

## Awareness And Knowledge of Blood Donation Among Medical Faculty and Students in Vadodara District



### Medical Science

**KEYWORDS :** Blood donation, Blood, Medical personnel

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### ABSTRACT

*Blood is defined as most valuable drug by the World Health Organization that can be substituted only by blood. The objective of the study is to assess the knowledge & awareness of blood donation among medical faculty and students of medical colleges in Vadodara district. This prospective study was conducted in three medical colleges in Vadodara district, Gujarat, India from June 2012 to September 2013 among 475 medical personnel. Systemic sampling technique was used for choosing the sample. Results show that 19.2% of participants have carried out blood donation at least once and 80.8% have never donated blood at all voluntarily. General awareness regarding voluntary blood donation is high but has not translated into voluntary blood donation. Medical personnel, who are healthy, enthusiastic and approachable as a group, should be nurtured to become voluntary blood donors and motivators. Wide spread medical education programs of voluntary blood donation should be carried out.*

### INTRODUCTION

Blood is defined as most valuable drug by the World Health Organization that can be substituted only by blood.<sup>1</sup> The Blood is the nature's unique gift to the human beings for the survival, maintenance and normal restoration. The most important and salient feature of blood is that it can never be synthesized in any clinical laboratory of the world.<sup>2</sup>

Blood also acts as a scavenger to evacuate waste products from all organs of the body. Lifespan of red blood cells is about 120 days and white blood cells normally last 3-9 days. New blood cells are constantly generated in the body. One can donate blood 168 times in his lifetime. At one time, only 350 ml (Or 450-470ml, Red Cross and Red Crescent Societies) will be taken from a donor in not more than 20 minutes time including time for rest and refreshment. There are four main blood types: A; B; AB and O. Blood type AB positive is considered as the universal recipient while O negative, the universal donor.<sup>3</sup>

"Safe blood starts with me, blood saves lives." was the W.H.O theme for 2000 AD. Blood is the most donated tissue in medical science and human donation is the only way of acquiring blood to meet emergency requirements. Blood donation is the act of giving one's blood so that it can be used to transfuse into another for therapy.<sup>4</sup> There are three types of blood donors: voluntary unpaid; family/replacement and paid. "Voluntary" blood donation refers to "unpaid, non-remunerated" blood donation. Voluntary blood donors are of three types: new voluntary donor, lapsed voluntary donor and regular voluntary donor.<sup>5</sup>

A well-established voluntary unpaid blood donor programme can contribute to a significant reduction in the risk for infections such as HIV, hepatitis B, hepatitis C, malaria and syphilis.<sup>6</sup> Promotion of voluntary blood donation is done under safe blood program in India and 1st October is celebrated as National Voluntary Blood Donation Day.<sup>7</sup> Voluntary unpaid blood donors who give blood purely for altruistic reasons has been reported with lowest prevalence of HIV, hepatitis viruses and other blood-borne infections whereas higher infection rates are found among family or family replacement donors who give blood only when it is required by a member of the patient's family or community.<sup>8</sup>

WHO estimates that blood donation by 1% of the population is generally the minimum needed to meet a nation's most basic requirements for blood; the requirements are higher in countries with more advanced health care systems. However, the average donation rate is 15 times lower in developing countries than in developed ones.<sup>5</sup>

### OBJECTIVE

To assess the knowledge & awareness of blood donation among medical faculty and students of medical colleges in Vadodara district.

### MATERIALS AND METHODS

This prospective study was conducted in the tertiary care centres with attached three medical colleges (S.B.K.S.M.I.R.C, Baroda medical college and G.M.E.R.S Gotri) in Vadodara Gujarat, India from June 2012 to September 2013 among 475 medical personnel which included both clinical and non clinical branches were comprised of medical students (2nd and 3rd year), Interns, PG students, Assistant Professors, Associate Professors, Professors, Casualty Medical Officers, other doctors i.e. resident medical officers, senior residents, junior residents. 20% sample from each of the above mentioned categories has been taken for the study and systemic sampling technique was used for choosing the sample.

