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Assessment of Knowledge and Attitude Regarding Voluntary Blood Donation in Individuals Attending and Donating at Blood Centre

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ABSTRACT

Introduction: Voluntary blood donation is a crucial aspect of ensuring a safe and sufficient blood supply for transfusion services. This study was conducted to evaluate knowledge, attitude, and practices regarding voluntary blood donation and the associated socio-demographic factors among people attending and donating at a blood center.

Materials and Methods: A cross-sectional observational study was carried out on 427 participants attending the Department of Immunohematology and Blood Transfusion at a tertiary care hospital. Data was collected through a pre-validated structured questionnaire. Statistical analysis was carried out using suitable descriptive and inferential statistics, and association was tested by chi-square test at $p<0.05$ significance.

Results: Among 427 participants, 59.0% had good knowledge, and 73.5% had a positive attitude towards voluntary blood donation, but only 43.6% had ever donated blood. Good knowledge was significantly related to younger age, male gender, higher educational level, urban residence, and previous donation ($p<0.05$). Positive attitude was also significantly related to the aforementioned factors ($p<0.05$).

Discussion: The findings of this study suggest that while knowledge and attitude towards voluntary blood donation were quite positive, the practice was relatively lower. Socio-demographic variables, pre-existing exposure to the concept have played an important role in shaping knowledge, attitude, and practice.

Conclusion: The findings of the study showed satisfactory levels of knowledge (59.0%) and positive attitude (73.5%) towards voluntary blood donation, but the percentage of voluntary blood donors was lower (43.6%). Younger age, male, higher education, urban residence, were significant predictors for better knowledge, positive attitude, practice of voluntary blood donation.

Keywords: Voluntary blood donation, Knowledge, Attitude, Practice, Blood donors.

INTRODUCTION

Blood is a specialized body fluid in the human organism that transports essential substances like nutrients and oxygen to cells and removes waste products from cells. Human blood is a part of human life. Blood transfusion is a medical procedure that is intended to supply patients requiring blood or blood components to compensate for a defect. Blood donation is when an individual voluntarily donates blood for transfusions and/or the production of biopharmaceutical drugs through a procedure known as fractionation, which is the separation of whole blood components.[1]

The percentage of total blood donations is a good indicator of the general blood supply in a nation. The World Health Organization (WHO) reported in 2018 that more than 118.5 million units of blood were donated every year, and industrialized countries contributed about 40% of the donations.[2] Fifty-four countries got more than 50% of their blood from family/replacement or paid donors, although 79 countries get more than 90% of their blood from volunteer unpaid blood donors (5). Generally, the WHO reported that 60 countries collected less than 10 donations per 1,000 population.[3] "In India, as reported by NACO, voluntary blood donations constitute only 84.3% of total donations, reflecting a continuing gap between the demand and supply of safe blood. Evaluation of knowledge and attitudes regarding voluntary blood donation among individuals can help in formulating targeted awareness strategies to enhance voluntary blood donation and ensure adequate blood availability."

Blood banks may also be involved in the collection process as well as the subsequent processes. Blood transfusion is an essential part of health care. It has led to the preservation of millions of lives every year in both normal and emergency conditions, made possible more complex medical and surgical procedures and enhanced the quality of life of patients with various acute and chronic conditions.[4] The national need for blood is established by the strength of the health care system and its reach within the population. The need for blood in a country is dependent on the population, health care system, and the prevalence of diseases that require frequent transfusion.

Age, sex, level of education, level of understanding, and attitude are some of the factors that have been revealed to influence the practice of voluntary blood donation in previous studies. [5 – 8] The only way to guarantee a steady blood supply is to develop voluntary blood donation programs at the national and local levels and to effectively manage blood donors. To the best of our knowledge, there is no adequate information on the practice of voluntary blood donation and its factors within the framework of the current study.[2]

Thus, the present study was undertaken to assess the knowledge and attitude toward voluntary blood donation among individuals attending and donating at a blood centre. The objective of the study was to evaluate the level of knowledge and attitude regarding voluntary blood donation among these individuals.

