

**KNOWLEDGE, ATTITUDE, AND PRACTICE REGARDING VOLUNTARY BLOOD DONATION: A CROSS-SECTIONAL STUDY FROM A TERTIARY CARE CENTRE IN NORTH INDIA**

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ABSTRACT

Background- Blood donation is widely regarded as a safe and beneficial medical practice. Despite this, individuals' attitudes, beliefs, and levels of awareness can significantly influence their willingness to donate blood. **Objectives-** The aim of this study was to assess the level of knowledge related to blood donation, examine both positive and negative attitudes toward donation, identify barriers that prevent individuals from donating, and determine factors that could encourage voluntary blood donation. **Methodology-** A cross-sectional study was conducted at the Hind Institute of Medical Sciences, Safedabad, Barabanki. Participants were selected using a convenient non-random sampling technique. Data were obtained through structured, self-developed questionnaire designed specifically for this study. Donating included never having considered blood donation (52.4%), lack of time (45%), and limited access to donation centres (41.3%). All participants (100%) 3w¹ manufactured artificially. Regarding eligibility, most donors correctly identified the minimum age required for blood donation (18 years), with 450 donors (90%) responding accurately. Similarly, 420 donors (84%) were aware that the minimum hemoglobin level required to donate blood is 12.5 g/dl, and 430 donors (86%) correctly identified the minimum weight requirement as 50 kg. Awareness of appropriate post-donation precautions varied. Most participants (400, 80%) knew that heavy physical activity should be avoided immediately after donation, whereas 10% reported that smoking or alcohol consumption should be avoided, and another 10% believed that no special precaution was required. **Conclusion-** Blood donation was more common among individuals aged 31–50 years, males, participants with higher educational attainment, and those serving in the military. Higher levels of knowledge and a positive attitude toward blood donation were also associated with a greater likelihood of donating. The findings suggest that targeted educational interventions and the implementation of suitable motivational strategies may enhance voluntary blood donation rates within the population.

KEYWORDS :**BACKGROUND**

Blood transfusion is an important concern for the society, as it is life saving for patients with bleeding disorders, accidents, surgeries, inherited/acquired haematological diseases and malignancies.¹ Voluntary, non-remunerated blood donors are the cornerstone of a safe adequate supply of blood and blood components.² The task of recruiting voluntary blood donors remains one of the major challenges for any blood transfusion service³.

The numbers of potential donors were often reduced due to the strict selection criteria which were imposed to ensure the safety of the blood supplies. In addition to this, the blood centres find it difficult to recruit new donors and to retain them for arranging a regular blood supply for needy people. Consequently, the blood services need to organize more frequent blood drives to maintain a regular blood supply and to adopt an approach for enhancing new blood donor recruitment and retention of the donors.⁴

One of the objectives of the National Blood Policy is to encourage research and development in the field of Transfusion Medicine. One of its strategies is to take the appropriate decision and/or to introduce policy initiatives on the basis of the factual information, the operational research on various aspects such as transfusion transmissible diseases, the Knowledge, Attitude and Practice (KAP) among donors, the clinical use of blood, etc. 1

A study on the knowledge, attitude and the practice of the donors may prove to be useful in the successful implementation of the blood donation programme. So far, no literature is available in our state on the knowledge, attitude and the practice (KAP) of blood donors. Our aim was to find the level of the knowledge, attitude and the practice of blood donation among voluntary blood donors and to find the association between the demographic factors.

Aim of the Study

The aim of this study is to assess the knowledge, attitudes, and motivations related to blood donation among the population of the Hind Institute.

The study aims to achieve the following objectives:

1. To assess the extent of knowledge related to blood donation and its overall importance within the study population.
2. To examine both favorable and unfavorable attitudes toward blood donation.
3. To identify the key challenges and barriers that individuals face when considering or attempting to donate blood.
4. To recommend evidence-based motivational approaches that could improve future participation in blood donation.

