



International Journal of Medicine and Health Profession Research

Journal home page: www.ijmhpr.com



ATTITUDE AND AWARENESS OF STUDENTS OF ASMARA SECONDARY SCHOOLS AND ASMARA COLLEGE OF HEALTH SCIENCES TOWARDS BLOOD DONATION

John Issac^{*1}, Yacob Tesfamichael¹, Hagos Habtit¹

^{1*}Department of Clinical Laboratory Science, Asmara College of Health Sciences, Asmara, Eritrea.

ABSTRACT

Background: In spite of extensive promising researches, blood donation by human will continue to be the only source for blood and its components. Blood donation and transfusion are remarkably safe medical procedures. However, attitude and awareness associated with blood donation and transfusion may affect such procedures. **Aim:** To determine the attitude and awareness about blood donation and transfusion among students of secondary schools in Asmara city and Asmara College of Health Sciences (ACHS). **Materials and Methods:** In this cross sectional descriptive study, 323 students aged 16 years and above were evaluated using a predesigned questionnaire. Data generated was analyzed using SPSS program. Frequency tables and percentage were calculated, and Chi-square was applied to see difference between categorical variables. P-value of <0.05 was taken as significant. **Results:** 67% of the total participants (50.6% females and 49.4% males) were found to have an acceptable level of awareness towards blood donation. Comparing knowledge with educational level 70% and 64% of the participants with acceptable level of knowledge were from secondary schools and ACHS respectively. Over all attitude of the participants is 75% (50.6% females and 49.4% males) having good attitude towards blood donation and transfusion. Comparing attitude of students with educational level 60% and 90% of the participants were with positive attitude towards blood donation from secondary schools and ACHS respectively. **Conclusion:** Although the evaluated students were with acceptable level of knowledge and attitude towards blood donation, but there are some misunderstanding and misconceptions need to be removed.

KEYWORDS

Blood donation, Attitude and Awareness and Students.

Author for Correspondence:

John Issac,
Department of Clinical Laboratory Science,
Asmara College of Health Sciences,
Asmara, Eritrea.

Email: johnissac@rediffmail.com

INTRODUCTION

Blood has always held mysterious fascination for all and is considered to be the living force of our body. Ancient Egyptians recognized the life giving properties of blood and they used it for baths to resuscitate the sick, rejuvenate the old and infirm, and as a tonic for the treatment of various disorder¹. Aristocrats drank it, and modern humanity transfuses it. The road to an efficient, safe, and uncomplicated

transfusion technique has been rather difficult, but great progress has been made².

The first blood transfusion recorded in history was, the blood taken from three young men given to the stricken Pope Innocent VII in 1492, in the hope of curing him; unfortunately, the outcome was not satisfactory, all four died. Moreover before the discovery of ABO blood group, transfusion of incompatible blood was causing serious reactions².

In Eritrea blood transfusion was started from 1976 in areas were the Eritrean Population Liberation Front (EPLF) used to control. In addition to this the storage of blood in hospital blood bank started from 1984 in Orotta Central Hospital (Sahel) and other four semi-mobile blood banks. At the time of liberation the biggest blood bank was at Mekane Hiwet Hospital (Asmara). However, this blood bank was moved to separate premises on January 1999 to function as an autonomous unit or as a central blood bank and started its regular service in January 2002. This is the current National Blood Transfusion Centre (NBTC) which practices in blood collection and distribution for transfusion to save life³.

In spite of extensive promising researches, a true substitute for blood and its components (red blood cells, platelets, blood clotting factors, fresh frozen plasma, and white blood cells) will not be available for many years. Therefore, blood donation by human will continue to be the only source for blood and its components. Donated blood can be life saving for individuals who have lost large amount of blood because of serious accidents, civil and military conflicts, major surgeries, as well as for individuals who have become severely anaemic or have dangerous low platelet counts because of certain haematological diseases such as sickle cell anaemia or treatments such as cancer therapy⁴. In Eritrea also the above mentioned causes plus during summer when schools are closed the supply blood falls below the demand as students are the most blood donating group. Therefore this study addresses on attitude and awareness of students, and to make them alert with the problem faced by the NBTS during their vacation there by motivating them to donate blood regularly even during their vacation.

