GAVIN PUBLISHERS

Current Research in Complementary & Alternative Medicine

Seid T, et al. Curr Res Complement Altern Med:CRCAM-107.

DOI: 10.29011/CRCAM-107/100007

Research Article

Voluntary Blood Donation Practice and Its Associated Factors among Health Care Providers, at Axum Town Public Health Facilities, Northern Ethiopia: A Cross Sectional Study

Tigist Seid[1*], Balem Dimtsu[2], Ayalnesh Zemene[2], Getachew Arage[1], Maru Mossisa[3], Tewachew Muche[1]

[1]Department of Midwifery, College of Health Sciences, Debre Tabor University, Debre Tabor, Ethiopia

[2]Department of Midwifery, College of Health Sciences, Mekelle University, Mekelle, Ethiopia

[3]Department of Midwifery, College of Health Sciences, Ambo University, Ambo, Ethiopia

[*]**Corresponding author:** Tigist Seid, Department of Midwifery, College of Health Sciences, Debre Tabor University, Debre Tabor, Ethiopia. Tel: +251910435581; Email:tigistseid@yahoo.com

Citation: Seid T, Dimtsu B, Zemene A, Arage G, Mossisa M, et al.(2017) Voluntary Blood Donation Practice and its Associated Factors among Health Care Providers, At Axum Town Public Health Facilities Northern Ethiopia: A Cross Sectional Study. Curr Res Complement Altern Med:CRCAM-107. DOI: 10.29011/CRCAM-107/100007

Received Date: 25 July, 2017; **Accepted Date:** 28 July, 2017; **Published Date:** 04 August, 2017

Abstract

Donating blood is an act that can save the lives of thousands of people's. The practice of peoples towards voluntary blood donation is still unchanged, especially in the developing countries like Ethiopia. Therefore, focusing on health care providers create a public image towards blood donation practice.

Objective: To assess Voluntary Blood Donation Practice and its associated factors among health care providers at Axum town public health facilities, Northern Ethiopia.

Methods: An institutional based quantitative cross-sectional study was conducted from September– October 2016. A total of 237 health care providers were included in the study by using systematic random sampling technique. Data were collected by using pretested and self-administrated questionnaire. Data was entered in EPI INFO and transferred SPSS version 20 for further analysis. Descriptive and summary statistics were employed. bivariate and multiple logistic regressions were computed. Odds ratios and their 95% confidence intervals were calculated to determine the level of significance.

Result: A total of 237 participants were included in the final analysis (response rate = 100 %). Of them 38% of respondents had ever donated blood in their life time. Almost half (48.9%) of the donors donated two and above times. Male participants were 3 times more likely to donate blood when compared with female participants [AOR (95% CI) =3.091 (1.6, 6)]. Those who were Age >30 years old were about 2 times more likely to donate blood than those who are less than 30 years old [AOR (95% CI) =2.165 (1.11, 4.21)] and Participants who have a family members or relatives received blood were 6 times more likely to donate blood when compared with those who have no family members or relatives who had received blood [AOR (95% CI) = 6.0 (2.61, 13.76)] which were significantly associated with practice of blood donation.

Conclusion and recommendation: Voluntary blood donation practices among health care providers were low compared to WHO recommendation, its lifesaving importance and national demand. Axum zonal health Bureau blood bank work in associated with Axum town health institutions to increase level of voluntary blood donation among health care providers as well as general population.

Keywords: Associated Factors; Health Care Providers; Practice; Voluntary Blood Donation

Background:

Blood is an essential element of human life; there are no substitutes for it. Safe blood is a critical component in improving health care and in preventing the spread of infectious disease worldwide[1].

World Health Organization (WHO) Promotes that 3-5% of the population should donate blood every year to meet the population basic requirements for blood; the requirements are higher in countries with more advanced health care systems [2]. It recommends countries to focus on young people to achieve 100% non-remunerated voluntary blood donation by 2020 [3]. Donated blood can be lifesaving for individuals who have lost large volumes of blood from serious accidents, obstetric and gynecological hemorrhages, or surgery and stem cell transplant patients as well as for individuals who have symptomatic anemia from medical or hematologic conditions or cancers [4].