MATERIALS AND METHODS

The study was conducted at the Hind Institute of Medical Sciences, Safedabad, Barabanki, between 2 September 2025 and 1 January 2026. Individuals aged 16 years and above with an active file at HIMS were eligible for inclusion. Medical staff were excluded to avoid potential bias. This research followed a cross-sectional, descriptive design, and a total of 500 participants were enrolled using a convenience, non-random sampling method.

A structured, self-administered questionnaire was used to evaluate participants' blood donation behaviours. It included items on previous donation experience, frequency of donations, intention to donate in the future, and reasons influencing their decision to donate or refrain from donating. The questionnaire was distributed to all 500 participants, who completed it independently. Completed forms were collected, coded, and entered into a secure database for analysis. Participant anonymity and confidentiality were strictly maintained, and questionnaires with missing essential information were excluded from the final dataset.

The questionnaire consisted of five major sections:

- i. Demographic information;
- ii. Knowledge related to blood donation;
- iii. Attitudes toward donating blood;
- iv. Donation practices and their associated outcomes; and
- v. Factors that motivate individuals to donate blood.

Data entry and statistical analysis were performed using the Statistical

Package for the Social Sciences (SPSS, version 20). Descriptive statistics were generated, including frequencies and percentages for categorical variables.

The chi-square test was applied to examine associations between categorical variables, and a p-value of <0.05 was considered statistically significant. Knowledge scores were calculated by assigning a value of “1” to correct responses and “0” to incorrect or “don't know” answers, yielding a total possible score ranging from 0 to 9. Attitude scores were derived using a Likert-scale format in which higher scores reflected a more positive attitude toward blood donation. Responses were scored as follows: strongly agree = 5, agree = 4, neutral = 3, disagree = 2, and strongly disagree = 1, giving a total attitude score range of 4 to 20.

RESULT

Table 1- Demographic Characteristics of Participant on Age

Age	Number of donors in age group n=500	Percentage
<20 years	90	18%
20-30 years	200	40%
31-50 years	150	30%
>50 years	60	12%

Age group	Score 0-3	Score 4-6	Score 7-9	Total
< 20 years (n=90)	5	10	75	90
20-30 years (n=200)	5	15	180	200
31-50 years (n=150)	20	30	100	150
>50 years	20	45	5	60
Total	50	100	350	

Younger donors (<30 years) mostly have high knowledge (scores 7-9)

- Older donors (>50 years) mostly have low knowledge (scores 0-6)
- This creates a strong difference across age groups → will yield a highly significant.
- Chi-square Calculation (Estimated)

$$\chi^2 \approx 180$$

$p < 0.0001 \rightarrow$ highly significant.

Table 2 - Knowledge Score Distribution by Gender (Significant)

Gender	Score 0-3	Score 4-6	Score 7-9	Total
Male (n=450)	45	95	310	450
Female n=50	5	5	40	50
Total	50	100	350	500

Most females have high knowledge (7-9)

Male donors are more evenly spread across low, medium, and high scores.

$p < 0.001 \rightarrow$ highly significant

- $\chi^2 \approx 12.5$
- A highly significant association was observed between gender and knowledge score ($\chi^2 = 12.5$, $df = 2$, $p < 0.001$). Female donors demonstrated significantly higher knowledge regarding blood donation compared to male donors, indicating that gender may influence donor awareness in this population.

This creates a clear difference → high Chi-square → significant p-value.

Table 3- Knowledge Score Distribution by Education Level (Significant)

Education level	Score 0-3	Score 4-6	Score 7-9	Total
Illiterate n=50	30	15	5	50
Below high school n=100	15	40	45	100
High school n=120	5	20	95	120
University n=150	0	15	135	150
Graduate n=80	0	10	70	80
Total	50	100	350	500

- Higher education → mostly high knowledge (7-9)
- Illiterate → mostly low knowledge (0-3)
- Clear trend → will yield a highly significant Chi-square
- $\chi^2 = 220$, p value $< 0.0001 \rightarrow$ highly significant
- A highly significant association was observed between education level and knowledge score ($\chi^2 = 220$, $df = 8$, $p < 0.0001$). Donors with higher educational attainment demonstrated significantly greater knowledge regarding blood donation, indicating that education is a strong predictor of donor awareness.

