.8.3 Marital status:

Marital status has been categorized into married or single. Single includes unmarried, divorced, widowed and separated.

3.8.4 Occupational status:

The information for this variable was collected based on the type of occupation and is categorized into unemployed, office goers, businessman and others. The others comprised of farmers, housewives, drivers and students.

3.8.5 Religion:

Various religious groups believe that the drawing of blood is a sacrilegious act violating the basic tenets of their faith, while the best known group to hold such a view is that of the Jehovah's Witnesses, who argue that Biblical tracts rule out both receipt and

donation of blood or any other human matter. Others who share similar objections include certain Buddhist and Islamic Sects *(38).*

The religion refers to the respondent's religion at the time of the interview. It is categorized into Hindu, Buddhist, and others. The others comprised of Christians and Muslims.

3.8.6 Community status:

This refers to community to which the subject belongs. They are categorized into schedule tribe, schedule caste, other backward classes and others. The others mean the upper caste and people from other parts of India.

3.8.7 Literacy status:

This refers to the highest level of education as completed by the respondents at the time of interview. The levels are categorized into illiterate, primary completed, junior school completed, secondary school completed and senior secondary and above.

3.8.8 Socioeconomic status:

The information on this variable was collected from the respondents as to their total monthly household income irrespective of their status in the household. The total monthly expenditure was taken as a proxy measure to assess income. To ascertain the monthly per-capita household income, the total monthly income was then divided by the total members in the household. For the analysis the 33.3^{rd} and 66.7^{th} percentile were taken to categorize the subjects into three groups from lower to higher income group.

3.9 Ethical issues:

The permission to conduct the study in Gangtok and STNM Hospital was taken from the office of the Secretary Health and Family Welfare Department, Government of Sikkim.

All the participants were explained about the purpose of the study and were ensured strict confidentiality, and then verbal informed consent was taken from each of them before the interview. The participants were given the options not to participate in the study if they wanted.

3.10 Data analysis:

The data collected were thoroughly cleaned and entered into Excel spread sheets and analysis was carried out using SPSS, version 11 software. Univariate, bivariate and multivariate analysis was carried out and a p value of <0.05 was considered for statistical significance.

The analysis of in-depth interview was carried out by iterative process. The procedures involved were transcription, preliminary data inspection, content analysis and interpretation.

3.11 Limitation of the study:

The limitation of the study is that the study population was from Gangtok town, the capital of Sikkim and this does not represent the general population of the state. The place of study being the capital of the state where the populations are somewhat better educated, have higher household income then the general population of the state. This might have affected the exact percentage of knowledge and attitude towards blood donation in the study.

CHAPTER 4

Results

4.1 Sample profiles:

A total of 300 adults were interviewed. Table 1 and 2 presents the distribution of the sample population by socio demographic characteristics. The age of the study population was between 18 to 55 years. The mean age of the participants was 35.33 years.

Table 1:Socio demographic features of the study population: (n = 300)

Characteristics	Mean	Median	Standard Deviation	Range
Age in completed years	35.3	35.0	7.9	18 - 55
Household size	4.7	4.5	1.7	1 - 13
Total monthly expenditure in Rs/month. *	4361.4	4000.0	2146.1	800 - 12000
Monthly household per capita expenditure in Rupees. *	1025.9	816.6	610.7	100 - 3167

(* Expenditure was taken as a proxy for income)

In Sikkim the average household size is 4.8 persons for urban area, 5.5 persons for rural area and 5.4 persons for the state as a whole and India (*39).* Gangtok being the capital and an urban area the participants came from the household with a mean size of 4.7 members.

The mean household income per month was Rs 1025.30/ - with a range between Rs 100/- to Rs 3167/ -. Here total monthly expenditure was taken as a proxy for income. The sample had 75% men and 25% women subjects that were taken purposely.

Table 2: Age and Sex Distribution: (n = 300)

Age in years	Number of subjects	Percentage
<30	83	27.7
30 – 39	132	44.0
> =40	85	28.3
Total	**300**	**100**
Sex		
Male	225	75
Female	75	25
Total	**300**	**100**

Table 3 presents the distribution of sample population by selected socio economic characteristics. Almost 80 %of the respondents are married and only 20 %of them are single. The single includes unmarried, divorced, and separated. The maximum number of unmarried belongs to age group less than 30 years. In Sikkim there are not many industries or factories. People mostly depend on government service, so Gangtok being the capital of the state, 41% of the participants were office goers and the rest were businessman, unemployed and others who comprised of housewives, drivers, students and farmers.

Table 3: Socio economic characteristics of the study population:

Characteristics	Number of subjects	Percentage
Marital status:		
Married	238	79.3
Single	62	20.7
Total	**300**	**100**
Occupational Status:		
Unemployed	49	16.3
Office goers	123	41.0
Businessman	88	29.3
Others	40	13.3
Total	**300**	**100**
Literacy status:		
Illiterate	14	4.7
Primary school completed	32	10.7
Junior school completed	65	21.7
Secondary school completed	96	32.0
Senior Secondary and above	93	31.0
Total	**300**	**100**
Percapita monthly income:		
<700	118	39.3
700 - 1100	79	26.3
> 1100	103	34.3
Total	**300**	**100**

The level of education of general population may affect their knowledge and attitude towards blood donation. The literacy rate of Sikkim is 69.68 percent and east district is 75.57 percent with Gangtok having the highest literacy rate *(36).* A very small percentage (4%) of the study population was illiterate. (Table 3)

Per capita monthly income when categorized into three groups by taking the 33.3rd and 66.67th percentile it is found that 39.3 % belonged to low income, 26.3 belonged to middle income and 34.3% belonged to high income. (Table 3)

In Sikkim, 60 percent of the populations are Hindu, 33 percent are Buddhist, and 5 percent are Christian and 1 percent Muslim *(39).* The majority of the study population was Hindus followed by Buddhist and others, which include Christian, and the Muslims. (Table 4).