People in the developing countriesespecially women continue to die every day from complications related to pregnancy andchildbirth, children also die every day from severe anaemia secondary to malaria and/ormalnutrition.Pregnancy related Hemorrhage is one of the leading causes of maternal mortality across the world, accounting for 34% of maternal deaths in Africa, 31% in Asia, 21% in Latin America, and 13% in developed countries [5,6].

In sub- Saharan Africa, it is estimated that 26% of maternal hemorrhagic deaths are a direct consequence of the lack of adequate blood and blood transfusion services, and the estimated need of the countries are around 18 million units of safe blood per year, only about 15% were collected [7]. This is due to the limitations of placing the burden of sustaining the blood supply on a small number of donors. Regular blood donation also has its own similar challenges that need to be explored to determine the best recruitment and retention strategies in addition to limited supply, the safety especially with regard to the risk of transfusion is also an issue and one of the concerns especially in the developing countries [8].

Adequate and safe blood supply has remained a challenge in developing countries like Ethiopia. Key challenges to progress included a relatively high prevalence of HIV, poor community awareness of the importance of voluntary blood donation with a consequent lack of voluntary donors, social taboos, misconceptions, religious factor, fears about the blood donation process and other issues which result in a limited number of voluntary blood donors within the community. In order to help reduce blood shortages, progress must be made to improve blood donation rates in voluntary blood donor's because in most developing countries family replacement and paid blood donors are still a significant source of blood components for transfusion [9]. Access to safe blood could help to prevent up to one quarter of maternal deaths each year and blood transfusion has been identified as one of the eight life-saving functions that should be available in a first-referral level healthcare facility providing comprehensive emergency obstetric and newborn care [10].

To ensure safe, adequate and sustainable blood supplies all over the country, the health workers have a significance role in different ways. Even if the health workers have knowledge about blood donation, in practice and initiating the community to donate blood is very low. As we know health workers are too low in number, but they are vital to mobilize the community towards voluntary blood donation and they have to be front line to practice. Therefore, the aim of this study was to determine blood donation practice and its associated factors among health care providers.

Methods:

An institutional based cross-sectional quantitative study was conducted from September to October2016 among health care providers at Axum Town Public health facilities in, Northern Ethiopia.

Axum city is found in the Northern part of Ethiopia. it is 1024Km far from Addis Ababa, Capital City of Ethiopia and 241 Km North of Meklle, and is One of the known center of tourists and it is an Archeologist area registered by UNESCO. According to Central Statically agency of Ethiopia (CSA) the town of a population was 56,576 and the census indicated that 30,293 of the population were females and 26,283 were males [11].

According to Axum town city administration health bureau information in Axum town there are a total of four governmental health facilities and four private clinics are found. One Referral Hospital with a total of 190 Health Care Providers 33 General Practioner,6 Specialist , One General Hospital with a total of 230 Health Care Providers, The hospital is staffed by 5 specialties in different departments and 15General Practioner, radiographers, environment health professionals, pharmacists, physiotherapists, laboratory staffs, midwives, nurses and support staffs it also serving for a total population of about 1.2 million peoples of Axum town and 2 Health centers, Millennium Health center and Axum Health center with a total of 28 and 32 health care providers respectively with a total of480 heath care providers[12]. All health care providers working in Axum Town governmental health facilities 2016 and those available during the study period were Source Population and study population respectively.

Sample Size determination: The sample size was determined based on the following assumption by using Single population proportion formula.

Assumptions: A 95% confidence level Z = 1.96 andP-valueThe Proportion of blood donation practice taken from a study conducted from other similar study, the prevalence of blood donation practices was P=18 % (0.18) [13].d= Margin of error is taken as 5% = 0.05

$$n = \frac{\left(Z_{\frac{\alpha}{2}}\right)^2 p(1-p)}{(d)^2} = \frac{(1.96)^2(0.18)(0.82)}{(0.05)^2} = 226$$

- For non-response rate, 5% of the total sample was added which is 11.3 ≈11.
- Thus, a total of 237study Participants were taken.

All governmental health facilities that are found in Axum town were included in the study.Systematic Random Sampling Technique was used to select the study participant from each institution after proportional allocation was done. A total of four governmental health facilities were found with a total of 480 health professionals. When they are divided proportionally 113from Axum s"t marry Hospital, 94from Axum teaching andReferral hospital 16 from Axum Hc and 14 from Millennium Hcwas taken.

