

CHAPTER V

SUMMARY, DISCUSSION AND RECOMMENDATIONS

This research focuses on the perception of deferred blood donors in regards to the service and conditions encountered at the National Blood Center, Red Cross Society, Thailand. It was conducted at the National Blood Center headquarters from February 1 to February 29, 2004. The objectives of the research are to evaluate deferred blood donor satisfaction with the service processes of the National Blood Center deferral system, including association between deferred blood donor perceptions and their socio-demographic characteristics. Calculation determined a sample size of 375.

The researcher invited 397 blood donors who were deferred during the study period to participate, however, only 382 agreed to participate. A cross-sectional explanatory survey was used in the field, with a self-administered questionnaire. The self-administered questionnaire was developed and tested for reliability among 30 cases at the National Blood Center before the study was started. The result, using Cronbach's Alpha Coefficient, was 0.91 for perception in quality of service and 0.92 for satisfaction. Willing participants completed the questionnaire by themselves. A Chi-square test was performed in an attempt to identify possible associations between socio-demographic characteristics and perception. It was also used to test for possible associations between perception and satisfaction. It is the hope of the researcher that the results will be used as guidelines to improve the quality of the blood donor deferral system, therefore increasing blood donor retention in the future.

SUMMARY

Table 4.1, The majority of the deferred blood donors who participated in this study were female (Male: Female ratio equals 1:1.18). Majority of participants were of working age, between 26 to 39 years old (42.7%), with mean at 33.26 years. The educational level was relatively high, bachelor's degree (44.5%). The largest occupational sectors were private company employee (35.1%) and self-employed (26.2%). In respect to the respondent's personal income, the largest group was in the range of 5,000-10,000 Baht per month (27.2%); the second and the third were higher than 10,000 Baht (10,001-15,000 Baht at 17.0%, and higher than 30,000 at 13.6%).

37.6% of first time potential blood donors were deferred, those with more than four donations were deferred at a rate of 36.3%; and if we look at the total number of deferred blood donors who donate more than one time (regular donor), the data shows 62.4%.

Table 4.2, the data presented that deferred females were deferred at station 1, Self-deferral Questionnaire and Volunteer Screening, 67.7% and station 3, Hemoglobin Test and Technical Staff Screening, 76.6%. These results are higher than in males, who were deferred more at station 2, Physical Examination and Physician/trained nurse Screening station, 61.3% and station 4, History Check and Information Staff Screening, 63.8%.

Table 4.3, Self-deferral Questionnaire and Volunteer Screening (station 1) blood donors were deferred at the first visit, 79.0%. At the Physical Examination and Physician/ Trained Nurse Screening (station 2), those who had donated more than four times were deferred at a rate of 42.6%. At the Hemoglobin Test and Technical Staff Screening (station 3) those who had donated more than four times were deferred

at the rate of 49.1%. Lastly, at the Previous History Check and Information Staff Screening (station 4) first time donor were deferred at 53.2%

Comparing the results of data analysis (table 4.9), the mean overall perception of deferred blood donors was 3.18, out of a scale of 4.00. Responses show a high total mean, 3.30, for the physical examination and physician/ trained nurse screening station. The hemoglobin test and technical staff screening station has the lowest mean, 3.09.

Both the highest and lowest means within each station component was over 3.0. As for physical examination and physician/trained nurse screening station, this station presented the highest mean in place and environment (3.19), staff capability (3.34), and staff attention (3.37). The lowest mean of place and environment (3.05), staff capability (3.13) and staff attention (3.08) were found in the Hemoglobin Test and Technical Staff Screening station.

Table 4.10, the highest rank in overall performance from “strongly agrees” was in the category, clear explanation, with a rate of 31.1%. This was followed by reason for deferral explanation (30.9%) and adequate explanation (29.8%). The three lowest rankings from deferred blood donor responses were short waiting (20.4%), convenient place for service (20.2%), and enough staff (19.6%).

Table 4.11, the highest ranking category in Self-deferral Questionnaire and Volunteer Screening for “strongly agrees” was clear explanation with a rate of 32.3%. The next highest were practical explanation (29.0%) and convenient place for service (27.4%). Low ranks from deferred blood donor responses were in the categories: time to find station, description at station, follow-up visit provide (21.0%) and staff willing to listen (19.4%).

