Donor Care Service for deferred donors due to Anemia or Low Hemoglobin in National Blood Center, Thai Red Cross Society

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การบริการสำหรับผู้บริจาคเลือดที่เป็นโรคโลหิตจางหรือเม็ดเลือดแดงน้อยของศูนย์บริการโลหิต สภากาชาดไทย กรุงเทพมหานคร ประเทศไทย

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วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาสาธารณสุขศาสตรมหาบัณฑิต

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Thesis Title	DONOR CARE SERVICE FOR DEFERRED DONORS DUE TO ANEMIA OR LOW HEMOGLOBIN IN NATIONAL BLOOD CENTER, THAI RED CROSS SOCIETY.
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คิม ซอน อิล: การบริการสำหรับผู้บริจาคเลือดที่เป็นโรคโลหิตจางหรือเม็ดเลือดแดงน้อยของศูนย์บริการโลหิต สภากาชาดไทย กรุงเทพมหานคร ประเทศไทย (DONOR CARE SERVICE FOR DEFERRED DONORS DUE TO ANAEMIA IN NATIONAL BLOOD CENTER, THAI RED CROSS SOCIETY) อ.ที่ปรึกษาวิทยานิพนธ์: เอเลสซิโอ แพนซา M.D, M.Com H., DTMH, 107 หน้า

การศึกษาแบบภาคตัดขวางในครั้งนี้มีวัตถุประสงค์เพื่อศึกษาความพึงพอใจที่มีต่อการบริการสำหรับผู้บริจาคเลือดที่เป็นโรคโลหิตจางของศูนย์บริการโลหิตสภากาชาดไทย กรุงเทพมหานคร ประเทศไทย รวมทั้งทดสอบปัจจัยสำคัญที่เกี่ยวข้อง ประชากรที่ศึกษาคือผู้บริจาคเลือดที่เป็นโรคโลหิตจางซึ่งมารับการบริการสำหรับผู้บริจาคโลหิตในห้วงเดือนกุมภาพันธ์ พ.ศ. 2554 ดำเนินการเก็บข้อมูลโดยใช้แบบสอบถามชนิดที่ผู้ตอบกรอกแบบสอบถามเอง ในกลุ่มตัวอย่างจำนวน 382 คน ผลการวิจัยพบว่ากลุ่มตัวอย่างผู้บริจาคเลือดที่เป็นโรคโลหิตจางส่วนใหญ่เป็นเพศหญิง (87.2%) มากกว่าชาย อายุระหว่าง 25-44 ปี (61.5%) สถานภาพโสด ระดับการศึกษาปริญญาตรี (58.4%) โดยส่วนใหญ่อยู่ในกลุ่มอาชีพพนักงานเอกชนและธุรกิจส่วนตัว (41.1%) มีรายได้สูงกว่า 30,000 บาทต่อเดือน (22%) กลุ่มตัวอย่างส่วนใหญ่มารับการบริการสำหรับผู้บริจาคเลือดเป็นครั้งแรก (83%) และมีความพึงพอใจต่อการบริการอยู่ในระดับสูง 76.4% กลุ่มตัวอย่างเกือบทั้งหมดมีการรับรู้เชิงบวกเกี่ยวกับการบริการ (97.9%) และการเข้าถึงบริการ (95.8%) ประเด็นที่พบว่ามีความพึงพอใจน้อยได้แก่ พื้นที่ของห้องที่ให้บริการ การรู้จักบริการมาก่อน ระยะทางในการเดินทางมารับบริการ และค่าใช้จ่ายในการมารับบริการ ปัจจัยที่มีผลต่อความพึงพอใจ ที่ระดับนัยยะสำคัญ 0.05 ได้แก่ อาชีพ การรับรู้เกี่ยวกับการเข้าถึงบริการ และความพึงพอใจต่อบริการอื่นๆ ของศูนย์บริการโลหิต จากผลการศึกษา ผู้วิจัยมีข้อเสนอแนะในการพัฒนาบริการดังกล่าวให้ดียิ่งขึ้นต่อไป เนื่องจากเป็นการบริการที่มีความสำคัญต่อการดำรงไว้ซึ่งจำนวนผู้บริจาคโลหิต นอกจากนี้ยังมีความจำเป็นต้องประเมินความเป็นไปได้ในการขยายบริการไปสู่การดูแลผู้บริจาคปกติเพื่อป้องกันการเกิดโรคโลหิตจางและผลกระทบสุขภาพอื่นๆ

คำสำคัญ: โลหิตจาง/ การบริการดูแลผู้บริจาคเลือด/ ความพึงพอใจ/ การรับรู้/ การเข้าถึงบริการ

สาขาวิชา: สาธารณสุขศาสตร์ ลายมือชื่อนิสิต _____

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This cross sectional study was conducted with the aim of identifying the satisfaction of anemic donor care service in National Blood Center, Thai Red Cross Society and its related factors. Data based on a self-administered questionnaire was collected from 382 deferred donors due to anemia who received the blood donor care service from 1st February to 4th March. The result showed anemia was more prevalent among female group (87.2%) than male group and most affected age group among female and male was from 25-44 (61.5%). Most of the respondents had visited the donor care service for the first time (83%). The study revealed that 76.4% of the respondents expressed “high satisfaction” with the service. Almost all of the respondents showed positive perception about the donor care service and accessibility, at the rate of 97.9% and 95.8% respectively. Less satisfied items were mainly related to “space of service room”, “prior knowledge about the service”, “distance to reach the service” and “cost to reach the service”. Chi-square and logistic regression analysis revealed that age, employment state, perception about service effectiveness and perception, satisfaction with other services in NBC were associated with satisfaction with the donor care service. The age group between 25-44 years was more likely to satisfy with donor care service than the other two age groups; < 25 years and > 44 years ($p=0.045$). The service clients who had jobs were more likely to satisfy with donor care service than those who were student or did not have jobs ($p=0.012$). The factors significantly related to the satisfaction were perception about the accessibility and satisfaction with other services of NBC ($p<0.05$). Based on the finding of this study, it is recommended to develop the service further as an essential part of national blood donor retention program and explore possibility to expand the service in the way of protecting and expanding current pool of potential blood donors who are deferred due to anemia or other conditions.

Field Study : Public Health Student’s Signature .....

Academic Year : 2010 Advisor’s Signature .....

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INTRODUCTION

1.1 Background and Rationale

1.1.1 General Information

Blood is usually called “a gift of life” as it saves millions of people from death but it cannot be synthesized or made artificially like all other medical or pharmaceutical products. Human beings are the only source of this life-saving product. But a shortage of safe blood in several developing countries often leads to unnecessary deaths or ill-health (Plianbangchang, 2008).

The requirement of blood and blood products in a country depends on the population, health care structure, prevalence of conditions requiring regular transfusions, such as hemophilia and thalassaemia, availability of surgical centers using modern sophisticated techniques, and awareness amongst clinicians regarding judicious use of blood (World Health Organization, 1998). The need for blood varies from 7-15 units per acute bed per year depending on the type of medical care available. In a primary health care unit, the need is estimated at 5-7 units/bed/year whereas in a specialized institution the need may be 25-30 units/bed/year. (World Health Organization South East Asia Regional Office, 2006)

It is recommended that 1% to 3% of the population donate blood to meet a country's needs. While the need for blood is universal, there is a major imbalance between developing and developed countries in the level of access to safe blood (World Health Organization, June 2008)

Facing the challenge of dwarfing stock of blood, the blood transfusion community across the world has expedited the process of invention of

artificial blood and blood substitutes. The main purpose of artificial blood is to act as normal blood in the body, providing a long term solution to blood loss or distortion, while a blood substitute is to provide temporary support to the circulatory system when necessary. However, currently no real working source of artificial blood or blood substitutes exist that can perform the multifarious tasks of real human blood cells (Goorha et al., 2003).

Therefore the only source of blood is still the human being and quantity of blood units is dependent on the number of blood donors each country recruits and retains through its well-functioning blood donor retention program (Barkworth et al 2002).

1.1.2 Situational analysis

Around 25% of maternal deaths each year are attributable to obstetric hemorrhage, for treatment of which blood transfusion is invariably required (WHO, UNICEF, and UNFPA, 2004). In children under the age of five who are anemic, often as a result of malaria or malnutrition, transfusion support may be necessary in the management of severe life-threatening anemia. In the 5- to 29 year age group, road traffic injuries rank second as cause of death and are a leading cause of morbidity for both sexes; intensive use of transfusions is frequently needed in the management of trauma (World Health Organization, 2002).

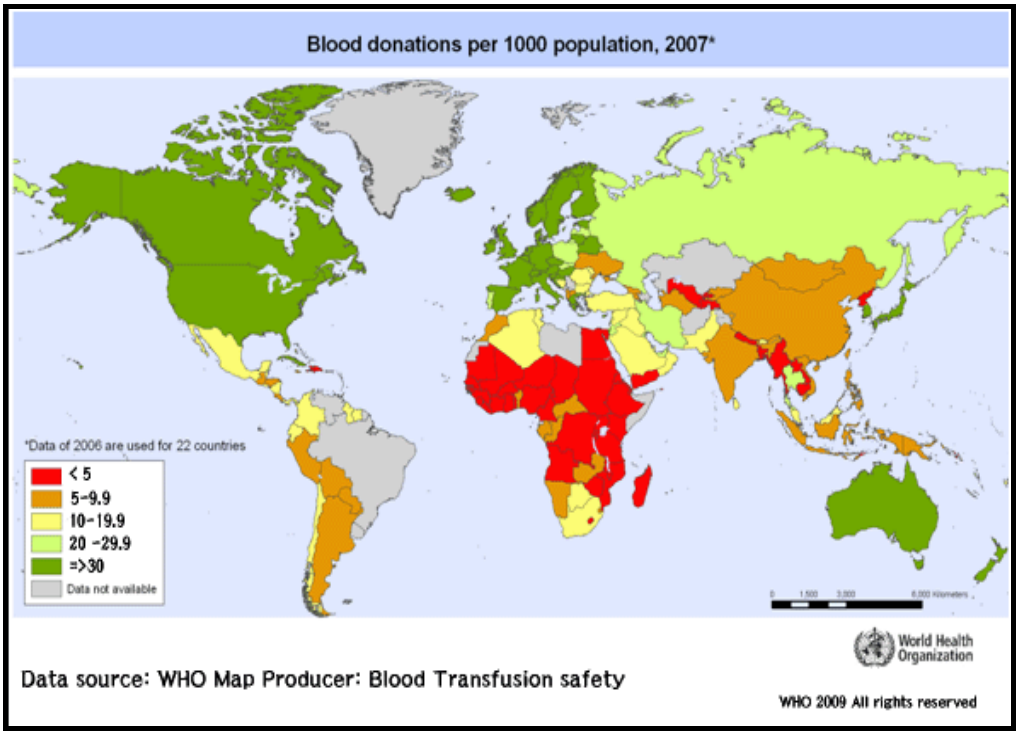
Globally, more than 81 million units of whole blood are collected annually.

In 2006, 150 countries provided data to WHO on 69 million units of blood collected. The data came from countries that account for a total of 5 billion people. Of these 69 million units, less than 30 million units (or 45%) were collected in developing and transitional countries, which are home to about 80% of the world's population.

Of the 73 countries that had donation rates of less than 1% (fewer than 10 donations per 1000 people), 70 were either developing or

transitional countries. The average blood donation rate is three times higher in transitional countries and 10 times higher in developed countries than in developing countries (World Health Organization, June 2008)

Figure 1: global map showing blood donation rate per 1000 population.



The need for blood was raised by the advance in medical and surgical techniques, the medical complexities associated with the ageing population and the increased occurrence of violence and trauma (Ibrahim and Mobley, 1993). According to Barworth's observation, blood is needed not only in emergency situation like a war or natural disaster but also for routine operations, such as heart bypasses, and medical treatments, with highlight on leukemia patients who need to use up to 700 donations over the course of their treatment (Barkworth, Hibbert, Horne, and Tagg, 2002).

Demand for blood is upsoared in accordance with the key role of blood transfusion in the management of such conditions as hematological

disorders (including hemophilia, thalassaemia), cancer chemotherapy, open heart surgery, and bone marrow and organ transplantation (World Health Organization, 2005).

In the South East Asia Region, home to almost one-third of the world population, blood collection is only 7 million units which amount to 9% of global collection. This represents a shortfall of 8 million units in the estimated annual blood requirement for the SEA Region. This accounts to 50% of need still unmet in the region (World Health Organization South East Asia Regional Office and Kumari, 2001).

As seen in the figure 1, most of the countries in the region are marked in red which are categorized as less than 1% donation rate against population and this culminates the regional effort to intensify the activities to increase number of donors and retain repeated donors(Bharucha, 2005).

1.1.3 Rationale

Many studies were taken place to identify the reasons for lowered donation rate, in which deferral due to low hemoglobin or anemia is accounted as most prominent factor of reducing donation rate.

Around 6.93 million prospective donors were deferred prior to blood collection in 97 countries and the causes of these deferrals included anemia, existing medical conditions and risk behaviors for transmissible infections (World Health Organization, June 2008).

Deferral due to anemia falls under category of deferral for donor safety, not for recipient safety. A retrospective study was undertaken for the period of 2001-2006 in American Red Cross Blood Services where approximately 45% of blood need of the USA is covered and had revealed the number of donors temporarily deferred for donor safety was 4,389,977 which accounts to 71.9% of total number of deferred donors. Low hemoglobin, high/low blood pressure and

abnormal pulse rate is responsible for the temporary deferral for donor safety (Zou et al., 2008).

Another study was done to assess iron status among first time voluntary unpaid donors who passed the clinical interview for selecting new blood donors in the blood bank, Haukeland University Hospital, Bergen, Norway and produced result that 25% of them were not able to be accepted in 2006 for failing to meet the Hgb criteria, predominantly amongst young women (Røsvik, Hervig, Wentzel-Larsen, and Ulvik, 2009).

The same example could be observed through study of deferred donor-data in NBC/TRCS, Bangkok, in which around 209,849 volunteers were rejected from donation for mere reason of low hemoglobin during the period of 2004-2010 and the proportion of this kind of deferred donors amounts to 40.42% in average against total deferred donors due to the rest 19 deferral criteria (National Blood Center, n.d). The data also supports the assertion that frequency of blood donation is correlated with low-hemoglobin. Though further meticulous analysis is needed to make conclusion, apparently the deferred number of regular donors due to anemia is 3.6 times higher than that of first time donors.

The study results above give us an impulse that, unless adequate action or intervention is taken or implemented to bring Hgb level of all these deferred donors due to low hemoglobin back to normality, a significant number of donors would be lost and stringency in blood supply would suffer the field of public health continually.

To our best knowledge, many studies have focused on identification of negative factors of reduction of donation and contributing factors to deferrals in connection with donor life style and behavior and satisfaction towards overall donation service, in the effort to feed appropriate data to improve the existing retention program and donation system. However, few study was observed to measure intervention to protect our valuable donors from being deferred for

mere avoidable conditions such as low Hgb or anemia and put out optional interventions that blood collection agencies should consider and adopt to its specific setting for implementation.

It is therefore worthwhile to look into the donor care service, being rendered by the National Blood Center/Thai Red Cross Society, where both prospective (first time donor) and regular donors are taken good care by medical staff to recover their Hgb back to normal level, irrespective of donation history. This service is differentiated from the conventional care of donor in other countries where donors are put under medical surveillance for one week or so after donation until it is assured that no adverse effect of donation would occur, in the effort to prevent them from post donation medical symptoms such as vasovagal reaction, thus leading them to feel satisfied and secured for next return. In this sense, the donor care service available in Siriraj hospital is typical for conventional care as it is said to provide the service in the form of information to donor of lab screening results and medical consultation for donation reaction after donation (Permpikul and Bejrachandra, 2010)

1.2 Research Questions

The following research questions are formulated for this study:

1. What is the level of satisfaction among deferred cases due to anemia towards donor care service in the National Blood Center?
2. What are the factors related with donor's satisfaction?
3. What is the estimated recovery rate among deferred cases due to low hemoglobin after this service?
4. What is the relationship between the level of satisfaction and perceived quality of the service?
5. What are the potential service components to be added to or strengthened in the current service for maximum outcome from perspective of service users?

1.3 Research Objectives

1.3.1 General Objective

To assess satisfaction of blood donor care service among donors deferred due to low hemoglobin or anemia and provide appropriate recommendations to maximize the effect of service to enable deferred donors to donate blood and to contribute to national blood donor retention program.