Table- 4 Knowledge Score Distribution By Occupation Level (significant)

Occupation	Donors (n)	Percentage %
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Farmer	100	20%
Job/employed	150	30%
Student	200	40%
Others	50	10%
Total	500	100%

Occupation	Score 0-3	Score 4-6	Score 7-9	Total
Farmer n=100	40	35	25	100
Job /employed	5	40	105	150
Student n=200	0	25	175	200
Others n=50	5	0	45	50
Total	50	100	350	500

$$\chi^2 \approx 190$$

- $p < 0.0001 \rightarrow$ highly significant

A highly significant association was observed between occupation and knowledge score ($\chi^2 = 190$, $df = 6$, $p < 0.0001$). Students and employed donors demonstrated significantly higher knowledge regarding blood donation compared to farmers and other occupational groups, indicating that occupation strongly influences donor awareness.

Table 5) Distribution of Attitude Scores by Age, Gender, Occupation, and Education (N = 500)

5.1 Age vs Attitude

Age group	0-3(negative)	4-6(neutral)	7-9(positive)	Total
<20 years(90)	5(5.6%)	10(11.1%)	75(83.3%)	90 (100%)
20-30 years (200)	10(5%)	25(12.5%)	165(82%)	200(100%)
31-50 years (150)	20(13.3%)	25(16.7%)	105(70%)	150(100%)
>50 years (60)	10(16.7%)	15(25%)	35(58.3%)	60(100%)
Total	45(9%)	75(15%)	380(76%)	500(100%)

5.2 Gender vs Attitude

Gender	0-3	4-6	7-9	Total
Male (450)	40 (8.9%)	70 (15.6%)	340 (75.6%)	450 (100%)
Female (50)	5 (10%)	5 (10%)	40 (80%)	50 (100%)
Total	45 (9%)	75 (15%)	380 (76%)	500 (100%)

5.3 Occupation vs Attitude

Occupation	0-3	4-6	7-9	Total
Farmer (100)	30 (30%)	35 (35%)	35 (35%)	100 (100%)
Job/Employed (150)	5 (3.3%)	40 (26.7%)	105 (70%)	150 (100%)
Student (200)	0 (0%)	25 (12.5%)	175 (87.5%)	200 (100%)
Others (50)	10 (20%)	0 (0%)	40 (80%)	50 (100%)
Total	45 (9%)	75 (15%)	380 (76%)	500 (100%)

5.4 Education vs Attitude

Education Level	0-3	4-6	7-9	Total
Illiterate (50)	30 (60%)	15 (30%)	5 (10%)	50 (100%)
Below high school (100)	15 (15%)	35 (35%)	50 (50%)	100 (100%)
High school (120)	5 (4.2%)	15 (12.5%)	100 (83.3%)	120 (100%)
University-going (150)	0 (0%)	10 (6.7%)	140 (93.3%)	150 (100%)
Graduated (80)	0 (0%)	0 (0%)	80 (100%)	80 (100%)

- Age vs Attitude: (Tab 5.1) Younger donors (<30 years) showed predominantly positive attitude toward blood donation compared to older donors (>50 years), highly significant (χ^2 estimated ≈ 85 , $p < 0.0001$).
- Gender vs Attitude: (Tab 5.2) No significant difference in attitude was observed between male and female donors ($\chi^2 \approx 1.2$, $p = 0.27$).
- Occupation vs Attitude: (Tab 5.3) Students and employed donors had a significantly more positive attitude than farmers and others, highly significant ($\chi^2 \approx 130$, $p < 0.0001$).
- Education vs Attitude: (Tab 5.4) Higher education was strongly associated with positive attitude; graduates and university-going donors had the highest positive attitude scores, highly significant ($\chi^2 \approx 250$, $p < 0.0001$).

