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Knowledge and Intentions toward Blood Donation among Medical Students of Taibah University, Madinah, Saudi Arabia 2015

Nojood H. Al-Rahili

MD, College of Medicine, Taibah University, University Road, Madinah, Saudi Arabia

Wafaa A. Al-Johani

MD, College of Medicine, Taibah University, University Road, Madinah, Saudi Arabia

Maram A. Al-Mutairi

MD, College of Medicine, Taibah University, University Road, Madinah, Saudi Arabia

Shorooq H. Al-Rehaili

Medical Student, College of Medicine, Taibah University, University Road, Madinah, Saudi Arabia

Israa A. Al-Suhaymi

MD, College of Medicine, Taibah University, University Road, Madinah, Saudi Arabia

Al-Anood O. Al-Nazzawi

MD, College of Medicine, Taibah University, University Road, Madinah, Saudi Arabia

Abstract:

Introduction. The shortage of blood in blood banks in Saudi Arabia is mainly due to the increase in demands as a result of an increase in the population size and the increased number of complex therapies such as chemotherapy, organ transplants and heart surgeries, which require large amounts of blood and blood products.

Objectives. The present study aimed to assess the knowledge, attitude, and to understand the obstacles facing blood donation among medical students.

Methodology. In a cross-sectional, descriptive study 408 medical students were assessed by self-administered questionnaire conducted at Taibah University, College of Medicine, Madinah, Kingdom of Saudi Arabia between April 2015 and June 2015. Participants were selected by convenient non-random sampling technique.

Results. The study population consisted of 408 respondents. The majority of the respondents (71.8%) had never donated blood before. Health reasons were the most common cause for declining to donate blood 17.6%. While nothing worries most of the males (47.8%) regarding blood donation, disease transmission ranked first among females (28.3%). Most of the participants (87.7%) believe that there was no enough awareness to donate blood in the society.

Conclusion. Increasing the awareness of blood donation in the society especially among those in the medical field may increase the number of donors in Saudi Arabia. In addition, the implantation of some motivational factors might be helpful.

Keywords: knowledge, intentions, blood donation, Saudi Arabia.

1. Introduction

Donating blood is an active way of helping others as well as the whole society. All over the world people of all ages need blood transfusions to survive. However, despite medical and technological advances, there is no substitute for it and there is no way to manufacture it outside the body. Yet, millions of times each year, human blood is required to save the lives of people suffering from disease or who are victims of accidents. The only way of obtaining it is by blood donations from blood donors. Demands are increasing day by day in spite of the millions of blood units that are collected from donors every year.

The first recorded successful human blood transfusion was accomplished in 1818, but due to the lack of knowledge and research, it was followed by many blood transfusion failures. Some 80 years later, it was discovered that inherited differences in people's red cells were the cause of many of the incompatibilities seen with transfusions. Four blood types were identified - A, B, AB and O. This discovery revolutionized haematology and led the way for successful blood transfusions.

Blood donors can be differentiated into: voluntary, family replacement, and paid donors. About 108 million blood donations are collected worldwide. More than half of these are collected in high-income countries, home to 18% of the world's population. Data

reported to WHO shows significant increases of voluntary unpaid blood donations in low- and middle-income countries, an increase of 8.6 million blood donations from voluntary unpaid donors from 2004 to 2012 has been reported by 162 countries. The highest increase of voluntary unpaid blood donations is in the South-East Asia (78%) and African (51%) Regions. The maximum increase in absolute numbers was reported in the Western Pacific Region¹.

There are many factors that play a role in the readiness of people to donate blood voluntarily. Various studies have shown a significant association between the donor population and their demographic data (sex, age, and level of education). Also studies show that the more knowledge the person has about the subject the more willing he or she is to donate blood². However, it has been seen that fear, lack of knowledge, and inconvenience are the primary obstacles to donation which is why understanding blood donors' motivations is crucial to improve the effectiveness of donor programs.

Based on the literature reviews, it can be identified that the unpaid blood donation system, both in developed and developing countries, have problems. Due to the difference in traditions, cultures, religion, and level of education, the awareness and approach were found to be different. Therefore, in order for a blood donation system to be effective, it has to be according to specific elements of a society³.