1.3.2 Specific Objectives

- To assess the percentages of deferrals due to low-hemoglobin during 1st February – 4th March 2011.
- To assess the socio-demographic characteristics of deferred donors and compare them with satisfaction level of donor care service.
- To evaluate contributing level of perception about effectiveness of the service to satisfaction of the clients and return to blood donation after recovery to normality of haemoglobin (Hgb) by deferred donors.
- To identify further suggestive components of service which are thought to be essential to cover, for maximum effect of the service.
- To evaluate the intention of return for donation after recovery through the service

1.4 Research Hypothesis

- There is a relationship between socio-demographic characteristic of deferred donors and satisfaction to the donor care service
- There is positive relationship between the donation status and satisfaction to donor care service

- There is relationship between the satisfaction of other services of NBC and satisfaction of the donor care service
- There is association between perception about the quality of service and accessibility with satisfaction
- There is positive relationship between change in Hgb level during service and satisfaction

1.5 Conceptual framework

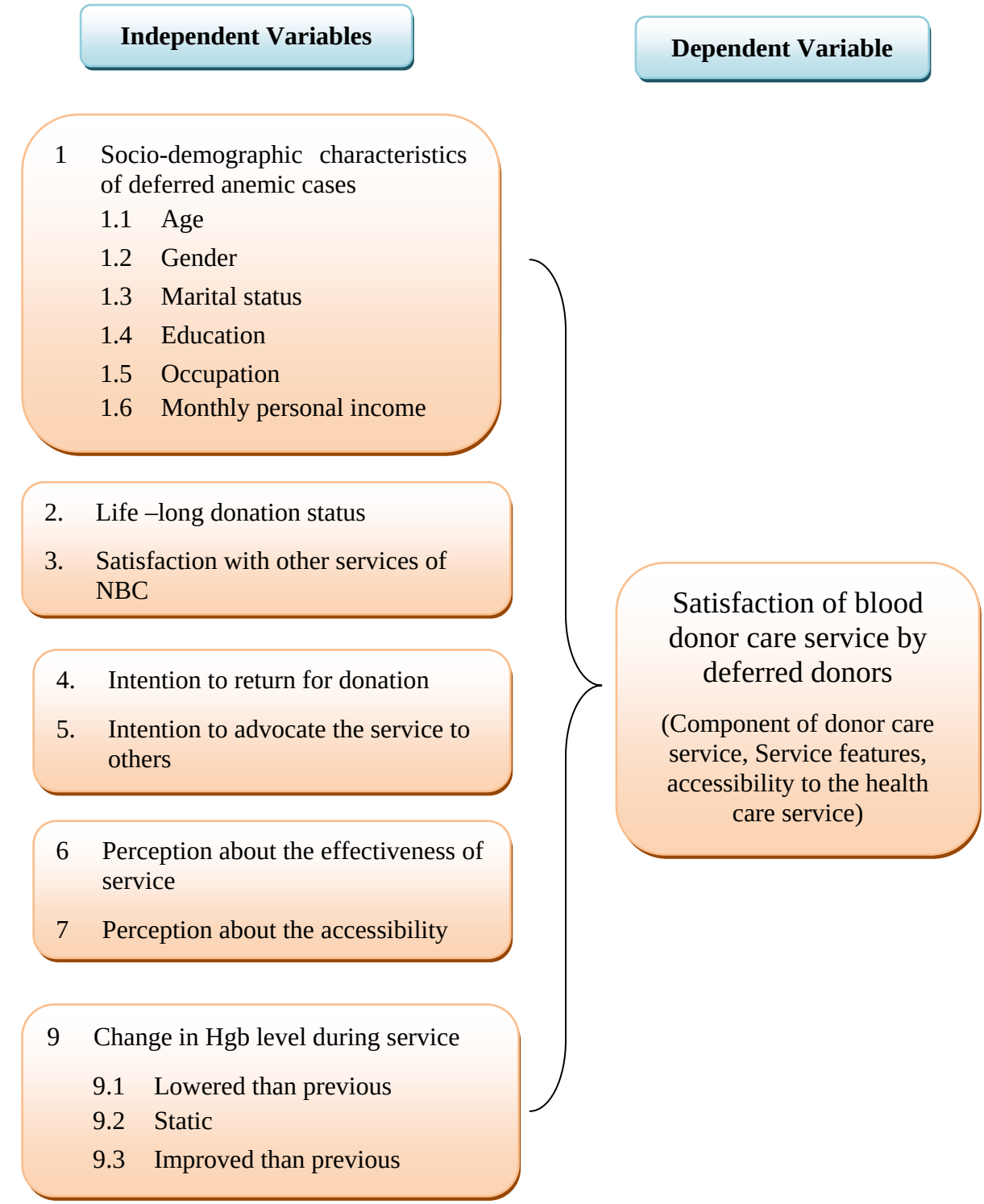


Figure 2: Conceptual framework

1.6 Operational Definitions

Accessibility: It refers to the possibility of the client to obtain services they need, relevant to the distance and time such as travelling to the hospital and waiting time and cost of care to get treatment

Anemia: a decrease in number of red blood cells (RBCs) or less than the normal quantity of hemoglobin in the blood.

Blood Donor: a person in normal health with good medical history who voluntarily gives blood or plasma for therapeutic use

Cost of care: it is defined as total costs (direct and indirect costs without distinction). Direct costs are those for drug, medical counseling and lab test. Indirect costs are traveling expense, out of pocket expenditure (e.g, to buy drinks and food while waiting at OPD)

Deferral: Suspension of the eligibility of an individual to donate blood or blood components, such suspension being either permanent or temporary.

Deferred donor: an individual who was suspended to donate a blood or blood components due to unmet eligibility criteria, such suspension being either permanent or temporary.

Donor with equal or above standard Hgb: those whose Hgb level is recovered to normal enough to allow donation of blood.

Donor with Hgb level lower close to standard: those whose Hgb level goes upward near to the standard level when measured during service period.

Donor with Hgb level much lower than standard: those whose Hgb level gets lowered down from the standard level when measured during service period.

Family/replacement donation: donation given by an individual who gives blood when it is required by a member of the patient's family or community. This may involve a hidden paid donation system in which the donor is paid by the patient's family.

First time anemic case: the donor who is diagnosed as having anemia and thus referred to the donor care service of NBC for the first time, irrespective of times of donation.

First time donor: someone who has never donated either blood or plasma

Hemoglobin (Hgb) : The iron-containing oxygen-transport metalloprotein in the red blood cells. The normal (standard) level of hemoglobin is 12 g/dl for woman and 13 g/dl for man and anyone who has lower than the normal, it is called low-Hgb or anemic donor.

Other services of NBC: the services rendered by NBC other than donor care service eg, registration, screening, blood collection, refreshment, entertainment etc

Paid donation: Donation of blood by an individual in return for money or other form of payment.

Perception about the donor care service – the feeling of the service user usually being taken after the service and it is expressed either positive or negative way with presumable influence over the satisfaction

Physical facilities: general appearance and environment of the place where the service is rendered.

Regular donor: someone who routinely donates their blood or plasma (i.e. within the last two years), in accordance with minimum time intervals in the same donation center.

Repeat donor: someone who has donated before but not within the last two years.

Satisfaction : the degree of client's positive feelings towards the quality of donor care service to meet their expectation that their anemia due to low-hemoglobin would be raised and this is measured in terms of physical environment (facilities), care provider's services (doctors, nurses) , service procedure, accessibility to the donor care service and improvement in Hgb level for donation.

Service procedure: steps or process to be followed by the service client to meet his requirement or need and usually it may be acceptable or not

acceptable, convenient or inconvenient to client to express satisfaction with overall service.

Socio demographic characteristics of deferred anemic case: it consists of general characteristics of donors in terms of age, gender, marital status, education, occupation, monthly family income

Subsequent (follow-up) case: the donor who visits the donor care service more than once to receive follow-up test and subsequent service.

Voluntary non-remunerated donation: donation given by an altruistic donor who gives blood freely and voluntarily without receiving money or any other form of payment

Waiting time: time for one's turn to see a doctor and receive a service

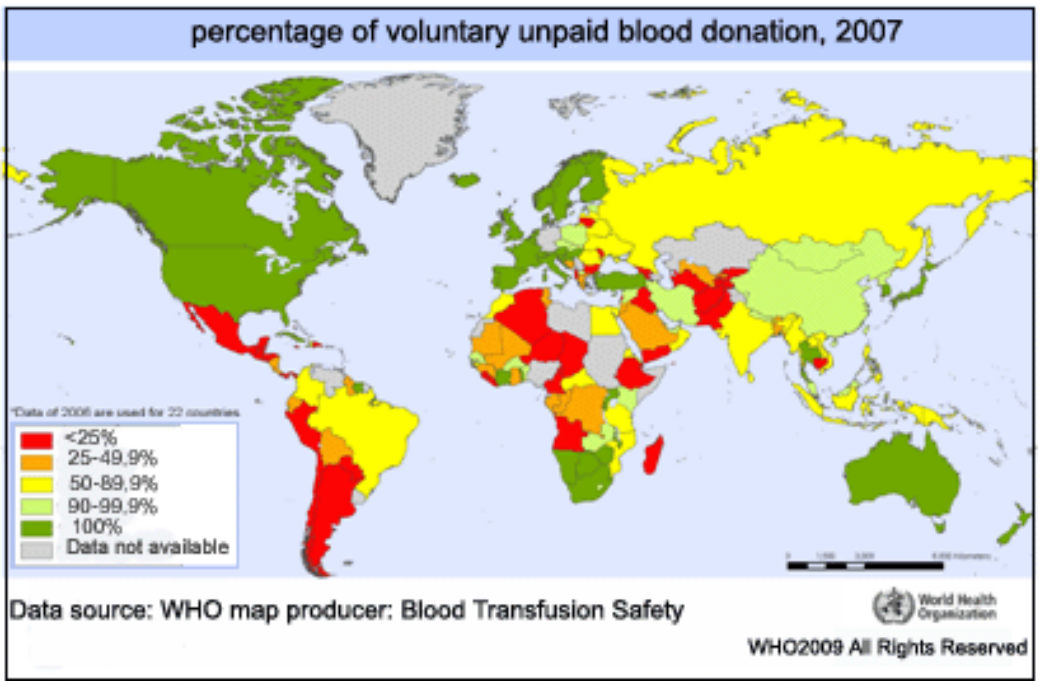
CHAPTER II

LITERATURE REVIEW

2.1 Blood Donation in NBC, Thailand

Thailand is the only country in the region which lies in the range of global standard in donation rate per population as seen in donation rate of 2.6% in 2010 (Soissang Phikulsod, 2010), with 100% voluntary non-remunerated donation as seen in figure 2.

Figure 3: percentage of voluntary unpaid blood donation, 2007



The success is attributable to well-structured and functioning blood collection and donation system in the country along with altruistic and patriotic nature of Thai people who are generous and willing to help people who cannot help themselves. In addition, continued political commitment

and support has enabled the blood transfusion authorities to achieve and sustain the success (Permpikul and Bejrachandra, 2010).

The National Blood Center (NBC) of the Thai Red Cross Society has been assigned by the government to operate the National Blood Program in Thailand since 1966. It has the mission to supply adequate and safe blood to all hospitals. It performs all activities of a blood program including donor recruitment, blood collection, blood screening, blood component processing, blood storage and distribution. The NBC has 6 hospital-based blood banks as its branches in Bangkok and affiliated another12 Regional Blood Centers (RBC) which act as centers for blood donation, laboratory and supply of blood, its components and other plasma products to the provincial hospitals in the catchment regions across the country. There are another 152 hospital-based blood banks in the provinces which perform all activities as the branches in Bangkok, except donor recruitment (Yuvahongs, Sornchaipaisarn, and Rattanachan, 2010). The standard and norms the NBC follows are those from the concerned 5 international organizations working in the area of blood transfusion services such as International Society of Blood Transfusion (ISBT), International Federation of Blood Donor Organization (IFBDO), American Association of Blood Banks (AABB), Council of Europe (COE) and International Plasma Fractionation Association (IPFA). (Soissang Phikulsod, 2010).

The criteria for donor selection at the national blood center, Thai Red Cross society are as below:

1. Age between 17-60 years old (donors of ≥ 60-70 years old are requested to undergo such additional testing as CBC (complete blood count), SF(serum ferritin), BC(blood chemistry) and ECG(electro-cardiograph)

2. Body Weight no less than 45kg (350ml for 45 – 49 kg & 450ml for ≥50kg)

3. Slept at least 6 hours the night before donation

4. Hemoglobin content

   Male – ≥ 13g/dl
   Female – ≥ 12g/dl

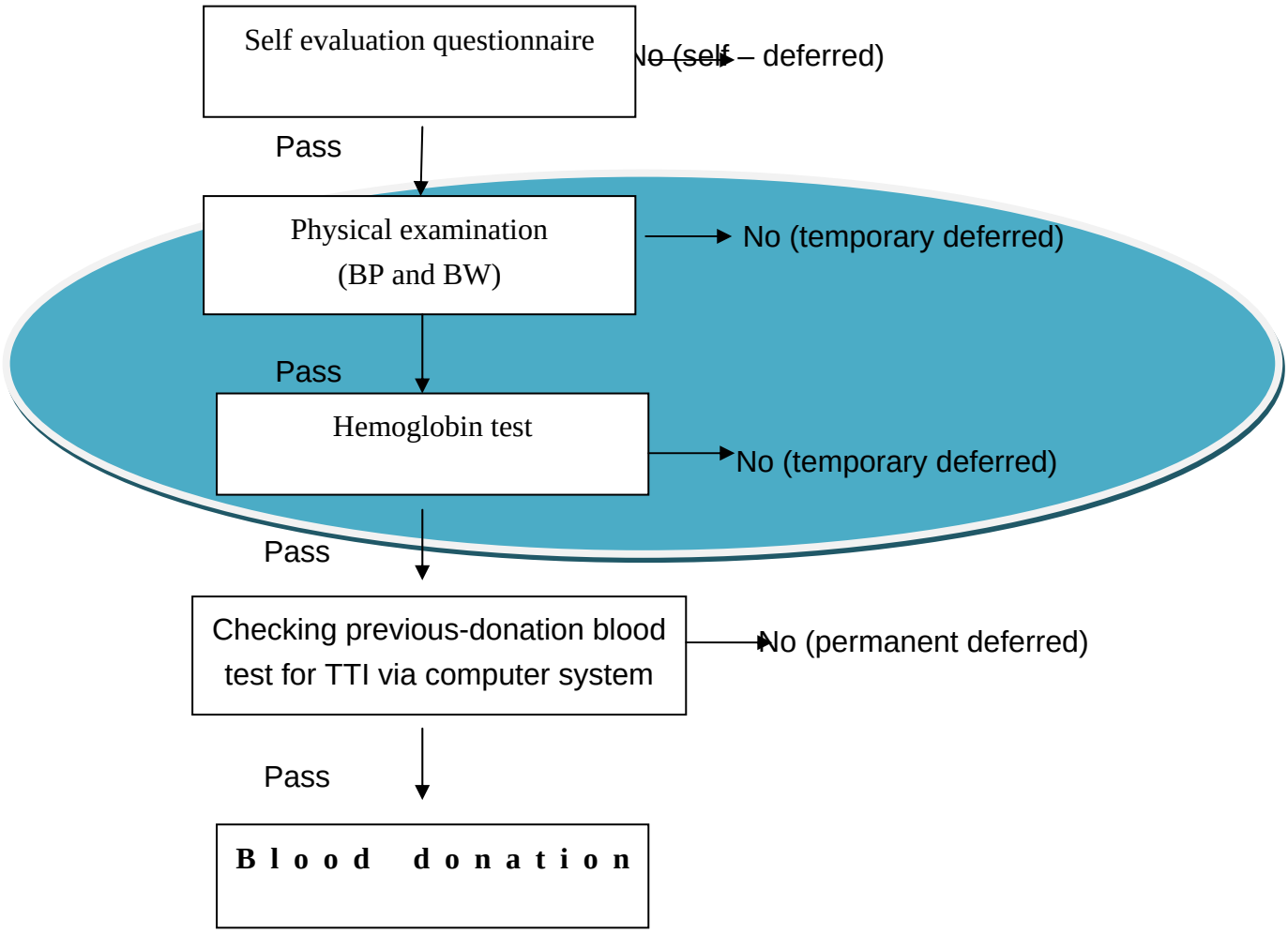
5. Systolic blood pressure not below 100mmHg

6. Individuals who correspond to at least one of the following should be deferred

- AIDS
- Circulatory diseases
- Jaundice
- Those having malaria within the past 3 years
- Lung diseases
- Kidney diseases
- Those considered not in good health judged by high temperature or other physical conditions.
- Woman either during lactation period or abortion

Based on the criteria, NBC has the following deferral system in place.

Figure 4: Deferral system in NBC



**The circled area is where current donor care service steps in.*

2.2 Blood demand versus supply in NBC

In spite of recent observed achievement in terms of improved quality of blood and its component products in Thailand, it is not exceptional in facing challenge of imbalance of supply and demand of blood as this challenge is universal across the world. According to the annual report of NBC 2009, during the period of October 2008 – September 2009, total number of required blood units was 1,304,031 and only 539,094units were supplied, which means around 41.34% of need was met and the rest 58.66% was left

as unmet supply (Yuvahongs, et al., 2010). The universal issue of decline in blood collection is explained in connection with the more complex infectious disease testing and strict donor deferral criteria and enhanced regulatory scrutiny, any of which should not be compromised in any case for the sake of both donors and recipients. (Nguyen, Devita, Hirschler, and Murphy, 2008).

With continued development and enhancement in screening for donation eligibility, more and more prospective donors are deferred and one of the major deferral reasons is low hemoglobin. In a study undertaken in 2004 revealed that total number of deferred cases during the month of study was 397, of which 120 (30.2%) were deferred for low hemoglobin (Subhachaturas, 2004). The rate of deferral because of anemia was increased from 35 .2% in 2004 to 37.39% in 2006. In the finding of a study indicated low hemoglobin was the most common cause of donor deferral in Thai Blood donors, especially among young adults with the mean age of 34 and 32 years for females and males, respectively (S. Phikulsod, Chiewsilp, Ongtilanont, Bhakbhumpong, and Patanapongsak, 2009).