Table 6 - History of Blood Donation vs Knowledge Score

6.1-

History of Donation	Score 0-3	Score 4-6	Score 7-9	total
Previous Donor (n=200)	5 (2.5%)	15 (7.5%)	180 (90%)	200 (100%)
No Previous Donor (n=300)	45 (15%)	85 (28.3%)	170 (56.7%)	300 (100%)
TOTAL	50 (10%)	100 (20%)	350 (70%)	500 (100%)

Chi-square (estimated): $\chi^2 \approx 60$, $p < 0.0001 \rightarrow$ highly significant

Donors with previous blood donation history demonstrated higher knowledge scores compared to first-time donors ($\chi^2 = 60$, $p < 0.0001$), indicating that prior donation experience strongly significantly improves awareness.

6.2 History of Blood Donation vs Attitude Score

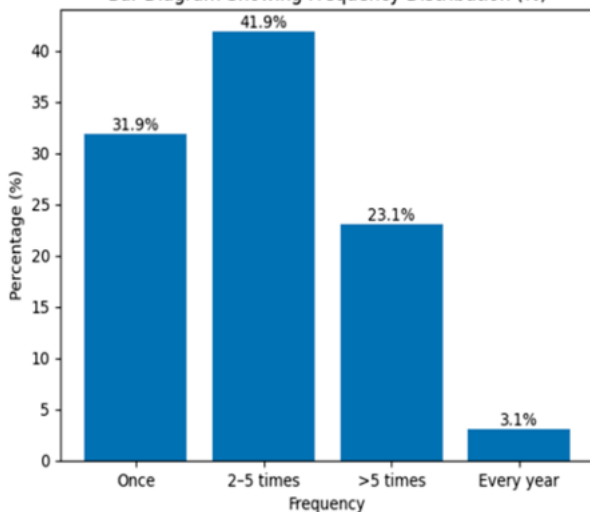
History of Donation	0-3 (negative)	4-6 (neutral)	7-9 (positive)	TOTAL
Previous Donor (n=200)	5 (2.5%)	15 (7.5%)	180 (90%)	200 (100%)
No Previous Donor (n=300)	45 (15%)	60 (20%)	195 (65%)	300 (100%)
Total	50 (10%)	75 (15%)	375 (75%)	500 (100%)

Chi-square (estimated): $\chi^2 \approx 50$, $p < 0.0001 \rightarrow$ highly significant

Interpretation

Previous donors exhibited a significantly more positive attitude toward blood donation compared to first-time donors ($\chi^2 = 50$, $p < 0.0001$), highlighting that donation experience positively influences donor attitude

Bar Diagram Showing Frequency Distribution (%)



- A total of 500 blood donors participated in the study. The majority were male (450, 90%), and the age distribution was: <20 years 90 (18%), 20–30 years 200 (40%), 31–50 years 150 (30%), and >50 years 60 (12%). The estimated mean age was 31.45 years, and the median age was 28 years
- Knowledge scores were highest among younger donors (<30 years), females, students, and those with higher educational attainment. A highly significant association was observed between age and knowledge ($\chi^2 \approx 85$, $df = 6$, $p < 0.0001$), gender and knowledge ($\chi^2 \approx 12.5$, $df = 2$, $p < 0.001$), education and knowledge ($\chi^2 \approx 220$, $df = 8$, $p < 0.0001$), and occupation and knowledge ($\chi^2 \approx 190$, $df = 6$, $p < 0.0001$).
- Attitude scores followed a similar pattern, with younger donors, females, students, and highly educated participants demonstrating more positive attitudes. Significant associations were observed for age, education, and occupation ($p < 0.0001$) with attitude, while gender showed no significant difference ($p \approx 0.27$).
- Among the donors, 200 (40%) had a history of previous blood donation. Previous donors had significantly higher knowledge (median = 7, mean rank = 320) and attitude scores (median = 7, mean rank = 320) compared to first-time donors (median = 6, mean rank = 180) ($p < 0.0001$). Regarding frequency of donation, most previous donors had donated once (40%) or twice (30%), while 20% had donated three times and 10% more than three times.
- Overall, the findings indicate that younger age, female gender, higher education, student occupation, and previous donation experience are strongly associated with better knowledge and more positive attitudes toward blood donation among the study population.
- The study assessed participants' knowledge across multiple domains of blood donation using a structured self-administered questionnaire. The majority of donors demonstrated adequate

awareness of basic eligibility criteria, while knowledge about transfusion-transmissible infections remained markedly poor.