The study participant who was not available for more than 3 times then the next person from the list was selected to fulfil the study subject. 1st year students were excluded from the study as they are usually not yet exposed to blood bank and pathology. The respondents were briefed about the aims of the study and they were ensured about confidentiality by one of the authors. A pre-designed and pretested questionnaire was used to collect the data. Ethical committee consent was taken from the institutional ethical committee.

### RESULTS

Participants were divided into three groups i.e. MBBS students (2nd year, 3rd year pre final, 3rd year final and interns), residents and faculty (Professors, associate professors, assistant professors and casualty medical officers) for convenience of analysis and discussion purpose.

**Characteristics of participants:**

**Table 1: Distribution of study participants (n=485)**

S.NO	PARTICIPANTS	TOTAL NUMBER	NUMBER OF PARTICIPANTS (Column %)
1	Professors	119	23(4.74)
2	Associate professors	104	20(4.13)
3	Assistant professors	217	43(8.86)
4	Casualty Medical Officer (C.M.O)	19	03(0.63)
5	Resident Doctors	629	125(25.77)
6	Interns	389	77(15.88)
7	3 <sup>rd</sup> yr final MBBS students	233	46(9.48)
8	3 <sup>rd</sup> yr pre- final MBBS students	256	51(10.51)
9	2 <sup>nd</sup> yr MBBS students	486	97(20)
10	Total	2452	485(100)

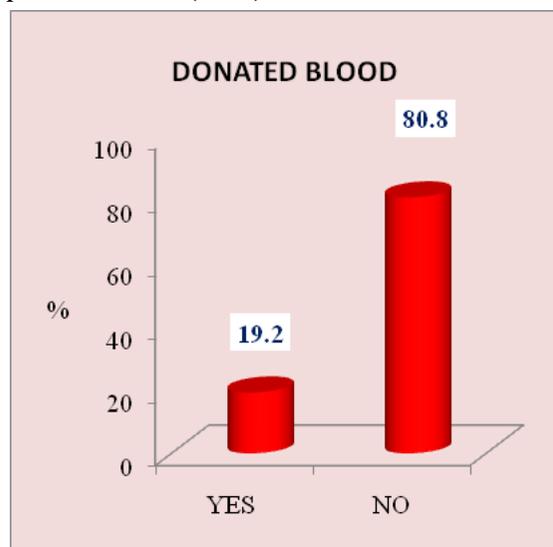
**Table 2: Participants in groups (n=485)**

Participants group	Distribution of participants (%)
MBBS students	271(55.88)
Residents	125(25.77)
Faculty	89(18.35)
Total	485(100)

**Table 3: Blood donation carried out by participants (n=485)**

Donated blood at least once	Number of participants
Yes	93(19.2)
No	392(80.8)
Total	485(100)

**Chart 1: Voluntary blood donation carried out by participants at least once (n=485)**



**Table 4: Blood group distribution among study participants (n=485)**

Blood group of study participants	Number of participant (%)
A -ve	14 (2.9)
A +ve	58 (12)
AB -ve	11 (2.3)
AB +ve	75 (15.5)
B -ve	1 (0.2)
B +ve	225 (46.3)
O -ve	12 (2.5)
O +ve	89 (18.3)
Total	485 (100)

Table 4 shows at least one voluntary blood donation carried out by participants. 19.2% of participants have carried out blood donation at least once, and 80.8% have never donated blood.