Similarly, in regards to ethnicity of the Sikkimese population, 7 percent belongs to schedule caste, 28 percent belong to schedule tribe, about 1/3 belong to other backward classes and less than 1/3 do not belong to any of these group *(39).*The schedule tribe and the number of other back ward classes is more among the participants which may be due to the fact that the two communities belonging to other backward classes have been included in schedule tribe from the year 2002. (Table 5)

Table 4: Cultural characteristics study population:

Religion	Number of subjects	Percentage
Hindu	159	53
Buddhist	113	37.7
Others	28	9.3
Total	**300**	**100**

Table 5: Ethnicity of the study population:

Community status:	Number	Percentage
Schedule Tribe	101	33.7
Schedule Caste	20	6.7
Other Backward Classes	109	36.3
Others	70	23.3
Total	**300**	**100**

4.2 Knowledge and Attitude towards blood donation:

4.2.1 Source of information:

To assess the knowledge and attitude towards blood donation the study population were asked questions related to the subject. The study subjects were asked whether they had heard about blood donation and it is found that more than 90 percent of the respondents had heard about blood donation. The main source of information was health provider. (Table 6)

Table 6: Source of information:

Source	Number	Percentage
Health provider	140	46.7
Friends	62	20.7
Media	76	25.3
Don’t know	2	.7
Never heard	20	6.7
Total	**300**	**100**

It is also found that 68.3% of the respondents was aware of the fact that blood is donated at a blood bank and only 1.7% of the respondents had no idea about the place of blood donation. (Table 7)

Table 7: Place of blood donation:

Place	Number	Percentage
Blood Bank	205	68.3
Any hospital	73	24.3
Blood donation camps	17	5.7
Don’t know	5	1.7
Total	**300**	**100**

4.2.2 Knowledge about blood donation:

To assess the level of knowledge, the interview schedule contained ten questions related to knowledge. The questions were related to importance of blood donation, different blood groups, and conditions where blood transfusion is required and if a patient could get infection through blood transfusion.

Table 8: Knowledge about Blood Groups

Statement	Yes (Number /%)	No (Number /%)	Don't know (Number /%)	Total
Do all people have same blood group?	11(3.7)	254 (84.7)	35 (11.7)	**300**
Can a patient receive blood of any group?	11 (3.7)	259 (86.3)	30 (10)	**300**
Do you know that there are blood groups like: -				
Blood group A	271 (90.3)	None	29 (9.7)	**300**
Blood group B	270 (90)	None	30 (10)	**300**
Blood group AB	199 (66.3)	None	101 (33.7)	**300**
Blood group O	271 (90.3)	None	29 (9.7)	**300**

The knowledge regarding the different blood groups was good. Majority knew about the blood groups like A, B, and O but comparatively a lesser percentage knew about the group AB. (Table 8)

It is found that 166 (55.3%) of the respondents had the knowledge that a person could donate twice a year, while 134 (54.7%) had no idea that blood could be donated more than once. The knowledge about the importance of blood donation was assessed by asking the respondents about the conditions where blood transfusion is required.

Almost all the participants knew one or the other conditions where blood transfusion is required. (Table 9)

Table 9: Knowledge about conditions where blood transfusion is required

Conditions	Number	Percentage
Accidents and burns	51	17.0
Bleeding during pregnancy and delivery	33	11.0
Major surgical operations	31	10.3
Cancers	5	1.7
Severe anemia	9	3.0
All of above	171	57.0
Total	**300**	**100**

4.2.3 Knowledge about transfusion transmitted infections:

Though blood transfusion is regarded as the very essence of life, it is not without problems. Transfusion of blood and blood products accounts for approximately 5-10% of the global HIV infection. *(6)*

The knowledge about transfusion-transmitted infections was assessed by asking the participants if a patient could get infection through blood transfusion and about the possible diseases that could be transmitted by blood transfusion. The respondents were given options for the five diseases for which the screening test are mandatory for all the blood collected at a blood bank. The respondents had a very good knowledge about most of the diseases except for syphilis. (Table 10)

Table 10: Knowledge about Transfusion Transmitted Infections

Statement /Diseases	Yes (Number/%)	No (Number/%)	Don't know (Number/%)
Can a patient get infection when he or she is receiving blood?	251 (83.7)	46 (15.3)	3 (1.0)
Have you heard about diseases like: -			
Hepatitis B	240 (80.0)	2 (.7)	58 (19.3)
Hepatitis C	224(74.7)	9 (3.0)	67 (22.3)
HIV/AIDS	267 (89.0)	None	33 (11.0)
Malaria	211 (70.3)	9 (3.0)	80 (26.7)
Syphilis	114 (38.0)	12 (4.0)	174 (58.0)

Regarding the knowledge about prevention of infection due to blood transfusion. Majority indicated that the blood should be tested for these diseases before transfusion but 12.0 percent had no idea about prevention. (Table 11)

Table 11: Multiple responses for prevention of transfusion-transmitted infections

Responses	Number	Percentage
Screening test	198	66.0
Safe technique	14	4.7
Proper donor selection	14	4.7
Both screening test and safe technique	38	12.7
Don’t know	36	12
Total	**300**	**100**

In the bivariate analysis knowledge about infection during blood transfusion was found to have a significant association with education ($p<0.001$) and occupation ($p <0.001$). (Table 12)

Table: 12: Knowledge about infection during blood transfusion having significant association with education and occupation in bivariate analysis

Variables	Can a patient get infection when he or she is receiving blood?			Frequency (No/%)	Chi-square (p- value)
	Yes (No/%)	No (No/%)	Don't know (No/%)		
Occupation					
Unemployed	34(69.4)	15(30.0)	None	49(100)	**<0 .001**
Office goers	102(82.8)	21(17.1)	None	123(100)	
Businessman	77(87.5)	10(11.4)	1(1.1)	88(100)	
Others	38(95.0)	None	2(5.0)	40(100)	
Total	**251(83.7)**	**46(15.3)**	**3(1.0)**	**300(100)**	
Education					
Illiterate	7 (50)	7(50)	None	14(100)	**<0.001**
Primary school completed	18(56.3)	12(37.5)	2(6.3)	32(100	
Junior school completed	58(89.2)	7(10.8)	None	65(100)	
Secondary school completed	83(86.5)	12(12.5)	1(1.0)	96(100)	
Senior secondary & Above:	85(91.4)	8(8.6)	None	93(100)	
Total	**251(83.7)**	**46(15.3)**	**3(1.0)**	**300(100)**	