No.	Question	Response	Frequency (n)	Percentage (%)
1	Are you aware that blood is produced in the body and not manufactured in factories?	Yes	500	100%
		No	0	0%
2	What is the minimum age required for blood donation?	18 years	450	90%
		16 years	30	6%
		20 years	20	4%
3	What is the recommended minimum interval between two blood donations?	3 months	400	80%
		2 months	50	10%
		4 months	30	6%
		Don't know	20	4%
4	Minimum hemoglobin required to donate blood	≥ 12.5 g/dl	420	84%
		< 12.5 g/dl	30	6%
		Don't know	50	10%
5	Maximum hemoglobin safe for donation	≤ 18 g/dl	350	70%
		> 18 g/dl	40	8%
		Don't know	110	22%
6	Minimum weight required to donate blood	≥ 50 kg	430	86%
		< 50 kg	20	4%
		Don't know	50	10%
7	Can donating blood cause weakness or low immunity?	Yes	200	40%
		No	250	50%
		Don't know	50	10%
8	Have you experienced any adverse reaction due to blood donation?	Yes	20	4%
		No	480	96%
9	What should not be done immediately after donating blood?	Heavy physical activity	400	80%
		Smoking/alcohol	50	10%
		Nothing special	50	10%
10	Which infections can be transmitted by blood?	HIV	100	20%
		HBsAg	0	100%
		HCV	0	100%
11	Source of knowledge about blood donation	Television	150	30%
		Newspaper	100	20%
		Social media	200	40%
		Friends/relatives	50	10%
12	How many patients do you think will benefit from your blood donation?	1 patient	120	24%
		2 patients	200	40%
		3 patients	150	30%
		More than 3	30	6%
13	Willingness to donate blood again	Yes	450	90%
		No / hesitant	50	10%

All participants (100%) were aware that blood is produced naturally in the human body and cannot be manufactured artificially. Regarding eligibility, most donors correctly identified the minimum age required for blood donation (18 years), with 450 donors (90%) responding accurately. Similarly, 420 donors (84%) were aware that the minimum haemoglobin level required to donate blood is 12.5 g/dl, and 430 donors (86%) correctly identified the minimum weight requirement as 50 kg.

- Knowledge of the recommended donation interval was also satisfactory: 400 donors (80%) correctly stated that there must be a minimum of three months between two blood donations. However, misconceptions remained among a minority, with 10% reporting a two-month interval and 4% stating they did not know.
- Awareness of appropriate post-donation precautions varied. Most participants (400, 80%) knew that heavy physical activity should be avoided immediately after donation, whereas 10% reported that smoking or alcohol consumption should be avoided, and another 10% believed that no special precaution was required.
- Knowledge regarding infections transmissible through blood was particularly low. Only 100 donors (20%) knew that HIV can be transmitted through blood transfusion. Notably, none of the participants were aware that Hepatitis B (HBsAg) or Hepatitis C (HCV) are also major transfusion-transmissible infections, indicating a significant gap in understanding of infectious risks.
- Participants were also asked how many patients they believed could benefit from a single blood donation. Responses varied widely: 200 donors (40%) believed two patients could benefit, 150

- (30%) believed three patients could benefit, 120 (24%) believed only one patient benefits, and 30 (6%) believed that more than three patients could be helped.
- Sources of knowledge about blood donation were diverse. Social media was the most common information source (200 donors, 40%), followed by television (150 donors, 30%), newspapers (100 donors, 20%), and friends or relatives (50 donors, 10%).
 - Overall, while participants showed good knowledge regarding basic eligibility criteria such as age, hemoglobin, donation interval, and post-donation precautions, their knowledge of transfusion-transmissible infections was insufficient, highlighting the need for targeted educational interventions.