Therefore, it is obvious that the blood supply will be virtually doubled in number, if the blood donor program including donor recruitment, donor retention and donor care is well navigated enough to successfully retain all donors to donate at least one more time in 1-year period yet remain in good health (S. Phikulsod, et al., 2009)

The difference of donor care service available in NBC from that in other blood center lies in the fact that it focuses on health management of donors

before and after donation so that it manages the pool of donors by managing deferral state of donor which is medically controllable. Also this service helps donors who would like to remain healthy and it is in this respect that we call the service “the donor oriented service”.

2.3 Deferral due to anemia - the global trend

The major reason for determining the donor’s hemoglobin concentration prior to donation is to ensure either that the donor does not have pre-existing anemia or that the donor will not be made anemic by the blood donation (Souza, 2001).

A study done in western India found that most common reasons for deferral were low Hb(55.5%) (Agnihotri, 2010).

A retrospective study was undertaken for the period of 2001-2006 in American Red Cross (ARC) Blood Services where approximately 45% of blood need of the USA is covered and had revealed the number of donors temporarily deferred for donor safety was 4,389,977 which accounts to 71.9% of total number of deferred donors. The temporary deferral for donor safety is due to low hemoglobin, high/low blood pressure and abnormal pulse rate(Zou, et al., 2008).

Another study was done to assess iron status among first time voluntary unpaid donors who passed the clinical interview for selecting new blood donors in the blood bank, Haukeland University Hospital, Bergen, Norway and produced result that 25% of them were not able to be accepted in 2006

for failing to meet the Hb criteria, predominantly amongst young women (Røsvik, Hervig, Wentzel-Larsen, and Ulvik, 2009).

Phlebotomy of a unit of blood produces a loss of 200 to 250 mg of iron in haemoglobin. Lack of iron is the most important medical reason for deferral from repeat donation and primarily affects women of childbearing age. Deferral of these women discourages them from further donation and may lead to their loss as donors. Provisions for blood donation should protect those who give blood from adverse consequences of their altruism. Safe and effective approaches to iron replacement after donation have been developed that can prevent iron deficiency in women who give blood repeatedly. Blood centers should consider incorporating programmes of iron replacement for women of childbearing age who give blood repeatedly to protect these donors against iron deficiency and to enhance their retention and commitment as dedicated donors (Agnihotri, 2010)

The same example could be observed through study of deferred donor-data in NBC/TRCS, Bangkok, in which around 209,849 volunteers were rejected from donation for mere reason of low hemoglobin during the period of 2004-2010 and the proportion of this kind of deferred donors amounts to 40.42% in average against total deferred donors due to the rest 19 deferral criteria(National Blood Center, n.d).

The data also supports the assertion that low-hemoglobin is correlated with frequency of blood donation. Though further meticulous analysis is needed

to make conclusion, apparently the deferred number of regular donors is 3.6 times higher than that of first time donors.

2.4 Utilization of Health Care Service

The donor care service available in National Blood Center is purposed to reduce number of donors and clients who are, or at risk of being, deferred for low hemoglobin, through appropriate medical intervention like donor care service, and this service is distinguished from donor vigilance which focuses on post donation care watching for and subsequent treatment of any side effect of donation. As the service being unique in NBC, it is hard to find study literatures specifically dealing with donor care service or alike.

Most of the studies related to blood donation have focused on identification of factors that motivate donors to return for next donation and need to be considered in organization of blood collection drive in favor of attraction of more donors. To our best knowledge, there has been no study to measure service for donor's health in blood collecting institute like NBC and satisfaction of donors about the service in connection with their return to donation as motivation so far. However, the donor care service is more or less similar enough to explain with the general concept of health care service in terms of taking care of health of donors.

One of the most widely adopted models in the study of health service utilization is Andersen's behavioral model of health services utilization. Utilization rate should vary with need, with the highest level of need associated with level of utilization(Anderson, 1968). Health care utilization

are classified into three components; Predisposing characteristics, enabling characteristics and need characteristics. Predisposing factors include social demographic categories: (e.g. gender, age, race, occupation, education) and beliefs about health matters (e.g values, attitudes and knowledge about health and illness). Need component refers to one's level of illness and represents the most immediate cause for the utilization of health care services. Need is measured as perceived health status or number of self-reported symptoms (David and Kaplan, 1995). It is assumed that the current study on donor care service should focus on predisposing and need factors because enabling factor is related affordability of a patient for medical service and donor care service has nothing to do with financial capability of recipient of the service. However, time affordability of recipient needs to be considered as a factor that may indirectly affect to satisfaction of the service. *Hygiene* of donation place (environment) and *time schedule* convenient to most of the donors are recommended to be included in the guidelines for retention of blood donors. In addition, it is recommended to give *personal attention* to donors and streamline the process to avoid unnecessary *long wait* by donors (World Health Organization, 1998).

The health care consumer satisfaction is modeled on the basis of established relationships among service quality, value, patient satisfaction and behavioral intention (Choi, Cho, Lee, Lee, and Kim, 2004). Consequence of dissatisfaction of patient includes incompliance to treatment regimen, failing to pursue follow-up care and, in extreme cases, resorting to negative

word-of-mouth that dissuades others from seeking health care from the system. Service orientation of doctors was found to be the strongest factor influencing patient satisfaction in hospitals. Service orientation of nurses is an important factor for ensuring patient satisfaction, but the dearth of both is a continuing problem (Andaleeb, Siddiqui, and Khandakar, 2007).

No much study is available to explain how the hospital service be utilized for anemia control among blood donors and instead, the fall of retained number of blood donors was explained in many literatures. To fill the gap of supply and demand on nationwide is a joint responsibility of both blood centers and hospitals as well, in respect of provider and user. Demand for blood comes up on hospital basis and thus it is pertinent to think potentiality that hospital may contribute some of its services to minimizing deferred donors due to health and establishment of networking between blood center (blood provider) and hospital (blood user) is pre-requisite. Timely and appropriate measure has been emphasized in a study done by (Zou, et al., 2008). According to them, a significant number of blood donors had been lost after deferral for reasons related to donor safety or recipient (blood) safety and assuming that the ARC provides approximately 45 percent of the total blood supply for the United States, more than 3.7 million blood donors were likely lost during 2001 through 2006 after deferral.

In another study in India where donor deferral rates varies from 5 to 24 per cent, the nation's blood supply would be increased by more than 500,000 units annually, if all blood centers reduced their deferral rates to 7 per cent (Tomasulo, Anderson, Paluso, Gutschenritter, and Aster, 1980).

2.5 Socio-demographic Characteristics

In blood donation community, satisfaction about the blood collection service, not a donor care service, is varied per socio-demographic characteristic of individuals. In a study, to measure donor's satisfaction about the overall blood donation process of a blood collection center(Nguyen, et al., 2008), the satisfaction was expressed differently by age and education level and found to be associated with most of all socio-demographic characteristics of donors in analysis of individual step of the donation process. Burnett attempted to reduce some of the confounding over the demographic and behavioral characteristic of blood donors carrying out a postal survey of 800 blood donors. The results of this study indicated that the donor " tends to be male, married with children, have rare blood types and low self-esteem, to be a low risk taker, very concerned with health, better educated, religious and quite conservative". Furthermore, they highlighted interactions between variables: age and gender for example, where females are the more prominent among younger but older donors are more likely to be male(Burnett, 1981).

Rabeya found in his study that the main cause of donor deferrals was low hemoglobin (40.7%) and out of those deferred due to low hemoglobin, 69% were females, which can be explained by the fact that this group of the population is more prone to depleted iron stores and consequently low hemoglobin levels (Rabeya, et al., May 2008).

More worrisome is the far higher rate of non-return among younger donors who receive a temporary deferral (21/2 times higher among 16- to

19-year-olds than those 50-59 years), which implicate that temporary deferral plays greatest havoc with the donors who represent the future of volunteer blood donation (Ferguson, France, Abraham, Ditto, and Sheeran, 2007).

2.6 Donation status

The studies undergone in the blood transfusion field have focused on the measurement of satisfaction level of blood collection process rather than care service in connection with donation status.

Nguyen revealed the difference in satisfaction level of the service and subsequent motivation to return for next donation in accordance with donation status of individuals. The repeated donors were graded higher than first time donors in terms of overall satisfaction and first time donors higher than repeated donors in terms of valuing experience of donation(Nguyen, et al., 2008).

The satisfaction about the donor care service is presumed to be associated with donation status as hemoglobin level is affected by the amount of bleeding (hemorrhage, frequent blood donation etc). That is, whether repeated donor or first time donor, the level of satisfaction would be varied as the level of hemoglobin varies frequency of donation.

Earlier studies showed that regular blood donors are at risk of developing depletion of iron stores (Finch et al, 1977; Simon et al, 1981; Mittal et al, 2006; Norashikin et al, 2006). One unit of blood donation results in depletion of 236 mg of iron (Cancado et al, 2001). Simon concluded that lifetime donations were not a predictor of decreased iron stores but frequency of

donations(Simon et al, 1981). Similar findings were observed in Norashikin's study which 11% of regular donors had depleted iron stores, but this was not the case in those who donated blood less than 5 times within 2 years (Norashikin et al, 2006).

2.7 Donor care service to deferred anemic cases

Recent reports have shown that the frequency of iron deficiency is high in blood donors (1.8% to 8.4% in males and 4.5% to 34.8% in females), and more dependent on the frequency of donations than on the accumulated number of donations. The only known significant disadvantage of blood donation is the potential risk for iron deficiency. Therefore it seems reasonable to secure adequate iron reserves in the donor population in order to maintain an appropriate donation potential and to avoid possible non-hematological side-effects of iron deficiency, i.e. changes in immune function, energy metabolism and work performance. Blood donation has a profound influence on iron stores and is a very important factor for iron deficiency in blood donors, particularly in multi-time donors and, especially in female donors (Cançado, Chiattone, Alonso, Júnior, and Alves, 2001)

With reference to the deferral system (Figure 4), current scope of donor care service of the NBC covers the care for donor who is deferred from the level of physical examination and hemoglobin test with more focus on deferred cases with low hemoglobin. The detailed flowchart of the donor care service is given below.

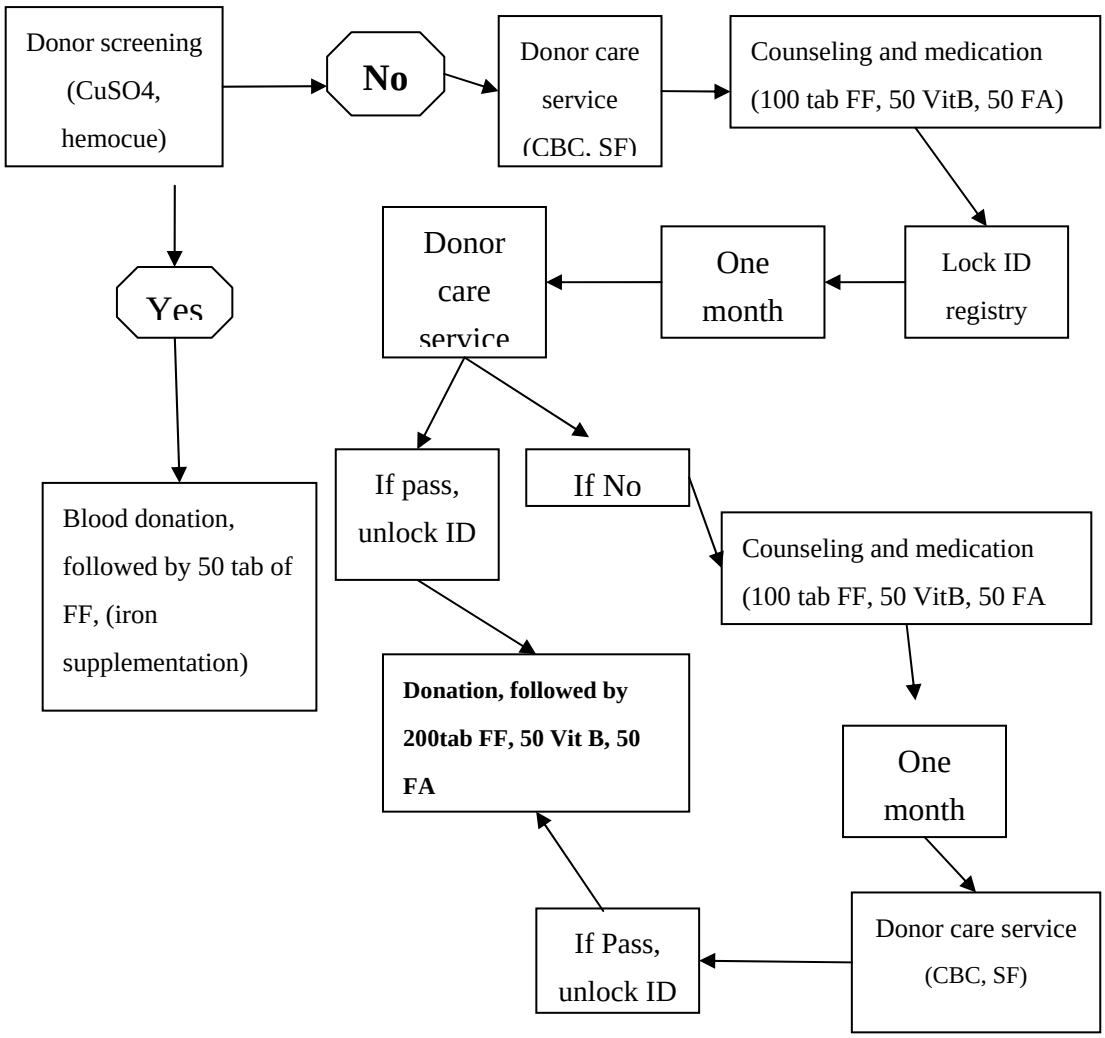


Figure: 5 Flowchart of Donor Care Service (National Blood Center, 2010)

The service is provided as trial with the staffs employed under volunteer and part-time contract with retired medical doctors and nurses during the weekdays and national holidays and weekends are still off days for the service.

2.8 Customers' perception and satisfaction

Well managed organizations will have a better chance to increase motivation for blood donations. Human resources, both staff and blood donor remain the most important component of a successful blood supply system.

Motivation is defined in terms of " agency factor, power or driving force of both internal and external body or individual. It is intensity, direction and persistence for reaching the target followed by need, drives and incentives with effort to reach the target (Draft, 2000; Griffin, 1999).

In an effort to motivate the population to donate, blood centers must satisfy the need of donors for them to remain as regular donor and advocate others to participate in donation as well.

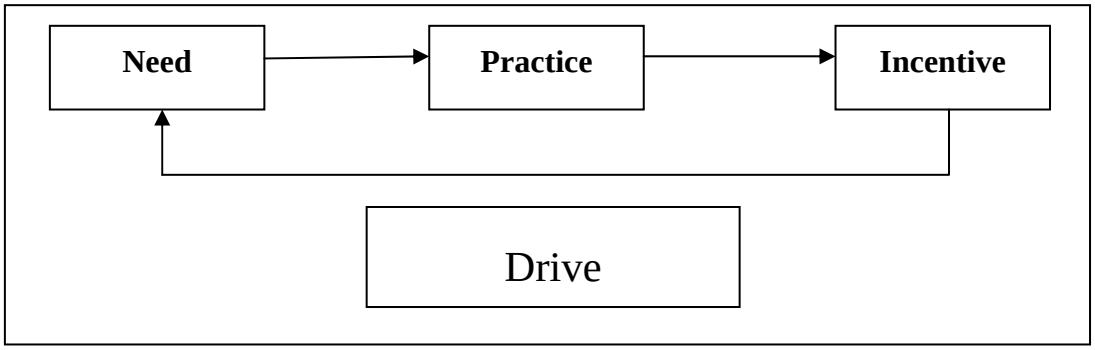


Figure 6. Flowchart of Motivation (Griffin, 1999)

There are five aspects of needs: physiological, security and safety needs, social esteem and self-actualization (Robbins, 1993). Blood donation help satisfy need in terms of esteem and self-actualization. Esteem is the need of the individual to find success in their life and feel a sense of pride about it. They need community respect and gain this by giving something back to their community. Self-actualization is the need for more success in life, for example, number of donation, honor and certificate of donation.

The definition of satisfaction was given as the happiness of people when they succeed in their goal, wants and motivation (Walman, 1973). Another

study suggested that satisfaction in health services depends on service skill, information explanation, convenience and ability to pay (Chipayom, 1999).

Satisfaction, in reference to this study, is the gap between perception and expectation. There are two component of satisfaction in health service systems, functional and technical (Edversson, Thomasson, and Ovretveit, 1994). Technical quality depends on customer perception and equipments. Functional quality is dependent on how the customer receives information such as environment or personal interest.

