

# A STUDY TO ASSESS THE BARRIERS AND FACILITATORS OF BLOOD DONATION AMONG UNIVERSITY STUDENTS OF SOUTH INDIA

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## ABSTRACT

### INTRODUCTION

Donated blood is very crucial and lifesaving for those who require large volumes of blood in any medical emergency. Many blood donation camps are routinely organized to fill this void of demand and supply. In a university campus associated with a hospital, it is important that student volunteers should contribute towards the increase in demand for blood during times of crisis. This makes it imperative to understand their perception of this noble cause.

### METHODS

A descriptive cross-sectional study was conducted among 354 volunteers of a university campus using convenience sampling. The primary outcome was to assess the factors that influence voluntary blood donation among the volunteers. The adjusted association was performed using logistic regression. R Console was used for statistical analysis. Odds ratios and p-value < 0.05 with 95% confidence intervals were calculated to determine the level of significance.

### RESULTS

A total of 354 responses were received and analysed. Among these, 38.98%, (n=138) participants had donated blood at least once. Factors that were significantly associated with blood donation were gender, being a member of an NGO, frequency of volunteering activities, fear of needles, and belief that they would acquire the disease during blood donation.

### CONCLUSION

Most of the participants had good knowledge of blood donation, but their attitude and practice did not fall along the same lines. The study also highlighted that attitude towards donating blood is high among the participants who are associated with the NGOs or participate in voluntary activities. Voluntary work induces a 'sense of giving something to the society which appears to be facilitating factor and an effective measure to encourage blood donation among youth.

## KEYWORDS

Voluntary Blood Donation, practices, volunteerism, NGO, Students

## INTRODUCTION

Voluntary blood donation started in 1942 in India, during the second world war when blood was vital in saving the lives of the injured ones. During that time, the blood donors were mainly government employees and the people from the Anglo-Indian fraternity who donated blood for a generous cause. [1] The number of voluntary donors declined after the war and the donors had to be paid for blood donation. [2] The World Health Organization (WHO) states that the safest blood donors are voluntary donors and the non-remunerated ones from low-risk populations. As per the Melbourne declaration, voluntary non-remunerated blood donation (VNRBD) has been globally declared to be the cornerstone of safe and secure blood. [3] In accordance with World Health Assembly resolution, which was adopted in 1975, WHO aims to obtain blood supplies through unpaid voluntary donors in all countries [3]. There is a huge gap between the demand and the supply in developing countries, especially in India due to the high prevalence of nutritional anemia. [4] It is estimated that India needs equivalent to 85 donations per 1000 eligible people, which was found to be equivalent to 31 donations per 1000 eligible people in 2018. Hence, there is a huge deficit that needs to be fulfilled with multisectoral efforts. [5] Blood scarcity is frequently encountered in healthcare settings and is attributable to an imbalance between the increasing demand for safe blood and blood products on the one hand and failure to organize regular blood supply due to misconceptions, perceived harms and risks, and lack of motivation among potential donors. [6]

Donated blood is very crucial in saving the lives of those who require large volumes of blood in an emergency. [7] Factors that promote blood donation include altruism/humanitarian, personal or family credit, social pressure, replacement, and reward. Fear of needles, contracting an infection, and other adverse effects including medical problems are reasons which demotivate blood donors. [8, 9] Some studies have also shown poor blood donation practice among the students despite relatively good knowledge and favourable attitude toward voluntary blood donation. [10] The prevalence of voluntary blood donation is reported to be even lower among females. [11] Studies have revealed that there is a positive association

among knowledge, attitude, and practice on blood donation, which suggests that positive attitude and practice can be improved by inculcating knowledge on blood donation among college students to recruit and donate blood regularly, which will help to achieve 100% of blood donation on a voluntary basis. [12, 13]

In India, the number of blood units collected through voluntary blood donation at the National AIDS Control Organization (NACO) supported blood bank was 84.3% in 2012. [14] Even today, recruiting volunteers for blood donation remains a major challenge. Almost every day around 12000 people die in India due to the lack of availability of donated blood and getting a safe blood supply on time remains a challenge. Over 40 districts in India does not have a single blood bank. [14, 15] Medical college students can serve as a readily available pool of voluntary blood donors for the attached medical college hospitals and help tide away some of the scarcity of blood and blood products. However, different studies involving medical students have expressed concern about the low level of awareness and unsatisfactory voluntary blood donation practices among them. Since student volunteers are potential sources of donated blood in society, it is essential to assess the factors which motivate and demotivate them in terms of blood donation., this study aimed to evaluate the knowledge, attitude, and practice of blood donation and to ascertain the factors which positively or negatively affects blood donation among the students at a university campus.