METHODOLOGY

The current study was a cross-sectional observational study performed in the Department of Immunohematology and Blood Transfusion at MGM Medical College, Navi Mumbai, till December 2025, after receiving approval from the Institutional Ethics Committee. The study population included all adults aged 18-60 years attending and donating at the blood center, including patients' attendants, visitors, and eligible walk-in community members. Persons willing to participate, giving informed consent, and able to read and understand the study language were considered for inclusion. Acutely ill or unstable persons and those with cognitive impairment or severe communication barriers preventing valid responses were excluded from the study.

The data was collected using a pre-designed structured questionnaire that included sections on informed consent, socio-demographic information, knowledge, attitude, practice/intentions, barriers and motivators, source of information, and brief health screening. Knowledge was measured using multiple-choice and true/false questions, with one mark for each correct answer. Attitude was measured using 10 items on a five-point Likert scale, ranging from strongly agree (5) to strongly disagree (1), with reverse scoring for negatively worded items. Knowledge scores were calculated as the percentage of correct answers and were categorized as poor (<50%), fair (50-74%), and good (≥75%). Attitude scores ranged from 10-50, with higher scores indicating a more positive attitude, and were categorized into negative, neutral, and positive using tertiles or predefined cut-offs.

Data gathering was done using a structured Google Form developed from the final questionnaire. The form was arranged in a sequential manner consisting of consent, socio-demographic information, knowledge, attitude, and a closing section. An obligatory informed consent page was incorporated at the start, permitting only consenting participants to access the form. The link to the form was disseminated among the target population using on-site recruitment in the waiting areas and around the blood center. To ensure the final sample size of 427 participants, the questionnaire was administered to 500 individuals.

Data entry and analysis were done using SPSS version 25 (Statistical Package for the Social Sciences). Descriptive statistics were presented as mean ± standard deviation or median (interquartile range) for continuous variables and frequency and percentage for categorical variables. Scores of knowledges and attitude were compared between socio-demographic variables like age, sex, education, and residence using appropriate statistical tests like independent t-test.

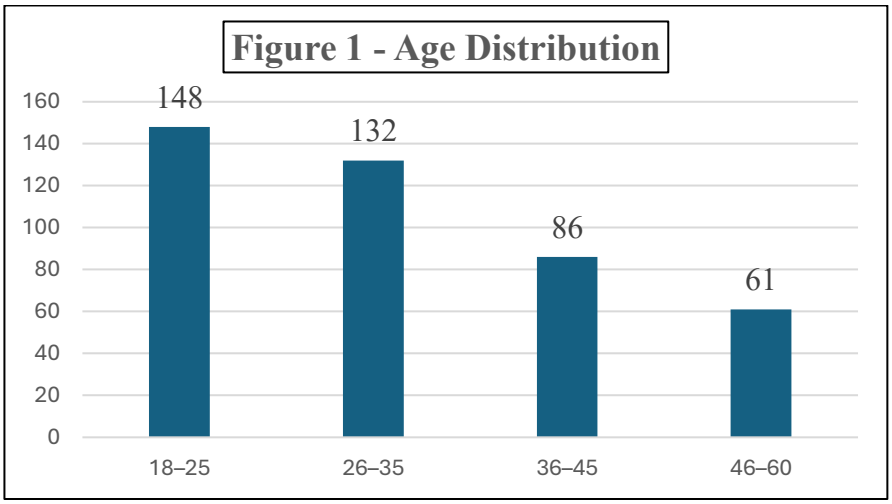
Participation in the study was voluntary, and confidentiality and anonymity were maintained throughout the study. No monetary compensation was provided. Informed written consent was taken from all participants.