4.2.4 Knowledge Scoring:

The interview schedule contained ten questions relating to knowledge about blood donation and its importance. A summary indicator was later calculated giving scores to the questions, with due weightage being given to correct answers. The 33.3rd and 66.7th percentiles were used to categorize the subjects into three groups of poor, moderate and high knowledge. Thirty two percent of the respondents have poor knowledge score about blood donation and its importance while 22.0% have moderate knowledge score and 46.0% was found to have high knowledge score. (Table 13)

Table 13: Knowledge scoring

Knowledge score	Number	Percentage
Poor	96	32
Moderate	66	22
High	138	46
Total	**300**	**100**

The knowledge about blood donation was found statistically significant with occupation (p .005) and education in the bivariate analysis. (p <0.001). It was found that employed respondents had higher knowledge score than the others and there is an increase in level of knowledge with increase in the level of education. (Table 14)

Table 14: Knowledge about blood donation and socio demographic characteristics with which it was found to have significant association in bivariate analysis:

Socio demographic variable	Knowledge about blood donation			Number (%)	Chi-Square (p value)
Occupation	**Poor**	**Moderate**	**High**		
Unemployed	26(53.1)	10(10.4)	13(26.5)	49 (16.3)	**.005**
Office goers	28(22.8)	25(20.3)	70(56.9)	123 (41.0)	
Businessman	29(33.0)	20(22.7)	39(44.3)	88 (29.3)	
Others	13(32.5)	11(27.5)	16(40.0)	40 (13.3)	
Total	**96(32.0)**	**66(22.0)**	**138(46.0)**	**300(100)**	
Education					**<0 .001**
Illiterate	12(85.7)	2(14.3)	None	14 (4.7)	
Primary school completed	24(75.0)	3(9.4)	5(15.6)	32(10.7)	
Junior school completed	23(35.4)	17(26.2)	25(38.5)	65(21.7)	
Secondary school completed	19(19.8)	20(20.8)	57(59.4)	96(32.0)	
Senior secondary and above	18(19.4)	24(25.8)	51(54.8)	93(31.0)	
Total	**96(32.0)**	**66(22.0)**	**138(46.0)**	**300(100)**	

4.2.5 Attitude towards blood donation:

To assess the general attitude, the study participants were asked why do people donate blood. The respondents were given options for the question. Maximum percentage responded that they donate blood to save a relative or a friend and very few indicated that blood is donated to get some money. (Table 15)

Table 15:Attitude toward blood donation

Statement	Number	Percentage
People donate blood to save a relative or a friend	236	78.7
Donating blood makes one healthy	45	15.0
People donate blood to get some money	8	2.7
People donate blood to get some free investigations done	11	3.7
Total	**300**	**100**

Out of 300 subjects, only 12.7% of the respondents had ever donated blood while 87.3% had never donated. (Table 16 A)

Looking at the characteristics of these thirty-eight ever donors, gender wise men donors were found to be more than the women and it is a known fact that greater proportion of the blood donors are men. Eighty nine percent of them were married and 50% of them were employed. Almost similar percent were from both Hindu and Buddhist among the religion group while the schedule tribe was the highest among the community status group. These donors were mostly educated belonging to the higher income group. Age wise the maximum donors were from the 30 to 39 years age group. (Table 16 B)

Table 16 A: Attitude towards blood donation

Ever donated blood	Number	Percentage
Yes	38	12.7
No	262	87.3
Total	**300**	**100**

Table 16 B: Characteristics of the ever donors (n=38)

Variables	Ever donors (no/%)
Sex	
Male:	**32 (84.2)**
Female	6 (15.8)
Marital status	
Married	**34 (89.5)**
Unmarried	4 (10.5)
Occupation	
Unemployed	6 (15.8)
Office goers	**19 (50.0)**
Businessman	6 (15.8)
Others	7 (18.4)
Religion	
Hindu	**17 (44.7)**
Buddhist	**17 (44.7)**
Others	4 (10.3)
Community Status	
Schedule Tribe	**16 (42.1**)
Schedule Caste	1 (2.6)
Other Back ward classes	8 (21.1)
Others	13 (34.2)
Education	
Illiterate	Nil
Primary School completed	1 (2.6)
Junior School completed	9 (23.7)
Secondary school completed	11 (28.9)
Higher Secondary and above	**17 (44.7)**
Age group	
<30 years	8 (21.1)
30 to 39 years	**19 (50.0)**
> =40	11(28.9)
Per-capita monthly income	
<700	1 (2.6)
700 – 1100	12 (31.6)
> 1100	**25 (65.8**)

About 46% of the respondents showed a positive attitude towards voluntary blood donation, 31.7% were not in favor of donating blood voluntarily while 22.3% were yet undecided. (Table 17)

Table 17: Attitude towards voluntary blood donation

Donate blood voluntarily?	Number	Percentage
Yes	138	46.0
No	95	31.7
Can’t say	67	22.3
Total	**300**	**100**

Table 18: Attitude towards VBD and variables - education and per-capita monthly income that was found to have significant association

Variables	Attitude towards voluntary Blood Donation		Number	Chi- Square (p value)
	Positive	Negative		
Education				
Illiterate	4 (28.6)	10 (53.5)	14	
Primary school completed	8 (25.0)	24 (75.0)	32	
Junior school completed	24(36.9)	41 (63.1)	65	**.004**
Secondary school completed	45(46.9)	51 (53.1)	96	
Senior secondary and above:	57(61.3)	36 (38.7)	93	
Total	**138(46.0)**	**95 (31.7)**	**300**	
Per-capita monthly income:				
<700	52(44.1)	31(26.3)	118	
700 – 1100	32(40.5)	33(41.8)	79	**.042**
> 1100	54(52.4)	31(30.1)	103	
Total	**138(46.0)**	**162 (54)**	**300**	

The results of bivariate analysis showed a significant association between attitude towards voluntary blood donation and education and per capita monthly income with a p- value of .004 and .042 respectively. (Table 18)

Several possible reasons have been put forward for donating and not donating blood voluntarily. The respondents who were not in favor of blood donation, 51.60 % of the gave health problems as the reasons, 25.26% because of fear of the painful procedure they have to go through while donating blood and 15.78% were of opinion that blood donation will make them weak and harm them physically and rest had no time.