## MATERIALS AND METHODS

### STUDY POPULATION

A descriptive cross-sectional study was carried out in the university campus of Manipal from January 2018 to January 2019. A total of 354 students were interviewed who were selected using convenience sampling and met the inclusion criteria of being a current student at Manipal campus. Volunteers from other sister campuses of the university and those not consenting to the study were excluded.

## MEASURES

The study questionnaire comprises of two parts: part-A and part-B. The questionnaire was prepared by thorough literature review, then peer-reviewed, validated by two independent senior faculty members, pilot-tested, and administered to all the participants. The primary outcome was to assess the factors that influence the voluntary blood donation among the participants. Part A consisted 7 closed-ended questions on background information, such as gender; age; year of study; membership to any NGO/ Rotary/ Volunteer organization/ Volunteer Services Organization (VSO); the number of hours of voluntary services completed so far; type of family; frequency of involvement in voluntary work.

The part B of the questionnaire consisted of questions on knowledge, attitude, and practice of the participants towards blood donation.

## KNOWLEDGE TOWARDS BLOOD DONATION

We used six questions to assess knowledge of the participants towards blood donation. These questions were about the "age at which a person can start to donate blood (16 years, 18 years, 21 years, Don't Know); minimum weight required to donate blood (40kg, 45kg, 50kg, Don't Know); the volume of blood drawn out in each session (450ml, 600ml, 650ml, Don't Know); the minimum interval between two donations by a person (3 months, 6 months, 1 year, Don't Know); screening of donated blood prior to transfusion (Yes, No); aware that diseases can be acquired through transfusion of unscreened blood (Yes, No)." A score of one was assigned to each correct response and zero for incorrect response. All correct response results in a total knowledge score of 6. The knowledge score was further classified as below average (if below 4), average (those who scored 4) and above average (above 4).

## ATTITUDE TOWARDS BLOOD DONATION

In this study, we used eight questions to assess the attitude of the participants towards blood donation. These questions were, "Are you interested in donating blood (Yes, No); Why do people donate blood (Social Responsibility, Influence of friends, Religious purpose, For incentives/money, Screening for disease, Others); Do you have a fear of needles (Yes, No); Do you think the side effects of blood donation outweigh the benefits of doing so (Yes, No); Will you donate blood if an incentive is provided (Yes, No); Do you think one can acquire diseases while donating blood (Yes, No); Do you believe there will

be any side effects to your body after donating blood (Yes, No); Which of the following do you think is the adverse effect of donating blood (Makes you weak, Anaemia, No adverse effects, Don't Know, Others)."

## PRACTICES, BARRIER TOWARDS BLOOD DONATION, AND A WAY TO IMPROVE

This section consisted of seven questions to assess practices, barriers towards blood donation and a way to improve voluntary blood donation. The questions were "Have you donated blood before (Yes, No); Are you a frequent blood donor (Yes, No); Do you have any difficulty during the procedure (Yes, No); Will you recommend blood donation to others (Yes, No); If not donate blood before, Why you did not donated blood (Fear of needles, Lack of knowledge, Complicated procedure, No exposure to blood donation, Others)" The open-ended questions were used to understand ways to improve voluntary blood donation. These questions were, 'what will encourage you to donate blood?' and 'How do you think blood donation camps can be improved?'

## DATA COLLECTION AND STATISTICAL ANALYSIS

The data on blood donation was collected by the interviewers (Interviewer Administered). The categorical variables were summarized using frequency & percentage. The adjusted association was performed using logistic regression. The response to open-ended questions were coded (in vivo coding), categorised, and represented in the form of themes, and presented as frequency and percentages. A  $p < 0.05$  was considered significant. R Console (4.0.1) was used for performing statistical analysis.

## ETHICAL CLEARANCE

The study was approved by the Institutional Research Committee (IRC) & Institutional Ethics Committee (IEC-813/2017), of Manipal Academy of Higher Education. No personal identification was collected, and confidentiality was maintained throughout the course of the study.

## RESULTS

A total of 354 responses were received and analysed. There were 38.41 % (n=136) male and 61.58 % (n=218) female respondents. Of 354 participants, majority (n= 220, 62.14%) were aged between 20 and 25 years. A total of 38.98 % (n=138) participants had donated blood at least once. Out of 138 participants who donated blood, 55.8% (n=76) were males and 22.84 % (n=62) were females and the majority (n=102, 43.36%) were in the age group of 20 to 25 years.