RESULTS

A total of 427 individuals attending and donating at the blood centre were included in the study and analyzed. The socio-demographic characteristics of the participants are presented in Table 1. Most participants belonged to the 18–25 years age group (34.7%), followed by 26–35 years (30.9%). (Ref Figure 1) Most participants were male (67.0%), and the predominant residence was urban (70.5%). Regarding educational status, higher secondary (25.8%) and secondary education (24.4%) constituted the largest proportions, followed by graduates (24.1%). With respect to occupation, 38.4% were employed and 29.5% were students. More than half of the participants (56.4%) had never donated blood previously, while 43.6% reported a history of prior blood donation.

Table 1: Socio-demographic Characteristics of Participants (n = 427)

Variable	Category	Frequency (n)	Percentage (%)
Age group (years)	18–25	148	34.7
	26–35	132	30.9
	36–45	86	20.1
	46–60	61	14.3
Sex	Male	286	67
	Female	141	33.02
Education	No formal	18	4.2
	Primary	52	12.2
	Secondary	104	24.4
	Higher secondary	110	25.8
	Graduate	103	24.1
	Postgraduate	40	9.4
Occupation	Student	126	29.5
	Employed	164	38.4
	Self-employed	61	14.3
	Homemaker	48	11.2
	Unemployed	28	6.6
Residence	Urban	301	70.5
	Rural	126	29.5
Previous blood donation	Yes	186	43.6
	No	241	56.4



The knowledge of participants regarding voluntary blood donation is presented in Table 2. Overall, the study participants demonstrated good awareness on several key aspects of blood donation. The highest level of correct knowledge was observed for the life-saving nature of voluntary blood donation (91.1%) and the fact that donated blood is tested before transfusion (83.4%). A substantial proportion also knew that blood cannot be manufactured artificially (79.9%), that blood donation is safe for healthy individuals (77.8%), and that individuals with fever should not donate blood (74.5%). Knowledge regarding eligibility criteria such as minimum age (69.8%) and minimum weight (64.6%) was moderate. However, comparatively lower awareness was noted for the recommended amount of blood collected per donation (58.3%) and the permissible frequency of donation (51.8%). (Table 2)

Table 2: Knowledge regarding eligibility criteria of blood donation.

Knowledge Item	Correct n (%)	Incorrect/Don't know n (%)
Minimum age for blood donation (18 years)	298 (69.8)	129 (30.2)
Minimum weight for donation (≥50 kg)	276 (64.6)	151 (35.4)
Blood donation is safe for healthy individuals	332 (77.8)	95 (22.2)
Amount of blood collected (350–450 ml)	249 (58.3)	178 (41.7)
Frequency of donation (every 3 months)	221 (51.8)	206 (48.2)
Blood donation does not transmit infection to donor	287 (67.2)	140 (32.8)
All donated blood is tested before transfusion	356 (83.4)	71 (16.6)
Person with fever should not donate blood	318 (74.5)	109 (25.5)
Blood cannot be manufactured artificially	341 (79.9)	86 (20.1)
Voluntary blood donation saves lives	389 (91.1)	38 (8.9)

The attitude of participants towards voluntary blood donation is presented in Table 4. The participants showed a positive attitude towards blood donation. Most participants strongly agreed or agreed that blood donation is a social responsibility (85.0%), a good habit (84.1%), and that blood donation camps should be arranged frequently (85.3%). Most participants also showed willingness to donate blood in the future (79.9%) and would donate blood if a relative needed it (87.4%). In addition, most participants showed that they encourage others to donate blood (78.9%) and found voluntary donors to be more reliable (82.0%). Most participants also disagreed that they are afraid of blood donation (46.4%) and that blood donation weakens the body (52.0%), showing low fear and misconceptions. These results indicate a positive attitude of the participants towards voluntary blood donation. (Table 3)

Table 3: Attitude Toward Voluntary Blood Donation Among Participants (n = 427)