(Table 19)

Table 19: Reasons for not donating blood: (n -95)

Reasons	Number	Percentage
Fear of painful procedure	24	25.26
Blood donation will harm one physically	15	15.78
Health problems	49	51.60
Have no time	7	7.36
Total	**95**	**100**

The respondents who showed positive attitude towards blood donation, 69% give reasons like blood donation is a duty of an individual to the community; 26% indicated it as a charitable contribution and only 7.98 % will donate because of a sense of moral obligation. (Table 20)

Table 20: Reasons for donating blood: (n -138)

Reasons	Number	Percentage
Blood donation is a duty of an individual to the community	91	65.94
Blood donation is a charitable contribution	36	26.08
Donate blood because of a sense of moral obligation	11	7.98
Total	**138**	**100**

When the respondents were further asked in which of the conditions given would they donate blood. Almost 50 percent responded for an assurance of free blood for the donor or his direct relative in the future, 25.3% did not want any thing for donating blood, 20.3% wanted non monetary benefit like time off from office, some kind of certificate or recognition while 4.3% wanted monetary benefit. (Table 21)

Table 21: Conditions for voluntary blood donation

Conditions	Number	Percentage
Donate blood for assurance of free blood for donor or a relative in future	147	49.0
Donate blood but do not want anything	76	25.3
Donate blood for non monetary benefit	61	20.3
Donate blood for monetary benefit	13	4.3
Can't say anything	3	1.0
Total	**300**	**100**

The results of bivariate analysis showed a significant association between knowledge about blood donation and attitude towards voluntary blood donation ($p<0.001$). It was found that subjects with good knowledge score have more positive attitude towards blood donation than the subjects with poor knowledge score. The positive attitude is 30.2% with poor knowledge score, 42.4 % with moderate knowledge score, and 58.7 % with high knowledge score. There is increase in trend of positive attitude with increase in knowledge level (Chi-square test for trend; $p < 0.00001$). (Table22)

Table 22: Knowledge and attitude, which was found to have significant association in bivariate analysis

Attitude towards VBD	**Knowledge Score**			**Number**	**Chi Square (p value)**
	Poor	**Moderate**	**High**		
Positive	29(30.2)	28(42.4)	81(58.7)	138(46.0)	**< 0.001**
Negative	67 (69.8)	38(37.6)	57(41.3)	162 (54.0)	
Total	**96(100)**	**66(100)**	**138(100)**	**300(100)**	
Chi-square test for trend p<0.00001					

4.3 Results of multivariate analysis:

The dependent variables, knowledge about blood donation and attitude towards voluntary blood donation was taken into consideration in the multivariate analysis. The multiple logistic regressions was the preferred method taking into consideration that the dependent variables to be modeled were binary variables. The variable that was found significant in the bivariate analysis were analyzed in the multivariate analysis.

4.3.1 Knowledge about blood donation:

The knowledge about blood donation in bivariate analysis was significantly associated with occupation and education. Significant relationship was observed with occupation and education in multivariate analysis. Compared to the unemployed group the employed group was found to have more knowledge about blood donation. (Odds ratio 2.49; 95%CI 1.16 – 5.36, p .019). Similarly the knowledge about blood donation was found to be more among the higher educated than the lesser-educated ones (Odds ratio 1.69; 95%CI 1.33 – 2.15, p <0.001). (Table 23)

Table 23: The results of multivariate analysis: Variables associated with knowledge about blood donation

Variables	Odds Ratio	95% Confidence Interval	p value
Occupation:			
Unemployed	**1**		
Employed	2.499	1.165 – 5.362	.019
Businessman	2.054	.931 – 4.533	.075
Others	1.775	.700 – 4.499	.227
Education:			
< Junior School	**1**		
> = Junior school	1.699	1.336 – 2.159	<0.001

4.3.2 Attitude towards voluntary blood donation:

The attitude towards voluntary blood donation was found statistically significant with education and per-capita monthly income in bivariate analysis. In the multivariate analysis the attitude towards voluntary blood donation was found to be statistically significant with education (Odds ratio 1.54; 95%CI 1.24 – 1.925, p <0.001).

It was found that odds of having more positive attitude towards voluntary blood donation is 1.5 times more in those with higher education level then those with lesser education level. (Table 24).

Table 24: The results of multivariate analysis, Attitude towards voluntary blood donation (VBD) with education and percapita monthly income

Variables	Odds Ratio	95% Confidence Interval	p value
Education:			
< Junior School	**1**		
> = Junior school	1.549	1.247 – 1.925	<0.001
Per Capita Monthly Income:			
<700	**1**		
700 – 1100	.880	.486 – 1.592	.672
> 700	1.333	.771 – 2.303	.303

Table 25: Knowledge score with different socio demographic variable, which was found to be not significant bivariate analysis