Participants who were not members of any NGO (Non-Government Organizations) (n=203, 57.34 %), among them 45.81 % (n=93) donated blood at least once. Even those volunteers who had worked once in the past six months, among them 65.22%(n=30) donated blood. The majority of the participants having knowledge scores of average, and above-average did not donate blood.

Among the volunteers who did not donate blood were those who said they are not afraid of needles (n=146, 56.15%), they did not require incentive (n=80, 56.34%), and they feel that diseases are acquired while blood transfusion (n=136, 64.15%). Among those who were interested in donating blood, most of them (n=198, 59.28%) did not donate blood. The main reasons for not donating blood among non-donors were that it makes them weak (n=22) and that they did not know they should donate (n=40). The majority (n=210, 59.32%) of the respondents selected other reasons as an option for not donating blood. The other

reasons which non-donors (n=126) quoted were low haemoglobin (n=60), underweight (n=35), personal choice (n=22), and medical conditions like diabetes, low BP, on medications, etc.(n=9) for not donating blood. Out of 354 participants, 115 (32.48%) responded to the open-ended question on 'what will encourage you to donate blood?'. Most of the responses were, social responsibility (n=54, 46.95%), feeling of contentment (n=50, 43.47) and proper education (n=11, 3.10%). Two hundred and eight (58.57%) participants responded to the open-ended question on 'How do you think blood donation camps can be improved?'. Major themes that emerged for this are publicity (pamphlets, posters, social media) (n=49, 23.56%), education and awareness (n=76, 36.53%), incentive (attendance, food, certificates, free blood test) (n=33,15.87%), hygiene and sanitation at the collection point (n=20, 9.62 %) and more comforting atmosphere (n=30, 14.42%). Descriptive for other variables are presented in Table I.

**TABLE I: DESCRIPTIVE OF VARIABLES UTILIZED IN THE STUDY FOR BLOOD DONATION (N=354)**

VARIABLES	NUMBER (PERCENTAGE) N (%)	BLOOD DONATION	
		YES, N (%)	NO, N (%)
<b>Gender</b>			
Male	136 (38.42)	76 (55.8)	60 (44.12)
Female	218 (61.58)	62 (28.44)	156 (71.56)
<b>Age</b>			
Below 20	118 (33.33)	26 (22.03)	92 (77.97)
20-25	220 (62.14)	102 (46.36)	118 (53.64)
25-30	12 (3.39)	6 (50)	6 (50)
Above 30	4 (1.13)	4 (100)	0
<b>Year of Study</b>			
1st year	70 (19.77)	27 (38.57)	43 (61.43)
2nd year	148 (41.81)	44 (29.73)	104 (70.27)
3 <sup>rd</sup> year	110 (31.07)	49 (44.55)	61 (55.45)
4 <sup>th</sup> year	16 (4.52)	8 (50)	8 (50)
5 <sup>th</sup> year	2 (0.56)	2 (100)	0 (0)
Intern	8 (2.26)	8 (100)	0 (0)
<b>Member of NGO</b>			
Yes	151 (42.65)	45 (29.8)	106 (70.2)
No	203 (57.34)	93 (45.81)	110 (54.19)
<b>Volunteering Service Hours</b>			
Hour <5	210 (59.32)	79 (37.62)	131 (62.38)
5-10	48 (13.56)	23 (47.92)	25 (52.08)
10-20	36 (10.17)	14 (38.89)	22 (61.11)
20<hour	60 (16.95)	22 (36.67)	38 (63.33)