What pushes a person to donate blood and what are the difficulties they face when doing so? Are there centres that encourage people to donate? Does the media play a role in teaching people the importance and benefits on blood donations? The answers to these questions would help medical organizations a great deal in determining potential blood donors that meet safe blood requirements.

College students, particularly from medical colleges, can be a very good source of quality blood if they are motivated and are willing to be voluntary blood donors. Therefore, the objective of this study was to determine the knowledge, and intentions towards blood donation among medical students of Taiba University in Madiinah, Saudi Arab.

2. Research objectives

2.1. General Objective

To determine the knowledge and intentions toward blood donation among medical students.

2.2. Specific Objectives

The objectives of the study are as follows:

1. To explore the level of awareness regarding blood donation and its importance.
2. To assess the attitude towards blood donation.
3. To identify the challenges that could face the individuals.
4. To suggest factors that can encourage the donation process in the future.

3. Methods

This study was done during the period from April to June of 2015 at Taibah University in Madinah. It is a cross-sectional survey to assess the medical students' level of knowledge and awareness towards blood donation and their desire to do so. The study sample which includes 408 students drawn by non-random convenient technique. Objectives of the study were explained to the participants and their verbal agreement was taken after emphasis on the confidentiality and privacy of the information conducted by them. Participants answered the questions mentioned in an especially English designed self-administered questionnaires, which included the following sections: demographic data, Knowledge and attitude toward blood donation and previous blood transfusion practices.

A pilot study of 20 cases was conducted to make the questionnaire in its final appropriate form. The pilot study participants were excluded from the original survey. Approval of the Ethical Committee of the Faculty of Medicine was obtained.

Statistical Analysis: Data was collected in excel sheet and calculations were done using SPSS version 22.0.

3. Results

3.1. Demographics

The study population consisted of 408 respondents. In terms of gender, the percentage of females is (77.9%), which is larger than that of males (22.1%). Of all the respondents; 61.8% aged 21 to 23 years, 44.4% were in the specialty of medicine, 35.3% were in the second grade, and 92.6% were single at the time of the survey (Table1).

	Male (N=90)		Female (N=318)		Total (N=408)	
	n	%	n	%	n	%
Age group						
18 – 20	9	10.0	101	31.8	110	27.0
21 – 23	57	63.3	195	61.3	252	61.8
24 – 26	22	24.4	20	6.3	42	10.3
No response	2	2.2	2	0.6	4	1.0
Marital Status						
Single	85	94.4	293	92.1	378	92.6
Married	1	1.1	23	7.2	24	5.9
No response	4	4.4	2	0.6	6	1.5
Specialty						
Medicine	49	54.4	132	41.5	181	44.4
Dentistry	3	3.3	33	10.4	36	8.8
Pharmacy	6	6.7	60	18.9	66	16.2
Medical laboratory	31	34.4	30	9.4	61	15.0
Clinical nutrition	1	1.1	51	16.0	52	12.7
Nursing	0	0.0	12	3.8	12	2.9
Grade						
First year	8	8.9	54	17	62	15.2
Second year	28	31.1	116	36.5	144	35.3
Third year	7	7.8	48	15.1	55	13.5
Fourth year	15	16.7	40	12.6	55	13.5
Fifth year	32	35.6	60	18.9	92	22.5

Table 1: Distribution of respondents by Personal characteristics

3.1.1. Attitude towards blood donation

Table 2 shows the attitude of participants toward blood donation. A total of 99.3% thought that blood donation is important, 99% had positive feeling towards blood donation, 63% thought that blood donation a religious duty, 99.5% thought that blood donations help needy patients, 87.7% thought that there was no enough awareness to donate blood in the society, and 58.8% disagreed about paying money to donors.

	Male (N=90)		Female (N=318)		Total (N=408)	
	n	%	n	%	n	%
Do you think that blood donation is important?						
Yes	89	98.9	316	99.4	405	99.3
No	1	1.1	2	0.6	3	0.7
What is your feeling towards blood donation?						
Positive	90	100.0	314	98.7	404	99.0
Negative	0	0.0	4	1.3	4	1.0
Is blood donation a religious duty?						
Yes	66	73.3	191	60.1	257	63.0
No	24	26.7	127	39.9	151	37.0
Do you think that blood donations help needy patients?						
Yes	90	100.0	316	99.4	406	99.5
No	0	0.0	2	0.6	2	0.5