Socio demographic variable	Knowledge about blood donation (No/%)			Number	Chi-square (p value)
Age group	**Poor**	**Moderate**	**Good**		
<30	26 (31.3)	11(13.3)	46 (55.4)	83	.060
30 – 39	37 (28.0)	36(27.3)	59 (44.7)	132	
>= 40	33 (38.8)	19(22.4)	33(38.8)	85	
Total	96 (32.0)	66(22.0)	138(46.0)	300	
Sex					
Male	69 (30.7)	51 (22.7)	105(46.7)	225	.681
Female	27 (36.0)	15 (20.7)	33 (44.0)	75	
Total	96(32.0)	66(22.0)	138(46.0)	300	
Marital status					
Married	74 (31.1)	56(23.5)	108 (45.4)	238	.445
Single	22(35.5)	10(16.1)	30 (48.4)	62	
Total	96 (32.0)	66(22.0)	138 (46.0)	300	
Religion					
Hindu	51 (32.1)	38 (23.9)	70 (44.0)	159	.551
Buddhist	38 (33.6)	24 (21.2)	51 (45.1)	113	
Others	7 (25.0)	4(14.3)	17 (60.0)	28	
Total	96 (32.0)	66 (22.0)	138 (46.0)	300	
Community status					
Schedule Tribe	36 (35.6)	20 (19.8)	45 (44.6)	101	.264
Schedule Caste	4 (20.0)	8(40.0)	8 (40.0)	20	
O BC	35 (32.1)	27 (24.8)	47 (43.1)	109	
Others	21 (30.0)	11 (15.7)	38 (54.3)	70	
Total	96 (32.0)	66 (22.0)	138 (46.0)	300	
Per-capita monthly income					
<700	31 (26.3)	27 (22.9)	60 (50.8)	118	.454
700 – 1100	30 (38.0)	15 (19.0)	34 (43.0)	79	
> 1100	35 (34.0)	24 (23.3)	44 (42.7)	103	
Total	96 (32.0)	66 (22.0)	138 (46.0)	300	

Table 26: Attitude towards VBD with different variable, which is found to be not statistically significant

Variables	Attitude towards Donate Blood Voluntarily (Number/%)		Frequency	Chi- Square (p value)
Age group	**Positive**	**Negative**		
<30	44 (53.0)	39 (47.0)	83	.187
30 – 39	58 (43.9)	74 (56.0)	132	
>= 40	36 (42.4)	49 (57.6)	85	
Total	138(46.0)	162 (54.0)	300	
Sex				
Male	104(46.2)	121 (53.8)	225	.991
Female	34 (45.3)	41 (54.7)	75	
Total	138(46.0)	162(54.0)	300	
Marital status				
Married	108 (45.4)	130 (54.7)	238	.874
Unmarried	30 (48.4)	32 (51.6)	62	
Total	138(46.0)	162 (54.0)	300	
Occupation				
Unemployed	18 (36.7)	31 (63.3)	49	.430
Office goers	60 (48.8)	63 (51.2)	123	
Businessman	41 (46.6)	47 (53.4)	88	
Others	19 (47.5)	21 (52.5)	40	
Total	138(46.0)	162 (54.0)	300	
Religion				
Hindu	77 (48.4)	82 (51.6)	159	.379
Buddhist	48 (42.5)	65 (57.2)	113	
Others	13 (46.4)	15 (53.6)	28	
Total	138 (46.0)	162 (54.0)	300	
Community status				
Schedule Tribe	42 (41.6)	59 (58.5)	101	.33
Schedule Caste	9 (45.0)	11 (55.0)	20	
O BC	54 (49.5)	55 (50.4)	109	
Others	33 (47.1)	37 (52.9)	70	
Total	138(46.0)	162 (54.0)	300	

Table 27: Results of multivariate analysis with variables that were not significant

Variables	Odds ratio	95% C I	P value
Sex:			
Male	1		
Female	.91	.528 – 1.59	.763
Occupation:			
Unemployed	1		
Employed	1.83	.895 – 3.77	.097
Businessman	1.45	.675 – 3.117	.340
Others	1.74	.705 – 4.33	.227
Religion:			
Hindu	1		
Buddhist	1.03	.323 – 3.31	.956
Others	.78	.298 – 2.05	.620
Community Status:			
Schedule tribe	1		
Schedule caste	1.28	.334 – 4.90	.719
Other backward classes	1.31	.372 – 4.66	.669
Others	1.64	.500 – 5.43	.412
Age group:			
<30 years	1		
30 to 39 years	.591	.312 – 1.11	.106
>= 40	.543	.259 – 1.13	.104
Income:			
<700	1		
700 to 1100	.86	.468 – 1.60	.65
>1100	1.53	.866 – 2.73	.14

4.4 Results of In-depth interviews:

A qualitative study of the donors at Central Blood Bank, STNM Hospital, Gangtok was conducted to complement the information gathered from the quantitative study.

In-depth interview of ten donors were taken. All the donors were men and their age group was between 18 to 49 years. As for their education qualifications, three of them were graduates and employed, four of them had completed secondary school while two of them had education less than primary school, one of them was a farmer, and one was a Buddhist monk. Four of the donors were Hindus, five of them were Buddhists and one was a Christian. The main objective of this study was to assess the knowledge and attitude towards blood donation among these donors.

4.4.1 Knowledge about Blood donation:

It was found in the study that all the ten donors were donating blood for a relative or a friend. Majority expressed their readiness to donate blood for the family members because they think that as assisting the relatives. None of them had come voluntarily nor ever donated voluntarily. Two of the donors had donated more than four times; three were second time and rests five were donating for the first time.

Majority of the donors knew about different blood groups except blood group AB, as most of them were not sure about it. Two of the donors with education level less than primary school had no knowledge about different blood groups. They thought that all people have same kind of blood that was why blood bank accepts blood from any donor. Out of the ten donors only four of them who had donated more than twice knew that blood would be donated after an interval of four to six months and they also knew how much blood is taken at a time, others had no idea and the reason they gave was that they never tried to find out as they are too scared see during the blood collection.

When the donors were asked about deferral criteria only few of them knew some conditions like a weak, sick, or a diseased person and drugs abusers could not donate blood. Eighty percent of the donor had the knowledge that some diseases could be transmitted through blood. The main diseases they knew were HIV/AIDS and Hepatitis They also thought that diseases like Tuberculosis and Cancers are also transmitted through blood. Twenty percent had no idea about these infections. Forty percent knew that testing the blood before blood transfusion could prevent these diseases.

The donors had good knowledge about conditions where blood transfusion is required. Most of these donations were for bleeding cases due to accident, deliveries and operations and for anemia.

4.4.2 Attitude towards blood donation:

Among the ten donors interviewed, seventy percent of them had a positive attitude towards blood donation. Each one of them said that they were very scared of the painful procedure before donation but the feeling was different after the donation. Most of the participants agreed that blood donation is a good practice. The reason they revealed was that blood donation affects the health of the donor positively. They thought that the “old and impure” blood was out from their body and the new blood, will make them healthy. The other reason was that by blood donation one was involved in saving lives. Rest of the thirty percent had a negative attitude towards blood donation. They were donating for the first time and they told that it is not that they are scared to donate but they would donate only for a known person or somebody in need of blood transfusion. May be they had come to donate for their relative under pressure which was not revealed though at the time of the interview. When asked whom they would be advising to donate after going back, all of them told that they would advise their friends and relative and those

who would listen to them. One among them said that he would tell only the boys because according to him, girls are weak and always have lot of problems.