As students are an important and the most group of blood donors, and no study was conducted on the Eritrean students; and keeping in view the significance of blood donation and transfusion, the present study was conducted to determine the attitude and awareness among students of Asmara secondary schools and ACHS towards blood donation and transfusion. This study will help to define the factors which may block students from blood donation and to improve donation strategies in the students of Eritrea. Moreover, the results of the present study may help to remove the concept of misunderstanding about current issues regarding blood donation and transfusion and may also facilitate to develop promotional and educational approaches to enhance blood donors' participation. Up on overcoming all the problems every one may donate blood, and no life will be lost due to shortage of blood.

MATERIALS AND METHODOLOGY

Study Design and Population

This cross-sectional descriptive study was designed to determine the awareness and attitude among students of Asmara secondary schools and ACHS towards blood donation. The total list of students enrolled in ACHS and three Asmara secondary schools namely Harnet, Barka, and Asmara Hafeshawi, was collected from respective registrar office. A total of 323 students were involved in the study. Inclusive criteria used were students of 16 years and above of their own free will. The proportion of students in each grade of secondary schools and students in each academic year of ACHS was calculated and used to find out the number of study subject to be involved from each program. Appropriate anonymous English questionnaire was used to collect data. The study was conducted in two phases; in the initial phase orientation was given to the students to explain the aim, procedure involved, and benefit of the project. The second phase involves filling out of anonymous questionnaire designed particularly for this study. The questions provided were of closed ended type.

Data Collection, Processing and Analysis

A stratified and randomized sampling method was used to select 323 students from the total list of students enrolled in ACHS and the three aforementioned secondary schools of Asmara to be involved in the study. Instructions regarding the purpose of the study and how to fill the questionnaire were given before participants start filling the questionnaire. Data generated was subjected to statistical treatment using SPSS software program. Frequency tables and cross tabulations were prepared. Mean, SD, and percentage was calculated. Chi-square was applied to see difference between categorical variables. *P*-value of 0.05 was taken as significant.

Ethical Consideration

The proposal and the questionnaire for this research got ethical clearance from research ethical committee of ACHS. Anonymity was maintained by using questionnaire which bears no name.

RESULTS

In this cross-sectional study 323 college and secondary school students have participated. Their age was ranged between 16 and 62 years with a mean (\pm SD) of 18.17(\pm 3.968). Table No.1 summarizes demographic distribution of students under the study.

The knowledge section of the questionnaire consists of 6 questions. Table No.2 summarizes knowledge of students for the minimum age, weight, donation interval, and volume of blood donated at a time. When the participants asked about deferral criteria for blood donation including pregnancy, underweight, under age or too old, donor with alcoholic smelling; majority of them, 264(81.7%) cited that all the aforementioned criteria could be cause for donor deferral. The remaining mentioned pregnancy, underweight, underage/too old, and donor with alcoholic, with 11 (3.4%), 24 (7.4%), 14 (4.3%), and 10 (3.1%) respectively. Knowledge of the students related to TTIs was assessed by specified diseases including HIV/AIDS, hepatitis, TB, Malaria, and syphilis. Only 97(30%) of them were aware that TB is not TTI. 135(41.8%) of them answered wrongly, while the remaining 91(28.2%)

claimed that all the aforementioned diseases are TTIs.

The other part of this section is the difference of knowledge, which is due to the difference in demographic aspects of the participants. The difference could come from gender, and educational level. Regarding the knowledge of students for the minimum age for blood donation, 25.7% of the college students stated correctly as compared to 47.8% of the secondary school students while 58.5% and 48.6% of the college and secondary school students answered incorrect respectively. The *P*-value= 0.000. Out of the total participants 9.9% and 20.1%, college and secondary school students respectively stated that TB is not TTI, while 22.9% and 5.3% respectively cited that all the diseases plotted in figure above are TTI.

Table No.3 summarizes the attitude of the students towards blood donation. The last series of question of the attitude section was regarding blood supply in blood bank. Most of the participants 134(41.5%) had no idea about the supply of blood, 86(26.6%) cited that there is less blood supply, and the remaining 103(31.9%) stated that there is more than needed blood supply in the blood bank. Regarding the attitude towards autologous blood donation, though it was a confusing question to most of the participants, 203(62.8%) consider it as a good idea. 41(12.7%) have no idea whether autologous blood donation is beneficial or not while the remaining reasoned against it.