Statement	Strongly Agree n (%)	Agree n (%)	Neutral n (%)	Disagree n (%)	Strongly Disagree n (%)
Blood donation is a social responsibility	214 (50.1)	149 (34.9)	41 (9.6)	17 (4.0)	6 (1.4)
I feel satisfied after donating blood	176 (41.2)	163 (38.2)	55 (12.9)	23 (5.4)	10 (2.3)
Donating blood is a good habit	198 (46.4)	161 (37.7)	46 (10.8)	16 (3.7)	6 (1.4)
I am willing to donate blood in future	189 (44.3)	152 (35.6)	52 (12.2)	24 (5.6)	10 (2.3)
Blood donation camps should be frequent	207 (48.5)	157 (36.8)	39 (9.1)	17 (4.0)	7 (1.6)
I encourage others to donate blood	168 (39.3)	169 (39.6)	56 (13.1)	24 (5.6)	10 (2.3)
I am afraid of blood donation*	52 (12.2)	91 (21.3)	86 (20.1)	136 (31.9)	62 (14.5)
Blood donation weakens the body*	39 (9.1)	74 (17.3)	92 (21.5)	148 (34.7)	74 (17.3)
Voluntary donors are more reliable	183 (42.9)	167 (39.1)	53 (12.4)	18 (4.2)	6 (1.4)
I would donate if relative needed	231 (54.1)	142 (33.3)	32 (7.5)	15 (3.5)	7 (1.6)

The practices related to voluntary blood donation among participants are presented in Table 5. Less than half of the participants (43.6%) reported having ever donated blood, while 30.9% had donated within the last year. (Refer Fig 2) Among those who had previously donated (n = 186), the majority had donated 2–3 times (42.5%), followed by single-time donors (38.7%), and 18.8% had donated four or more times. Encouragingly, a large proportion of participants (79.9%) expressed willingness to donate blood in the future, whereas only 8.0% were unwilling. Regarding the type of last donation among donors, most donations were voluntary (80.1%), with a smaller proportion being replacement donations (19.9%). (Table 4)

Table 4: Practices Related to Voluntary Blood Donation Among Participants (n = 427)

Practice Variable	Category	Frequency (n)	Percentage (%)
Ever donated blood	Yes	186	43.6
	No	241	56.4
Donated blood in last 1 year	Yes	132	30.9
	No	295	69.1
Number of lifetime donations (among donors n=186)	1 time	72	38.7
	2–3 times	79	42.5
	≥4 times	35	18.8
Willing to donate in future	Yes	341	79.9
	No	34	8
	Not sure	52	12.2
Type of last donation (among donors n=186)	Voluntary	149	80.1
	Replacement	37	19.9