4.4.3 Future expectations:

The donors were asked about people's cooperation towards voluntary blood donation and all were of opinion that only fifty percent of the public might cooperate. The reason they gave was that all people do not know much about blood donation and it also depends upon person to person. Some of them said that those who understand the misery of the other people might cooperate. But all were of the opinions that if we educate people about the importance of blood donation they will definitely cooperate. All suggested that village people must be educated; one of them gave the reason that you get "pure blood" among the village people because the city people are becoming more and more drugs users and their blood is infected with many diseases. Some suggested for monetary incentive for the village people as they have financial problem to come to a blood bank to donate.

The over all belief was that if there was a voluntary flow of blood in the future, many problems would be solved for both - the patients as well as the doctors. The patient can be treated in time and many lives could be saved.

CHAPTER 5

Discussions and Conclusion

5.1 Discussions:

It was found in the present study that more than 90% of the study population had heard about blood donation. This finding is higher than the findings of a study in Thailand where only 80% of the participants (n= 400) knew about blood donation (*31)* and also higher than the study in urban slum of Delhi where only 77.8% of the subjects studied had heard about blood donation. *(40).*

It was found that the main source of information was health provider (46.7%), followed by media (25.3%) and information passed on from the friends (20.7%). The information through media like television and radio could be improved as it was found in a study in Pakistan that media can play a very important role to create awareness among the masses about voluntary blood donation by eliminating the fears and misconceptions about blood donation and conveying its advantages to general public *(41).*

Another important finding of my study was that 68.3 % of the respondents were aware of the fact that blood donation is done at a blood bank; whereas only 1.7 % of them had no idea where blood is donated.

My study also found that 84.7% of the respondents knew that people have different blood groups. More than 80% had knowledge about A, B and O groups but only 66.5% knew about group AB. The knowledge about this rare group is important because individuals aware of the significance of rare blood groups are likely to respond to requests for blood donation to patients with rare groups.

With respect to the knowledge about the importance of blood donation almost all the participants knew at least one condition where blood transfusion is required. One of the important finding of the study was that only 11% knew that blood transfusion could be

required in cases of bleeding during pregnancy and delivery. A study in North Stafford shire, UK also found that 57% of the women (N= 228) were not aware of the possible need for blood transfusion during pregnancy and childbirth (*42*).

As far as knowledge about interval between blood donations, 166 (55.3%) of the respondents knew that person could donate twice a year while 134 (54.7%) had no idea about the frequency of blood donation. This knowledge level is a little better when compared to the findings of a study in Saudi population where 51% (n= 209) answered that one could donate blood only once a year *(43*).

While looking at the knowledge about transfusion-transmitted infections, 83.7% of the respondents had the knowledge that a patient could get infection through blood transfusion. With regards to specific diseases 80% and 74% percent had heard about Hepatitis B and Hepatitis C respectively. 89% had heard about HIV/AIDS, 70 % about malaria. This knowledge about transfusion transmitted infections is much higher than the findings of a study in Trivandum, India which reported that 46% of the study population knew about HIV/AIDS, 45% knew about viral Hepatitis, only 13 percent about malaria. However, knowledge about transfusion transmitted Syphilis was lower in the present study (38.0%) compared to the study in Trivandrum, which reported 55% *(44).*

The results of the in-depth interview of the blood donors also showed that all the participants had a good knowledge about HIV/AIDS and hepatitis though almost all had the misconception that tuberculosis is also transmitted through blood. This was an important finding of the qualitative study. Given the high prevalence of tuberculosis in the Indian population this misconception about tuberculosis, as being a transfusion-transmitted disease has to be eliminated from among the general public.

Regarding the knowledge about prevention of transfusion transmitted infections, 66% indicated that testing the blood before transfusion could prevent the infections. The other

important finding of the study was that 4.7% of the respondents were aware that one could prevent these infections by proper donor selection. Even during the in-depth interview, the participants were of the opinion that blood should be collected from only those who are fit and healthy. All the ten participants of the in-depth interview were replacement donors. The majority of the participants expressed their readiness to donate blood for the family members because they think that as assisting the relatives. None of the respondents of the qualitative study had ever donated blood voluntarily. A study in Pakistan found that there is a high rate of Hepatitis B, Hepatitis C and HIV in replacement or hidden paid donors. This was despite the high deferral rate of donors on history and medical examination and strict observation of donor selection criteria. The prevalence of transfusion-transmitted infections was much lower in voluntary non-remunerated blood donors as compared to replacement donors (*41*). These findings indicate that replacement donors must be educated and motivated for voluntary blood donation.

The over all finding of the present study regarding knowledge about blood donation was that 46 % of the respondents had high knowledge score. 22% percent had moderate knowledge score and 32% of the respondents were found to have poor knowledge score about blood donation and its importance.

There was no statistically significant association of knowledge about blood donation with socio demographic indicators like age, sex, religion, and community status and percapita monthly income. Similar findings were observed in a study in Thailand *(31*). However, in the present study a significant association was found between occupation and knowledge level of the respondents (p value <0.001) as well as between education and knowledge of the respondents (p value <0.001). It was found that the percentage of

respondents with high knowledge score was more among the office goers. Illiterate group was found to have the least knowledge score (0%). Those who are educated more than secondary and senior secondary was found to have a higher level of knowledge score. It was found that there is increase in level of knowledge score with increase in level of education. It is likely that the better educated are more likely to read about blood needs and to understand them better.

The association between knowledge about blood donation and occupation as well education that was found to be significant in bivariate analysis was also found to be significant in multivariate analysis. Compared to the unemployed group the employed group was found to have more knowledge about blood donation. (Odds ratio 2.49; 95%CI 1.16 – 5.36, p- .019). Similarly, the knowledge level was found to be more among the better educated than the lesser educated (Odds ratio 1.69; 95%CI 1.33 –2.15, $p<0.001$).