The next part of this section is to consider the existence of demographic effects (gender, educational level, religion, ethnicity, and age) up on the few selected attitude representative questions. Majority 93.2% of the college students answer no when asked whether blood donation is harmful to the donor or not, whereas 76.7% of secondary school answered no. The *P*-value=0.006. Majority 84.4% of the Christian participants stated that their religion permits to receive or donate blood and 80.5% of the Muslim participants have similar attitude. On the other hand 6.4% and 12.2% of Christian and Muslim respectively answered no. The remaining percentages of the participants have no idea about it.

From the total participants of the present study 87 (26.9%) were donors and the remaining 236 (73.1%) were non donors. Table No.4 summarizes the reasons that block the students from donating blood.

DISCUSSION

According the results of the present study, 67% of the total participants (50.6% females and 49.4% males) were found to have an acceptable level of awareness towards blood transfusion in general and blood donation in particular, as compared to the study conducted in University students Kerman city, Iran with only 48% having acceptable level of awareness⁶. In another study in Thailand, 80% of the students were at an acceptable level of awareness¹⁷. Comparing knowledge with in educational level of the present study 70% and 64% of the participants with acceptable level of knowledge were from secondary schools and ACHS respectively.

Assessing question related to awareness revealed that, although the overall knowledge of the students about blood donation was acceptable, less than half (42.7%) of the population under the study knew the correct minimum age for blood donation. In a similar study conducted in University students of Kerman city only 11.7% of the students were aware of the minimum age for blood donation⁶. Therefore it is clear that the participants of this study have relatively better knowledge on the minimum age for blood donation. Comparing the knowledge of students of the present study, towards the minimum age for blood donation gender wise and by educational level, there was significant difference (P -value = 0.002 and 0.000) respectively. Females were more aware and by educational level secondary school students were having upper hand.

Regarding the question about the knowledge of minimum weight for blood donation majority 78.9% of them were found to be aware of it. In other similar studies conducted in Kerman city, Iran⁶ and Zanjan University¹², 51.2% and 28% respectively of the participants of the studies were aware of the minimum weight for blood donation. The knowledge of the participants was also tried to be assessed with the question related to the volume of blood donated and about 60.1% of them were found to be aware of

it. There was no significant correlation (P -value=0.904) on knowledge of students for the volume of blood donated at a time between the educational levels. In a similar issue, conducted in Kerman city, 38.7% of that study was aware⁶.

The subsequent question was regarding donor deferral with the specified criteria including underweight, pregnancy, under age/too old and a donor with alcoholic smelling. Majority of the participants (81.7%) claimed that all the aforementioned criteria could be cause for donor deferral. 7.4% and 4.3% of the participants asserted that underweight and under age/too old respectively should not be allowed to donate blood. Likewise 3.4% and 3.1% of the participants stated that pregnancy and a donor with alcoholic smelling respectively are criteria for donor deferral. In a similar study conducted in Eritrea by Dr. Yifdeamlak *et al* similar percentage of that participants claimed that underweight and under age/too old could be donor deferral criteria⁷.

On the question related to the knowledge of donation interval, in the present study half of the participants 49.5% knew the donation interval. Comparing knowledge of the students on donation interval, it was not found to be significant (P -value=0.05) with respect to educational level. But the overall knowledge of the participants of the present study was similar to that of 54.6% of the Saudi population¹³. In other study conducted in Kerman city of University students only 24.6% knew the donation interval⁶ which is similar to 25.9% of the Iranian women with the knowledge of donation interval¹⁴. From the above correlations it can be said that the awareness of the present study was relatively good.

On the subsequent question related to the knowledge of TTI, on the provided choices namely, HIV/AIDS, hepatitis, TB, syphilis, and malaria only 30% of the participants cited correctly that TB is not TTI. The remaining respondents cited incorrectly that HIV/AIDS (5%), hepatitis (15.8%), syphilis (1.5%), and malaria (19.8%) are not TTI. But the 28.2% claimed that all are TTI including TB. It is surprising to find that participants of the current study in general and in students of health sciences in

particular having misunderstanding and doubt of citing TB as a TTI to this percent (28.2%). To the contrary of TB, the NBTS need to address on donor education for the means of transmission of hepatitis and malaria that they are blood transmissible diseases, especially hepatitis which is very serious disease. Yet 5% of the participants of the secondary students are not aware that HIV/AIDS is TTI. In a similar study conducted by Dr. Yifdeamlak *et al*, Eritrea 7.5% of the respondents claimed that TB is TTI⁷.