Do you think that the awareness for blood donation in our society is enough?						
Yes	12	13.3	38	11.9	50	12.3
No	78	86.7	280	88.1	358	87.7
What do you think about paying money to donors?						
Agree	9	10.0	41	12.9	50	12.3
Disagree	59	65.6	181	56.9	240	58.8
I don't know	22	24.4	96	30.2	118	28.9

Table 2: Response to attitude questions about blood donation (gender wise)

Table 3 shows that All the respondents were questioned to assess their thinking about blood donation importance. The sum of responses was summarized as a thinking score and a comparative analysis was done for respondents according to their demographic categorization. The score was greatest for Yes donors and least for No donors in all the categories. All the respondents in the gender, age, Marital Status, Specialty and grade groups had significantly greater thinking about blood donation importance ($P < 0.05$).

Characteristics	Yes	No	P-value
<i>Gender</i>			0.000
Male	89	1	
Female	316	2	
Total	405	3	
<i>Age</i>			0.000
18 - 20	108	2	
21 - 23	252	0	
24 - 26	42	0	
Total	202	2	
<i>Marital Status</i>			0.000
Single	376	2	
Married	24	0	
Total	400	2	
<i>Specialty</i>			0.000
Medicine	181	0	
Dentistry	35	1	
Pharmacy	69	1	
Medical laboratory	61	0	
Clinical nutrition	51	1	
Nursing	12	0	
Total	405	3	
<i>Grade</i>			0.000
First year	62	0	
Second year	141	3	
Third year	55	0	
Fourth year	55	0	
Fifth year	92	0	
Total	405	3	

Table 3: Comparison of thinking about blood donation importance scores of the respondents according to demographic characteristics.

3.1.2. Knowledge about blood donation

Table 4 shows the level of knowledge about blood donation. In all the groups, the most number of respondents (56.1%) had knowledge about the benefits of blood donation, followed by those who had some information 40%, and most of the participants (46.6%) thought that times of blood donor should give in a year is 2 times.

	Male (N=90)		Female (N=318)		Total (N=408)	
	n	%	n	%	n	%
Do you know the benefits of blood donation?						
Yes	59	65.6	170	53.5	229	56.1
No	3	3.3	13	4.1	16	3.9
Some information	28	31.1	135	42.5	163	40.0
How many donations do you think a blood donor should give in a year?						
1 time	14	15.6	43	13.5	57	14.0
2 times	36	40.0	154	48.4	190	46.6
3 times	21	23.3	66	20.8	87	21.3
4 times	14	15.6	36	11.3	50	12.3
5 times	4	4.4	5	1.6	9	2.2
Other	1	1.1	14	4.4	15	3.7

Table 4: Response to knowledge questions about blood donation (gender wise)

3.1.3. History of previous donation

Table 5 shows that the majority of the participants (71.8%) reported no previous history of blood donation, the proportion of the females having donated blood was found to be much less than that of the males. The most common reason for previous donations among males was voluntary (57.8%), While around 78.9% of the females reported that they never got an opportunity to donate. While 61.1% of the males will donate again if asked, the same proportion was found to be 21.4% among females. Previous refusal to donate blood to one of the family members was reported by 43.3% of the males, with 88% of the females left the question unanswered. Blood bank was the preferred place for blood donation by most of the students 71.3%. 76.5 % of the participants had never declined to donate when asked. For those who declined to donate when asked, health issues were the most common cause for declining 17.6%.

	Male (N=90)		Female (N=318)		Total (N=408)	
	n	%	n	%	n	%
Have you ever donated blood before?						
Yes	54	60.0	58	18.2	115	28.2
No	36	40.0	260	81.8	293	71.8
What were your reasons for previous donations?						
Voluntary						
Relatives, friends and work mates	52	57.8	65	20.4	117	28.7
Never got an opportunity to donate	4	4.4	2	0.6	6	1.5
No response	34	37.8	251	78.9	123	30.1
Will you donate again if asked?						
Yes	55	61.1	68	21.4	123	30.1
No	2	2.2	5	1.6	7	1.7
No response	33	36.7	245	77.0	278	68.1
Have you ever donated blood to a family member when they needed it?						
Yes	15	16.7	11	3.5	26	6.4
No	39	43.3	59	18.6	98	24.0
No response	36	40.0	248	88.0	284	69.6
Where do you prefer to donate at?						
Blood bank	62	68.9	229	72.0	291	71.3
Workplace/Resident	27	30.0	88	27.7	115	28.2
No response	1	1.1	1	0.3	2	0.5
Have you ever declined to donate when asked?						
Yes	21	23.3	75	23.6	96	23.5
No	69	76.7	243	76.4	312	76.5
Why have you declined to donate when asked?						
Fear	3	3.3	13	4.1	17	4.2
Health reasons	10	11.1	62	19.5	72	17.6
No time	7	7.8	8	2.5	16	3.9
No specific reasons	5	5.6	2	0.6	7	1.7
No response	65	72.2	233	73.3	296	72.5