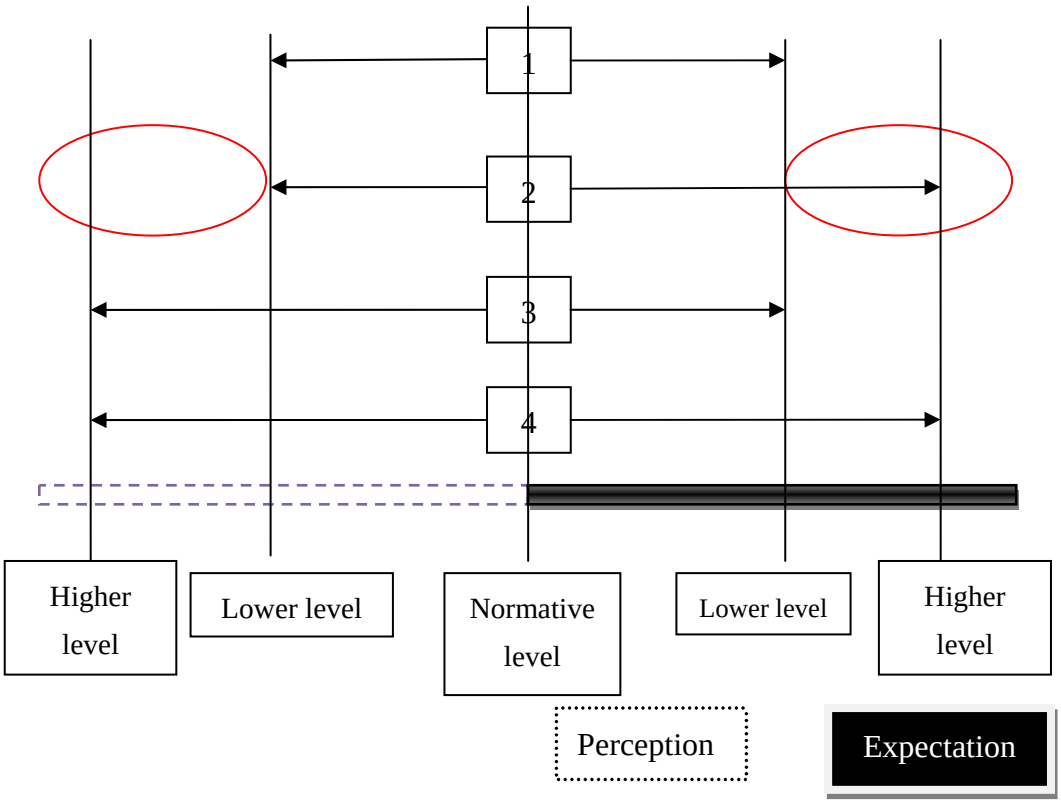


Figure 7: satisfaction (Gap) between expectation and perception

However, if the expectation is higher or perception is lower than average or both, the gap or the result of a comparison will be wider. The results in dissatisfaction are shown in figure 7.

1. The result is in Moderate level range of satisfaction
2. The result is in low level range of satisfaction
3. The result is in High Level range of satisfaction
4. The result is in moderate level range of satisfaction

The graph above shows that dissatisfaction occurs when actual perception does not match with the level of expectation and any of the service, whether medical or commercial may generate dissatisfaction among clients if it is not perceived as much as it was expected.

CHAPTER III

METHODS AND MATERIALS

3.1 Research design

The research was designed for cross-sectional study among blood donors in the National Blood Center registered as deferred due to anemia from 1 February 2011 to 4th March 2011 to measure their satisfaction with donor care service. The survey was based on self-administered questionnaire.

3.2 Study site and population

The study area was the National Blood Center, the Thai Red Cross Society, Bangkok, Thailand. The target population for study was the "deferred" donors only due to anemia or low Hgb and thus received blood donor care service.

3.3 Sample size and criteria

3.3.1 Sample size

The sample size of the study population was calculated with the number of deferred donors due to anemia of one year from 1 October 2009 to 30 September 2010, which was 64,702 (in house 22,626 and mobile 42,076). (National Blood Center, n.d).

As the study was planned to undergo in NBC, the number of in-house deferred cases were only taken into consideration for total population (N)

$$n = \frac{Nz^2\,p\,q}{d^2\,(n-1)+z^2\,p\,q} = \frac{22{,}626^{*}\,(1.96)^2 \times 0.5 \times 0.5}{(0.05)^2(22{,}626-1)+(1.96)^2 \times 0.5 \times 0.5} = 378$$

In addition, **a refusal rate of 5%** was taken into account to make **397** study subjects in total.

N = total number of deferred donors for anemia in NBC in one year

z = the reliability coefficient at the 95% CI

p = assumed proportion of deferred blood donor satisfaction 50% = 0.5 for maximum sample size

q = 1 – p =0.5

d = absolute precision of difference = 0.05 or 5% (acceptable error)

n = sample size

3.3.2 Inclusion criteria

Those who were sent by screening section as “deferred” due to anemia and got confirmed via complete blood cell counter and thus received donor care service of NBC during the study period.

3.3.3 Exclusion criteria

- Those who were confirmed non-anemic at confirmatory test of the donor care service section.
- Those who visited the blood donor care service section more than two times during the study period.
- Those who have answered the pre-test questionnaire
- Those who do not read or write “Thai” language” eg. Foreign donors

3.4 Measurement Tools

3.4.1 Research instrument for data collection

The donors are usually checked for hemoglobin at screening section by copper sulphate (CoSu) or hemocue with arterial blood drawn by fingerstick. Under the revised donor registration system, any suspected anemic cases at screening stage are sent to the blood donor care service section in which 10 cc of venous blood were collected by phlebotomy into vacuum collection tube for CBC (complete blood count) and SF(serum ferritin) tests.

For CBC test, Beckmun Coulter, the automated complete blood cell counter, is used and anemia is confirmed based on the result of CBC. The service is provided to the cases who are confirmed anemia at donor care service and the cases who are normal in hemoglobin measure by the reading of Beckmun Coulter are sent again to the registration counter to proceed for donation.

3.4.2 Questionnaire construction

Questions included basic demographics, satisfaction with the donor care service, perception of the service, satisfaction with other services of NBC and intent to return. Questionnaire had four parts : Part I touched upon socio-demographic variables. Parts II was five-scale formatted questionnaire about satisfaction and Part III is four-scale questionnaire to measure perception of service components, features and accessibility. Part VI is designed to measure overall satisfaction of the other services of NBC and motivation or intention to come again.

The questionnaire was restructured to measure satisfaction and perception about donor care service of deferred donors in NBC, based on PSQ-18 and the questionnaire used for study on satisfaction with deferral system of the NBC (Haya D., 1994 : Subhachaturas, 2004).

3.5 Validity and reliability

The questions in the questionnaire were already validated in earlier studies and literatures were published. However the process of validity and reliability was undergone to re-ensure the quality of the revised questionnaire.

Validity

Content validity was measured by three professional experts in NBC for accuracy and clarity of the questionnaire. The questions agreed by proportion of two out of three were taken as good questions.

Reliability

The structured self-administered questionnaire was pre-tested with 20 samples at NBC. Cronbach's alpha coefficient test was introduced for the reliability of the questionnaire. The scores of the test were 0.912 for satisfaction and 0.95 for perception. The criteria of Cronbach's alpha coefficient for this study was greater than 0.7.

3.6 Data collection

The collection of data was started from 1 February, 2011 upon receipt of approval of ethical committee.

Before then, English questionnaire was initially translated into Thai followed by back-translation by second person for confirmation. Any discrepancies between the first English version and the back translated English version was sorted out by the two translators. In case of disagreement a third translator was referred for

the final version. This process was followed by pre- testing with 10 similar clients in January to customize the questions to the setting.

Two research assistant was hired and training was imparted to the staffs of blood donor care service section and research assistant for one day before entering into the study.

During the study, the service users, immediately after service, were approached by the research assistants outside of the service room and asked if they would complete a brief, voluntary and self-administered research survey to rate their satisfaction with the donor care service process. To preserve anonymity, clients were requested to give the completed surveys directly to researcher who does not read or write Thai language. All the completed questionnaires were kept away from the study site and only researcher was allowed to access to the result.

The collected data was entered on SPSS database for further analysis by the researcher.

3.7 Data Analysis

SPSS Version 16 was used for data analysis,.

Descriptive statistics was used to describe the characteristics of the participants, determining frequency and percent, mean, median, mode, maximum, minimum and standard deviation for variables under study.

Mono-variate analysis was undertaken with 382 dataset following data input in accordance with the following table.

Table 1: Recoding values for individual variables of questionnaire

Variables	Scale	Recoded value
age	ratio	In years
gender	nominal	0=female, 1=male
education	nominal	1= primary school 2= secondary school 3= high school 4= graduate 5= post-graduate 6= others
occupation	nominal	1= government worker 2= NGO 3 = business owner 4=private company worker 5= student 6=unemployed 7=monks 8=others
Personal income	ordinal	0= don't want answer 1=No income 2= <5,000B 3=5,000–10,000B 4=10,001–15,000B 5=15,001 – 20,000B 6=20,001 – 25,000B 7=25,001 – 30,000B 8= >30,000B
Number of donation	ordinal	0 (0), 1 (1), 2(2), 3 (3), 4(4), 5 (5), >5 (more than five)
Part two questionnaire	ordinal	Least Maximum 1 2 3 4 5
Part three questionnaire	ordinal	1= strongly disagree 2= disagree 3=agree 4=strongly agree
Return to next donation	nominal	0=No 1=Yes
Advocacy of donor care service	nominal	0=No 1=Yes
Change in HB level	ordinal	1= negative direction 2=positive direction 3=for man 13g/dl, for woman 12g/dl)
Overall satisfaction	ordinal	1=very dissatisfied 2=dissatisfied 3=uncertain 4=satisfied 5=very satisfied

Responses to questionnaire Part 2 and 3 were recorded on 5- and 4-point Likert scales. In SPSS, satisfaction of the donor care service was measured with total sum score of each subvariables in questionnaire Part 2, followed by re-categorization of the sum into two: low satisfaction and high satisfaction. The threshold of these two level is sum =76, which means those whose score did not reach to 76 were grouped as low satisfaction and those whose score reached or exceed 76 were grouped as high satisfaction. The satisfaction of other service of NBC was also recorded as low satisfaction = 1, 2, 3 and high satisfaction=4, 5.

Inferential statistics was used for identification of association and interpretation of relationship between some study variables and satisfaction level.

For the bi and multi variable analysis, individual variables were re-categorized by recoding in SPSS 16.0 according to the similarity in characteristics within variable. Number of categories were defined to three at maximum for socio-demographic variables and defined to two categories for satisfaction and perception variables, as follows.

Table 2: Recoding values of individual variables for bi- and multi-variable analysis

variables	scale	value
Age group	ordinal	0=<24 years, 1=25-45 years, 2=>46 years
Education	nominal	0= compulsory (primary/secondary school) 1= high/other schools 2= graduate/ post-graduate
Occupation	nominal	0= student 1= unemployed/others/monks 2=government/NGO/ business owner/private company worker
Personal income	ordinal	0= low income (No income/<5,000B) 1=middle income (5,000–30,000B) 2= high income (>30,000B)
Number of donation	ordinal	0= (0), 1= (1 -5) 2= >5 (more than five)
Part two questionnaire	nominal	0=Low satisfaction (level 1-3) 1=high satisfaction (level 4-5)
Part three questionnaire	nominal	0=negative 1=positive
Return to next donation	nominal	0=No 1=Yes
Advocacy of donor care service	nominal	0=No 1=Yes
Change in HB level	ordinal	1= negative direction 2=positive direction 3=for man 13g/dl, for woman 12g/dl)
Satisfaction with other services	ordinal	0=Low satisfaction (level 1-3) 1=high satisfaction (level 4-5)

χ^2 test was used to assess bi-variable associations between socio-demographic and blood donation variables compared to satisfaction and perception of the

donor care service. Associations at the p≤0.05 level were considered significant.

Binary logistic regression was applied for multi-variable analysis and variables found to be statistically significant in bi-variable analysis at p≤0.25 were used to address potential confounding in the bivariate association. The association at p≤0.05 level were considered significant when confounding factors were controlled. Those variables with more than two categories were recoded for two dummy variables to avoid contamination between categories. The following variables were seemingly associated with satisfaction and thus re-categorized again for dummy variables in SPSS 16 before running analysis.

Table 3: Recoding values of variables of age and occupation for multi-variable analysis

Age	Dummy variable one	0=young and old 1=middle
	Dummy variable two	0=old and middle 1=young
Occupation	Dummy variable one	0= unemployed and employed
		1=student
	Dummy variable two	0=student and unemployed
		1=employed
Change in Hgb	Dummy variable one	0=static and improved
		1=lowered
	Dummy variable two	0=static and lowered
		1=improved
Time to NBC	Dummy variable one	0=in an hour & less than an hour
		1=more than an hour
	Dummy variable two	0=more than an hour & in an hour
		1=less than an hour

3.8 Ethical Consideration

An official letter was sent from the College of Public Health Sciences, Chulalongkorn University to National Blood Center, Thai Red Cross Society, with a humble request to review the proposal in its own ethical committee to be followed by approval for initiation of data collection at the Center as per the schedule.

The ethical committee of the National Blood Center was opened on 12 January 2011 and approved to undergo the research in the NBC as per the details in the proposal.

Information sheet for research participants was distributed to all potential respondents to inform the objective of the research and assure confidentiality of data collected from them. Liberty was given to the respondents to reject or deny participating in the research after reading the information sheet but fortunately no denial was observed during study period. Anonymity and privacy were ensured in the way that each questionnaire was filled by the participants after the service outside of the service room so that the service providers could not see how the service users expressed satisfaction and completed questionnaires were collected and kept in the envelope.

Research assistant was employed outside of the Center to assist in the respondent to fill the questionnaire appropriately.

Any of the missing data during the study was retrieved by the research assistant from the registry database upon permission of access by the NBC.

The data was collected upon receipt of written informed consent from the respondents in which objectives of the study were explicitly stated with assurance of confidentiality and acceptance of their liberty to refuse participation.

3.9 Limitation

Although the national Blood Center is the leading institute of blood collection and supply in the country, the study result still cannot be generalized for its limited representativeness due to time constraint.

Moreover, the study subjects are selected among those who visit donor care service in February 2011 and the survey data may not be sufficient to represent overall deferred donors of whole year and it is recommended to undergo the same at different point of time of the year to check other variables such as seasonal tendency of satisfaction, though the seasonal influence has only been confirmed with diseases.

3.10 Expected benefit and application

- The study is expected to provide the basis for refreshed donor retention strategy of the NBC

- The result will generate recommendation to NBC decision makers on direction and actions for better management of deferred donors due to low hemoglobin

- The study result can be taken as reference for further study and for other centers where incidence of deferred donors due to anemia is relatively high.

CHAPTER IV

RESEARCH RESULTS

This chapter presents the results of the survey. During the period of 1st February to 4th March 2011, 407 donors visited the donor care service section, out of which 344 cases were referred from screening section of NBC for confirmation of anemia and 63 cases were second time visitors for follow-up service. Upon the confirmatory test of CBC, only 319 cases were confirmed anemic and thus received the donor care service. At the end of the service each of these cases plus follow up cases was asked to fill in the questionnaire, of which 24 respondents (6%) made one or two missing answers in the questionnaire and 25 answered as "Don't want answer" in such variables as "occupation" and "marital status".

For descriptive analysis, all 382 data was used to capture general trend of satisfaction and other aspects that seem important to draw out conclusion of the study.

For the association analysis, 333 data were used, after cleaning the missing and vaguely answered data, in order to avoid distortion of results.

With regard to those cleaned data which accounts to 12% of 382, the study did not analyze the potential bias that may be introduced in statistical analysis by this drop-out rate of 12%. However the drop-out rate is unlikely to have introduced bias because it is small percentage commonly accepted in research (Nancy & Grove, 2005).

The study results were described into the following topics.

4.1 Socio demographic and other characteristics of the respondents

4.2 Relationships between independent and dependent variables

4.3 Multi variable analysis of factors associated with satisfaction with donor care service

4.1. Socio demographic and other characteristics of the respondents

As shown in Table 4, the majority of deferred blood donors due to anemia were females (86.9%) and mostly under the age group of 25-44 years (61.5%). More than half of the respondents were unmarried (63.6%), followed by the married group (27.2%). The university graduates and postgraduates took the majority, respectively 58.4% and 14.7% and primary and secondary school graduates the minority. Most of the clients were private company workers (41.1%) and students (19.9%). Those who were engaged in religious work like monks and in non-governmental organization (NGO) work were the least in number (0.8%) respectively.

As far as personal monthly income, around one fifth (22%) of cases were living on income level of more than 30 thousands baht per month and no income group was around one tenth (11.8%). During the study period, most of the visitors to the service were first time anemic cases (83%) with only 17% accounted to subsequent clients.