Table 4.12, the highest rank in Physical Examination and Physician/ Trained Nurse Screening for “strongly agrees” was reason for deferral explanation (44.5%). This was followed by clear explanation about deferring cause (42.6%) and clear explanation (39.4%). The three lowest rankings from deferred blood donor responses were short waiting (22.6%), enough staff (21.9%), and convenient place for service (20.0%).

Table 4.13, the highest ranking in Hemoglobin Test and Technical Staff Screening for “strongly agrees” was description at station (22.0%). The next highest were appropriate greeting (22.0%) and time to find station (19.5%). The lowest rankings from deferred blood donor response were staff willing to listen (13.6%), convenient place for service, clear explanation about deferring cause (12.7%), and enough staff (11.0%). This station had the lowest mean in convenient place for service and enough staff (2.92).

Table 4.14, the highest ranking in Previous History Check and Information Staff Screening for “strongly agrees” was adequate explanation (40.4%). This was followed by clear explanation (38.3%) and place suitable (29.8%). The five lowest rankings from deferred blood donor responses were short waiting (19.1%), staff helpful, follow-up visit provide, staff willing to listen (17.0%), and time to find station (19.5%).

The association determined by Chi-square test for socio-demographic characteristics of deferred blood donors showed no statistically significant relationship to perception levels, (p-value <0.05 for age group, gender, education, occupation, income, and number of donation time) these presented in table 4.35 to 4.40.

The correlation between the perception of deferred blood donors and their overall satisfaction is statistically significant at p-value <0.001. The physical examination and

physician/ trained nurse screening station, hemoglobin test and technical staff screening station, and previous history check and information staff screening station, all had a p-value less than 0.050. However, the perceptions did not quite meet the level of statistically significant for the Self-deferral Questionnaire and Volunteer Screening station, 0.060. (tables 4.41 to 4.45)

DISCUSSION

The blood supply available in Thailand does not equal even the lowest targets. In countries with highly developed health services, the minimum requirement is donation by 3% of the population. Normally, however, the level of sufficient blood donation usually equals 5% of the population (Hollan, 1990). Another source by Gibb, 1992, recommended 2% of population of a developing country's should be voluntarily donating blood.

When comparing health services, Thailand is often grouped with developed countries by World Bank; however, health service status is only highly developed in Bangkok. This fact should be considered and mentioned before running the blood donation recruitment program. The baseline data that was collected by NBC showed that only Bangkok city nearly reached the donation target level, about the level of sufficient blood donation, 5% of the population. In the rural areas, the donation rate represented only about 1-2% of the population (NBC, 2003).

This result may be because the NBC headquarters is located in Bangkok. It is easy to implement a recruitment program with the large and mobile population. Although NBC has branches in the other provinces, those branches still only conduct laboratory tests for blood supply safety. Blood donor recruitment and blood collection are

practices conducted by central and regional hospitals, university hospitals, and some private hospitals; however these institutions are not always effectively collaborating their activities.

One of the causes of low blood donor numbers is deferral. During the one month period of the study, deferred blood donors constituted 397 cases or 2.92% of potential blood donors at the National Blood Center headquarters. This deferral rate does not include the others potential donors lost at the mobile units and other blood centers. The previous data collected from NBC in 2003 shows about 10% of blood donors are deferred each year. This number is not acceptable.

One thing that should be mentioned is the responsibility of the National Blood Center to manage the blood supply throughout the country. The NBC should have an updated and comprehensive policy in order to build unity in their recruitment program throughout the country with support from the government health sector. Furthermore, continued program evaluation is necessary for improving and updating this policy.

Additionally in an attempt to locate the causes of deferral, socio-demographic characteristics of blood donor must be studied. If the NBC wants to follow the criteria of health organization improvement, presented by Balridge in 1995, satisfaction of the potential donor is essential. The NBC's target groups must be clearly identified before recruitment implementation in order to achieve the best results.

The location of the blood center headquarters is in the center of the capital city. This limitation leads to specific socio-demographic characteristics of both blood donors and deferred blood donors. This limitation was evident in this study.

The most common age of deferred blood donors was 26-39 years of age, 42.7%, with mean age of 33.26 years. The mean age is similar, 31.5 years, in a previous study by

Nuchprayoon, 1996. The most common educational level was a bachelor's degree, 44.5%. This result may be due to the fact that the blood center is located in the business area. This is confirmed in that the primary occupation was private company employee, 35.1%, and self-employed, 26.2%. As with a previous study by Vivanitchkul in 1993, the most common personal income level found was 5,000-10,000 Baht/month, 27.2%.