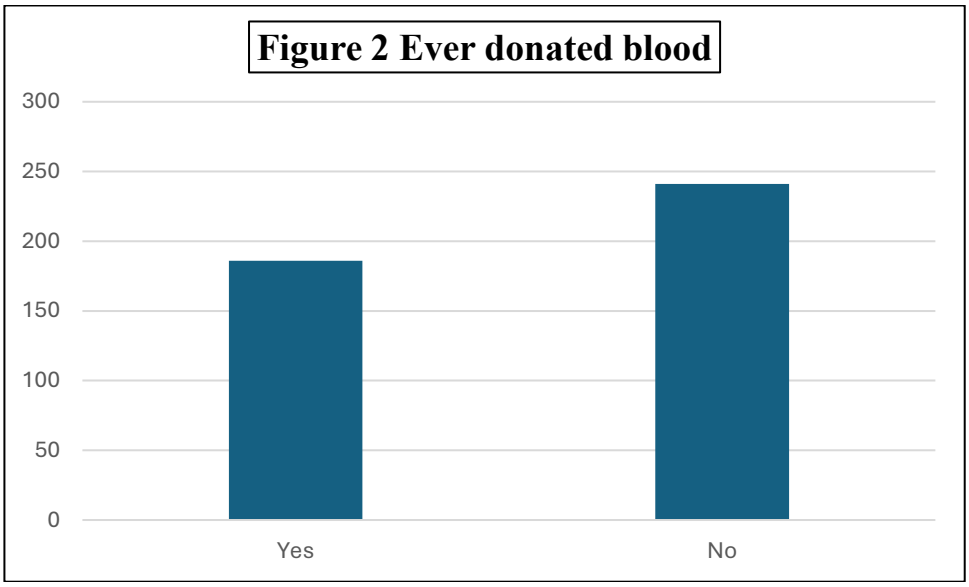


Table 5 shows the factors associated with knowledge regarding voluntary blood donation among participants. Good knowledge was significantly higher among younger participants (≤35 years: 63.1%) compared to those aged >35 years (50.0%) (p = 0.012). Males demonstrated better knowledge (61.5%) than females (53.6%) (p = 0.041). Educational status showed a strong association, with participants having higher secondary education or above exhibiting substantially better knowledge (66.2%) compared to those with secondary education or less (42.2%) (p < 0.001). Urban residents also had significantly higher good knowledge levels (63.5%) than rural residents (48.4%) (p = 0.003). Previous blood donors showed the highest proportion of good knowledge (74.2%) compared to non-donors (47.3%) (p < 0.001). (Table 5)

Table 5: Factors Associated with Knowledge of Voluntary Blood Donation (n = 427)

Variable	Good Knowledge n (%)	Poor/Fair n (%)	p-value
Age group			
≤35 yrs	186 (63.1)	109 (36.9)	0.012*
>35 yrs	66 (50.0)	66 (50.0)	
Sex			
Male	176 (61.5)	110 (38.5)	0.041*
Female	76 (53.6)	66 (46.4)	
Education			
≥Higher secondary	198 (66.2)	101 (33.8)	<0.001*
≤Secondary	54 (42.2)	74 (57.8)	
Residence			
Urban	191 (63.5)	110 (36.5)	0.003*
Rural	61 (48.4)	65 (51.6)	
Previous donation			
Yes	138 (74.2)	48 (25.8)	<0.001*
No	114 (47.3)	127 (52.7)	

Table 6 depicts the factors associated with attitude toward voluntary blood donation among participants. A significantly higher proportion of younger participants (≤35 years) demonstrated a positive attitude (76.6%) compared to those aged >35 years (66.7%) (p = 0.018). Males showed a more favorable attitude (79.0%) than females (62.0%) (p = 0.002). Educational status had a strong influence, with participants having higher secondary education or above exhibiting markedly higher positive attitude (82.9%) compared to those with secondary education or less (51.6%) (p < 0.001). Urban residents had

significantly more positive attitudes (78.4%) than rural residents (61.9%) (p = 0.006). Previous blood donors demonstrated the most favorable attitudes (87.1%) compared to non-donors (63.1%) (p < 0.001). (Table 6)

Table 6: Factors Associated with Attitude Toward Voluntary Blood Donation (n = 427)

Variable	Positive Attitude n (%)	Neutral/Negative n (%)	p-value
Age group			
≤35 yrs	226 (76.6)	69 (23.4)	0.018*
>35 yrs	88 (66.7)	44 (33.3)	
Sex			
Male	226 (79.0)	60 (21.0)	0.002*
Female	88 (62.0)	54 (38.0)	
Education			
≥Higher secondary	248 (82.9)	51 (17.1)	<0.001*
≤Secondary	66 (51.6)	62 (48.4)	
Residence			
Urban	236 (78.4)	65 (21.6)	0.006*
Rural	78 (61.9)	48 (38.1)	
Previous donation			
Yes	162 (87.1)	24 (12.9)	<0.001*
No	152 (63.1)	89 (36.9)	

Table 7 shows the factors associated with the practice of voluntary blood donation by comparing donors and non-donors. Younger individuals (≤35 years) had a significantly higher donation rate than those >35 years (48.8% vs 31.8%, p=0.021). Males were much more likely to donate than females (53.1% vs 23.9%, p<0.001). Participants with higher education (≥higher secondary) showed greater donation practice compared to those with lower education (51.5% vs 25.0%, p=0.004). Urban residents donated more frequently than rural residents (49.2% vs 30.2%, p=0.008). Good knowledge about blood donation and a positive attitude were strongly associated with actual donation behavior—individuals with good knowledge (54.8%) and positive attitude (51.6%) were significantly more likely to be donors than those with poor knowledge (27.4%) or neutral/negative attitude (21.2%) (both p<0.001). Overall, younger age, male gender, higher education, urban residence, good knowledge, and positive attitude were significant predictors of voluntary blood donation practice. (Table 7)