Data collection procedures: The questionnaire was adopted after reviewing different published literature on similar studies and the framework was derived from the World Health Organization (WHO) manual Methodological guidelines for socio-cultural studies on issues related to blood donation [14]. A total of 34 questionnaires were used to answer the objective of the study and it is consisting of information on socio-demographic characteristics, knowledge, attitude and practice of blood donation. Pre-test was done on 5% of the total sample size which is on 11 health care providers at Adwa hospital that is assumed to have similar characteristics of the targeted population. Based on the feedback received during the pretest necessary amendment were done and the questioner were assessed for its clarity; completeness, content and modified accordingly. The data were collected by those trained and who had previous experience on similar study by two diploma nurses and two diploma midwives for about one month. The data were collected through self-administered English version questionnaire.

The questionnaires were coded, cleaned, and entered in to EPI info version 7.1 statistical software and then exported to SPSS Version - 20 for analysis. All require variables recoding and transformation were done before the final data analysis. Bivariate and multiple logistic regressions were calculated to identify the presence and strength of associations variable having P-value less than 0.05 in multiple logistic regression models were significantly associated with the dependent variable. Degree of Association between outcome and predictor variables was calculated by using adjusted odd ratio, and 95% CI.

Operational Definition: Knowledge respondents who scores the mean and above value from the knowledge questions were considered as having Knowledgeable whereas respondents who score below the mean value is considered as not. The overall knowledge level of the respondents was assessed by summing up the correct answers of individual questions and mean score is taken as a cut of point.

Ever donated: Those respondents who donate once or more times in their life time

Favorable attitude: Measured through nine questions using 5-Point Likert scale, the overall attitudes of respondents was assessed by summing up the score of individual questions. Mean score was taken as a cut of point to categorize the respondents. Respondents who scores mean and above mean value were labeled as having favorable attitude where as those respondents that scored below the mean score were categorized as having unfavorable attitude.

Voluntary blood donor: Someone who gives blood based on his or her personal interest without receiving incentive or payment.

Health care provider: Individual who graduated from known college or university and who full fills Ethiopian ministry of health criteria in identifying, preventing or treating illness.

Results

Socio-demographics characteristics of the study Participants: A total of 237 health care providers were included in this study which resulted with a response rate of 100%. 100% response rate was achieved since the data collection facilitators are experienced and the issue of blood donation is not sensitive. As a result, the subjects were not falling to comply with the intended study. The mean age of the study participants was 30.6yrs +7 SD. Majority of them were male, married, Orthodox Christianity and from Tigray ethnic group accounting 126 (53.2%), 143 (60.3%), 223 (94.1%) and 204 (86.1%) respectively. Majority 135 (59.9%) of the participants have been practicing in the facility >5 years, respondents from 8 departments were including more than one fourth of the respondent were from nursing department 89 (37.6%) and 142 (59.9%) had BSC holders respectively (Table 1).

Variable	Characteristics	Number	Percentages %
Sex	Male	126	53.2
	Female	111	46.8
Age	23to 26yrs old	62	26.2
	26 to 30yrs. Old	81	34.2
	31 to 35 yrs. Old	31	13.1
	36 to 40 yrs. old	32	13.5
	41 to 45yrs old	23	9.7
	>=46	8	3.4
Marital status	Single	94	39.7
	Married	134	56.5
	Divorced	5	2.1
	Widowed	4	1.7
	Orthodox	223	94.1
	Protestant	4	1.7
Religion	Muslim		4.2
	Tigray	204	86.1
	Amhara	29	12.2
Ethnicity	Others*	4	1.6
Qualification	Diploma	62	26.2
	Degree (other than MD)	142	59.9
	Specialist and 2nd degree	12	5.1
	GP	21	8.9
	6 month to 5 yr	102	43.1
Work experience	>5 yrto 10 yr	61	25.7
	>10 yr	74	31.2
	Nursing	89	37.6
Department	Midwifery	43	18.1
	Laboratory	28	11.8
	Pharmacy	23	9.7
	public health officer	13	5.5
	Anestethest	9	3.8
	Radiologist	5	2.1
Salary	1000.00 to 3000.00 Ethiopian Birr	99	41.8
	3001.00 to 6000.00 Ethiopian Birr	115	48.5
	>6001.00 Ethiopian Birr	23	9.7

Table 1: Socio-demographic characteristics of the study participants VBD, Axum Public Health Institution, Ethiopia, October 2016(n=237).