Table 5: Response to questions about history of previous donation (gender wise)

3.1.4. Worries about blood donation

Figure 1 shows the causes cited by respondents for not donating blood divided by gender. While disease transmission ranked first among females (28.3%), nothing worries most of the males (47.8%) regarding blood donation.

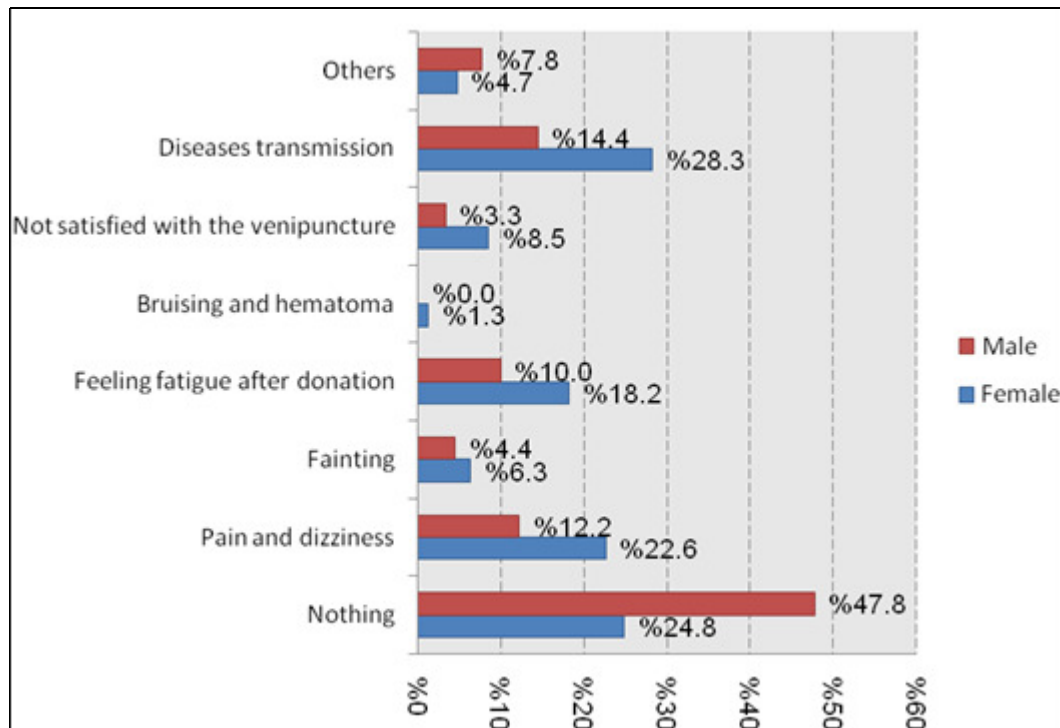


Figure 1: Worries about blood donation (gender wise)

4. Discussion

The current study reported Taibah University medical students' knowledge about blood donation, and their attitude towards it, and the barriers that are faced in Madinah.

It has been reported that gender, marital status and age are important identifiers of those willing to donate. It's shown that in this study donors were more likely to be females (77.9%) compared to males (22.1%). This was the same result of a study for African American college students⁴. The reasons for the higher percentage of female donors could be due to the willingness of female medical students to help and their enthusiasm to participate in extracurricular projects. In addition, the majority of the donors' age groups were between 21 – 23 years of age (61.8%), in comparison to the (10.3%) which were between 24 – 26 years of age. It also showed that the minority of the donors (5.9 %) were married which could be due to them not having the free time to donate.