From the present study the result about students 'attitude showed a positive attitude toward a blood donation. Over all attitude of the participant is 75% (50.6% females and 49.4% males) having good attitude towards blood donation and transfusion. This indicates that there is no significant difference in attitude gender wise. It is better result as compared to study which was conducted in University students of Kerman city⁶. It is while, 80% of Thailand students had positive attitude towards blood donation¹⁷. Comparing attitude of students of the present study with in educational level 60% and 90% of the participants were with positive attitude towards blood donation from secondary schools and ACHS respectively.

In the attitude section the first question was related to attitude of the students on the effect of blood donation to the donor. Majority (80.5%) of the participant believe that blood donation is not harmful to the donor because of the screening tests done in blood banks prior to donation. With increasing the educational level there was an increase of positive attitude on harmfulness of blood donation to the donor showing a significant difference (P -value=0.006). In a similar study conducted in Saudi population 88.5% of the participants believe that blood donation is not harmful to the donor⁴.

Blood banks always follow screening guide lines and illegibility requirements to make sure blood donation will not harm the donor. In addition, new sterile disposable consumables are used for each donor to eliminate the risk of transmitting blood-borne. Nonetheless, 12.1% of the participants in the current study believe that blood donation is harmful to the donor. Similarly in the study conducted in Saudi

population 11.5% of the sample was found having the same believe⁴.

Regarding the attitude of the students toward blood donation with respect to their religion and culture was found to have a similar 83.5% positive attitude that their religion and culture permits for blood donation and transfusion. In a similar study done by Dr. Yifdeamlak *et al*, Eritrea 62.2% and 68.2% of the respondents were found to have positive attitude respectively with respect to their religion and culture respectively⁷. The result of the present study shows that there is no significant difference among attitude of the students with respect to their religion (P -value >0.05).

The majority 93.2% of the participant in the current study states that they would receive blood transfusion if they are in need. In a similar study of Saudi population, 80% stated similar idea⁴. When the blood transfusion is needed the harm verses benefits are weight carefully. However, 6.8% of the participant in the current study claimed that they would refuse blood transfusion even if they are in need, because of the risk of acquiring an infectious disease. In addition, 20.5% of the participants in the current study states that they would accept blood transfusion only from a relative. However, despite careful donor screening and blood testing, the incidence and prevalence of TTI is high in recipients receiving blood from direct and paid donors^{2,8}. There was a significant difference between the educational levels (P -value=0.001) on willingness of the students to accept blood transfusion only from a relative, the higher willingness being on secondary schools. In the study of Saudi population 49% would like to accept blood transfusion only from a relative⁴. Furthermore 31.7% of the present study mentioned they prefer to now the donor who donates blood for them, for the reason of thanking him/her for the gift of life. While the remaining majority of them cited that knowledge of the donor is of no value.

Regarding the attitude of the students towards the autologous blood donation, though it was a confusing question to most of the participants, majority 62.8% of them consider it as a good idea for the reason that autologous blood donations are something like in advance reserves and free of

infection. Comparing the attitude of the students towards autologous blood donation with respect to educational level a significant correlation was found (P -value= 0.02) college students having upper hand. In a similar study conducted in Eritrea by Dr. Yifdeamlak *et al* more than half 51.1% of the respondents stated it as a good idea⁷. In addition, Dhingra *et al* reported that autologous blood transfusion should be implemented in countries with high incidence of TTI to reduce the chance of transmitting blood-borne infectious agents and to increase blood bank supply¹⁵. Thus, the safest blood remains to be your own.

The next series of question in the attitude part was related to motivation. It was asked to assess the importance of motivation in blood donation. Almost all, 95% of the participant of this study believe that motivation is an important factor for blood donation. Hence the NBTC need to address this issue, and so as to strengthen their way of motivating donors and sometimes to add incentives such as free T-shirt or other small trinkets like first aid kits. Other study conducted in Greece showed similar finding, that motivation is necessary¹⁶.

The student's response to the last two series of attitude questions about safety and supply of blood in the blood bank were 86.4% and 26.6% safe and less than needed respectively, while 13.6% and 31.9% of them believe respectively vice-versa. The remaining 41.5% of the participants have no idea on the supply of blood.