Knowledge and attitude about blood donation: One hundred and sixty-seven (70.5%) respondents have scored mean and above mean value and considered as knowledgeable towards blood donation with the mean knowledge score of the participants was 12.3 + 3.1SD and more than half 150(63.3%) the respondents have favorable attitude with the mean attitude score of the participants were 28.8 + 5.1 SD.

Blood donation practice: Ninety-two (38%) of respondents have ever donate blood in their life time. Forty-five (48.9%) donated their blood two and above times. Forty-five (19%) of the total respondents said that one or more member of their family members/relatives had ever received blood, the major source of blood for them were form other family members 25(60%)&regarding to duration of practice majority of the participants were donated 2 yrs ago 59 (64.2%) (Table2).

Variable	Frequency	Percentage%	
Have you ever donated blood? (n=237)	Yes	92	38
	No	145	62
How many times you donate? (n=92)	Once	47	51.1
	Two time	20	21.7
	Threetime	18	19.6
	five times	6	6.5
	>6 times	1	1.1
	Voluntarism	56	60.9
Why did you donate? (n=92)	For friend or relative	36	39.1
	within one yr.	8	8.7
	one yrs ago	25	27.13
When was the last time do you donate blood? (n=92)	two yrs ago	27	29.4
	Threeyrs ago	21	22.8
	Fouryrs ago	2	2.17
	Five yrs ago	8	8.7
	>6yrs	1	1.08
	Yes	45	19
Is there any family member or relative who received blood? (n=237)	No	186	81
Source of blood received by the family members(n=51)	Family /relatives	27	60
	Red Cross	18	40

Table2: Distribution of the study participants in relation to Practice of blood donation among health care workers in Axum public Health Institution, Ethiopia, October2016 (n=237).

Reasons for not donating blood: One hundred forty-five(62%)of the respondents had never donate blood in their life time the major Rea-

son for not donation were no Time for donation 31 (13%), no nearby blood donation center 21 (8.9%), followed by never been asked for blood donation 20 (8.4%), were the major Reason for not donating blood among respondents (Figure 1).

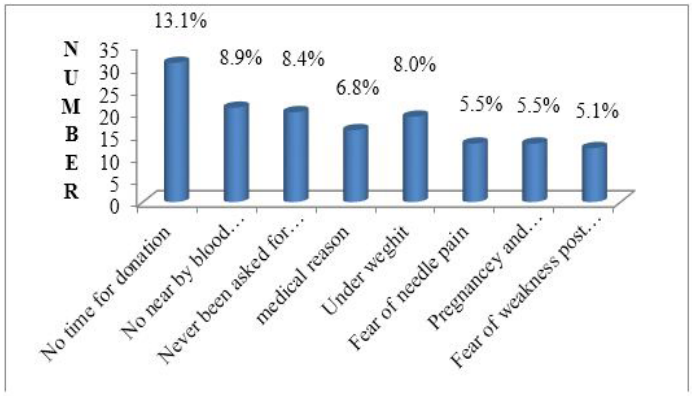

Figure 1: Reason mentioned by the study participants for not donating blood, Axum Public Health Institution Ethiopia, October 2016, (n=237).

Factors Associated with practice of voluntary Blood Donation: Both bivariate and multivariate analysis showed a statistically significant association with sex, age >30 and their family members receive bloods from blood bank were significant associated voluntary blood donation practice with (P = 0.002), (P = 0.001) and (P = 0.000) respectively. Male participants were 3 times more likely to donate blood when compared with female participants [AOR (95% CI) =3.091 (1.6,6)]. Those who were Age >30 years old were about two times more likely to donate blood than those who are less than 30 years old [AOR (95% CI) =2.165 (1.11, 4.21)] and Participants who have a family members or relatives received blood were six times more likely to donate blood when compared with those who have no family members or relatives who had received blood [AOR (95% CI) = 6.0(2.61, 13.76)] (Table 3).