Table 4: Socio-Demographic Characteristics Of Deferred Donors Due To Anemia

Socio-demographic variables (n=382)	Frequency (n=382)		Valid Percent
Age group	**M**	**F**	
< 24	5 (6.1)	77 (93.9)	82 (21.5)
25-44	30 (12.8)	205 (87.2)	235 (61.5)
>45	15 (23.1)	50 (76.9)	65 (17.0)
Total	50 (13.1)	332 (86.9)	382 (100)
Marital status			
single	243		63.6
married	104		27.2
widow	8		2.1
separate	14		3.7
divorce	10		2.6
don't want to answer	3		0.8
Total	382		100.0
Education			
Primary school	19		5.0
Secondary	12		3.1
High school	54		14.1
Graduate	223		58.4
Post graduate	56		14.7
Others: vocational school etc.	18		4.7
Total	382		100.0
Occupation			
Government worker	16		4.2
NGO officer	3		0.8
Business owner	48		12.6
Private company worker	157		41.1
Student	76		19.9
Unemployed	34		8.9
Monks	3		0.8
Others (Household wife)	45		11.8
Total	382		100

Income in baht (ppp, international dollar)		
Don't want to answer	26	6.8
No income	45	11.8
< 5000 ($299.9)	17	4.5
5000-10000 ($300.0-599.9)	61	16.0
10001-15000 ($600.0-899.9)	59	15.4
15001-20000 ($899.9-1199.8)	30	7.9
20001-25000 ($1199.9-1499.8)	32	8.4
25,001-30000 ($1,499.9-1799.7)	28	7.3
>30,000 ($1799.8)	84	22.0
Total	382	100.0
Number Of Service Use by the respondents		
1st time visitor	319	83
Sub-sequent	63	17
Total	382	100

Table 5 shows the life-long donation status of the deferred donors due to anemia, in which anemia was developed after donation of 5 times at the rate of 47.1%, followed by 1-5 times donated group at 38.2%. Those who had never experienced donation accounted to 14.7% of the subjects.

Table 5: Life-Long Donation Status of Deferred Donors Due To Anemia

Lifelong Donation status (n=382)	Frequency	Valid Percent
Never donated	56	14.7
1-5 times donated	146	38.2
More than 5 times donated	180	47.1
Total	382	100.0

Table 6 shows time for traveling to NBC was taken less than an hour among 37.5% of deferred donors while 26.2% of more than one hour. The usual transportation media for travel was public transportation media at 53.8% of respondents and only 34.4% used private car to get NBC.

Table 6: Travel Time And Media Taken By Deferred Donors To Get NBC

Travel time and media (n=382)	Frequency	Valid Percent
Time		
>1 hour	100	26.2
= 1 hour	138	36.2
< 1 hour	143	37.5
Total	381	100.0
Missing system	1	0.3
Media		
Private car	131	34.4
Bus	101	26.5
Sky train /underground transport	72	18.9
Both the above	32	8.4
Others (taxi, taxi-motorbikes)	45	11.8
Total	381	100
Missing system	1	0.3

In Table 7, almost all respondents (98.7%) expressed intention to return for blood donation after the service and only 1.3% showed hesitation to continue the donation.

Table 7: Intention to Return for Blood Donation after the Service

Intention to return for blood donation (n=382)	Frequency	Valid Percent
Negative	5	1.3
Positive	377	98.7
Total	382	100.0

In Table 8, Intention to advocate the donor care service for anemic donors to others was found among 98.4% of respondents while only 1.6% manifested negative response.

Table 8: Intention to advocate the Service to others after the service

Intention to advocate the service to others (n=382)	Frequency	Valid Percent
Positive	376	98.4
Negative	6	1.6
Total	382	100.0

Table 9 shows 88.4% of anemic donors satisfied with the other services of NBC preceding to the donor care service whereas 11.6% expressed dissatisfaction.

Table9: Satisfaction about Other Services in NBC

Satisfaction about other services in NBC N=382	Frequency	Valid Percent
Low satisfaction	44	11.6
High satisfaction	336	88.4
Total	380	100.0
Missing system	2	0.5

Comment [U1]: Specify other srvices in definitons list

With regard to Table 10, Hgb level compared to the previous level of one month ago was improved among 84.1% of subsequent clients while only 15.8% remained static or lowered.

Table 10: Change in Hgb Level after Service

Change in Hgb level after service (N=63)	Frequency	Valid Percent
Lowered	4	6.3
Static	6	9.5
Improved	53	84.1
Total	63	100

Comment [U2]: Discuss apparent improvemtns

In table 11, the normal recovery rate was further scrutinized by gender. 42.3% of female donors reached the normal level (12g/dl), whereas more than half (63.6%) of male donors recovered their normality (13g/dl).

Table 11: Hgb recovery rate by gender

Recovery level among female after one month (N=52)	Frequency	Valid Percent
Below 12g/dl	30	57.7
Equal or above 12g/dl	22	42.3
Total	52	100.0
Recovery level among male after one month (N=11)		
Below 13g/dl	4	36.4
Equal or above 13g/dl	7	63.6
Total	11	100.0

Table 12 shows that 76.4% of respondents were at the level of high satisfaction with the anemic donor care service and 23.6% at the level of low satisfaction.

Table 12: Overall Satisfaction with the Donor Care Service

Overall satisfaction with the Donor care service	Frequency	Valid Percent
Low satisfaction	86	23.6
High satisfaction	278	76.4
Total	364	100.0
Missing system	18	4.7

When this overall satisfaction is broken down by components, 85.8% of respondents were highly satisfied with medication with 2.1% expressed low satisfaction. Relatively, high satisfaction was observed with packing and labeling of the medicines at 90.3% whereas only 88.2% of high satisfaction was given to quantity of medicine in table 11.

Comment [U3]: Yellow Potential cut

Table 13: Satisfaction with Medication of the Donor Care Service

Satisfaction with medication (N=382)	Low satisfaction (%)	Medium satisfaction (%)	High satisfaction (%)	Total (%)	Missing System (%)
Overall	**8(2.1)**	**46(12.1)**	**327(85.8)**	**381(100)**	**1(0.3)**
Packing and labeling	4(1.0)	33(8.6)	345(90.3)	382(100)	0(0)
Description of dosage	6(1.6)	33(8.6)	343(89.8)	382(100)	0(0)
Quantity of medicine	8(2.1)	33(8.6)	340(89)	381	1(0.3)

Table 14 shows level of satisfaction with laboratory testing service was high among 86.9% of respondents with only 1.1% of respondents with low satisfaction. 93.7% of respondents showed high satisfaction with speed of availability of lab test result and the provision of the follow-up test received the least “high satisfaction” (87.1%).

Table 14: Satisfaction with laboratory testing service of the Donor Care Service

Satisfaction with laboratory testing service (N=382)	Low satisfaction (%)	Medium satisfaction (%)	High satisfaction (%)	Total (%)	Missing System (%)
Overall	**4(1.1)**	**45(12.1)**	**324(86.9)**	**373(100)**	**9(2.4)**
Speed of availability of test results	1(0.3)	23(6.0)	357(93.7)	381(100)	1(0.3)
Techniques of phlebotomy	3(0.8)	26(6.8)	351(92.4)	380(100)	2(0.5)
Appropriateness of test indices	4 (1.1)	26(6.9)	349(92.1)	379(100)	3(0.8)
Filing and copying of test result	5 (1.3)	32(8.4)	343(90.3)	380(100)	2(0.5)
Provision of the follow up test	7 (1.8)	42 (11.1)	331 (87.1)	380(100)	2 (0.5)

Regarding table 15, most of the respondents (91.6%) expressed high satisfaction with medical consultation with only 0.8% low satisfaction. The degree of satisfaction with medical consultation was measured with three statements and statement of "understanding of the explanation and advice of medical doctor" received high satisfaction at 94.2% whereas statement of "Explanation of medical personnel about the test result" received 92.1% of high satisfaction.

Table 15: Satisfaction with medical consultation of the Donor Care Service

Satisfaction with medical consultation (N=382)	Low satisfaction (%)	Medium satisfaction (%)	High satisfaction (%)	Total (%)	Missing System (%)
Overall	**3(0.8)**	**29(7.7)**	**347(91.6)**	**379(100)**	**3(0.8)**
Understanding of the explanation and advice of medical doctor	3(0.8)	19(5)	360(94.2)	382(100)	0(0)
Explanation of medical personnel about the cause of anemia and use of medicine	2(0.5)	21(5.5)	358(94)	381(100)	1(0.3)
Explanation of medical personnel about the test result	2(0.5)	28 (7.4)	350(92.1)	380(100)	2(0.5)

Table 16 shows degree of satisfaction with service features among 382 respondents. 78.5% of respondents had high satisfaction with consultation and only 4.2% showed low satisfaction. In the detailed components, "hospitality and kindness of medical personnel" received high satisfaction at 90.6% and "space of service room" was at 77.5% in high satisfaction.

Table 16: Satisfaction with Service Feature

Satisfaction with service feature (N=382)	Low satisfaction (%)	Medium satisfaction (%)	High satisfaction (%)	Total (%)	Missing System (%)
Overall	**16(4.2)**	**66(17.3)**	**299(78.5)**	**381(100)**	**10.3)**
Hospitality and kindness of medical personnel	3(0.8)	33(8.6)	346(90.6)	382(100)	0(0)
Procedure to get the service	6(1.6)	36(9.4)	339(89)	381(100)	1(0.3)
Waiting time	21(5.5)	52(13.6)	309(80.9)	382(100)	0(0)
Space of service room	18(4.7)	68(17.8)	296(77.5)	382(100)	0(0)

In Table 17, high satisfaction with accessibility was observed among 45.1% of respondents and low satisfaction among 16.7% of respondents. The high satisfaction rate was low with the statement “prior knowledge about the service” (48.3%) and “distance to reach the service” (57.7%).

Table 17: Satisfaction with accessibility

Satisfaction with accessibility (N=382)	Low satisfaction (%)	Medium satisfaction (%)	High satisfaction (%)	Total (%)	Missing System (%)
Overall	**63(16.7)**	**144(38.2)**	**170(45.1)**	**377(100)**	**5(1.3)**
Request for monthly visit to the service	14(3.7)	63(16.6)	303(79.7)	380(100)	2(0.5)
Cost to reach the service	64(16.8)	91(23.9)	226(59.3)	381(100)	1(0.3)
Distance to reach the service	47(12.3)	114(29.9)	220(57.7)	381(100)	1(0.3)
Prior knowledge about the service	83(21.8)	114(29.9)	184(48.3)	381(100)	1(0.3)

In Table 18, perception about effectiveness of anemic donor care service was expressed positive among 97.9% of respondents while only 2.1% remained negative. With regard to perception about individual service components, high percentage of positive response (99.5%) was observed with statements "The test received is necessary for my health", "Medical personnel is kind and very efficient" and "I feel impressive after receiving medical advice from DCS" and relatively low percentage of positive response was seen with the statement "I feel more energetic and lively than ever, after starting intake of medicines" (93.7%) which was asked to the subsequent visitors of the service who already experienced first service.

Table 18: Perception about the effectiveness of the Service

Comment [U4]: Compare wth diagramme of thesis

Perception about the effectiveness of the service	Negative (%)	Positive (%)	Total (%)	Missing System (%)
Overall	**8(2.1)**	**368(97.9)**	**376(100)**	**6(1.6)**
Medication				
I feel that I would be better if I take medicines given by the service (n=380)	3(0.8)	377(99.2)	380(100)	2(0.5)
I feel more energetic and lively than ever, after starting intake of medicines (n=63)	4 (6.3)	59 (93.7)	63 (100)	0(0)
Lab Test				
The test received is necessary for my health	2(0.5)	380(99.5)	382(100)	0(0)
I feel comfort while lab testing is undertaken	3(0.8)	376(99.2)	379(100)	3(0.8)
I could understand the test result and my health status through explanation of medical personnel	4(1)	378(99)	382(100)	0(0)
The follow up test by the service every month is important for my early recovery and donation	0(0)	381(100)	381(100)	1(0.3)
Medical Consultation				
Medical advice given by the medical personnel is easy to understand and comply	4(1)	378(99)	382(100)	0(0)
Medical personnel is kind and very efficient	2(0.5)	380(99.5)	382(100)	0(0)
I feel impressive when after receiving medical advice from DCS	2(0.5)	380(99.5)	382(100)	0(0)
After consultation, I feel confident that I would become normal and be able to donate blood if I follow the advice	6(1.6)	376(98.4)	382(100)	0(0)

Table 19 shows perception level about accessibility, in which most of the

respondents (95.8%) had positive perception about accessibility. However, 4.2% of respondents were negative with perception of accessibility. Three statements were used to measure perception level of accessibility and high positive rate (98.4%) was observed with the statement "The service needs to be advocated to the public" and relatively low positive rate (97.1%) was seen with the statement "It is not trouble to me to come to receive the service".

Table 19: Perception about accessibility

Perception about accessibility	Negative (%)	Positive (%)	Total (%)	Missing System (%)
Overall	**16 (4.2)**	**364 (95.8)**	**380 (100)**	**2 (0.5)**
The service needs to be advocated to the public	6 (1.6)	376 (98.4)	382 (100)	0(0)
The cost for travelling to the NBC is nothing compared to the benefit I gain through the service	8 (2.1)	372 (97.9)	380 (100)	2 (0.5)
It is not trouble to me to come to receive the service	11 (2.9)	371 (97.1)	382 (100)	0(0)

4.2 Relationship between Independent and Dependent Variables

Table 20 shows that most of the socio-demographic characteristics were not statistically significant in association with satisfaction with the Donor Care Service at p-value >0.05, except occupation. In occupation, the high satisfaction rate of those who have jobs was three-fold greater than those have no jobs.

Table 20: association of socio-demographic characteristics with overall satisfaction with the Donor Care Service

	Overall Satisfaction With Service								
	Low Satisfaction		High Satisfaction		Total		df	χ^2	p-value
	freq	%	freq	%	freq	%			
Age									
<25	24	31.6	52	68.4	76	100			
26-50	43	21.5	157	78.5	200	100	2	3.121	0.210*
>51	13	22.8	44	77.2	57	100			
Sex									
Female	68	23.4	223	76.6	291	100	1	0.545	0.461
male	12	28.6	30	71.4	42	100			
Marital status									
Single	54	25.1	161	74.9	215	100			
Married	19	21.3	70	78.7	89	100	2	0.490	0.783
Widow, separation, divorce and others	7	24.1	22	75.9	29	100			
Education level									
Compulsory(primary and secondary school)	4	14.8	23	85.2	27	100			
High/vocational school	16	26.7	44	73.3	60	100	2	1.502	0.472
University graduate/postgraduate	60	24.4	186	75.6	246	100			
Income level									
Low income	29	25.4	85	74.5	114	100			
Middle income	31	22.5	107	77.5	138	100	2	0.329	0.848
High income	20	24.7	61	75.3	81	100			
Occupation									
Student	23	33.8	45	66.2	68	100			
Unemployed (including household)	18	28.1	46	71.9	64	100	2	6.519	0.038**
Employed (government,NGO,business,private)	39	19.4	162	80.6	201	100			

**p<0.05 *p<0.25 for binary logistic regression

Despite of the result above, table 21 showed almost significance when relationship

between age and the service component was sought for through bi-variable analysis while the result of other variables remained no difference compared with table 20.

Table 21: association of age group with overall satisfaction of service components

	Satisfaction with service component								
	Low satisfaction		High satisfaction		Total		df	χ^2	p-value
	freq	%	freq	%	freq	%			
total	44	13.2	289	86.8	333	100			
young (24)	16	21.1	60	78.9	76	100			
middle(25-44)	23	11.5	177	88.5	200	100	2	5.565	0.062*
old (45-over)	5	8.8	52	91.2	57	100			

*p<0.25 for binary logistic regression

Table 22 presents the satisfaction level was varied by the increase in ages with the highest satisfaction among the group aged more than 45 (93%) at p=0.019.

Table 22: association of age group with lab testing service

	Satisfaction with lab testing								
	Low satisfaction		High satisfaction		Total		df	χ^2	p-value
	freq	%	freq	%	freq	%			
total	44	13.2	289	86.8	333	100			
young (24)	17	22.4	59	77.6	76	100			
middle(25-44)	23	11.5	177	88.5	200	100	2	7.975	0.019
old (45-over)	4	7	53	93	57	100			

Table 23 shows that there is no statistically significant association between donation status of clients and satisfaction with donor care service (p=0.405).

Table 23: Association of Donation Status with Overall Satisfaction with the Donor Care Service

	Overall Satisfaction with service								
	Low Satisfaction		High Satisfaction		Total		df	χ^2	p-value
	freq	%	freq	%	freq	%			
Donation status									
Never donated	16	31.4	35	68.6	51	100			
1-5 times donated	28	22.2	98	77.8	126	100	2	1.810	0.405
> 5 times donated	36	23.1	120	76.9	156	100			

With regard to Table 24, perception about service components was highly significant in association with satisfaction with the Donor Care Service ($p<0.001$) and high satisfaction rate of the service among donors with positive perception about service components was far greater than donors with negative perception.

Table 24: Association of perception about service components with overall satisfaction with the Donor Care Service

	Overall Satisfaction with service								
	Low Satisfaction		High Satisfaction		Total		df	χ^2	p-value
	freq	%	freq	%	freq	%			
Perception about service components									
Negative	7	85.7	1	14.3	7	100	1	14.909	<0.001**
Positive	74	22.7	252	77.3	326	100			

**p<0.05

Table 25 presents the results of Bi-variable analysis of association between perceptions about accessibility and satisfaction with the Donor Care Service. Chi-square test showed a significant association between these variables at $p<0.001$.