About 78.7% of the respondents in the present study felt that people donate blood to save a friend or a relative; 15% responded that people donate blood to get healthy; 3.7% responded that they do it to get some free investigations done for diseases like HIV/AIDS and Hepatitis and 2.7% responded that they donate for money.

It was also observed in the in-depth interview that the majority of the participants agreed that blood donation is a good practice. The reason they revealed was that blood donation affects the health of the donor positively. They thought that after donation the old and impure blood in their body gets replaced by new blood, which will make them healthier. The other reason they spelt out was that by blood donation one was involved in saving lives, which is a noble act by many.

Out of the total 300 participants, 12.7% had donated blood. These donors were mostly educated, employed, married and from higher income group. The results of a study in

Thailand showed that 11% of the participants (n =400) had ever donated blood voluntarily *(31).* The results of another study in Bangladesh showed that 16% of the respondents (n = 200) had actually ever donated blood voluntarily *(32).* A study in Delhi urban slum reported that 7.7% of the participants (n =434) had been ever donors *(40).*

As for the attitude, 46% of the respondents had positive attitude towards voluntary blood donation. The respondents who showed positive attitude had their reasons for donating blood. 66% said that it was a duty of an individual to the community; 26% said that donating blood was a charitable contribution and only 7.98% said that they would donate blood because of a sense of moral obligation.

Those who were not in favor of blood donation also had many reasons for their reluctance. 50% gave health problems as their main reason; 25.26% indicated fear of painful procedure, 15.78% believed that blood donation will make them weak and harm them physically and 7.36% indicated inconvenience and lack of time as their reasons for reluctance to donate blood. More than 50% indicated health problem as their reason for non-donation. The real question is whether these are actual beliefs or excuses for not donating. Similar reasons were found in Australia in a study among the college students. The reluctance was mostly due to fear, possible illness and inconvenience of giving blood *(45).* Another study in Mexico also found that non-donation was mainly due to the fear of getting dizzy at the site of blood *(46*).

A study in Lagos Nigeria also found that 47% were afraid to donate because of the possible side effects like weight loss, sexual failure, high blood pressure, sudden death and convulsions. It was also found in the same study that 41% had preferred certificate as an incentive, 13.65% preferred money and 2.58% would donate for nothing (*47*). Comparatively, in the present study 49% of the participants showed willingness to donate blood for a future assurance of free blood for the donor or his direct family, while

20.3% preferred some kind of non-monetary benefit in the form of certificates of recognition or time off from the office; only 4.3% preferred some monetary benefit and 25.3% did not want anything. This finding indicates that an incentive can be used in enhancing the effectiveness of blood donation campaigns. A study in Baltimore also found that the donors would be encouraged to donate if specific incentives were offered. The highest response was for future blood credits and medical testing *(48*). Another study in Texas also concluded that individuals donate in order to reduce medical risks and that earning future blood credits would be a primary motivator (*49*). A study amongst the adults in Mwanza Region, Tanzania also noted a positive attitude towards voluntary blood donation but majority of the people will do so only for an incentive *(50).*

The attitude towards voluntary blood donation was found to have significant association with education (P value <0.001) and per-capita monthly income (p value .042) in the bivariate analysis. The current results are in agreement with one study in United States where it was found that educational level and family income are both strong indicators of the probability of someone's donating blood. As percapita income or level of education increases, so does the percent of blood donors in the population *(51*).

The attitude towards voluntary blood donation was also found to be significantly associated with education in the multivariate analysis. (Odds ratio 1.54; 95%CI 1.24 – 1.92, p <0.001). It was found that odds of having a positive attitude towards voluntary blood donation is 1.5 times more in those with better educational levels then those with lesser educational levels. It was also found in bivariate analysis that there is a significant association between knowledge score and attitude towards voluntary blood donation (P value <0.001). It was found that the respondents with higher knowledge score have more positive attitude than the respondents with poor knowledge score. The positive attitude was 30.2% with a low knowledge score, 42.4% with moderate knowledge score and

58.7% with high knowledge score. There is increase in trend of positive attitude with increase in knowledge level. The observations suggest that knowledge about blood donation is found to play an important role on an individuals' attitude.

5.2 Conclusion:

The objective of the study was to assess in the general population of Gangtok, the capital of Sikkim, the knowledge, and attitude towards blood donation. The subjects were 300 adults comprising of 75% men and 25% women.

The overall finding of the study regarding knowledge about blood donation was that 46% had a high knowledge score. Knowledge about blood donation was found to be significantly associated with factors such as education and occupation was also found to be significantly associated in multivariate analysis The attitude towards voluntary blood donation that was found significantly associated with factors like education and percapita monthly income. Only education was found to be statistically significant in multivariate analysis.

It was also found in bivariate analysis that there is a significant association between knowledge score and attitude towards voluntary blood donation ($P < 0.001$). It was found that as the level of knowledge increases there is increase in positive attitude towards blood donation. The findings of the study indicate that attitude towards voluntary blood donation can be influenced to a large extent by knowledge about blood donation.

The important factors responsible for the negative attitude are certain beliefs and mistaken ideas that donating blood will cause people weak and harm them physically. Lack of incentive for the blood donors was another reason for reluctance for blood donation. Almost 50% of the respondents showed willingness to donate blood for future

assurance of blood and other non-monetary incentive suggesting that an incentive can be used to enhance the effectiveness of voluntary blood donation program in Sikkim.

5.3 Recommendations:

According to data from Central Blood Bank, Sir Thutop Namgyal Memorial Hospital, Gangtok for the year 2002, the total collection of blood is 1273 units while the demand is about 1500 units yearly. This data reveals that there is a blood deficit of more than 200 units (15%) yearly indicating that there is a need for improving voluntary blood donation system in the state.

Given the findings in the present study, the following recommendations are made: -

1 Health education:

Health education system needs to improve knowledge about blood donation among the people with lesser educational level. It could be done by means of improving educational tools preferably based on audiovisual techniques. The system should create wider awareness about the importance of voluntary blood donation and encourage more people to become regular donors.