Variable	Category			OR (95% CI)	AOR
		Not ever donated	Everdonated		With95%CI
Sex	Female	80(72.1%)	31(27%)	1	**1**
	Male	65(51.6%)	61(48.4%)	2.42(1.40,4.165)*	**3.091 (1.6, 6)****
Age	<30 yrs.	104(72.2%)	40(27.8%)	1	1
	>30 yrs.	41(44.1%)	52(55.9%)	3.3(1.9,5.70)*	**2.16(1.11,4.2)****
Marital status	Single	56(38.6%)	38(41.3%)	1	
	Married	89(61.4%)	54(58.7%)	1.118 (.656,1.9)	
Religion	Orthodox	135(93.1%)	88(95.7%)	1	
	Protestant	2 (1.4%)	2 (2.2%)	0.652(.09,4.7)	
	Muslim	8 (5.5%)	2 (2.2%)	2.607(.54, 12.5)	
Ethnicity	Tigray	126 (86.9%)	78(84.8%)	1	
	Amhara	19 (13.1%0)	14(15.2%)	0.840(.39,1.7)	
Qualification	Diploma	41 (28.3%)	21(22.8%)	1	
	Degree	88 (60.7%)	57(62.0%)	0.79(.424,1.47)	
	Specialist and 2nd degree	16 (11.0%)	14(15.2%)	0.58(.24, 1.4)	

Departments	Nursing	57 (39.3%)	32 (34.8%)		
	Midwifery	24(16.6%)	19(20.7%)	0.71(.34, 1.48)	
	MD	13 (9.0%)	14 (15.2)%	0.52(.22, 1.25)	
	Laboratory	20 (13.8%)	8 (8.7%)	1.41(.555,3.55)	
	Pharmacy	16(11.0%)	7(7.6%)	1.28(.478,3.45)	
	Public health	7(4.8%)	6(6.5%)	0.45(.113,1.79)	
	officers				
	Anestethest	4(2.8%)	5(5.4%)	2.24(.24,20.9)	
	Radiologist	4(2.8%)	1(1.1%)		
	1000 TO 3000br.	72 72.7%	27 (27.3%)	1	1
	3001 to 6000br.	6455.70%	51 (44.3%)	1.95 (.782, 4.87)*	1.6(.56,5.0)
	>6000	939.10%	14 (60.9%)	4.1 (1.61,10.69) *	2.3(.67,7.04)
Work experience of respondents	6 months to 5yrs.	76(52.4%)	26(25.5%)	1	1
	>5yrs to 10 yrs.	35(57.4%)	26(42.6%)	3.439 (1.81,6.51)*	2.499(1.15,5.41)
	>10yrs.	3 (45.9%)	40(54.1%)	1.6 (.80,3.136) *	1.361(.609,3.04)
Family member or relative received blood	No				
	Yes				
	Poor	52.00%	18	1	1
	knowledge	35.90%	19.60%		
	Good	93	74	2.29	1.99(1.001,3.99)
	knowledgeable	-64.10%	80.40%	(1.24,4.260)*	
*Factors associated with bivariate analysis. ** Factors associated with multivariate analysis.					

Table 3: Bivariate and multivariate analysis of factors associated with voluntary blood donation practice of among health workers at Axum town Public Health Facility, north Ethiopia, October 2016 (n=237).

Discussion

Maintaining an adequate and safe blood supply is an issue of concern to health planners especially with the increase in demand as a result of an increase in population size and an increase in the number of medical facilities in Ethiopia. In this study, less than half, 92(38%) of health care workers had ever donated blood prior to the study period. this finding is similar with study conducted among adults in Ado-Ekiti, Nigeria and a study conducted in the city of Yazd, Iran which was 39.9%, 38% of the Population under study had donated blood at least once in the past, respectively [15,16]. It is also supported by the WHO report on percentage of blood donors among WHO African countries, which categorized Ethiopia on group Countries who have least number of VBD with <50% voluntary blood donors but it is higher than finding from a study conducted among Madawalabu, Addis Ababa University health science students and study conducted among the students of Nigeria, colleges of Jammu, India and Brazil which was 18.4, 23.4%, 32%, 13.8%, and 13.3%respectively [17,18,19-21]. This might be due to the fact that health care providers are more concern about blood donation in case of awareness; attitude and they are more exposure for the problem than students and population. The other reason might be a difference in socio economic status and age gap in between them.