Table 25: Association of Perception about Accessibility with Overall Satisfaction with the Donor Care Service

	Overall Satisfaction with service								
	Low Satisfaction		High Satisfaction		Total		df	χ^2	p-value
	freq	%	freq	%	freq	%			
Perception about accessibility									
Negative	48	44.4	60	55.6	108	100	1	36.517	<0.001**
Positive	32	14.2	193	85.8	225	100			

**p<0.05

In Table 26, travel time to NBC has no influence over the overall satisfaction with the donor care service was not statistically significant at p=0.229 in relation to the. However, traveling time

Table 26: Association of traveling time to NBC with Overall Satisfaction with the Donor Care Service

	Overall Satisfaction with service								
	Low satisfaction		High satisfaction		Total		df	χ^2	p-value
	freq	%	freq	%	freq	%			
Traveling time to NBC									
>1hour	18	20.7	69	79.3	87	100			
=1hour	36	29.3	87	70.7	123	100	2	2.944	0.229*
<1hour	26	21.1	97	78.9	123	100			

*p<0.25 for binary logistic regression

High statistical significance in association between satisfaction with other services in NBC and satisfaction with DCS was observed at p<0.001 in Table 27.

Table 27: Association of satisfaction with other services in NBC with overall satisfaction with the Donor Care Service

	Overall Satisfaction with service								
	Low satisfaction		High satisfaction		Total		df	χ^2	p-value
	freq	%	freq	%	freq	%			
Satisfaction with other services in NBC									
Low satisfaction	25	65.8	13	34.2	38	100	1	40.994	<0.001**
High satisfaction	55	18.6	240	81.4	295	100			

**p<0.05

Table 28 shows that change in Hgb level during the service seemed to have no relationship with satisfaction with DCS at p=0.132 when the changes were categorized into three based on the previous Hgb level: lower, static and raised.

Table 28: Association of change in Hgb level after service with overall satisfaction with the Donor Care Service

	Overall Satisfaction with service								
	Low satisfaction		High satisfaction		Total		df	χ^2	p-value
	freq	%	freq	%	freq	%			
Change in Haemoglobin level after service									
Lower	0	0	4	100	4	100			
Static	0	0	6	100	6	100	2	4.047	0.132*
raised	16	30.2	37	69.8	53	100			

Table 29 shows that intention to return for donation has no relationship with satisfaction with donor care service while intention to advocate the service to others showed almost significant at p=0.058.

Table 29: Association of Intention to Return for Donation and Advocate to Others with Overall Satisfaction with Donor Care Service

	Overall Satisfaction with service								
	Low satisfaction		High satisfaction		Total		df	χ^2	p-value
	freq	%	freq	%	freq	%			
Intention to return to donation									
Negative	1	33.3	2	66.7	3	100	1	0.144	0.705
Positive	79	23.9	251	76.1	330	100			
Intention to advocate the service to others									
Negative	3	60	2	40	5	100	1	3.600	0.058**
Positive	77	23.5	251	76.5	328	100			

** p<0.05

4.3 Multi variable analysis of factors associated with satisfaction with donor care service

Binary logistic regression analysis was employed to predict the probability that positive perception about service components and acceptability and high satisfaction group of other services in NBC would express more satisfaction with donor care service in comparison with negative perception group and low satisfaction group. And also age, groups of occupation, time to NBC, intention to advocate and change in Hgb level during service were included in this analysis to see if any confounding masked the association..

It was found in binary logistic regression that age, change in Hgb, time to NBC and intention to advocate were not statically significant in association with the satisfaction, except occupation.

Table 30 shows that, in occupation variable, the employed group is 1.15 times more likely to satisfy with the donor care service at p=0.012 than student and unemployed group while student and unemployed groups were found no significance in association at p=0.188, when confounding factors were controlled.

Table30: Multivariable Analysis of Occupation by Groups Independently Associated With Overall Satisfaction with the Donor Care Service in National Blood Center

Independent variables	B	Adjusted OR	95.0% C.I. Lower	95.0% C.I. Upper	p-value
Group0 (student+unemployed)	0.741	2.099	0.696	6.328	0.188
Group1 (employed)	0.656	1.927	1.156	3.214	0.012**
Constant	0.730	2.074			<0.001

** p<0.05

Table 31 presented that donors with ages between 25 - 44 years are around 2 times more likely to satisfy with the donor care service at p=0.045 than the other donors in different age group.

Table31: Multivariable Analysis of Age Groups Independently Associated With Satisfaction of Donor Care Service components

Independent variables	B	Adjusted OR	95% C.I. Lower	95% C.I. Upper	p-value
Age <24					0.069
25-44	0.719	2.052	1.017	4.141	0.045**
>45	1.020	2.773	0.951	8.091	0.062
Constant	1.322	3.750			0.000

** p<0.05

Table 32 presents perception about accessibility and satisfaction with other services in NBC were statistically significant at p<0.05, while perception about service components were excluded from association with p=0.054. The result tells us that the donors who have positive perception about accessibility are about 4 times more likely to satisfy with the service than those who have negative perception. Also donors who were satisfied with the Donor care service are about 6 times more likely to satisfy with overall services provided by NBC than those who were not satisfied.

Table 32: multivariate analysis of factors independently associated with overall satisfaction with the donor care service in National Blood Center

Independent variables	B	Adjusted OR	95.0% C.I. Lower	95.0% C.I. Upper	p-value
Perception about service components	2.366	10.659	0.964	117.901	0.054
Perception about accessibility	1.317	3.734	2.097	6.648	<0.001**
Satisfaction with other services in NBC	1.736	5.674	2.561	12.573	<0.001**
Constant	-4.032	0.018			0.002

4.4 Other suggestions from donors for improved performance of DCS

The questionnaire ended with closed questions with suggestions to make choice by donor care service recipients and they were summarized in the table 33 and 34.

Around 75.3% of respondents participated in giving their frank suggestion for improved donor care service, as seen in table 33.

Table 33: Offering suggestion for improved service

Offering suggestion for improved service (N=382)	Frequency	Valid Percent
Not suggested	94	24.7
Suggested	286	75.3
Total	380	100.0
Missing system	2	0.5

Around 40% of respondents requested to extend the test on the organs of the body like liver, kidney and spleen which they think may be affected by continued blood donation, followed by 18% of respondents with suggestion to provide medical consultation at mobile sites for their easy access.

Table 34: Offering suggestion for improved service

Suggestions for improved service (N=382)	Frequency	Valid Percent
Test for organ functions	153	40.3
Medical consultation at mobile sites	70	18.4
Telephonic consultation service	60	15.8
Others (communication via e-mail, face-book)	3	0.8
nothing	73	19.2
don't know	21	5.5
Total	380	100.0
Missing System	2	0.5

CHAPTER V

DISCUSSION, CONCLUSION AND RECOMMENDATION

This research focuses on assessment of satisfaction with the donor care service among the deferred anemic donors and identification of association between the satisfaction and the surrounding factors.

5.1 Discussion

The discussion part is narrated in the following sections.

5.1.1Socio-demographic features of the anemic donors

5.1.2 Donation status and Hgb level during the service

5.1.3 Satisfactions with the service

5.1.3 Perceptions toward the service and accessibility

5.1.4 Associations of socio-demographic features and perceptions with satisfaction of the service

5.1.5 Suggestions from the service users

5.1.1 Socio-demographic features of the anemic donors

In this study, more than half of the anemic donors were in the age group of 25-44 (61.5%) with mean age of 33.3 years. And female group had higher rate of anemia by 86.9% than male group by13.1%. It is consistent with other studies results in which mean age of anemic cases was 34 for females and 32 for males and proportion of female anemic cases was 82.9% (Phikulsod, Chiewsilp, Ongtilanont,

Bhakbhumpong, and Patanapongsak, 2009). This age group is used to be physically active and the healthiest in the general population with the least need for health care. However, the higher rate of anemia among the reproductive age females in blood donor society is related to physiological losses (*menstruation*) and this highlights the need of anemia prevention program more focused on female donor group (Mittal, Marwaha, Basu, Mohan, and Kumar, December 2006). In another study, the essentiality of having the anemia prevention program among female blood donor group was explained in relation to the benefits of children because it prevents their mental development retardation associated with mother's low hemoglobin (Brittenham, 2005).

All age groups had similar level of satisfaction and there was no significant association between age and satisfaction, though significance at $p<0.05$ was observed between age-groups in relation to the satisfaction of service component. Blood donors aged between 25-44 were 2 times more likely to be satisfied with service components of donor care service than the other age groups. The overall result was contrary to a study on patient satisfaction towards OPD services in public hospital in Pakistan, in which conclusion was made that old aged patients had high level of satisfaction as compared to younger age group (Javed, 2005). However, a similar finding could also be seen in a study on satisfaction with OPD service of Banphaeo Autonomous Community hospital in Thailand in which age of respondents was not associated with level of satisfaction (Amin Khan Mandokhail, 2007). The reason for almost equal level of satisfaction in NBC may lie in the fact that the donor care service is different from medical service in the aspect of pain and anxiety. The people who are seeking for the medical service in general prioritize

pain relief while donors in the donor care service seek relief of anxiety about discomfort from blood withdrawal. Anemia itself does not give direct impact to normal life of people and is not a disease that is usually handled in the hospitals. However, if this condition is persisted without any intervention, this may give indirect impact to quality of health or life or other unpleasant symptoms such as dizziness, dyspnea, palpitation up to life threatening situation. (N. Milman, 1991). Furthermore, this condition may cast fear to the donor to discontinue their blood donation behavior and thus negatively affects to the effort of the blood centers or national medical authorities to increase or maintain number of blood donors.

With regard to the education level of anemic donors, 58% of subjects were university graduates and post graduates and the higher rate of anemia in this group can be considered in relation to a study conducted by Kirtikara. In this study, Bangkok is a city with the higher rate of continuing study from secondary to higher education level comparing to the other part of the country and favorable environment for higher education was created by concentration of educational institutes in Bangkok and thus proportion of higher education level was greater than other part of the country (Kirtikara, 9 January 2001). If the study was done in other area, the rate of anemia among this group would be lowered. On the other hand, in a study conducted in U.S on return behavior of current and lapsed donors, lapsing (discontinuing) behavior due to anemia was more prevalent among college and higher education group (Germain, et al., 2007). However, the satisfaction level was not statistically significant in all respondents irrespective of their educational background. This result was similar with a study on clients' satisfaction toward health care service in a private hospital in Myanmar (Aung, 2010).

The majority (59%) of subjects had a job for living and it was consistent with income level in which 77% of subjects were at or above middle income level. There is no sufficient scientific clue to link anemia prevalence with higher income status and low hemoglobin level is mostly rooted in iron-lacking vegetarian diet.

Around 41% of the respondents were private company workers (including self-employed workers) whose incomes are usually less stable over time than government or NGOs and may be fluctuated by the economic season.

The satisfaction of the service users was assumed to be varied by different socio-demographic features. Statistical significance was not recognized in analysis for association with any socio-demographic variables except occupation. Around 58% of anemic deferred cases had jobs and the rest were students, household wives, monks and the unemployed. The higher rating of satisfaction among the employed compared to that of the unemployed is contrary to the finding of a study to measure satisfaction of deferral system of NBCs in which this group found to be not significant (Subhachaturas, 2004). In this study, strong association was observed between occupation and satisfaction with the Donor care service. The reason of different results of both studies can be explained with different objectives to measure. In Subhachaturas's study, the focus of measurement was occupation and satisfaction with deferral system which include the services focusing on kindly refusing from the blood donation those who did not meet the criteria for giving blood. The donor care service may be felt more essential to the people with jobs who are having difficulties in finding time to take care of themselves. Therefore, the service may have been viewed as an opportunity for them to look after themselves and more favored by them than those who have no job.

5.1.2 Donation status and Hgb level during the service

The donation status of clients was ranged from zero (14.7%) to 156 times (0.3%). For the convenience of analysis, the donation status was grouped into three and the high frequency of developing anemia was found in the group of more than 5 times of donation (47.1%). The gradual increasing rate of developing anemia by times of donation was also observed in the study (table 3). This is common outcome in the other studies in which anemia is more prevalent among repeated donors compared to new donors and thus frequency of donation in a year should be reconsidered (Mittal, et al., December 2006). The result also tells us that the blood donor retention program should consider about regular check-up of Hgb or serum ferritin level for blood donors with history of more than five times of blood donation, as a protective measure for this kind of donor from iron depletion (Ferguson, France, Abraham, Ditto, and Sheeran, 2007). In other studies, regular check up and appropriate measures were sought for to protect regular donor from being deferred from donation for mere low hemoglobin and one recommendation was to give further distance of time between donations (Cançado, Chiattone, Alonso, Júnior, and Alves, 2001). Currently, in most of the blood collection centers, 3 months of interval between donations is usual for all donors and this rule needs to be reconsidered for donors with more than 5 times of donation.

In another study , the compliance rate of outpatients to follow-up visit in Siriraj hospital was positively associated with previous satisfaction with the medical service the client experienced (Chipayom, 1999). The majority of clients of the service during the study period were the first time anemic cases (83%) and only 17% were subsequent cases. If the service had reached objective that all anemic

deferred donors were made to return after one month, then the rate of visit by subsequent cases should be leveled up almost as much as rate of first time anemic cases. This imbalance can be explained with the weak part of the registration system which currently allows those previously deferred cases to go directly to collection service if screening service section finds normal level of Hgb, without referring to the donor care service where these cases was first diagnosed as anemia. The consistency of referring point to the collection service for this kind of cases should be ensured and this must be the donor care service. The current registration system in NBC is now being restructured to guide this kind of donors only to the donor care service so that they could be checked for the progress of anemic condition and receive further necessary service.

The Hemoglobin level was improved 84.1% of subsequent clients and this tells us the service really works to return clients' Hgb to normality. 42.3% of female clients reached and exceeded the normal Hgb level following one month of service while male clients had the same effect at 63.6%. This result implicates the slower progress of the recovery among female group compared to male group and back up the previous findings in which rate of recovery of Hgb level for female is lower and therefore, it was more economic to prevent iron deficiency among women before it was detected(Gorlin, 2008). And the interval of test for female subsequent clients need to be considered as one-month interval test showed less than half rate of recovery, in view of expenditure for test.

Association of change in Hgb level with satisfaction of the service was not able to identify in this study due to imbalance of the fulcrum between numbers of first comers (83%) and subsequent comers (17%) and this highlights the need of further

study only among subsequent donors with sufficient number of subjects for comparison.

The discrepancies in results compared to the previous study may be derived from the limitation of the study that underwent only during the weekdays. It was found that donors were visiting the Blood Center more during weekends and national holidays than during weekdays. These donors, if found anemic, would be asked to go to the donor care service again in a weekday. Informants at the Blood center reported that a good number of anemic donors found on weekend do not come for follow up later on. This may cast doubt on representativeness of the study limited to donors who come to the blood center on weekdays and that may have different characteristics from the majority of donors who instead come during weekends and national holidays. And the satisfaction about service feature like waiting time may also be varied during the weekends. Waiting time may be elongated due to increased number of donors on weekend and national holidays. The collection of data during weekday may allocate less similar chance to this group to assess their satisfaction and this may have resulted in less representativeness to this group.

5.1.3 Satisfactions with the donor care service.

Through the study it was found that 76.4% of the service users expressed high satisfaction while 23.6% manifested low satisfaction. Initially, the researcher assumed that the service would achieve higher rate than 80% of high satisfaction as the service composed of medication, lab test and consultation all free of charge. Each component of the service was broken down to separately evaluate the

satisfaction level. As seen in the tables No.12-17, the items that received less than 90% of high satisfaction were service feature (78.5%) and accessibility (45.1%).

In the service feature part, space of service room received low score of satisfaction. The room which is used for the service is designed for screening and thus it is suitable to accommodate one donor at one time. However, it was personally witnessed by the researcher that several clients were receiving counseling in the room while another person was testing for blood in another side of the room and different services were disturbed one another.

In the accessibility part, cost and distance to reach the service and prior knowledge about the service did not satisfy at high level. The result had influence over the overall satisfaction level of the donor care service and underlines consideration of bringing the service closer to the clients in the form of mobile service or e-based service (website etc), in order to improve satisfaction level of the donor care service.

Satisfaction level with the donor care service was cross tabulated with level of intention to come to donation to see if there is any association between these two, although mono-variable analysis on intention to come to donation showed 98.7% positive answer (table was not presented in result part). The result revealed no statistical significance between these two variables. This can be interpreted in two ways: the number of negative answers for intention to return donation was not sufficient to match with number of low satisfaction and so the outcome may have been distorted. Another explanation could be no influence of satisfaction with the service over the intention because the clients were present in the Blood center just to donate the blood, not to receive the service. If they are in the blood center to receive

the donor care service and then donate the blood, then the result may have been different.

In the bi-variable analysis, traveling time to NBC found to be no influence over the satisfaction with donor care, which is contrary to the findings of the study on patients satisfaction with hospital service in Bangladesh in which traveling time affected to the level of satisfaction with health services (Andaleeb, Siddiqui, and Khandakar, 2007). However, the discrepancy in results may be explained with two folds greater in number of first time visitors to subsequent visitors and if the satisfaction is measured among same number of subsequent visitors as first time visitors, the traveling time may be differently act on the satisfaction of the service.