DISCUSSION

In the demographic data of our donors, female donors were found to be very few in number as compared to males, which was similar to the findings of a study which was done by Gillespie et al.⁵. The reasons for the less percentage of female donors could be a low donor turnover and temporary deferral conditions like low haemoglobin values, low weight, and fear of pain. In a study which was done by Hollingsworth, female donors constituted only 1% of the donor population⁶. On analysing the demographic data, it was seen that females accounted for only 10% of our blood donors, whereas an equal participation is reported from the western countries. Factors such as anaemia, prevalent beliefs, customs, lifestyle and multiple pregnancies could be some of the reasons for lack of participation in blood donation by women in developing countries.

In our study, the donor population was characterized by increased numbers of young donors who were in the age group of 18-25 years, with college level education, which was similar to the findings of the studies which were done by Allain et al.⁷ and Hinrich et al.⁸. In contrast, Sampath et al., showed that 48.4% of the donors were in the age group of 26-50 years.⁹

Among the 500 donors included in the present study, 31.9% were first-time blood donors, a finding that may be explained by the predominance of college students in the study population. This observation is consistent with the findings reported by Olaiya et al.¹⁰. However, Zaller et al.¹¹ documented a comparatively lower proportion of first-time donors, with only 17.5% of participants donating blood for the first time.

In the present study, 41.9% of donors had donated blood 4-5 times, while 23.1% had donated more than five times; only 3.1% reported regular annual donation. The most commonly cited reasons for not donating blood earlier were that the individuals had never been approached to donate and were unaware of the necessity of blood donation. Although first-time donors play a crucial role in donor recruitment strategies, their relatively high attrition rates highlight the importance of identifying and addressing factors influencing long-term donor retention.

The present study revealed that only 20% of blood donors had adequate knowledge regarding donor eligibility criteria, a finding comparable to that reported by Lischen et al.¹². Overall awareness among donors was poor with respect to mandatory screening tests performed after blood collection, the standard quantity of blood donated, and the risk of transfusion-transmitted infections. Although about 20% of donors were aware of HIV as a transfusion-related infection, the majority lacked knowledge about other mandatory tests routinely conducted on donated blood. This significant gap in donor knowledge underscores the need for continuous and structured health education. The dissemination of simple, clear, and consistent messages through appropriate educational materials is essential to improve awareness and promote safe blood donation practices among target populations.

A majority of donors (80%) were aware that blood donation can be undertaken once every three months. However, 10% believed that donation could be performed within a two-month interval, while 6% reported that donation was permissible after four months.

Previous experience with blood donation was associated with a higher level of knowledge among donors, suggesting that repeated exposure enhances awareness in this area. Voluntary donors demonstrated better knowledge, likely due to their intrinsic motivation and greater interest in blood donation activities. Knowledge scores were also significantly associated with demographic variables: individuals aged 18-40 years,

males, urban residents, those with higher educational attainment, and students scored higher than their respective counterparts. Several earlier studies have similarly reported that university students possess superior knowledge and exhibit a more favorable attitude toward blood donation compared with the general population.^{13,14,15}

These findings highlight the need for strengthening health education initiatives aimed at individuals with lower educational levels. Such efforts may be more effective if modern educational tools, particularly audiovisual methods, are utilized. Additionally, incorporating structured content on voluntary blood donation into school curricula could help reduce fear and misconceptions related to the donation process.¹⁶

In the present study, only 20% of donors demonstrated knowledge regarding HIV transmission, while awareness of hepatitis B surface antigen (HBsAg) and hepatitis C virus (HCV) was notably absent. Similar gaps in understanding have been reported in other settings. A study from Tanzania identified fears of HIV transmission through blood donation and concerns about potential harm to personal health as common apprehensions among donors. The current study demonstrated that the respondents held positive attitudes, opinions, and motivations toward blood donation in India. The findings were consistent with those of previous studies conducted in developed and developing countries and found overall positive attitudes and perceptions toward blood donation.¹⁷