<b>Type of Family</b>			
Nuclear	294 (83.05)	114 (38.78)	180 (61.22)
Joint	60 (16.95)	24 (40)	36 (60)
<b>Volunteering Work</b>			
Once in week	61 (17.23)	19 (31.15)	42 (68.85)
Once in month	74 (20.90)	26 (35.14)	48 (64.86)
Once in six months	46 (12.99)	30 (65.22)	16 (34.78)
Once in Year	26 (7.34)	10 (38.46)	16 (61.54)
Rarely	125 (35.31)	47 (37.60)	78 (62.40)
Never	22 (6.21)	6 (27.27)	16 (72.73)
<b>Knowledge Score</b>			
Below Average	81 (22.88)	27 (33.33)	54 (66.67)
Average	107 (30.22)	37 (34.58)	70 (65.42)
Above Average	166 (46.89)	74 (44.58)	92 (55.42)
<b>Why do people donate blood</b>			
Social responsibility	326 (92.10)	130 (39.88)	196 (60.12)
Influence of friends	04 (1.13)	01 (25)	03 (75)
Religious purpose	02 (0.56)	02 (100)	00 (0)
For incentives/money	06 (1.69)	02 (33.33)	04 (66.67)
Screening for disease	04 (1.13)	01 (25)	03 (75)
Others	12 (3.39)	02 (16.67)	10 (83.33)
<b>Fear of Needle</b>			
Yes	94 (26.55)	24 (25.53)	70 (74.47)
No	260 (73.45)	114 (43.85)	146 (56.15)
<b>Side effects of blood donation outweigh the benefits of doing so</b>			
Yes	89 (25.14)	39 (43.82)	50 (56.18)
No	265 (74.86)	99 (37.36)	166 (62.64)
<b>Donate blood if incentive is provided</b>			
Yes	285 (80.51)	119 (41.75)	166 (58.25)
No	69 (19.49)	19 (27.54)	50 (72.46)
<b>Acquire disease while blood donation</b>			
Yes	212 (59.89)	76 (35.85)	136 (64.15)
No	142 (40.11)	62 (43.66)	80 (56.34)
<b>Adverse effect of blood donation</b>			
Makes you weak	138 (38.98)	45 (32.61)	93 (67.39)
Anemia	30 (8.47)	12 (40.00)	18 (60.00)
No adverse effect	125 (35.31)	55 (44.00)	70 (56.00)
Don't Know	46 (12.99)	25 (54.35)	21 (45.65)
Others	15 (4.24)	1 (6.67)	14 (93.33)
<b>Are you a frequent blood donor</b>			
Yes	68 (19.21)	61 (89.71)	7 (10.29)
No	286 (80.79)	77 (26.92)	209 (73.08)
<b>Difficulty during procedure</b>			
Yes	65 (18.36)	16 (24.62)	49 (75.38)
No	289 (81.64)	122 (42.21)	167 (57.79)

<b>Reason for never donating blood</b>			
Makes you weak	37 (10.45)	15 (40.54)	22 (59.46)
No adverse effect	55 (15.54)	27 (49.09)	28 (50.91)
Don't Know	52 (14.69)	12 (23.08)	40 (76.92)
Others	210 (59.32)	84 (40.00)	126 (60.00)
<b>Will you recommend blood donation</b>			
Yes	348 (98.31)	138 (39.66)	210 (60.34)
No	6 (1.69)	0 (0)	6 (100)
<b>Encourage blood donation</b>			
Attendance	58 (16.38)	32 (55.17)	26 (44.83)
Half day	62 (17.51)	18 (29.03)	44 (70.97)
Incentive	72 (20.34)	22 (30.56)	50 (69.44)
Gift	14 (3.95)	8 (57.14)	6 (42.86)
Money	31 (8.76)	13 (41.94)	18 (58.06)
Other	117 (33.05)	45 (38.46)	72 (61.54)
<b>Side effect after blood donation</b>			
Yes	260 (73.45)	108 (41.54)	152 (58.46)
No	94 (26.55)	30 (31.91)	64 (68.09)

The study revealed that blood donation was associated with various factors after adjusting for confounders: females had 3.3 times odds of donating blood compared to males (OR (95% CI): 3.396 (2.060-5.684); p=0.00). Those who were not a member of any NGO had 53% lower odds of donating blood compared to those who are a member (OR (95% CI): 0.47 (0.251-0.882); p=0.01). Those who volunteer once in 6 months had 68% lower odds of donating blood compared

to those who volunteer once in a week (OR (95% CI): 0.32 (0.118-0.887); p=0.02). Those who were afraid of needles had 46% lower odds of donating blood compared to those who do not have fear (OR (95% CI): 0.54(0.298-0.961); p=0.03), and those who feel that they acquire disease while blood donation had 44% lower odds of donating blood compared to those who feel otherwise (OR (95% CI): 0.56(0.331-0.942); p=0.03).

**TABLE II: ADJUSTED ODDS RATIO FOR PREDICTOR VARIABLES FOR BLOOD DONATION.**

VARIABLE	ODDS RATIO (95% CI)	P VALUE
<b>Gender</b>		
Male	1	
Female	3.39(2.06-5.68)	0.0000*
<b>Member of NGO</b>		
Yes	1	
No	0.47(0.25-0.88)	0.0199*
<b>Volunteer services hours</b>		
Less than 5 h	1	
5-10	0.87(0.39-1.94)	0.7500
10-20	0.79(0.30-2.13)	0.6501
Above 20 h	0.66(0.26-1.61)	0.3656
<b>Frequency of voluntary work</b>		