But it is lower than a study conducted on physician of University of Benin Teaching Hospital in Nigeria which is (41.4%) and a study conducted on Saudi population at Armed force hospital, out of 500 individuals 291 (58.2%) were donors [22,23,24]. this might be due to deference in socio- economic and cultural background, difference in study subjects a study conducted at Saudi population all participants were male adults, difference in study areas, the possibility of donating blood is expected to be high in Saudi Army hospital due to frequent need of blood by the army casualties. In addition to this all participants in Nigeria were physicians in fact that they were more aware and knowledgeable regarding to the importance of blood. The other reason might be the difference in organization that mobilize blood donation Activities, in our countries only Ethiopian Red Cross Society providing blood donation services for the last 78 years (up to 2013).

In this study from the health care workers socio demographic factors sex, age >30 and having family members or relatives receive bloods from blood bank were statistically significant association with voluntary blood donation practice. Male participants

were 3 times more likely to donate blood than females 'participant this is supported by a study conducted in Addis Ababa University health science students, Saudi, India, and Brazil Among the total respondents 82.2 % males had ever donated blood and the reaming 17.8% were females. the possible reason for this difference with regard to donation practice between women and men might be most female relatives were perceive that females were not fit to donate blood. In addition to these females have one or more interfering factors with their chance of suitable to donate blood such as their frequent menstrual blood flow leading to anemia, physiological factors like pregnancy, lactations, underweight and other pregnancy related complications that limit from donation criteria. The finding of this study is also supported by the WHO report there are more male donors worldwide [18,21,23,25,26].

Age of the respondents towards blood donation was also one of the factors which were significantly associated with practice of blood donation. Those Age≥30 years old were2 times more likely to donate blood than those less than 30 years old. This is similar with a study conducted among Addis Ababa University, among King Abdul-Aziz Medical City Saudi and Brazil older age group were more likely to donate blood when compared to the younger ones [18,21,24]. This is due to older age group had more opportunity for donating blood in their life time than younger one this is the fact that older people have faced different problems in their relatives or families that have need blood donation. Younger individual or health care provider was not acquired sufficient maturity for recognizing the importance of blood donation or lack of awareness and attitudes even if they are healthier.

Another significant factor observed in this study was Participants who have a family member received blood were 6 times more likely to donate blood when compared with those who have no family member received blood from blood bank. This can be explained by the fact that saving the lives of their family member's or relatives could have changed the attitude of those participants and they repeated the donation even for non-relative ones. The other reason might be most people were not donating blood until something happen in their family members that would require blood transfusion this is also true according to Ethiopian Red Cross society report 2012 Family replacement blood donation accounts for 70% of the overall blood donations across the country and becomes the main sources of blood.

Conclusion

Voluntary blood donation practices among health care providers were low compared to WHO recommendation, its lifesaving importance and national demand. Among the socio demographic factors sex, age and the respondents whose family members or relatives receive bloods from blood bank were showed statistically significant association with voluntary blood donation practice.

Ethical Consideration

The study was approved by the Ethical Review Committee (ERC) of Mekelle university ethical review board and official letters was obtained from department of midwifery Before commencing with the distribution of the questionnaires to the study participant's written ethical consent were used to ask from the administration personal of each health facility. Respondent was briefly informed individually about the study by the data Collectors; they would be also informed confidentiality would be kept throughout the data collection, the entire study period, beyond and their full right not to be participating at all. At the same time, written informed consent was secured from each participant. Confidentiality of the information was maintained at all levels of the study by keeping the data in secure paces.

Acknowledgment

First of all, I would like to acknowledge Mekelle University, College of Health Sciences department of Midwifery for giving this golden opportunity to conduct this research and for its financial support. Moreover I would like to thanks to Axum Town governmental health facilities administrators for providing me the data regarding the number of Health professionals working in their hospital. I would like to thanks to all the participants of my research study for their interest and time they afforded me in responding positively to the study.