In spite of the acceptable level of awareness and attitude, only 26.9% of the participants of the present study have ever donated blood, 26.4% of these were students of ACHS as compared to 73.6% of the secondary school students. Gender wise there was similar result regarding practice of the students. The 50.6% of the total 26.9% donors were females and 49.4% males. There was no significant difference between donors and non-donors for the knowledge of minimum age for blood donation and volume of blood donated (P -value > 0.05). However, there was significant difference (P -value=0.027) in the donation interval, donors having better knowledge.

The non donors 73.1% of the participants cited different reasons for not donating blood. 44.9% of

them cited that deferral made them not to donate blood and the most common cause of deferral they claimed was under weight. 10.5%, 9.3%, 7.6% and 0.4% of the participants stated that their cause of not donating blood are fear, lack of information, non-consideration, and mistrust respectively. The remaining 27.1% of the non donors mentioned that their reasons of not donating were other than the specified reasons. In a similar study conducted in Yazd, Iran non consideration, forgetness and lack of time were the most reasons for not donating blood⁹. In other study done in Saudi population long distance to donation site, transportation difficulty, fear, mistrust, lack of information, and not being approached by anybody to donate were the main factors discouraging them from donation⁴. The non consideration of the public can be overcome by increasing advertisements and use of media to increase knowledge and keep the topic of blood donation alive in the minds of the general public. Appropriate slogans on suitable occasions can lead to recruitment of new blood donors.

Table No.1: Distribution of students under the study

S.No			Educational level		Total
			College	Secondary	
1	Sex of the students	F	24 (14.5%)	141 (85.5%)	165 (100%)
		M	50 (31.6%)	108 (68.4%)	158 (100%)
2	Religion	Christian	65 (23.4%)	213 (76.6%)	278 (100%)
		Muslim	9 (20%)	36 (80%)	45 (100%)
3	Ethnicity	Tigrigna	66 (22%)	234 (78%)	300 (100%)
		Tigre	5 (29.4%)	12 (70.6%)	17 (100%)
		Saho	-	3 (100%)	3 (100%)
		Bilen	2 (100%)	-	2 (100%)
		Nara	1 (100%)	-	1 (100%)
		Total	74 (22.9%)	249 (77.1%)	323 (100%)

Table No.2: Knowledge of students for the minimum age, weight, and donation interval and volume of blood donated at a time

S.No	Knowledge questions	Students response			
		Correct answer	Incorrect answer	Don't know	Total
1	Knowledge for minimum age for blood donation	138 (42.7%)	165 (51.1%)	20 (6.2%)	323 (100.0%)
2	Knowledge for donation interval	160 (49.5%)	86 (26.6%)	77 (23.8%)	323 (100.0%)
3	Knowledge questions	Yes	No	Total	
4	Knowledge of minimum weight for blood donation	255 (78.9%)	68 (21.1%)	323 (100.0%)	
5	Knowledge for volume of blood donated	194 (60.1%)	129 (39.9%)	323 (100.0%)	

Table No.3: Attitude of the students towards blood donation

S.No	Attitude related questions	Students response		
		Yes	No	Don't know
1	Is blood donation harmful to the donor?	39(12.1%)	260(80.5%)	24(7.4%)
2	Is it acceptable to donate or receive blood in your religion?	270(83.5%)	23(7.1%)	30(9.4%)
3	Is it acceptable to donate or receive blood in your culture?	270(83.5%)	32(9.9%)	21(6.6%)
4	Will you accept blood transfusion if you are in need?	300(93.2%)	23(6.8%)	
5	Do you prefer to know the donor when you are in need of blood?	220(68.3%)	103(31.7%)	
6	Are you going to accept blood donation only from a relative?	66(20.5%)	257(79.5%)	
7	Do you think that the blood in the blood bank is safe?	279(86.4%)	44(13.6%)	
8	Is motivation necessary for blood donation?	307(95%)	16(5%)	

Table No.4: Reasons for not donating blood

S.No	Reasons for not donating blood	Frequency	Percent
1	Fear	25	10.5
2	Deferral weight	106	44.9
3	Lack of information	22	9.3
4	Mistrust	1	0.4
5	Non-consideration	18	7.6
6	Other reasons	64	27.1

CONCLUSION

Blood donation by human is the only source of blood and its components. Hence knowledge and attitude of the population related to blood donation and transfusion are of concern, so as to keep the supply of blood demanded. The present study was conducted to determine the attitude and awareness among students of Asmara secondary schools and ACHS towards blood donation and transfusion as the students are considered to be the most blood donating group.