The male to female ratio of deferred blood donors was 1:1.18. This is different from a previous study that included successful blood donations with a male: female ratio of 3:1 (Vivanitchkul, 1993). This shows that the higher deferral rate was with females.

Deferred females were deferred at station 1, 67.7% and station 3, 76.6%. These results are higher than in males, who were deferred more at station 2, 61.3% and station 4, 63.8%.

At station 1, evidence shows deferred females do not prepare themselves before blood donation and may lack sufficient knowledge about blood donation. Other criterion that the NBC uses is blood donor body weight, which must be equal or higher than 45 Kg. For many Thai women, body weight falls below this minimum requirement.

The standard blood bag used by NBC holds 450 ml of donated blood. This size was calculated for proper use with blood donors who have bodyweight equal to or greater than 50 Kg. The 350 ml blood bag type applies for blood donors who have body weight between 45-50 Kg. In Japan, the average body weight is nearly the same as for Thai people. Presently, they have a small blood bag size (350 ml) for collecting blood; however, they are trying to change to the 450 ml blood bag to meet international standards. It should be noted that the progression of the health system and the technology in Japan is higher than in Thailand. The Japanese Red Cross Blood Center

uses a hemopheresis machine at every blood station, except in the mobile unit. This allows Japan more choices for preparing blood components than Thailand.

The NBC should, therefore observe the effectiveness of the Japanese system in the past, and if feasible, small blood bags (350 ml) which would allow low body weight (45-50 Kg) blood donors to make donations still necessary in Thailand. This is a partial solution for NBC to solve the current problem in terms of a lack of blood supply.

Previous data records of the blood collection section at the NBC show three major deferral causes: taking medication and antibiotic, low hemoglobin level, and hypertension. At station 2, males are most often deferred because of disease and/or the taking of medications. This result indicates that females' blood donor health status is better than for males.

Deferred blood donors were deferred at station 2 mostly because the majorities were taking medication and antibiotics, or they had a problem with hypertension. These potential donors deferred because of their lack of knowledge and they did not know about deferral criteria for blood donor screening at the NBC. It is the duty and responsibility of NBC to provide knowledge to the community, in order to increase population perception about blood donation and the benefits of this practice. Creating public awareness will result in a decrease in deferral rate, an increase in blood donors, a reduction in pre-donation screening cost, a reduction in staff workload, and a decrease in blood transmitted disease rate.

The explanation for deferral at station 3 has to do with the pathology of females. The major deferral cause is a low hemoglobin level. Normal hemoglobin levels and iron

storage in males are normally higher than in females by about 3:1 when measured by the serum ferritin level.

For the same reason as in station 2, potential donors lack sufficient knowledge, and therefore do not take proper care of themselves. Deferred blood donors do not know about the preventable side-effects from donations. During each donation, blood donors will lose iron with red blood cells that can be replaced with the ferrous sulfate tablets, which they receive from NBC. Some of them do not take these tablets or only take a part of it. Coupled with improper nutrition, regular donation can lead to low hemoglobin level. A previous study at NBC showed that a blood donor who has not consumed sufficient iron supplements will likely have a low hemoglobin level (Chiewsilp, 2002).

Not only is the iron supplement important, but also the knowledge about how to take these tablets is important for proper iron absorption. Iron is best absorbed with vitamin C during a meal. The NBC should provide this knowledge to the blood donor, and should also study the cost-effectiveness of providing vitamin C along with the ferrous sulfate. If it can increase the quality of the blood donor's health, it should be looked into.

Station 4 involves a previous history check. The results indicate that males have a greater history of blood transmitted diseases than females. Some males call attention to these diseases by coming to the NBC to confirm their condition through blood testing.

Deferred blood donors who were younger than 17 years old comprised only 1.0%. It is one of the rules and regulations of the blood center that blood donors under 17

years and older than 55 years should be deferred for a first donation for their health protection. The maximum age for donation is 60 years old.

However, this criterion still needs further study in Thailand. If we compare this criterion with other countries both regionally and internationally, we find that most apply this criterion based on two sources: AABB and the European Council. They set a suitable age for donation of 17 years as the minimum age but the maximum age is dependent on blood donor health status. In the South-East Asia region, one thing should be mentioned if we are to follow guidelines from European countries, and that is the level of National Health Service. Both physical and mental health status should be compared with European people.