Table 7: Factors Associated with Practice of Voluntary Blood Donation (n = 427)

Variable	Donors n (%)	Non-donors n (%)	p-value
Age group			
≤35 yrs	144 (48.8)	151 (51.2)	0.021*
>35 yrs	42 (31.8)	90 (68.2)	
Sex			
Male	152 (53.1)	134 (46.9)	<0.001*
Female	34 (23.9)	108 (76.1)	
Education			
≥Higher secondary	154 (51.5)	145 (48.5)	0.004*
≤Secondary	32 (25.0)	96 (75.0)	
Residence			
Urban	148 (49.2)	153 (50.8)	0.008*
Rural	38 (30.2)	88 (69.8)	
Knowledge level			
Good	138 (54.8)	114 (45.2)	<0.001*
Poor/Fair	48 (27.4)	127 (72.6)	
Attitude			
Positive	162 (51.6)	152 (48.4)	<0.001*
Neutral/Negative	24 (21.2)	89 (78.8)	

DISCUSSION

In the current cross-sectional study carried out among 427 participants at the Department of Immunohematology and Blood Transfusion, MGM Medical College, Navi Mumbai, Maharashtra, the preponderance of participants belonged to the younger age groups. In fact, 34.7% belonged to the 18-25 years age group, and 30.9% belonged to the 26-35 years age group, which revealed that nearly two-thirds (65.6%) of the participants were below 35 years of age. The participants belonging to the 36-45 years and 46-60 years age groups accounted for 20.1% and 14.3%, respectively. As far as the gender distribution is concerned, the current study revealed that males (67%) were predominant, while females accounted for 33%.

These results are like those of Addisu AG (2017), in which the average age of participants was 32 years, with most of the participants being young adults, with the highest proportion in the 18-22 years age group (22.1%). Similarly, males also dominated the study population (56.6%) compared to females, which is like the present study but with a higher proportion of males.

However, in the study by Mussema A (2023), the predominance of young participants was also observed, in which 41.47% were aged 18-25 years, and 47.63% were aged 26-35 years, which comprised nearly 89% of participants below 35 years, which is higher than the present study (65.6%). However, unlike the present study and Addisu AG, Mussema A found a slight predominance of females (52.13%) compared to males (47.87%).

Overall, the present study findings align with previous studies in demonstrating that voluntary blood donation research populations are largely composed of young adults. However, the present study shows a stronger male predominance compared to Mussema A (2023) and a higher male proportion than Addisu AG (2017), suggesting possible regional or sociocultural differences in blood donation participation.

In the current study, 252 (59.0%) participants had good knowledge about voluntary blood donation. Knowledge was found to be significantly higher among younger participants (≤35 years: 63.1% vs 50.0%, p = 0.012), males (61.5% vs 53.6%, p = 0.041), individuals with higher or more education (66.2% vs 42.2%, p < 0.001), urban dwellers (63.5% vs 48.4%, p = 0.003), and those with a previous donation experience (74.2% vs 47.3%, p < 0.001). The results suggest that education, urban experience, and previous experience with blood donation are important predictors of knowledge in the current scenario.

In comparison to the study by Addisu AG (2017), where only 38.3% of the respondents were knowledgeable about voluntary blood donation, the current study shows a significantly higher level of knowledge (59.0%), indicating better knowledge in the current context, possibly due to better educational attainment and urban dominance.[9] However, the current study result is comparable to the studies conducted in Jemberu YA, et al (2016), Ethiopia, where 56.5% and 56.8% of the respondents were knowledgeable, respectively.[10] The current study suggests better knowledge than some previous studies or rural-based studies but is consistent with studies conducted in more educated or urban-dominant populations.