In light of this study, it is concluded based on the findings of the present study that the level of knowledge and attitude of the students was acceptable. The overall knowledge of students towards blood donation was 67%. Further break down among students showed that 50.6% and 49.4% females and males respectively are within the acceptable level of knowledge. Yet the level of knowledge of students with respect to educational level was evaluated and found to be 70% and 64% for secondary school students and ACHS respectively. Regarding the attitude of students 75% of the students were found to have a positive attitude towards blood donation and transfusion.

In spite of the acceptable level of knowledge and attitude only 26.9% of the participants of the present study have ever donated. Majority 44.9% of the non-donors cited that their cause for not donating blood was deferral, mostly due to underweight. Others stated fear, lack of information and non-consideration are some of the causes of not donating.

ACKNOWLEDGMENT

We would like to sincerely appreciate and thank our adviser Mr. John Issac (M.Sc.) for his scientific guidance, kindness and encouragement for completion of this dissertation. We would also like to acknowledge to all who have contributed for completion of this research work.

CONFLICT OF INTEREST

We declare that we have no conflict of interest.

BIBLIOGRAPHY

1. Shenga N *et al.* Behavior disparities towards blood donation in Sikkim, India, *Asian J Transfu Sci*, 2(2), 2008, 56-60.
2. Hughes V C and Wright P A. Donor screening and component preparation. Modern blood banking and transfusion practices eds Harmening *et al*, F.A Davis Company, *Philadelphia*, 5th edition, 2005, 207-241. Harmening D M. Modern blood banking and transfusion practices, eds Harmening *et al*, F.A Davis company, *Philadelphia*, 5th edition, 2005, 1-21.
3. Quality managers. Quality system manual of Eritrean National Blood Transfusion Services, *Unpublished*, 2010.
4. Al-Drees A M. Attitude, belief and knowledge about blood donation and transfusion in Saudi population, *Pac J med Sci*, 24(1), 2008, 74-79.
5. Safizadeh H *et al.* University Students Awareness and Attitude towards Blood Donation in Kerman City, *Iranian J Blood and Cancer*, 1(3), 2009, 107-110.
6. Wiwanitkit V. Knowledge about blood donation among a sample of Thailand University students, *Vox Sanguinis*, 83(2), 2002, 97-99.
7. Mortazavi Y and Mahmoodizadeh F. Evaluation of the awareness of students in Zanzaj Universities about blood donation eligibility criteria, *SJIBTO*, 5(3), 2008, 195-202.
8. Yifdeamlak Tesfamariam. Knowledge, attitude, and practice of the population towards blood donation in Zoba Maekele, Anseba and Debub, Eritrea, *Unpublished*, 2004.
9. Javadzadeh-Shahshahani H *et al.* Knowledge, attitude and practice study about donation in the urban population of Yazd, Iran, 2004, *Transfusion Medicine*, 16(6), 2006, 403-409.
10. Khadir M *et al.* The evaluation of the attitude of Iranian women towards blood donation, *SJIBTO*, 1(1), 2004, 27-33.

11. Buciuniene I *et al.* Blood donors' motivation and attitude to non-remunerated blood donation in Lithuania, *BMC Public Health*, 6, 2006, 166.
12. Dhingra-Kumar N *et al.* Evaluation of awareness and utilization of an autologous blood transfusion programme, *Transfus Med*, 11(3), 2001, 177-182.
13. Marantidou O *et al.* Factors that motivate and hinder blood donation in Greece, *Transfus Med*, 17(6), 2007, 443-450.
14. Javadzadeh-Shahshahani H *et al.* Knowledge, attitude and practice study about donation in the urban population of Yazd, Iran, 2004, *Transfusion Medicine*, 16(6), 2006, 403-409.
15. Olaiya M A *et al.* Knowledge, attitude, beliefs and motivations towards blood donation among blood donors in Lagos, Nigeria, *Transfusion medicine*, 14(1), 2004, 13-17.
16. Yifdeamlak Tesfamariam. Standard for practice of blood transfusion in Eritrea, *Unpublished*, 1st edition, 2009.
17. Afshar R *et al.* Attitude and willingness toward blood donation in Iranian students, *Asian J Transfus Sci*, 3(2), 2009, 111.

Please cite this article in press as: John Issac *et al.* Attitude and awareness of students of Asmara secondary schools and Asmara college of health sciences towards blood donation, *International Journal of Medicine and Health Profession Research*, 4(1), 2017, 40 - 48.