First time donors were most frequency deferred, 36.9%. Those who had donated more than four times were deferred at a rate of 35.6% and any donors who donated more than one time were deferred at 63.1%. These results occurred due to a lack of knowledge about blood donation. Potential donors had not prepared themselves for donation and health care protection. The duties of the blood center are not only in promotion and attainment of a greater blood supply, but also to provide knowledge to the community. When donors gain more knowledge, they will be clear about donation and will come to the center more prepared, resulting in a lower deferral rate.

We can say that the knowledge directly received from staff is “defensive”. It is occurring after the problem begins. At every station, staff gives explanations to deferred blood donors for changing their practices and habits if they want to donate again. A more suitable way of educating the donor would be with a “proactive” approach, including effective communication with the community. A major challenge for the BTS will be to identify and motivate suitable low-risk blood donors to donate blood regularly (ICBS, 2003).

The overall perception rating of the deferral system was 3.18 out of 4.00. Perceptions in this study were measured in three aspects: place and environment, staff capability and staff attention, all of which were rated highly by participants.

Two theories that may explain the results of this study are Berry's and Clark's. A previous study by Berry et al, 1995, indicated that the background and expectation of customers influenced their personal perception of services. This may be one cause of different perceptions and levels of satisfaction of deferred blood donors who came to the center and received the same services. On the other hand Clark, 1999, presented the Hawthorne effect theory, this study was done at a blood center where the staff knew they were being observed by a researcher. The response to observation may have caused the staff to do the best service possible at the time of the research.

In addition to the above two theories, one other thing that should be mentioned in this study result is the quality of the research questionnaire. It is possible that the questionnaire was unable to accurately capture the complete opinions and ideas of the deferred blood donors at the time of study. For future studies, the questionnaire should be improved and refined to allow for a more effective extraction of participant input.

The level of deferred blood donor perception rated moderate in two stations: Self-deferral Questionnaire and Volunteer Screening station and Hemoglobin Test and Technical Staff Screening station. Analysis showed high rating levels in the other two stations: Physical Examination and Physician/ Trained Nurse Screening station and Previous History Check and Information Staff Screening. These results may be explained by expectation theory as previously mentioned.

The Self-deferral Questionnaire and Volunteer Screening station is the first step of the donation system. Some days during data collection for this thesis study, no volunteers were on duty at this station, causing the recommendation from the deferred blood donor to mention “not enough staff”.

Blood donors came to the Center with the hope and desire to donate. However, they could not donate when they were refused by volunteer staff, and sometimes the volunteers could not give them a clear explanation why they were refused. The solution to this problem is a training course for not only the blood center staff, but also the volunteers. Some, but not all, volunteers have experience in this particular work.

The Red Cross Society recruits volunteers through the Red Cross Volunteer Department. The NBC has a lot of duties, responsibilities and plans to implement, however, they do not have enough permanent staff. It would be advantageous to train “professional volunteers” for “the professional jobs”, and to find a way to change part-time volunteers in to full time participants and supporters in maintaining a regular service program at a suitable cost.

The Australian Red Cross (Australian Red Cross, 2004), for example, offers visitors to its website the chance to contribute in a variety of different ways, by: making a donation to support services or programs in Australia or the Asia Pacific region, responding to international appeals for donations in a region of the donor’s choosing, becoming a member, becoming a volunteer, taking part in or supporting campaigns, becoming a corporate partner, becoming a blood donor, and donating through a will or bequest.

The Thai NBC should apply this program for implementation of the blood donor recruitment program, especially in the areas of members and blood donation promotion volunteers. A member does not only refer to a blood donor, but also extends to the others types of donations, such as money and/or volunteer time. Blood donation promotion volunteer groups are one interesting topic that should be focused on. These volunteer groups can work from their homes and create their groups with their friends or neighbors. They can send a representative to the NBC to collect information and updates. As a group, they will have the authority and power to motivate their community and build a close relationship with the NBC in terms of helping in promotion and other activities when NBC mobile unit is out.

The other recommendation from deferred blood donor perceptions was about the questionnaire of the center. According to deferred donor the questions are unclear and are difficult to understand, the format of the questionnaire is not easy to read or answer, and the questionnaire is boring with the same questions every time. In one study, some HIV-positive donors failed to exclude their donated units because of the difficulty in understanding the written explanation of the self-exclusion process (Leitman, 1989).

The National Blood Center should improve the questionnaire in terms of both length and detail, so that it is more easily understood. The US-FDA conference in July 2003 mentions the questionnaire, and was presented in chapter II of this study.