**Chart 2: Pie diagram showing blood group distribution of study participants (n=485)**

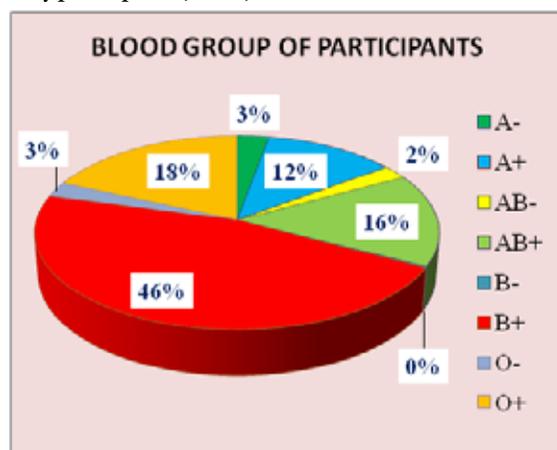
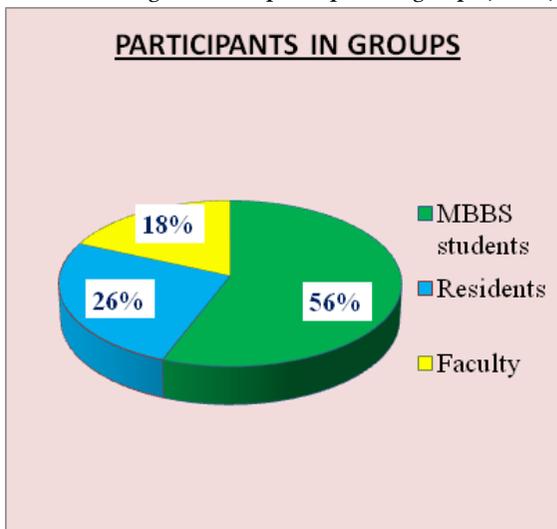


Table 3 shows blood groups of participants. Majority of participants (46.4%) have B+ve blood group followed by O+ve (18.4%). Universal recipient AB+ve were 15.5% and universal donor O-ve was 2.5%. B-ve blood group was the minimum with 0.2%. A-ve blood group was 2.9% among participants while A+ve and AB-ve were 12% and 2.3% respectively.

**Chart 3: Pie diagram shows participants in groups (n=485)**



**Table 5: Awareness and knowledge about blood donation**

Awareness and knowledge about	MBBS students (n=271) Correct response	Residents (n= 125) Correct response	Faculty (n=89) Correct response	Test of significance
Universal donor (O -ve)	89 (32.84)	91 (72.8)	74 (83.15)	$\chi^2=96.14$ df=2 p < 0.0001
Universal recipient (AB+ve)	264 (97.42)	125 (100)	89 (100)	Yate's $\chi^2=3.18$ df=2 p = 0.203
Time require for blood donation (15-20 minutes)	188 (69.37)	39 (31.2)	20 (22.47)	$\chi^2=85.19$ df=2 p < 0.0001
Minimum required age for blood donation	174 (64.21)	125 (100)	89 (100)	$\chi^2=95.74$ df=2 p < 0.0001
At most, how many times blood can be donated in a year	107 (39.48)	66 (52.8)	54 (60.68)	$\chi^2=14.51$ df=2 p = 0.0007
Minimum duration between two blood donation (3 months)	144 (53.14)	87 (69.6)	50 (56.17)	$\chi^2=9.65$ df=2 p = 0.0080
Minimum weight of donor to donate blood	90 (33.21)	44 (35.2)	40 (44.94)	$\chi^2=4.04$ df=2 p = 0.132
Amount of blood in adult body	102 (37.64)	68 (54.4)	46 (51.68)	$\chi^2=11.98$ df=2 p = 0.0024
Hb gm% required for blood donation	93 (34.32)	53 (42.4)	50 (56.17)	$\chi^2=13.54$ df=2 p = 0.0011
Maximum amount of blood that can donated at one time	75 (27.67)	48 (38.4)	40 (44.94)	$\chi^2=10.68$ df=2 p = 0.004
Time require for body to restore blood after blood donation	110 (40.59)	57 (45.6)	50 (56.17)	$\chi^2=6.63$ df=2 p = 0.036
Conditions contra indicated for blood donation	48 (17.71)	41 (32.8)	52 (58.43)	$\chi^2=54.99$ df=2 p < 0.0001
Incentive given to blood donors by government	125 (46.12)	99 (79.2)	87 (97.75)	$\chi^2=94.26$ df=2 p < 0.0001