2 Removal of myths and misconceptions:

The information education and communication system must have some productive advertisements to motivate the general public for voluntary blood donation. The advertisements need to address the fear factor, which is of great concern to all the blood donors. It also must focus on clearing the myths and misconceptions about blood donations and keep the people well informed about the importance of saving life through blood donation.

3 <u>Provision of incentives</u>:

The general public must be encouraged and motivated to donate blood. There should be provision of incentives like future assurance of free blood for the donor or his direct family. A blood insurance scheme may be started. A non-monetary incentive in the form of certificates of recognition may also be another motivating factor to improve voluntary blood donation.

4 <u>Provision of better facilities</u>:

Provision of better facilities in a blood bank, spreading awareness about the advantages of blood donation not only for the recipient but also for the donor himself could be a motivating factor. Making people aware of recent findings, like frequent and long-term blood donation is associated with a lower risk of cardiovascular events in men could motivate the men population to be regular donors.

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Annexure

Knowledge and Attitude towards Blood Donation among the General Population in Gangtok, East Sikkim

Achuta Menon Centre for Health Science Studies.

Sree Chitra Tirunal Institute for Medical Sciences and Technology,
Thiruvananthapuram. 695011.

All information obtained from this interview will remain confidential and will be used for research purposes only. Individual information will not be disclosed under any circumstances.

Principal Investigator

Data Collection Tool (Interview Schedule)

Date of survey: | | | |

ID No. |

House No: |

Name----------

Address----------

PART ONE

Demographic and Socio-economic Data.

1. Age in completed years. |
2. Sex: (Male -1, Female -2) |

3. Marital status: (Married -1, Unmarried -2, Divorce -3, |

   Others -4 (Specify ----------)

4. Occupation: (Unemployed -1, Office goers -2, Businessmen -3, |

   Others -5. (Specify ----------)

5. Religion: (Hindu – 1, Buddhist -2, Christian –3
Others – 4 (Specify ----------)

6. Community status: To which group of people you belong to?

(Schedule tribe - 1, Schedule caste -2,

Other backward classes -3, Others – 4 (Specify ----------)

7. Literacy Status.

Illiterate (1)
Primary school completed. (2)
Junior school completed. (3)
Secondary school completed. (4)
Higher secondary and above. (5)

8. Household expenditure of previous month.

9. Total member in the household**.**

PART II

<u>Knowledge about Blood Donation</u>

1. Have you heard about blood donation? (Yes =1, No =2)

2. If yes, from where did you come to know about blood donation?
Health provider. (1)
Friend. (2)
Media (TV, Radio, News Paper) (3)
All. (4)
Any other (Specify) ---------- (5)

3. Where is blood donated?
Blood bank. (1)
Any hospital. (2)
Blood donation camps. (3)
Don't know. (4)
Any other place (Specify) ---------- (5)

4. Do all people have same type of blood? (Yes =1, No =2, don't know =3) ☐

5. Do you know that there different are blood group like: -
(Yes =1, No =2, Don't Know =3)

1. Blood group A	Yes	No	Don't know
2. Blood group B	Yes	No	Don't know
3. Blood groupAB	Yes	No	Don't know
4. Blood group O	Yes	No	Don't know

6. Which is the most common blood group of all? ☐
(A group =1, B group =2, AB group =3, O group =4, don't know =5.)

7. Which is the uncommon blood group of all? ☐
(A Group =1, B group = 2, AB group = 3, O group = 4, don't know = 5)

8. Can a patient receive blood of any group? ☐
(Yes = 1, No = 2, don't know =3)

9. What are the conditions where blood transfusion is required? ☐
Accidents and burns. (1)
Bleeding during pregnancy and delivery (2)
Major Surgical operations. (3)
Cancers. (4)
Severe Anemia. (5)
All. (6)

10. What is the minimum interval required between two-blood donations? ☐
One month. (1)
4-6 months (2)
One year. (3)
Do not know. (4)
Any other (Specify) ---------- (5)

11. Do you know that a patient could get diseases when he/she is receiving blood? ☐
(Yes =1, No =2, don't know =3)

12. Have you heard about the diseases like: -
(Yes= 1; No=2' don't know = 3)

Hepatitis B	Yes	No	Don't know
Hepatitis C	Yes	No	Don't know
HIV/AIDS	Yes	No	Don't know
Malaria	Yes	No	Don't know
Syphilis	Yes	No	Don't know
Any other (Specify)			

13. How can we prevent transmission of a disease through blood transfusion? ☐

Screening test = (1)
Safe technique = (2)
Both 1 &2 = (3)
Proper donor selection= (4)
Don't know = (5)

PART III

Attitude towards Blood Donation;

14. Why do people donate blood? ☐

To save a friend or relative. (1)

Donating blood is good for health. (2)

To get some money (3)

To get some free investigation done example for HIV/AIDS and Hepatitis. (4)

Any other (Specify) ---------- (5)

15. Have you ever donated blood? (Yes = 1, No = 2) ☐

16. Will you donate blood voluntarily? (Yes =1, No =2) ☐

17. If no, Why? ☐

Due to fear of the painful procedure. (1)

Feel that blood donation will harm me physically. (2)

Due to health problems. (3)

Have no time. (4)

Any other (Specify) ---------- (5)

18.If yes, Why? ☐

Motivated by a sense of moral obligation. (1)

Feel it as a responsibility to the community. (2)

It is like making a charitable contribution. (3)

Any other (specify) ---------- (4)

19. In which of the following conditions or choices will you donate blood? ☐

For monetary benefit. (1)

Non-monetary incentive. (2)

An assurance of free blood for yourself or your family member in the future. (3)

Do not want anything. (4)

Any other (Specify) ---------- (5)

20. What are your suggestions to improve voluntary blood donation in our state? ☐

Compulsory donation once a year by those who are fit. (1)

A good awareness program for the general public in the state. (2)

Provision of incentive for all voluntary blood donors. (3)

Any other. (Specify) ---------- (4)

Thank you

Place ----------

Date ---------- Signature of the investigator.