Therefore, donor recruitment efforts should be directed towards age-gender groups with the lowest level of willingness to donate including male and those with the age range 24 – 26 years.

According to the distribution of respondents by specialty, the study showed that those with a Medicine specialty were more interested in donating (44.4%), this high percentage could be due to their accessibility to the blood banks in the hospital and their affiliation with patients in need of blood donations.

With regards to knowing the importance of blood donation and their feelings towards it, (99.0%) of the donors showed that they knew its importance and had positive feelings compared to the (1%) with negative feelings which was the same as a study done in India study Amongst Undergraduate Stude

According to the level of thinking that blood donations help needy patients, the most common respondents (99.5%) agreed which was also found in a previous study conducted in Saudi Arabia².

A (63%) of people donated blood because they thought it was a religious duty; in comparison to a Nigerian study, where (20.3%) of their study population would not donate blood for their religious beliefs⁶.

When asked about the number of times a blood donor should donate blood in a year the most number of respondents (46.6%) thought that they should donate twice a year while (3.7%) thought 4 times per year. In comparison to other studies that showed that 273 (51.2%) donors knew that people could donate once every three months and could start at 18 years of age⁷.

The most common reason (28.7%) for previous donations among respondents was voluntary during their student activities. However, (13.25%) would donate only if their relatives, friends or work mates were in need for donations, likewise, a study in Saudi Arabia² showed that the desire to donate blood for relatives and friends was higher in non-donors (58%) then donors (38.2%).

They (71.8%) also emphasized that they preferred to donate at blood banks as compared to donating at their workplace or residency (28.2%), which was concordant with the findings of a study in India⁵ which was conducted for 400 students, about (87.5%) of the participants believed that donating blood in the blood banks was safer.

When asked if they have ever declined to donate only (23.5%) had previously declined while the majority of respondents (76.5%) replied that they never declined. Other studies were in agreement on the high willingness of donors to donate again⁸.

The major reason for not donating blood reported by a previous study⁷ conducted of 530 donors (55%) donors felt that the fear of pain was the main reason for their hesitation to donate. However, in this study fear only played a minor role (4.2%). The main reason in our study was health reasons (17.6%)

Our study showed in general, a poor level of knowledge about blood donation seeing as when asked about the level of awareness in our society (87.7%) of our participants thought that there wasn't enough while (12.3%) thought the opposite. The findings of this study were in agreement with another study that showed that (45%) of their participants did not donate blood because of the lack of awareness⁹. A similar study carried out on 500 Saudi individuals, showed that 89 non-donors (42.6%) replied that they were 'not approached by anybody' for blood donation².

When asked about their opinion on paying money to donors, the majority (58.8%) disagreed while (12.3%) agreed on paying donor as an incentive. This might be attributable to the Muslim religion in Saudi Arabia, which urges people to help others without expecting anything in exchange. In contrast to a study conducted in Nigeria⁶ that showed about (41.0%) preferred certificates as an incentive for donation, whereas (13.6%) preferred money; and only (2.58%) would donate for nothing.

5. Conclusion and Recommendations

Medical field students are reasonably informed and have positive perception towards blood donation; however, only few of them have donated and are positively disposed to donate blood.

It was shown that single females with a medical specialty in the age group 21–23 years were more likely to donate blood while those between 24 – 26 years of age, males, other specialties, and married were less likely to donate blood.

Overall people have a high positive attitude towards blood donation and they all agreed that donating blood would help people in need.

However, the level of awareness in our society was poor which could be due to the lack of knowledge about blood donation.

Public education campaign should be implemented to promote and encourage people to donate blood also to lessen their worries and change their misconceptions.

5.1. Study Limitations

As a limitation of this study, the study included students from only one medical college with a modest sample size that future researches will need to include multi-college design to assess the extent to which the results of this study are generalizable.

5.2. Acknowledgments

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- Competing interests: None declared.