Are any questions asked prior to blood donation	192 (70.85)	125 (100)	84 (94.38)	$\chi^2=61.18$ df=2 p < 0.0001
Can blood be collected at high school	36 (13.28)	18 (14.4)	40 (44.94)	$\chi^2=45.65$ df=2 p < 0.0001

Anova: Single Factor						
Source of Variation	SS	Df	MS	F	P-value	F crit
Between Groups	47332.87	2	23666.43	11.36009	0.000263	3.354131
Within Groups	56249	27	2083.296			
Total	103581.9	29				

HSD Tukey's Post Hoc test

HSD Value= 41.71, and all the means from all three group are higher than HSD post hoc test value which means they are significantly different from each other.

Table 5 shows knowledge of blood donation among different groups of participants. The average numbers of participants who answered correctly in the MBBS students group were 60.81% in comparison to 77.52% and 79.21% of residents and faculty respectively.

Knowledge regarding Hb gm% required for blood donation were significantly low for all groups. It was 34.32% and 42.4% for MBBS students and residents respectively. It was 56.17% for faculty which does not show any significant difference. Knowledge regarding time required for body to restore blood was also approximately same in all groups, 40.59%, 45.6% and 56.17% among MBBS students, residents and faculty respectively and it was not statistically significant ( $\chi^2=6.63$ , df=2, p = 0.036). Knowledge about how many times at most blood can be donated in a year was 60.68% in faculty while it was 52.8% and 39.48% among residents and MBBS students which was statistically significant ( $\chi^2=14.51$ , df=2, p = 0.0007).

Correct response rate for knowledge about minimum duration between two blood donations was highest among residents 69.6% while it was 53.14% and 56.17% for MBBS students and faculty respectively. It was marginally significant ( $\chi^2=9.65$ , df=2, p = 0.0080). There was no significant difference in knowledge about maximum amount of blood that can be donated at one time ( $\chi^2=6.63$ , df=2, p = 0.036).

Knowledge about any question asked prior to blood donation were high in groups of residents and faculty, 100% and 94.38% respectively. It was 70.85% among MBBS students which was statistically significant with chi square value of 61.18 and p value of <0.0001.

Difference of knowledge between different group of study participants was found statistically significant (F=11.36 and p= 0.0002). Further post hoc tukey's test was also found significant (HSD value=41.71) for less awareness and knowledge about blood donation in group of MBBS students in compare to residents and faculty and also less in residents in comparison to faculty.

**DISCUSSION**  
**"Give the gift of life: donate blood"**  
 Slogan world blood donor day 2013

In present study majority of participants (46.4%) have B+ve blood group followed by O+ve (18.4%). Universal recipient AB+ve were 15.5% and universal donor O-ve was 2.5%. B-ve blood group was the minimum with 0.2%. A-ve was 2.9% among participants while A+ve and AB-ve were 12% and 2.3% respectively. Similarly an article in Gujarat Samachar shows that 0.8% is A-, B- 1.1%, AB- 0.4%, and O- 2% in India.<sup>9</sup>

Ideally, if 2% of population donates blood yearly, it will be more than sufficient to meet the need of a country like India. Every year our nation requires about 4 crore units of blood, but only a meager 40 lakh units of blood is available.<sup>45</sup> More than 38,000 blood donations are needed every day. If we start donating blood at the age of 18 and donated every 3 months until we reached 60, we would have donated 113 litres of blood, potentially helping save more than 500 lives!<sup>10</sup>

In India, this figure at the moment is 4 per thousand populations with some regions/states at a higher than the national average and some below the national average. If this national average can be raised to 8 voluntary blood donor per 1000 population, there would not be any shortage of blood for the country and none would die in need of blood for transfusion.<sup>11</sup> 12 lakhs unit of blood needed in Gujarat every year and in Vadodara 80,000 units per year.<sup>9</sup>

In current study, 19.2% of participants have carried out blood donation at least once, and 80.8% have never donated blood at all voluntarily. In contrast study carried out by Gilani I12, Sixty three out of 83 doctors were blood donors that makes a percentage of 76. A 49.2% of blood donations by doctors (whether random or regular donors) were voluntary. While study carried out by S.Manikandan13 in Tamilnadu, India, shown that majority of the participants (89.25%) had never done voluntary blood donation.