5.1.4 Perceptions toward the service effectiveness and accessibility

Perception was assessed in terms of components of the donor care service and accessibility. The study found that perceptions on the components of the service were generally favorable with few items still needed for improvement like explanation about the test result and medical advice by nurses and some discomfort while lab testing is undertaken. These can be improved by continued training of nurses on lab result interpretation and separation of phlebotomy and lab testing from counseling area. This perception is relevant to the quality of medical staffs in the service and the finding of this study agrees with the study on delivering quality service balancing customer perceptions and expectations in New York that if the customers met their expectation to perceive the medical staffs' abilities in the practical treatment of disease they might rate that they perceived high quality of service (Zeithaml, 1990).

The clients' perception of accessibility includes travelling cost, distance and public awareness. In general, the perception of accessibility was highly rated with minority (less than 3%) still in need of consideration. With regard to the cost and distance to reach the service, this may be a factor that would hesitate the clients to access the service every one month. In a study on public OPD services satisfaction in Manica, Mozambique most common complaints were lack of adequate transportation and long wait times and more and more people were seeking for community healer nearby (Newman RD, 1998). As mentioned earlier, the number of subsequent clients was far lower than the number of deferred donors due to anemia per day and this lower rate is presumed to be affected by the time and distance to get to the service.

This study found highly significant in association ($p<0.001$) between accessibility and the level of satisfaction in both bi variable and multivariable analysis after controlling other factors. Several studies confirmed the association between accessibility level and the satisfaction level. One of the studies towards mother and child health services satisfaction among mothers attending the maternal and child health training institutes in Dhaka, Bangladesh revealed that good accessibility was related to high satisfaction while poor accessibility was related to low satisfaction (Asma H, 2007). The result of this study agrees with the finding of a study on clients's satisfaction towards health care services at OPD, Pinlon hospital, Myanmar (Aung, 2010), in which high significant association between accessibility and the level of satisfaction was observed

5.1.5 Associations between satisfaction with other services of NBC and satisfaction with the donor care service

Other services of NBC includes the preceding services of the donor care services like reception, physical examination, Hgb screening, history checking of blood donation by computer system and what's more for regular donors, the collection and refreshment services. The study identified strong association between these two variables at both bi variable and multi variable analysis with $p \leq 0.001$. This finding supports the result of a study conducted by Andaleeb about service quality perceptions and patient satisfaction in hospitals of a developing country, in which satisfactions with diagnosis service and treatment service are correlated and thus the quality of adjacent services should not be ignored in terms of increasing quality and satisfaction level of other services (Andaleeb, May 2001).

5.1.6 Suggestions from the service users

Out of 382 respondents, around 75.3% gave general suggestions which is of value in terms of improving the service for higher satisfaction. This considerable response rate is presumably related to the sincerity of donors to have the service more contributable to the health care of blood donors. Among suggestions, hope to receive a test for other organ functions which perceived to be affected by blood donation was expressed at 53.4%, followed by willingness to have consultation at mobile site at 24.4%. it was also suggested that telephonic consultation service should be made available for the clients so that they don't need to consume time for travel to get information. Also free communication with medical staffs for health education via e-mail or face book was suggested.

5.2 Conclusion

The Donor Care Service for deferred donors due to low hemoglobin received high level of satisfaction among the service users, regardless to their socio-demographic characteristics, except occupation, which proved no relationship with satisfaction.

The Service brought about apparent improvement in Hgb level among almost all service users.

The finding that the blood donors with occupation are more satisfied with the donor care service than those with no occupation gathers attention with regard to recruitment of blood donors among this group through public advocacy about this donor care service and therefore those with occupation but never attempted blood donation for fear of anemia could be motivated.

Satisfaction with the donor care service does not seem to have major influence over intention to return donation but potential supportive role for increasing intention because most of the respondents showed positive intention to return. However, as the current study failed to measure how much influence the satisfaction with the DCS has in induction of intention to return because of extremely small number of “negative” intention group for comparison with “positive” intention group in terms of low and high level of satisfaction, another study is recommended to undertake with different study design.

Health care intervention for female blood donors needs to be intensified as long as anemia is most prevalent in female group.

All associations between independent and dependant variables should be regarded as positive outcome that the higher the measurement of the independent variable the higher the satisfaction.

Nowadays, almost all countries across the world are facing severe shortage of blood donor, especially gradual shrink of regular donor pool and thus are struggling to explore the way to get rid of this challenge. In this regard, the donor care service in National Blood Center of Thai Red Cross Society is an innovative intervention to stop shrinking of regular donors due to anemia and at least maintain the current pool of regular donors. In my study, all variables of perception towards the quality of the service showed significant association with clients' satisfaction. Therefore quality of the service is the major influencing factor in satisfaction level and thus contributing to retention of regular donor from deferral due to anemia as well. Given female donors are more in number than male donors and the highly frequent age group of anemia case is in the range of child bearing age, the service should pay more attention to control of anemia of female donors.

At policy level, the donor care service should be viewed as an essential part of donor retention program as it contributes to protection of reduced number of blood donors due to anemia. The NBC should be proud of having pioneered this service in the region and world

5.3 Recommendation

Based on the study results and discussion, the following recommendations could be offered for the National Blood Center and future studies.

5.3.1 For the National Blood Center,

- At policy level, the donor care service should be viewed as an essential part of donor retention program as it contributes to the reduced number of blood donors due to anemia,.
- The policy should underline prevention of anemia after blood donation by focusing on adequate iron replacement for each donation along with the donor education to comply with the iron regimen.
- The frequency of blood donation per year should be reconsidered for repeated donors of more than 5 times and female donors of reproductive age or else adequate iron replacement should seriously be emphasized for this kind of donors.
- The opportunity to develop the service should be explored or created with pride of having pioneered this service in the region and the world. The items that received relatively lower score of satisfaction in this study should be referred for improvement of the service.
- The Service should be made available for deferred donors due to anemia on weekends and national holidays and potentiality should be sought for opening of the service in accordance with working-days of the National Blood Center.

- Since Anemia is not a final diagnosis, a Standard Operation Procedure (SOP) should be developed and formalized for the Service in the way that the root of anemia could be identified and treated, especially for patients who do not respond to oral iron therapy. The SOP should also include referral system to specialized hospitals nearby for such services as endoscopy and coloscopy, especially for male anemic cases.

- The NBC should organize occasional training for the nurses and encourage experienced medical doctor to train them after establishment of close collaborative link with neighboring hospitals.
- With regard to the infrastructure, further spacious room should be provided for donor care service so that each component of the service could not be disturbed by one the other.
- Availability of the DCS at mobile site and through internet should be sought for in the effort to bring the Service closer to the service users and increase their convenience to access.
- Cross-sectional study should be encouraged on regular basis to identify point to improve and measure the progress.
- The NBC should advocate about the service into the public so that potential donors who fear of having anemia following blood donation could proactively participate in the donation because anemic donors will be properly followed up by this service.

5.3.2 For future research

- A study for measuring satisfaction level among subsequent clients is recommended as the current study mixed satisfaction with first comers.
- The satisfaction level should be compared between first time service users (those who visit DCS first time) and repeated service users (those who visit DCS more than one) in order to identify the portion of service that is highly or low appreciated.
- The economic benefits of the service for anemic donors should be estimated from service provider's perspective, by identification of additional increase in

blood supply subject to return rate of donation of previously deferred anemic donors.

- A study on association of satisfaction of DCS with intention to return needs to be planned again to disclose the potentially masked relationship between these two variables. In the study, the satisfaction- related data should be collected after separating the study group into two; “intention” group – a group of donors with recovered Hgb after DCS who continue donation and “no intention” group – another group who lapsed donation for one year despite of recovered Hgb after DCS.

Part One : Socio-demographic and donation status Information

Please put a √ in the ( ) of each question or fill in the blank as much as acceptable for our information.

Donor registration No: …….

1. Age : ……years **2. Sex:** ☐ male, ☐ female.

3. Marital status

( ) 1. Single ( ) 2. Married

( ) 3. Widow ( ) 4. Separate

( ) 5. Divorce ( ) 6. Don't want to answer.

4. Education

( )1. Primary school ( ) 2. Secondary school

( )3. High School ( ) 4. Graduate

( ) 5. Post graduate ( ) 6. Others ……

5. Occupation

( ) 1. Government Officer ( ) 2. NGO officer

( ) 3. Business owner ( ) 4. Private company officer

( ) 5. Student ( ) 6. Unemployed

( ) 7 Monks ( ) 8. Others

6. Personal Income (per month)

( ) 1. More than 30,000 Bhat ( ) 2. 25,001 – 30,000 Bhat

( ) 3. 20,001 – 25,000 Bhat ( ) 4. 15,001 – 20,000 Bhat

( ) 5. 10,001 – 15,000 Bhat ( ) 6. 5,000 – 10,000 Bhat

( ) 7 Less than 5,000 Bhat ( ) 8. No income

( ) 9 Don't want to answer.

7. How many times have you donated?

( ) 0 ( ) 3

( ) 1 ( ) 4

( ) 2 ( ) 5

If more than 5, please specify numbers of donation ……..

Part Two: Satisfaction of the Donor Care Service

Please answer the following by ticking (√) in the box of your choice where indicated your level of satisfaction from least to completely satisfied.

Satisfaction	Least 1	2	3	4	Max 5
1. Provision of medicine					
1.1 Packing and labeling of medicines received					
1.2 Description of dosage of medicines					
1.3 Amount of medicines					
2. Blood lab testing					
2.1 Appropriateness of the test indices					
2.2 Technique of phlebotomy					
2.3 Speed of availability of test result					
2.4 Filing and copying of test result for future reference by medical personnel and yourself					
2.5 Provision of the follow up test after one month					
3. Medical consultation					
3.1 Explanation of medical personnel about the cause of anemia and use of medicine.					
3.2 Explanation of medical personnel about the test result					
3.3 Understanding of the explanation and advice of medical doctor					

4. Service feature	**Least 1**	**2**	**3**	**4**	**Max 5**
4.1 Waiting time for consultation with doctor or nurse					
4.2 Hospitality and kindness of medical personnel					
4.3 Space of the service room					
4.4 Procedure to get the service					

5. Accessibility	**Least 1**	**2**	**3**	**4**	**Max 5**
5.1 Cost to reach the service					
5.2 Distance to reach the service					
5.3 Request for monthly visit to the service					
5.4 Prior knowledge about the service					

8. Is this your first visit to the Service?

☐ **Yes (if yes, please skip 1.2)**

☐ **No**

Part Three Perception of the service

Component of donor care service	Strongly disagree	disagree	agree	Strongly agree
1. Medicine				
1.1 I feel that I would be better if I take them all given by the Service				
1.2 I feel more energetic and lively than ever, after starting intake of medicines				
2. Lab test				
2.1 The test received is necessary for my health				
2.2 I feel comfort while lab test is being undertaken				
2.3 I could understand the test result and my health status through explanation of medical personnel.				
2.4 The follow up test by the Service every month is important for my early recovery and donation.				
3. Medical consultation				
3.1 Medical advice given by the medical personnel is easy to understand and comply with.				
3.2 Medical personnel are kind and very efficient.				
3.3 I feel impressive when after receiving medical advice from Donor Care service				
3.4 After consultation, I feel confident that I would become normal and be able to donate blood if I follow the advice				

4. Accessibility	Strongly disagree	disagree	agree	Strongly agree

4.1 The cost for travelling to the NBC is nothing compared to the benefit I gain through the Service.				
4.2 It is not trouble to me to come to receive the Service.				
4.3 The service needs to be advocated to the public.				

How long does it take for you to come to the National Blood Center for receiving the service? Please check in an appropriate box below.

☐Less than one hour ☐In one hour ☐More than one hour

Traveled by (you can choose more than one)

☐ Bus ☐BTS/MRT ☐Private car

☐ Both ☐Others

Part Four: Overall of opinion of deferred blood donors about the service

Please put a √ in the ( ) of each question or fill in the blank and write clearly for our reference.

1. Overall satisfaction about National Blood Center services

( ) very satisfied because…….

( ) satisfied because…….

( ) uncertain because……...

( ) dissatisfied because……

( ) very dissatisfied because……

2. What kind of service do you wish to receive in addition to the current services?

Please tick in a box where appropriate.

☐ Telephonic consultation service

☐ Test for other system of the body (liver, heart, kidney)

☐ Medical consultation at mobile session site

☐ nothing

☐ I don't know

☐ others : specify ……

3. Would you like to come back for blood donation?

( ) Yes

( ) No because……...

( ) May be

4. Would you introduce to your friend or relative the donor care service for anemia management?

( ) Yes

( ) No because……...

( ) May be

* To be filled by the assistant upon filed record
Hb level of last time: ……g/dl Hb level of this time: ……g/dl

<u>ส่วนที่ 1</u> ข้อมูลพื้นฐานทางสังคม และสถานะการบริจาคโลหิต

กรุณาใส่เครื่องหมาย √ ในช่อง ( ) ของคำถามแต่ละข้อ หรือตอบคำถามในช่องว่าง เพื่อให้ข้อมูลที่เป็นประโยชน์แก่ผู้จัดทำแบบสอบถาม

เลขทะเบียนผู้บริจาค .....

1. อายุ : .....**ปี** **2. เพศ:** ☐ **ชาย** ☐ **หญิง**

3. สถานภาพ

( ) 1. โสด *( ) 2. สมรส*

( ) 3. หม้าย *( ) 4. แยกทางกัน*

( ) 5. หย่าร้าง *( ) 6. ไม่ต้องการตอบ*

4. การศึกษา

( )1. ประถมศึกษา *( ) 2. มัธยมศึกษาตอนต้น*

( ) 3. มัธยมศึกษาตอนปลาย *( ) 4. ปริญญาตรี*

( ) 5. สูงกว่าปริญญาตรี *( ) 6. อื่นๆ .....*

5. อาชีพ

( ) 1. รับราชการ *( ) 2. เจ้าหน้าที่องค์กรไม่แสวงผลกำไร (NGO)*

( ) 3. เจ้าของกิจการ *( ) 4. พนักงานบริษัท*

( ) 5. นักเรียน/นักศึกษา *( ) 6. ไม่ได้ทำงาน*

( ) 7. พระ/นักบวช *( ) 8. อื่นๆ.....*

6. รายได้ต่อเดือน

( ) 1. มากกว่า 30,000 บาท *( ) 2. 25,001 – 30,000 บาท*

( ) 3. 20,001 – 25,000 บาท *( ) 4. 15,001 – 20,000 บาท*

( ) 5. 10,001 – 15,000 บาท *( ) 6. 5,000 – 10,000 บาท*

( ) 7 น้อยกว่า 5,000 บาท *( ) 8. ไม่มีรายได้*

( ) 9. ไม่ต้องการตอบ

7. ท่านเคยบริจาคโลหิตมาแล้วกี่ครั้ง

( ) 0 *( ) 3*

( ) 1 *( ) 4*

( ) 2 *( ) 5*

ถ้ามากกว่า 5 ครั้ง ระบุจำนวนครั้งที่บริจาคมาแล้ว……..