6. References

- i. WHO, Blood safety and availability, Updated June 2014, <http://www.who.int/mediacentre/factsheets/fs279/en/>
- ii. Alam M1, Masalmeh Bel D. Knowledge, attitudes and practices regarding blood donation among the Saudi population, Saudi Med J. 2004 Mar;25(3):318-21.
- iii. Hollingsworth, B. and Wildman, J. (2004), What population factors influence the decision to donate blood?. *Transfusion Medicine*, 14: 9–12. doi: 10.1111/j.0958-7578.2004.00473.x
- iv. Shaz BH, Demmons DG, Crittenden CP, Carnevale CV, Lee M, Burnett M, Easley K, Hillyer CD. Motivators and barriers to blood donation in African American college students. *Transfus Apher Sci*. 2009 Dec;41(3):191-7. doi: 10.1016/j.transci.2009.09.005. Epub 2009 Sep 24.
- v. Giri PA, Phalke DB. Knowledge and Attitude about Blood Donation Amongst Undergraduate Students of Pravara Institute of Medical Sciences Deemed University of Central India. *Ann Trop Med Public Health* 2012;5:569-73.
- vi. Okpara RA. Attitudes of Nigerians towards blood donation and blood transfusion. *Trop Geogr Med*. 1989 Jan;41(1):89-93.
- vii. Uma S., Arun R., Arumugam P. The Knowledge, Attitude and Practice towards Blood Donation Among Voluntary Blood Donors in Chennai, India. *J Clin Diagn Res*. 2013 June; 7(6): 1043–1046. Published online 2013 June 1. doi: 10.7860/JCDR/2013/4851.3033.
- viii. Najd Alfouzan, "Knowledge, Attitudes, and Motivations towards Blood Donation among King Abdulaziz Medical City Population," *International Journal of Family Medicine*, vol. 2014, Article ID 539670, 8 pages, 2014. doi:10.1155/2014/539670.
- ix. Amit Agrawal, Aseem K. Tiwari, Alok Ahuja, Rakesh Kalra. Knowledge, attitude and practices of people towards voluntary blood donation in Uttarakhand. *Asian J Transfus Sci*. 2013 Jan-Jun; 7(1): 59–62. doi: 10.4103/0973-6247.106740.
- x. Abolfotouh MA, Al-Assiri MH, Al-Omani M, Al Johar A, Al Hakbani A, Alaskar AS. Public awareness of blood donation in Central Saudi Arabia, *Int J Gen Med*. 2014 Aug 12;7:401-10. doi: 10.2147/IJGM.S67187. eCollection 2014.