In the current study, a vast majority of participants (314; 73.5%) showed a positive attitude towards voluntary blood donation. Positive attitude was found to be significantly higher in the younger age group ≤35 years (76.6% vs 66.7%, p = 0.018), male participants (79.0% vs 62.0%, p = 0.002), individuals with higher or ≥higher secondary education (82.9% vs 51.6%, p < 0.001), urban participants (78.4% vs 61.9%, p = 0.006), and those with prior experience of blood donation (87.1% vs 63.1%, p < 0.001). The results clearly suggest that education, urban experience, and past involvement in blood donation activities are key determinants of positive attitudes in the current study population.

In comparison to the study conducted by Addisu AG et al, (2017), where only 45.2% of respondents showed a positive attitude, the current study shows a significantly higher level of favorable attitude (73.5%), indicating

better awareness and acceptance of voluntary blood donation in the current scenario.[9] The current result is also higher than the Melku M et al, (2016) study (52.2% favorable attitude).[11] In the study conducted by Mussema A et al, (2023), half of the respondents showed poor attitude (50.5%), and 62.6% of respondents found blood donation a good idea, which is still lower than the positive attitude found in the current study.[12] The current study shows a favorable attitude towards voluntary blood donation.

In the current study, 186 (43.6%) participants had practiced voluntary blood donation. The practice of voluntary blood donation was significantly higher among younger people ≤35 years (48.8% vs 31.8%, p = 0.021), males (53.1% vs 23.9%, p < 0.001), people with ≥higher secondary education (51.5% vs 25.0%, p = 0.004), and urban dwellers (49.2% vs 30.2%, p = 0.008). Notably, people with good knowledge (54.8% vs 27.4%, p < 0.001) and positive attitude (51.6% vs 21.2%, p < 0.001) were significantly more likely to practice voluntary blood donation. These results suggest that knowledge and attitude, in addition to socio-demographic variables, played a significant role in influencing the practice of voluntary blood donation in the current study population.

Addisu AG (2017) found attitude to be the sole significant independent determinant of voluntary blood donation practice, with 16.5% of respondents with positive attitude donating blood compared to only 5.8% with unfavorable attitude.[9] Although the current study confirms the strong relationship between positive attitude and donation practice, it also reveals the significant influence of knowledge, education, sex, age, and residence. the study by Enawgaw et al. (2019) showed extremely high favorable attitude (94.5%) and strong intention to donate (≈91%), which are much higher than the current study and Addisu's findings, indicating better awareness and motivation among that population.[13]

The current study confirms the important role of attitude in determining voluntary blood donation practice but also emphasizes the additional role of knowledge and socio-demographic factors.

CONCLUSION

The present cross-sectional study conducted among 427 respondents at the Department of Immunohematology and Blood Transfusion, MGM Medical College, Navi Mumbai, demonstrated that 59.0% of participants had good knowledge, 73.5% had a positive attitude, and 43.6% had ever practiced voluntary blood donation. Thus, although knowledge and attitude towards voluntary blood donation were generally favorable, actual donation practice remained comparatively low, indicating a clear gap between awareness and behavior.

Younger age (≤35 years), male sex, higher education, urban residence, and previous donation history were significantly associated with better knowledge, more positive attitude, and higher voluntary blood donation. Participants with good knowledge (54.8%) and positive attitude (51.6%) were more likely to donate, highlighting knowledge and attitude as key determinants of donation practice. Strengthening targeted educational interventions, motivational strategies, and community-based blood donation campaigns—particularly among females, rural residents, and less-educated groups—may help bridge this knowledge–practice gap and improve voluntary blood donation rates.

Declaration by Authors

Ethical Approval: The study protocol was approved by the Institutional Ethics Committee, and informed written consent was obtained from all participants.

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Conflict of Interest: The authors declare no conflict of interest.

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