Blood is a vital healthcare resource used in a broad range of hospital procedures, viz. accidents, emergency obstetric services, and other surgeries. It is also a potential vector for harmful, and sometimes fatal, infectious diseases, such as HIV, hepatitis B and C. Every year, millions of people are exposed to avoidable, life-threatening risks through the transfusion of unsafe blood. As per a global database, 6 million of 81 million units of blood collected annually in 178 countries were not screened for transfusion-transmitted infections.<sup>14</sup>

A study done by Mohanty D et al "Prevalence of  $\alpha$ -thalassaemia and other haemoglobinopathies in six cities in India: a multi-centre study" shows that the overall prevalence of  $\alpha$ -thalassaemia trait was 2.78 % and varied from 1.48 to 3.64 % for which regular blood transfusion is needed every year.<sup>15</sup> The Gujarat State AIDS Control Society has initiated a free blood scheme for thalassaemia, haemophilia, and sickle-cell patients.<sup>16</sup>

In our study knowledge about universal recipient was found high in all groups with 97.42% in MBBS students while 100 % among residents and faculty. In contrast knowledge about universal donor was found to be 32.84% only in MBBS students group while it was 72.8% among residents. Even in faculty it was 83.50%. Majority of mistakes made between O-ve and O+ve. Out of the entire participant, 254 (53%) participants answered O+ve as a wrong answer.

In our study knowledge about time require for blood donation was also found markedly low 22.47% among faculty while it was 69.32% and 31.2% among MBBS students and residents. 37 (41.57%) participants from faculty gave the wrong answer with 20-25 minutes. Study carried out by Nwogoh Benedict17 "Knowledge, attitude and practice of voluntary blood donation among physicians in a Tertiary Health Facility of a developing Country"

in Benin also found similar results where 21.4% participants unaware of time require for blood donation while 47.9% were not able to give right answer. Only 30% of participants had knowledge about time require for blood donation.

In our study knowledge about "minimum age require for blood donation" was found 100% among residents and faculty while among MBBS students it was 64.21%. A study carried out by H. Sanayaima Devi18, "A cross sectional analytical study was conducted among undergraduate medical students of Regional Institute of Medical Sciences, Imphal" during September to December 2010 showed similar result with 56.8% undergraduates aware of minimum age require for blood donation. Shahshah-aniet al19 "Knowledge, attitude and practice study about blood donation in the urban population of Yard" in Iran 2004 reported that 45% in the general population had correct knowledge regarding minimum age requirement for blood donation. In other studies however, it was correctly, known by only 3.6% of the respondents. However study carried out by S. Manikandan13 "A study on knowledge, attitude and practice on blood donation among health professional students in Chennai, Tamil Nadu, south India" showed that 76.25% health professional students were aware about minimum age for blood donation.

In our study knowledge about "minimum weight of male donor to donate blood" was surprisingly found low for all groups, 33.21%, 35.2% and 44.94% among MBBS students, residents and faculty respectively. 270 (56.84%) participants gave 50 kg as a wrong answer. A study carried out by S. Manikandan13 "A study on knowledge, attitude and practice on blood donation among health professional students in Chennai, Tamil Nadu, south India" showed that 72.75% health professional students were aware about minimum weight for blood donation.

In our study knowledge about maximum amount of blood that can donate at one time was 44.94% in faculty while were 38.4% and 27.67% among residents and MBBS students. Similar low results were found among study carried out by H. Sanayaima Devi18 which showed that only 28.9% undergraduates were aware about maximum amount of blood that can donate at one time while 37.67% were not aware and 33.5% had no idea about maximum amount of blood that can donate at one time.