- xi. Moltzan C, Proulx N, Bormanis J, Lander N, Degroot H, Rock G. Perceptions and motivations of Canadian autologous blood donors, *Transfus Med*. 2001 Jun;11(3):177-82.
- xii. Kowsalya V, Vijayakumar R, Chidambaram R, Srikumar R, Reddy EP, Latha S, Fathima IG, Kumar CK. A study on knowledge, attitude and practice regarding voluntary blood donation among medical students in Puducherry, India, *Pak J Biol Sci*. 2013 May 1;16(9):439-42.
- xiii. Dilsad S, Tanriover O, Hidiroglu S, Gurbuz Y, Karavus M. Knowledge, attitudes and beliefs of Turkish women towards blood donation, *J Pak Med Assoc*. 2014 Aug;64(8):869-73.
- xiv. Shenga N, Thankappan K, Kartha C, Pa R. Analyzing socio demographic factors amongst blood donors, *J Emerg Trauma Shock*. 2010 Jan;3(1):21-5. doi: 10.4103/0974-2700.58667.
- xv. Sanchez AM, Schreiber GB, Bethel J, McCurdy PR, Glynn SA, Williams AE, Gilcher R; Retrovirus Epidemiology Donor Study (REDS). Prevalence, donation practices, and risk assessment of blood donors with hemochromatosis, *JAMA*. 2001 Sep 26;286(12):1475-81.
- xvi. Wiwanitkit V. A study on attitude towards blood donation among people in a rural district, Thailand, *Southeast Asian J Trop Med Public Health*. 2000 Sep;31(3):609-11.
- xvii. Ziegler AK, Grand J, Stangerup I, Nielsen HJ, Dela F, Magnussen K, Helge JW. Time course for the recovery of physical performance, blood hemoglobin, and ferritin content after blood donation. *Transfusion*. 2014 Dec 16. doi: 10.1111/trf.12926.
- xviii. Zeiler T, Lander-Kox J, Alt T. Blood donation by elderly repeat blood donors, *Transfus Med Hemother*. 2014 Jul;41(4):242-50. doi: 10.1159/000365401. Epub 2014 Jul 4.
- xix. Rosa-Bray M, Wisdom C, Marier JF, Mouksassi MS, Wada S. The effect of plasmapheresis on blood pressure in voluntary plasma donors, *Vox Sang*. 2015 Jan;108(1):11-7. doi: 10.1111/vox.12188. Epub 2014 Aug 28.
- xx. Gallerani M, Volpato S, Cellini M, Reverberi R, Mikhailidis DP, Manfredini R. Risk of illness, hospitalization and death in a cohort of blood donors in Italy, *Curr Med Res Opin*. 2014 Sep;30(9):1803-12. doi: 10.1185/03007995.2014.921146. Epub 2014 Jun 4.
- xxi. Dubey A, Sonker A, Chaudhary RK. Knowledge, attitude, and beliefs of young, college student blood donors about Human immunodeficiency virus, *Asian J Transfus Sci*. 2014 Jan;8(1):39-42. doi: 10.4103/0973-6247.126689.
- xxii. Kulkarni P, Kulkarni A. Mass counseling: effective tool to improve knowledge, attitude and behavior regarding blood donation, *Ann Med Health Sci Res*. 2014 Jan;4(1):90-4. doi: 10.4103/2141-9248.126609.
- xxiii. Sarkar RS, Philip J, Mallhi RS, Yadav P. Proportion of Rh phenotypes in voluntary blood donors, *Med J Armed Forces India*. 2013 Oct;69(4):330-4. doi: 10.1016/j.mjafi.2013.05.004. Epub 2013 Sep 24.
- xxiv. Sanchez AM, Schreiber GB, Bethel J, McCurdy PR, Glynn SA, Williams AE, Gilcher R; Retrovirus Epidemiology Donor Study (REDS). Prevalence, donation practices, and risk assessment of blood donors with hemochromatosis, *JAMA*. 2001 Sep 26;286(12):1475-81.
- xxv. Zaller N, Nelson KE, Ness P, Wen G, Bai X, Shan H. Knowledge, attitude and practice survey regarding blood donation in a Northwestern Chinese city, *Transfus Med*. 2005 Aug;15(4):277-86.
- xxvi. Nwogoh B, Aigberadion U, Nwannadi AI. Knowledge, Attitude, and Practice of Voluntary Blood Donation among Healthcare Workers at the University of Benin Teaching Hospital, Benin City, Nigeria. *J Blood Transfus*. 2013;2013:797830. doi: 10.1155/2013/797830. Epub 2013 Oct 9.
- xxvii. Quéniart A. Blood donation within the family: the transmission of values and practices. *Transfusion*. 2013 Dec;53Suppl 5:151S-6S. doi: 10.1111/trf.12474.
- xxviii. Renzaho AM, Polonsky MJ. The influence of acculturation, medical mistrust, and perceived discrimination on knowledge about blood donation and blood donation status, *Transfusion*. 2013 Dec;53Suppl 5:162S-71S. doi: 10.1111/trf.12476.
- xxix. Baig M, Habib H, H Haji A, T Alsharief F, M Noor A, G Makki R. Knowledge, Misconceptions and Motivations Towards Blood Donation Among University Students in KSA, *Pak J Med Sci*. 2013 Nov;29(6):1295-9.
- xxx. Batiha AM, AlBashtawy M. Knowledge of Philadelphia University students regarding blood donation, *Transfus Med*. 2013 Jun;23(3):195-8. doi: 10.1111/tme.12027. Epub 2013 Mar 21.
- xxxi. Lownik E, Riley E, Konstenius T, Riley W, McCullough J. Knowledge, attitudes and practices surveys of blood donation in developing countries, *Vox Sang*. 2012 Jul;103(1):64-74. doi: 10.1111/j.1423-0410.2012.01600.x. Epub 2012 Mar 23.
- xxxii. Fielding R, Lam TH, Hedley A. Risk-behavior reporting by blood donors with an automated telephone system, *Transfusion*. 2006 Feb;46(2):289-97.
- xxxiii. Olaiya MA, Alakija W, Ajala A, Olatunji RO. Knowledge, attitudes, beliefs and motivations towards blood donations among blood donors in Lagos, Nigeria, *Transfus Med*. 2004 Feb;14(1):13-7.