In this time of globalization, computerized systems have become extremely useful and important. The possibility that people would tell an impartial machine personal or embarrassing things about themselves, without fear of negative evaluation, has been raised since the first uses of computers for communication (Greist, 1973).

Subsequently, medical, marketing, personnel, and social science researchers have explored computer administration as a means for reducing social desirability biases. A belief that computer administration encourages self-disclosure has led to the development of important applications, such as computer interviews to detect risk conditions and behaviors of blood donors. Many groups benefit from the sharing of information between different components of health care, including patients, providers, insurance companies, medical equipment companies, pharmaceutical companies, hospitals, and data processing institute. Health research corporations are found in many developed countries for this specific reason.

A computerized questionnaire may improve the efficiency of the donor screening process. The computer is easy to use and the data entered into the computer is immediately available as a printed report and in an electronic medium for storage. Transcription errors are eliminated and the database is complete for each potential donor. However, some previous studies have found that a self-administered computerized questionnaire may increase risk reporting by blood donors from 0.1% to 2.7% (Sellors, 2002).

Infections in blood donors can be transmitted to blood product recipients. Strategies to reduce the risks to blood product recipients have involved public education programs, administration of questionnaires pertaining to blood transmitted disease risk factors, the use of a confidential self-exclusion (CSE) option (which allows the donor to indicate in a confidential manner that their blood should not be used for transfusion), and direct questioning about risk behaviors.

The Physical Examination and Physician/ Trained Nurse Screening station had both a high and moderate perception rating. Some 53.5% gave moderate acceptance to place

and environment. Most participants gave a high rating to staff capability, 52.9%, and moderate rating to staff attention, 52.9%. Overall perception at this station was high, 61.3%. No low perception rating was given for this station.

This station is important to double check the blood donor self-deferral questionnaire.

A suitable place and environment is necessary for privacy and proper operations.

Recommendations at this station were regarding practices of the staff in following the guideline of blood donor selection. These should be flexible as much as possible, and the NBC should have a system for uncovering false responses.

Closely monitoring infection rate data from the NBC laboratory is essential in discovering undisclosed infections. When comparing other research presented about the standard donor health assessment questionnaires, questionnaires may miss as many as 10% of donors who engage in high-risk behaviors (Belcher, 1989).

Previous research also suggests that limitations of screening questionnaires in identifying ineligible donors may in part be due to the donors' failure to carefully read the instructions or understand the information (Doll, 1991).

For example in Australia, the Australian Blood Bank has established a law to punish the infectious persons who come to donate blood, although they know they are infected (Australian Blood Bank, 2004). If Thai NBC wants to protect their blood recipients, then they should follow this policy from Australia, United States, and European countries. Also they should listen to the community opinion by conducting survey research, in order to protect the blood donation rate due to the differentiation in community culture.

Both recommendations should be compared to existing policies of the NBC, Thai Red Cross Society. The standards of the blood center should be adjusted on the basis of

safety, availability, and satisfaction. These three factors must be considered for both donor and recipient. The NBC should provide a simple and easy guide book to each deferred blood donor. It is an easy way to foster the communication between the blood center and the deferred blood donor. It is also a useful reminder to donors about blood donation procedures and deferral causes.

As with other stations, donors also recommended advisories and suitable scheduling which should be improved by increased staff numbers.

The Hemoglobin Test and Technical Staff Screening station received a moderate perception rating. Here the place and environment needed to be improved and had a mean 3.05. Deferred blood donors stated that the place was not suitable for services, especially on the weekend. The other recommendation was staff should give more advice and time; it is likely due to not enough staff at rush hour, especially on the weekend.

This station should be run by a physician or nurse, just as in other developed countries. Staff with higher education can perform more than one duty and help each other, moving around in times of emergency. However, the lack of human resources and budgeting that the NBC faces, limits the solution for this problem (The Third Red Cross and Red Crescent Symposium, 2001).

At the Previous History Check and Information Staff Screening station, respondents rated place and environment with a mean of 3.15, staff capability, 3.21, and staff attention, 3.10. Recommendations at this station were that the NBC should use a more computerized system for screening blood donors and in history taking. Additionally this section would benefit from more staff to provide service and information, since some donors were not clear about the deferral process.

Furthermore, this station should improve its information system and clarify the blood result report to deferred blood donor. At present, the system is not clear about indicating the deferral reason. This may be the cause for a low level of satisfaction in follow-up visit logistics. Staff's willingness to listen was also low according to deferred blood donor opinion. This may be due to insufficient staff and the environment of this station, which has a table and computer separating staff and donor. This makes for obstructed communications. Lastly, staff need greater training in relation to their duties.