In our study knowledge about number of patients that can be benefited from 1 unit of whole blood were significantly low in MBBS students and residents, 35.05% and 36.8% respectively with no significant rise in faculty 52.80%. In contrast study carried out by H. Sanayaima Devi18 showed that 63.9% undergraduate students aware of correct response while only 16.9% were wrong with 19.2% had no idea about number of patients that can be benefited from 1 unit of whole blood. While knowledge about how many components can be separated from one unit of whole blood in current study shows high 96.80% and 100% in residents and faculty respectively while among MBBS students it was only 35.79%. A study carried out by S. Manikandan13 "A study on knowledge, attitude and practice on blood donation among health professional students in Chennai, Tamil Nadu, south India" also showed that 22% participants were aware about number of patients that can be benefited from 1 unit of blood donation.

In our study correct response rate for knowledge about minimum duration between two blood donations was highest among residents 69.6% while it was 53.14% and 56.17% for MBBS students and faculty respectively. Similarly knowledge about how many times at most blood can be donated in a year was also same as 60.68% in faculty while were 52.8% and 39.48% among residents and MBBS students. Regarding knowledge about how many times blood can be donated in a year, 238 (50.10%) participants gave 3 times a year as a wrong answer, while regarding

what should be minimum duration between two blood donations, 201(42.31%) participants gave 6 months as a wrong answer. Similarly study carried out by Nwogoh Benedict<sup>17</sup> shows knowledge about “how many times blood can be donated in a year” was only 35.7% among physicians in tertiary care hospital while 13% were unaware of minimum duration even. In contrast a study carried out by H. Sanayaima Devi<sup>18</sup> “Knowledge, Attitude and Practice (KAP) of Blood Safety and Donation” showed that 36.5% undergraduates were aware of minimum interval between two donations while 42.5% were wrong and 21% undergraduates had no idea about minimal interval between two donations. Similar results were found by a study carried out by S. Manikandan<sup>13</sup> “A study on knowledge, attitude and practice on blood donation among health professional students in Chennai, Tamil Nadu, south India” which showed that 32.25% health professional students were aware about how many times at most blood can be donated in a year.

In our study correct response to minimum hemoglobin level in percent required for voluntary blood donation were also markedly poor among all groups with 34.32%, 42.4% and 56.17% for MBBS students, residents and faculty respectively. 259 (54.52%) participants gave 11gm% as a wrong answer.

In our study knowledge regarding time required for body to restore blood was also approximately same in all groups, 40.59%, 45.6% and 56.17% among MBBS students, residents and faculty respectively.

## RECOMMENDATIONS

The recruitment and retention of blood donors can only succeed if it is based on understanding the motivators of voluntary blood donation. General awareness regarding voluntary blood donation is high but it has not yet translated into voluntary blood donation.

- Medical students, who are healthy, enthusiastic and approachable as a group, should be nurtured to become voluntary blood donors and motivators.
- A periodic awareness program on voluntary blood donation is needed among health care personnel as well as general population. Students should lead from the front to donate blood regularly on voluntary basis on their birthdays or anniversary days and also to take all necessary steps for spreading awareness about the advantages of blood donation not only for the recipient but also for the donor himself/herself.
- Ongoing continuous training programs should be carried out in order to improve the quality and safety of blood transfusion among medical personnel. They are the ones who request, utilize and manage problems arising from use of blood and blood products. All respondents were within the eligible age group for voluntary blood donation hence they constitute a pool of potential donors.
- Wide spread medical education programs of voluntary blood donation should be carried out by Government of Gujarat via radio, T.V, media etc.
- Orientation visits to blood bank by medical graduates and other staff should be carried out periodically.
- All licensed blood banks must have list of voluntary blood donors with their names, addresses, telephone numbers and blood groups. They should be encouraged for regular voluntary blood donation as and when approached.
- Three increments may be given to employees who have carried out 25 or more voluntary blood donations.
- All the blood centers should make an effort to celebrate 7th April, WHO Day; 8<sup>th</sup> May, International Red Cross Day; 14<sup>th</sup> June, World Blood Donation Day; and 1<sup>st</sup> October, Voluntary Blood Donation Day.

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