ส่วนที่ 2 : ระดับความพึงพอใจในการให้บริการ ของผู้บริจาค

การตอบคำถามโดยใส่เครื่องหมาย (√) ในช่องที่ท่านเลือก ระดับความพึงพอใจจากน้อยไปหามาก (1-5)

ระดับความพึงพอใจ	1 น้อยที่สุด	2	3	4	5 มากที่สุด
1. การจัดเตรียมยา (เม็ดธาตุเหล็ก)					
1.1 การบรรจุและความชัดเจนของป้ายบอกประเภทยา					
1.2 คำอธิบายการใช้ยา					
1.3 จำนวนยาที่มอบให้					
2. การทดสอบโลหิตทางห้องปฏิบัติการ					
2.1 คำแนะนำรายการการทดสอบโลหิต					
2.2 เทคนิคในการเจาะเลือด					
2.3 ได้รับผลทดสอบรวดเร็ว					
2.4 เก็บผลการทดสอบในแฟ้มประวัติ และให้ท่านเก็บไว้เองอีก 1 สำเนา เพื่อใช้เปรียบเทียบในการตรวจครั้งต่อไป					
2.5 การกลับมาตรวจเลือดซ้ำใน 1 เดือน หรือเมื่อยาหมด					
3 การให้คำปรึกษาโดยบุคลากรการแพทย์					

3.1 การอธิบายถึงสาเหตุการเกิดภาวะโลหิตจาง และการใช้ยา (เม็ดธาตุเหล็ก) อย่างละเอียด					
3.2 การอธิบายผลการทดสอบโลหิต					
3.3 ความเข้าใจในคำอธิบายและคำแนะนำของบุคลากรการแพทย์					
4 ลักษณะการให้บริการ	**1 น้อยที่สุด**	**2**	**3**	**4**	**5 มากที่สุด**
4.1 ระยะเวลาการรอเพื่อเข้าพบแพทย์หรือพยาบาล					
4.2 การต้อนรับและการอำนวยความสะดวกของบุคลากรการแพทย์					
4.3 ขนาดของห้องตรวจ					
4.4 วิธีและขั้นตอนของการให้บริการ					
5 การเข้าถึงการให้บริการ	**1 น้อยที่สุด**	**2**	**3**	**4**	**5 มากที่สุด**
5.1 ค่าใช้จ่ายในการมารับการบริการ (ค่าเดินทาง และค่าใช้จ่ายอื่นๆ)					
5.2 ระยะทางในการเดินทางมารับบริการ					
5.3 ความพึงพอใจที่ต้องเดินทางมาทุกๆเดือนหลังจากรับประทานยาหมดแล้ว ตามคำแนะนำของแพทย์ที่ปรึกษา					
5.4 ความรู้ที่มีอยู่ก่อนได้รับการบริการ					

8. เป็นการพบแพทย์เนื่องจากโลหิตจางครั้งแรกใช่หรือไม่

☐ ใช่

☐ ไม่ใช่

(ถ้า ใช่ ไม่ต้องตอบข้อ 1.2)

ส่วนที่ 3 :การรับรู้และความคิดเห็นเกี่ยวกับบริการ

ส่วนประกอบของการบริการการดูแลผู้บริจาค	ไม่เห็นด้วยอย่างมาก	ไม่เห็นด้วย	เห็นด้วย	เห็นด้วยอย่างมาก
1. ยา(เม็ดธาตุเหล็ก)ที่ได้รับ				
1.1 มีความรู้สึกมั่นใจว่าจะมีอาการดีขึ้นเมื่อได้รับประทานยาทั้งหมดที่ได้รับจากศูนย์บริการโลหิตแห่งชาติ				
1.2 รู้สึกกระฉับกระเฉงและสดชื่นขึ้นมากกว่าเดิมหลังจากเริ่มรับประทานยา				
2 การทดสอบโลหิตทางห้องปฏิบัติการ				
2.1 การทดสอบที่ได้รับมีความจำเป็นต่อสุขภาพของข้าพเจ้า				
2.2 รู้สึกสะดวกสบายตลอดขั้นตอนการรับการตรวจโลหิต				
2.3 หลังจากได้รับฟังคำอธิบายจากบุคลากรการแพทย์แล้ว มีความเข้าใจในผลการทดสอบและสถานภาพร่างกายของตนมากยิ่งขึ้น				
2.4 การติดตามผลหลังการทดสอบโลหิตทุกเดือน มีความสำคัญต่อการฟื้นฟูสุขภาพและการบริจาคโลหิตในครั้งต่อๆไปของข้าพเจ้า				
3 การให้คำปรึกษาโดยบุคลากรการแพทย์				

3.1 คำแนะนำของบุคลากรการแพทย์ง่ายต่อการเข้าใจและปฏิบัติตาม				
3.2 บุคลากรการแพทย์มีความสามารถ ทั้งยังอัธยาศัยดีและเป็นกันเอง				
3.3 รู้สึกประทับใจเมื่อได้รับคำแนะนำจากศูนย์บริการโลหิตแห่งชาติ				
3.4 หลังจากได้รับคำแนะนำจาก แพทย์แล้ว ข้าพเจ้ามั่นใจว่าสุขภาพจะดีขึ้นเป็นปกติจนสามารถบริจาคโลหิตได้ หากปฏิบัติตามคำแนะนำ				
4 การเข้าถึงการให้บริการ	**ไม่เห็นด้วยอย่างมาก**	**ไม่เห็นด้วย**	**เห็นด้วย**	**เห็นด้วยอย่างมาก**
4.1 ค่าใช้จ่ายในการเดินทางมารับบริการ คุ้มค่าและสมเหตุสมผลกับบริการที่ได้รับ				
4.2 การมารับบริการที่ศูนย์บริจาคโลหิตแห่งชาติไม่เป็นปัญหาต่อข้าพเจ้า				
4.3 การบริการควรได้รับการประชาสัมพันธ์ต่อสาธารณะ				

ใช้เวลาในการเดินทางมายังศูนย์บริการโลหิตแห่งชาติ

☐ น้อยกว่า 1 ชั่วโมง ☐ 1 ชั่วโมง ☐ มากกว่า 1 ชั่วโมง

เดินทางโดย (เลือกได้มากกว่า 1 ข้อ)

☐ รถบัสประจำทาง ☐ BTS / รถไฟฟ้าใต้ดิน ☐ รถส่วนตัว

☐ เรือ ☐ อื่น.....

<u>ส่วนที่ 4</u> ความเห็นโดยรวมของผู้ถูกให้งดบริจาคโลหิต ที่มีต่อการให้บริการให้คำปรึกษาแก่ผู้

บริจาค

กรุณาตอบคำถามโดยใส่เครื่องหมาย (√) ในช่องที่ท่านเลือก หรือเขียนรายละเอียดเพิ่มเติมเพื่อใช้ในการอ้างอิง

1. ภาพรวมความพึงพอใจในการให้บริการของศูนย์บริการโลหิตแห่งชาติ

( ) พึงพอใจอย่างยิ่ง เนื่องจาก .....

( ) พึงพอใจมาก เนื่องจาก .....

( ) พึงพอใจ เนื่องจาก .....

( ) พึงพอใจน้อย เนื่องจาก .....

( ) พึงพอใจน้อยที่สุด เนื่องจาก .....

2. บริการที่ท่านต้องการเพิ่มเติมจากที่มีอยู่ในปัจจุบัน

☐ การให้คำปรึกษาทางโทรศัพท์

☐ การทดสอบโลหิตอย่างอื่น เช่น ทดสอบการทำงานของตับ ไต และหัวใจ เป็นต้น

☐ การให้คำปรึกษาที่หน่วยเคลื่อนที่

☐ พอใจแล้ว ไม่ต้องเพิ่มเติม

☐ ไม่มีความเห็น

☐ อื่นๆ โปรดระบุ.....

3. ท่านมีความประสงค์จะกลับมาบริจาคโลหิตอีกหรือไม่

( ) ใช่

( ) ไม่ใช่ เนื่องจาก .....

( ) ไม่แน่ใจ

4. ท่านจะแนะนำเพื่อนหรือญาติเกี่ยวกับการให้บริการให้คำปรึกษาผู้บริจาคโลหิตเกี่ยวกับการจัดการรักษาภาวะโลหิตจางหรือไม่

( ) ใช่

( ) ไม่ใช่ เนื่องจาก.....

( ) ไม่แน่ใจ

*** กรอกข้อมูลโดยผู้ช่วยวิจัย**.....
ระดับความเข้มข้นโลหิตครั้งที่แล้ว .....**g/dl** **ระดับความเข้มข้นโลหิตครั้งนี้** .....**g/dl**

Information for Study Participant

Title of research project: Donor Care Service for Deferral Donors due to anaemia

Principle researcher's name: Dr. Kim Son Il **Position:** MPH student, Chulalongkorn University

Office address: Institute building 2-3, Soi Chulalongkorn 62, Phyathai Rd. Pathumwan, Bangkok 10330, Thailand

Home address: Krungthep Apartment 106 Rangnam Rd., Phayathai, Rajataevee, Bangkok

Telephone (office) …….. **Telephone (home)** …….

Cell phone: 089 458 8295 **E-mail:** jwk0242@gmail.com

You are being invited to take part in a research project Donor Care Service for Deferral Donors due to Anaemia. Before you decide to participate, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and do not hesitate to ask to the researcher or research assistant if anything is unclear or if you would like more information.

This research project involves assessment of satisfaction level of deferred donors due to anemia about Donor Care Service of National Blood Center

Objectives of the project are

- To make the service more friendly to you
- To find possible way to improve the service
- To collect your frank opinion about the service

To be participant in the research, you should be deferred from blood donation due to unmet criteria for hemoglobin and have been received or being received the Donor Care Service in the National Blood Center. However, you are excluded from being participant if you are not registered as "a deferred donor".

You will be asked to fill in the questionnaire by the research assistant standing at the door of the Donor Care service, when you come out of the room to go home after you receive the Service.

The data of your haemoglobin level will be taken from the medical records kept by the Donor Care Service section upon permission.

Your participation to the study is voluntary and you have the right to deny or withdraw from the study at any time without any reason being asked and there will be no bad impact upon you regarding the use of service.

If you have any question or would like to obtain more information, the researcher can be reached at all time through the given contact details above.

The questionnaire filled by you will be kept confidential and it is assured that this study will not affect to your continued utility of the Service**.** Results of the study will be reported as total picture in my thesis and be used as a tool to improve and promote donor retention in blood centers. Any information which could identify you will not appear in the report.

After you completed the questionnaire, please return it to the research assistant.

Thank you very much for your time and participation

ข้อมูลสำหรับผู้ตอบแแบบสอบถาม

หัวข้องานวิจัย การบริการการดูแลแก่ผู้ถูกให้งดบริจาคโลหิตเนื่องจากภาวะโลหิตจาง

ชื่อผู้ทำวิจัย น.พ. คิม ซอน อิล (Dr. Kim Son Il) **ตำแหน่ง** นักศึกษาปริญญาโทด้านสาธารณสุข จุฬาลงกรณ์มหาวิทยาลัย (MPH student)
ที่อยู่สำนักงาน อาคารสถาบัน 2-3, ซอย จุฬาลงกรณ์ 62 ถนนพญาไท ปทุมวัน กรุงเทพ 10330 ประเทศไทย
ที่อยู่ผู้ทำวิจัย กรุงเทพอพาร์ทเม้นต์ 106 ถนนรางน้ำ พญาไท ราชเทวี กรุงเทพ

เบอร์โทร (สำนักงาน) **เบอร์โทร (บ้าน)**

มือถือ 089 458 8295 **E-mail:** jwk0242@gmail.com

ผู้ทำวิจัยขอเชิญท่านมีส่วนร่วมในโครงการวิจัยในหัวข้อ การบริการการดูแล(การให้คำปรึกษาและการรักษา) ผู้ถูกให้งดบริจาคโลหิตเนื่องจากภาวะโลหิตจาง ผู้ทำวิจัยขอให้ท่านกรุณาอ่านรายละเอียด เกี่ยวกับวัตถุประสงค์ และลักษณะการทำแบบสอบถาม ก่อนตัดสินใจให้ข้อมูลแก่ผู้ทำวิจัย ทั้งนี้ ผู้ทำวิจัย หรือผู้ช่วยวิจัย ยินดีให้คำอธิบายเพิ่มเติมแก่ท่าน หากท่านมีข้อสงสัยเกี่ยวกับเนื้อหาของแบบสอบถามนี้

งานวิจัยนี้ เกี่ยวข้องกับการประเมินผลระดับความพึงพอใจของผู้ถูกให้งดบริจาคโลหิตเนื่องจากภาวะโลหิตจาง ที่มีต่อการบริการการดูแลผู้บริจาคโลหิตของศูนย์บริการโลหิตแห่งชาติ สภากาชาดไทย

โดยมีวัตถุประสงค์ ดังนี้

- เพื่อให้บริการที่เป็นกันเองแก่ผู้มารับบริการ
- เพื่อปรับปรุงการให้บริการให้การดูแลผู้บริจาค
- เพื่อรวมรวมความคิดเห็นที่แท้จริงของท่านที่มีต่อการให้บริการให้การดูแลผู้บริจาค

ผู้ร่วมตอบแบบสอบถามนี้ ต้องเป็นผู้ถูกให้งดบริจาคโลหิตเนื่องจากระดับความเข้มข้นของโลหิตไม่ผ่านเกณฑ์ที่กำหนด และเคยรับหรืออยู่ระหว่างการรับบริการให้การดูแลผู้บริจาค ณ ศูนย์บริการโลหิตแห่งชาติ อย่างไรก็ตาม หากท่านไม่ได้เป็นผู้ถูกให้งดบริจาคโลหิต ทางผู้วิจัยขอสงวนสิทธิ์ที่จะไม่ขอให้ท่านตอบแบบสอบถามนี้

ผู้ช่วยวิจัยจะขอให้ท่านตอบแบบสอบถาม ที่หน้าห้องให้คำปรึกษาแก่ผู้บริจาค หลังจากท่านได้รับการดูแลจากบุคลากรทางการแพทย์แล้ว ทางผู้ทำวิจัยจะบันทึกข้อมูลระดับความเข้มข้นโลหิตของท่าน จากแฟ้มประวัติของท่านเมื่อได้รับอนุญาตจากฝ่ายบริการให้คำปรึกษาแก่ผู้บริจาคแล้ว

การมีส่วนร่วมของท่านในการให้ข้อมูลสำหรับวิจัยฉบับนี้เป็นไปโดยความสมัครใจของท่าน และท่านมีสิทธ์ที่จะปฏิเสธการให้ข้อมูล หรือถอนตัวจากการให้ข้อมูลได้ตลอดเวลา โดยไม่ต้องให้เหตุผลใดๆทั้งสิ้น รวมถึงจะไม่ส่งผลกระทบใดๆต่อท่านในการใช้บริการต่อไป ท่านสามารถติดต่อผู้ทำวิจัยได้ตามที่อยู่ข้างต้น หากท่านมีคำถามหรือต้องการข้อมูลเพิ่มเติม

ข้อมูลของท่านที่ให้ไว้ในแบบสอบถามนี้ จะถูกเก็บรักษาเป็นความลับ และจะไม่ส่งผลกระทบใดๆต่อท่านในการใช้บริการต่อไป ข้อสรุปของการศึกษานี้ จะบอกรายละเอียดในภาพรวมในวิทยานิพนธ์ของผู้ทำวิจัย และใช้เป็นเครื่องมือสำหรับการส่งเสริมและปรับปรุงการคงไว้ซึ่งผู้บริจาคโลหิตในงานบริการโลหิต ซึ่งทางผู้วิจัยให้การรับรองว่าข้อมูลของท่านจะไม่ถูกเปิดเผยในรายงานนี้

หากท่านกรอกข้อมูลในแบบสอบถามครบถ้วนแล้ว กรุณาส่งคืนที่ผู้ช่วยวิจัย

ขอขอบพระคุณสำหรับเวลาและความร่วมมือของท่านในการให้ข้อมูลในครั้งนี้

Informed Consent Form

Date: / February / 2011

I, who have signed here below, agree to participate in this research project

Title: " Donor Care Service for Deferred donors due to anaemia in National Blood Center", run by **Principle researcher's name** Dr Kim Son Il **(Contact Telephone**

Number 089 458 8295).

I have **read** the information sheet for study participants and got information of objectives of the project, what I will be engaged with in details and benefit of this project. I clearly understand with satisfaction**.**

I willingly agree to participate in this project and consent the researcher to collect data from me through the questionnaire.

I know I have the right to withdraw from this research project at any time as I wish with no need to give any reason and this withdrawal will not have any negative impact upon me and my further utility of the Service.

The researcher guaranteed that any of my personal information will be kept confidential and results of the study will be reported as total picture in the thesis.

I hereby certify that I understood the information sheet and undersigned on the informed consent form accordingly.

Sign ……..……

(……..……)

Researcher

Sign ……..……

(……..……)

Participant

Sign ……..……

(……..……)

Research Assistant

หนังสือให้ความยินยอม

วันที่ กุมภาพันธ์ 2553

ข้าพเจ้า ผู้ลงนามท้ายเอกสารนี้ ตกลงเข้าร่วมโครงการวิจัย ในหัวข้อ การบริการให้การ

ดูแลแก่ผู้ถูกให้งดบริจาคโลหิตเนื่องจากภาวะโลหิตจาง ของศูนย์บริการโลหิตแห่งชาติ ซึ่งจัดทำโดย ผู้ทำวิจัย น.พ. คิม ซอน อิล (Dr. Kim Son Il) เบอร์ติดต่อ 089 458 8295

ข้าพเจ้าได้อ่านข้อมูลสำหรับผู้ตอบแบบสอบถาม และรับทราบถึงวัตถุประสงค์และประโยชน์ของโครงการวิจัย ด้วยความเข้าใจและพึงพอใจ ที่จะมีส่วนร่วมในงานวิจัยนี้

ข้าพเจ้าตกลงเข้าร่วมโครงการนี้และยินยอมให้ผู้ทำวิจัยรวมรวมข้อมูลของข้าพเจ้าโดยการกรอกข้อมูลในแบบสอบถามที่ผู้ทำวิจัยจัดทำขึ้น

ข้าพเจ้าได้รับทราบว่ามีสิทธ์ที่จะถอนตัวจากการให้ข้อมูลสำหรับโครงการวิจัยนี้ได้ตลอดเวลา โดยไม่ต้องให้เหตุผลใดๆทั้งสิ้น และการถอนตัวนี้จะไม่ส่งผลกระทบต่อข้าพเจ้าในการใช้บริการต่อไป

ผู้ทำวิจัยให้การรับรองว่า ข้อมูลส่วนตัวของข้าพเจ้าจะถูกเก็บเป็นความลับ และข้อสรุปของการศึกษานี้ จะบอกรายละเอียดในภาพรวมในวิทยานิพนธ์ของผู้ทำวิจัย

ข้าพเจ้ารับรองว่ามีความเข้าใจในข้อมูลทั้งหมดที่ได้รับ และได้ลงชื่อไว้เป็นหลักฐาน

ลงชื่อ .....
(.....)
ผู้ทำวิจัย

ลงชื่อ .....
(.....)
ผู้ตอบแบบสอบถาม

ลงชื่อ .....
(.....)
ผู้ช่วยวิจัย

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