Once in Week	1	
Once in Month	0.65(0.27-1.50)	0.3262
Once in 6 Month	0.32(0.11-0.88)	0.0299*
Once in Year	1.15(0.36-3.69)	0.8084
Rarely	0.96(0.39-2.35)	0.9312
Never	2.63(0.70-10.69)	0.1607
<b>Knowledge score</b>		
Below Average	1	
Average	0.77(0.48-1.22)	0.2796
Above Average	0.67(0.42-1.06)	0.0937
<b>Fear of needle</b>		
Yes	1	
No	0.54(0.29-0.96)	0.0392*
<b>Incentive for blood donation</b>		
Yes	1	
No	1.87(0.95-3.80)	0.0740
<b>Acquired disease during blood donation</b>		
Yes	1	
No	0.56(0.33-0.94)	0.0301*
<b>Interested in blood donation</b>		
Yes	1	
No	3.79(0.85-27.36)	0.1153

CI: Confidence Interval, Significant values\*

## DISCUSSION

Escalating demand for safe blood and its availability in society can be assured only through enhancing voluntary blood donation. The role of volunteers is crucial to meet the demand for safe blood as they have a better understanding of healthcare requirements. The findings of our study are very similar to a study in Iran where 38% of respondents had ever donated blood which is 38.98% in our study. [16] There is also a significant increase in blood donation compared to the earlier study in India where they had only 10% of voluntary donors. [17] However, this proportion is relatively low when compared with studies among students from Nepal (43%), USA (56%) for blood donation. [18, 19] Our study revealed that males were more active in donating blood. There is evidence that women

donate less blood mostly due to physiological problems and low haemoglobin count. [20] Several factors were found to be predictors of blood donation. We found a significant association between being an NGO member

and donating blood. There are studies that support our findings that being an NGO member provides a sense of social responsibility and community welfare. [21, 22] We found that participants with nuclear families were less likely to donate blood which is in contrast with the study conducted in North India, which concluded that individuals from nuclear families were more likely to donate blood. [17] Even those participants who responded that it is a social responsibility to donate blood, have no fear of needles, and do not anticipate a difficulty during the procedure and agreed that there are no side effects of

blood donation, did not go for blood donation. This might be because of various misbeliefs or social constraints in society towards blood donation. The most cited reason to donate blood was a sense of social responsibility. [23] Most of the studies have evidenced that fear of needles and associated side effects like weakness, the transmission of diseases, etc. are the major reasons for not donating blood. [7] Any associated side effects from blood donation should be properly documented for any medico-legal case and even for research purposes. [24] In the present study, weakness, lack of awareness, low haemoglobin levels, underweight, personal choice, and medical conditions like diabetes, hypotension, under medications were mainly the stated reasons for not donating blood. This could also be attributed to poor knowledge about blood donation in general. Most of the participants who were not donating blood had average knowledge which is indicative of their negative behaviour towards blood donation. Majority of the participants responded that through education and awareness blood donation among students can be improved in the campus.

This study had few limitations too. The sample size utilized was not enough to generalize the findings. The cross-sectional nature of the study which is used may also hinder the cause-and-effect relationship. Future studies using a very large sample size are recommended for generalizing the findings.

## CONCLUSION

Majority of the participants had good knowledge of blood donation, but their attitude and practice did not fall along the same lines. The study also highlighted that attitude towards donating blood is high among the participants who are associated with the NGOs or participate in voluntary activities. Voluntary work induces a 'sense of giving something to the society' which appears to be a facilitating factor and an effective measure to encourage blood donation among youth. Incentivisation for blood donation proves to be another motivating factor. Innovative methods like health-related incentives such as blood credit, health screening, and economic incentives like a ticket to events, discount coupons etc. should be planned to encourage students for blood donation.

Age and gender are important identifiers for those unwilling to donate blood for a noble cause. Educational programs, digital communication material on blood donation and

way to mitigate misconceptions towards blood donation and blood transfusion should be prepared for the women in the respective age groups and run through the internet and social media regularly to curb the myths associated with blood donation and to motivate them to become a potential blood donor. Barriers to blood donation among women should be found out through in-depth studies. Government Health Officials should work towards this so that people do not have any misconceptions associated with the procedure. Education Institutions can play an active role in facilitating the youth to become safe blood donors and meet the blood requirement of any country. They should be encouraged to take lead in creating awareness programs, work in collaboration with medical institutions to create a curriculum on the topic of blood donation and impart learnings and motivate the student community to donate blood.

## DECLARATIONS

### Authors Contribution

AC, PR, and LK were involved in study concept, design, and data collection. AK carried out cleaning of data and statistical analysis. BT and AC wrote the manuscript. AG and PM did critical review of the paper. All authors have read and approved the manuscript.

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### Conflicts of Interest

Authors have no competing interests.

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