References

1. History of blood transfusion The American Red Cross report 2013.
2. Devi HS, Laishram J, k Shantibala, Elangbam v (2012) Knowledge, attitude and practice (KAP) of blood safety and donation. Indian Medical Gazette 1-5.
3. N D. World blood donor day New blood for the world WHO2013.
4. Nwogoh B, Aigberadion U,Alexander I (2013) Knowledge, Attitude, and Practice of Voluntary Blood Donation among Healthcare Workers at the University of Benin Teaching Hospital, Benin City, Nigeria. Blood transfusion 2013: 1-6.
5. Schantz-Dunn J, Nour NM, Brigham M (2011) the Use of Blood in Obstetrics and Gynecology in the Developing World. Rev Obstetric Gynecol 4: 86-91.
6. Safe blood needed to save mothers.
7. Regional training workshop on blood donor recruitment pre and post donation counseling WHO African Region (2006) Ethiopia 2006.
8. Damesyn MA, Glynn SA, Schreiber GB, Ownby He, Bethel J, et al. (2003) Behavioral and infectious disease risks in young blood donors Implications for recruitment Transfusion 43: 1596-1603.
9. Enosolease ME, Imarengiaye CO, Awodu OA (2004) Donor blood procurement and utilization at the University of Benin Teaching Hospital, Benin City Afr J Report Health 18: 59-63.

10. Bates I, Chapotera GK, McKew S, van den Broek N (2008) The contribution of ineffective blood transfusion services maternal mortality in sub-Saharan Africa. BJOG 115: 1331-1339.

11. National statistics-population 2011 by town and sex.

12. Axum town city administration health bureau information 2016.

13. Alfouzan N (2014) Knowledge, Attitudes, and Motivations towards Blood Donation among King Abdul-Aziz Medical City Population Saudi International Journal of Family Medicine: 1-8.

14. Tejada ESd. Methodological guideline for socio cultural studies on issue related to blood donation. WHO 2005.

15. S.K, et al. (2014) Knowledge attitudes and practices of blood donation among adults in Ado-Ekiti, Nigeria. Sky Journal of Medicine and Medical Sciences 2: 52-57.

16. JavadzadehShahshahani H, Yavari MT, Attar M, Ahmadiyeh MH (2006) Knowledge, attitude and practice study about blood donation in the urban population of Yazd, Iran, 2005. Transfus Med Dec 16: 403-409.

17. Dr. Sonam Kumara (2015) Knowledge, attitude and practices (KAP) regarding voluntary non-remunerated blood donation (VNRBD) among the students of colleges of Jammu, India 2: 45-50.

18. Zago A, silveiraMf, Dumith SC (2010) blood donation prevalence and its associated factors in Pelotas,southern Brazil 44: 112-120.

19. Salaudeen A, Odeh E (2011) Knowledge and behavior towards voluntary blood donation among students of a tertiary institution in Nigeria Niger J ClinPract 14: 303-307.

20. Birhanu Darega, Nagasa Dida, Tamiru, Tesfaye, Lencha B (2015) voluntary blood donation practices and Associated Factors among Regular Undergraduate Madawalabu university students. Southeast Ethiopia: 1-7.

21. Chalachew Misganaw, Meaza Tenkir, Andualem Deresea, Megdelawit Tesfaye, Teshome Tessema, et al. (2014) Knowledge, Attitude and Practice of blood donation among Health Science Students of Addis Ababa University 1: 105-118.

22. Nwogoh Benedict, Aigberadion Usimenahon, Nwannadi Ikenna Alexander, Aigbe Isi (2012) Knowledge, attitude and practice of voluntary blood donation among physicians in a tertiary health facility of a developing country 2: 4-10.

23. Gader AGMA, Osman AM, Al Gahtani FH, Farghali MN, Ramadan AH, et al. (2011) Attitude to blood donation in Saudi Arabia Asian journal of transfusion science 5: 121-126.

24. Alfouzan N (2014) Knowledge, Attitudes, and Motivations towards Blood Donation among King Abdul-Aziz Medical City Population.Saudi International Journal of Family Medicine 2014: 1-8.

25. Sabu KM, Remya A, Binu VS, vivek R (2011) Knowledge, Attitude and Practice on Blood Donation among Health Science Students in a University campus, South India. Online J Health Allied Scs 10: 1-6.

26. OrganizationWH. WHO Global Database on Blood Safety (2015). Geneva, WHO.