The associations between socio-demographic characteristics and perception showed no statistical significance for age group, gender, education, occupation, income, and number of donations. The reason for these results may be that donors come with the idea of donating blood, they do not mention and think about the process of the NBC.

The associations between perception and satisfaction were significant in overall opinion in most stations except at Self-deferral Questionnaire and Volunteer Screening station (station 1). One possible reason is expectation theory. Corresponding to findings by Bounjun, 2003, there is a correlation between perception and satisfaction.

As compared with satisfaction in a previous study at the National Blood Center, the dissatisfaction rate of deferred blood donors for services and personnel were significantly higher than for all blood donors especially for the registration process (17.0%) and registration staff (19.1%). This may be because of their disappointment from being unable to donate.

Deferred Blood Donor Satisfaction in part 4 of the questionnaire, satisfaction level was positive. This result was used as a quality control check by comparing it with results of the satisfaction level analysis in part 3. Satisfaction levels were similar.

The general opinions of deferred blood donors about NBC services are presented in the details about positive and negative thinking in services in table 4.35. Four major opinions are of concern: clear explanation, 23.67%, comfortable place for services, 16.57%, fast service, 13.61% and not enough staff, 7.69%.

The percentage of deferred blood donors who want to come back for more donations was 92.9%. The self-deferral questionnaire and volunteer screening section had the highest negative rating, “do not want to come back” from 16.1% of those questioned. The associations between “want to come back” and deferred blood donor satisfaction was statistically significant at p-value less than 0.05. This result means that deferred blood donors satisfaction influences their decision to donate blood at NBC.

The rescheduling among deferred blood donors was different from the findings in other countries where it was found that 97.2% will not come back for blood donation within 6 months (Enderson, 1985). The results have showed that most deferred blood donors at the National Blood Center will come back within 3 months (54.4%), or 6 months 17.0%. Lastly, it is a good sign that most deferred blood donors were comfortable introducing their relations and friends to blood donation, 97.6%.

RECOMMENDATIONS

The following recommendations are both recommendations to the NBC and for future study.

1. The recommendations for the National Blood Center

1.1 Policy Improvement

1.1.1 The NBC should give more attention to deferred blood donor satisfaction and deferral causes in order to improve blood donor retention program. For example, the NBC should develop an educational handbook which would be given to all potential blood donors; handbook should include among other things the importance of blood donation, information on healthy blood donor practices and reasons for deferral.

1.1.2 The NBC should have a more proactive policy for donor recruitment. For example, NBC headquarters should promote and develop NBC branches, which currently only conduct laboratory tests for blood safety, in order to act as regional centers for blood donor promotion and awareness.

1.1.3 The NBC should emphasize human resource development at all levels both for permanent staff and volunteers, by conducting annual trainings for all staff and long-term volunteers in blood donation facilities; included in trainings should be information on customer relations and customer service.

1.2 Policy Implementations

1.2.1 The NBC should maintain the deferral system based on cost-effectiveness findings. A reporting form for cost-effectiveness should be developed.

1.2.2 The NBC should study international laws and regulations of other countries related to blood safety. NBC could improve its blood safety program by

setting law(s) regarding donors who donate while knowingly possess an infectious diseases. This could be done by creating a survey in order to study public opinion.

1.2.3 The NBC should run a pre-donation education and post donation counseling program to reduce deferred blood donors and costs with donation promotion at the same time. This could be done by focusing on specific target groups; especially in the deferred blood donor and younger population to maintain their good health in order to prevent iron deficiency anemia from regular blood donations and risk of transfusion transmitted diseases.

1.2.4 The NBC should implement a policy to get volunteers to become participants and supporters. Actively recruit and train “professional” or long-term volunteers, preferable those who possess relevant education and skills.

1.2.5 The NBC should improve the relationship with blood donors in two ways in terms of both taking blood from them and giving the proper health information to them.

1.2.6 NBC should conduct follow-up activities on blood donor recruitment at blood collection center in rural area; this should include both logistical and technical.

2. The recommendations for future study

2.1 The quality of the deferral system should be monitored and improved throughout the full system, both at the headquarters and branches, including mobile units, for better quality in the future.

2.2 A study should be conducted every year for comparing results after policy improvement and implementation, this active research is necessary to maintain proper services for blood donors and an adequate recruitment program.