



Original Article

A Cross-Sectional Assessment of Blood Donation Awareness, Attitudes, and Practices Among Medical Students

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ABSTRACT

Background: Blood donation is essential for maintaining an adequate and safe blood supply. Medical students are an important potential donor group, and their knowledge, attitudes, and practices may influence future voluntary blood donation.

Objective: To assess knowledge, attitude, and practices regarding blood donation among undergraduate medical students and determine their associations with sex and academic year.

Materials and Methods: A cross-sectional questionnaire-based study was conducted among undergraduate MBBS students using a self-administered Google Forms questionnaire. Of 492 responses received, 401 were included in the final analysis after excluding non-consenting responses, an unverifiable test submission, and duplicate entries. Knowledge, attitude, and practice were assessed using predefined scoring criteria. Descriptive and inferential statistical analyses were performed using SPSS version 23.0. A p-value <0.05 was considered statistically significant.

Results: The mean age of participants was 21.19 ± 1.48 years, and 55.4% were female. The mean knowledge score was 9.67 ± 3.23 out of 14; 36.9% demonstrated good knowledge, while 33.9% had poor knowledge. A favourable attitude was observed in 86.8% of students. Although 87.8% expressed willingness to donate blood in the future, only 17.2% had donated previously. Knowledge category was significantly associated with sex ($p=0.0037$) and academic year ($p=0.0104$). Practice category was also significantly associated with sex and academic year ($p<0.001$ for both). No significant association was observed between attitude category and sex ($p=0.896$) or academic year ($p=0.5072$).

Conclusion: Undergraduate medical students demonstrated predominantly favourable attitudes and high willingness to donate blood, but previous donation was uncommon. Targeted educational activities and accessible voluntary blood-donation opportunities may help bridge the gap between willingness and actual donation.

Keywords: Blood donation; medical students; knowledge; attitude; practice.

INTRODUCTION

Blood transfusion is an essential component of modern healthcare and plays a vital role in the management of trauma, major surgical procedures, obstetric emergencies, severe anaemia, and various haematological disorders. Ensuring the timely availability of safe blood and blood components remains an important public health priority. Voluntary, non-remunerated blood donation is considered the foundation of a safe and sustainable blood supply because regular voluntary donors generally constitute a lower-risk donor population. Therefore, promoting voluntary blood donation and maintaining an adequate pool of eligible donors are essential for effective transfusion services [1].

Medical students represent an important potential donor population because of their health-related education, awareness of the clinical importance of blood transfusion, and opportunity to influence community health practices. As future healthcare professionals, they can also contribute to blood donor recruitment by educating patients, relatives, and the general public about the importance and safety of voluntary blood donation. However, being aware of the importance of blood donation does not necessarily translate into actual donation behaviour. Misconceptions, fear of needles, concerns about weakness or anaemia, uncertainty regarding donor eligibility, and limited opportunities to donate may discourage eligible individuals from becoming blood donors [2,3].

Knowledge, attitude, and practice (KAP) assessments provide a useful framework for understanding awareness, perceptions, and actual behaviour related to blood donation. Knowledge includes understanding donor eligibility criteria, the donation procedure, the screening of donated blood, and the appropriate intervals between donations. Attitude reflects an individual's perceptions and willingness to donate, whereas practice concerns previous donation experience and other relevant behaviours. Evaluating these domains together helps identify specific knowledge gaps and barriers that may be addressed through targeted educational and motivational activities [2,4].

Previous studies among Indian medical students have demonstrated that favourable attitudes and willingness to donate blood may coexist with relatively low rates of actual donation. Kowsalya et al. reported that 13.2% of medical students had donated blood, while Chauhan et al. found that 22.9% of participating medical students had a history of blood donation despite generally favourable attitudes. These findings indicate that positive perceptions alone may not be sufficient to translate willingness into donation practice [2,3]. Wasnik and Kashyap also highlighted differences in knowledge, attitudes, and donation practices among entry-level medical students, reinforcing the importance of assessing these domains within medical education settings [5].

Furthermore, differences in knowledge, attitudes, and donation behaviour according to sex and academic year may help identify student groups requiring specific educational support. Understanding these differences is particularly relevant in medical colleges, where structured teaching, student-led awareness programmes, and institutional blood donation campaigns can provide opportunities to improve donor participation.

Therefore, the present study was undertaken to assess the knowledge, attitude, and blood donation practices among undergraduate medical students,

MATERIALS AND METHODS:

Study Design and Setting

A cross-sectional questionnaire-based study was conducted among undergraduate Bachelor of Medicine and Bachelor of Surgery (MBBS) students to assess their knowledge, attitudes, and practices regarding blood donation after getting approval from the Institutional Ethics Committee. Data were collected using a self-administered online questionnaire through Google Forms.

Study Participants and Sample Size

A total of 492 questionnaire responses were received. One unverifiable test submission and 66 responses from students who did not provide consent were excluded. A further 24 duplicate resubmissions were removed using the combination of roll number and MBBS academic year for identification. Thus, 401 responses were included in the final analysis.

Study Tool and Data Collection

Data were collected using a structured questionnaire comprising demographic details and questions on knowledge, attitude, and practices related to blood donation. The questionnaire included 14 knowledge items, six attitude items, and seven

practice-related items. Demographic variables included age, sex, and MBBS academic year. The practice domain assessed previous exposure to blood donation-related activities, previous blood donation, willingness to donate in the future, and motivation of others to donate.

Scoring and Categorisation

Knowledge, attitude, and practice responses were scored using predefined answer keys. For knowledge, one point was awarded for each of the 14 correct responses, giving a total score ranging from 0 to 14. Knowledge was categorised as poor (<60%), moderate (60–79%), or good (≥80%).

The attitude score was based on six items, with one point awarded for each favourable response. The total score ranged from 0 to 6 and was categorised as unfavourable (<60%), moderately favourable (60–79%), or favourable (≥80%).

The practice score was calculated using four positive practice indicators, with a total possible score of 0–4. Practice was categorised as poor (<50%), moderate (50–74%), or good (≥75%). These cut-offs were based on commonly used percentage-based categorisation conventions in knowledge, attitude, and practice studies. The scoring system was applied to the available questionnaire responses.

Statistical Analysis

Data were analysed using SPSS Statistics version 23.0. Categorical variables were summarised as frequencies and percentages, while continuous variables were expressed as means and standard deviations. Associations between categorical variables were assessed using the Pearson chi-square test. Independent-samples t-tests were used to compare continuous scores between two groups, and one-way analysis of variance (ANOVA) was used for comparisons across more than two groups. Spearman's rank correlation was used to assess relationships between knowledge, attitude, and practice scores. Internal consistency of the knowledge and attitude item sets was assessed using Cronbach's alpha. All tests were two-sided, and a p-value <0.05 was considered statistically significant.

Ethical Considerations

Participation was voluntary, and consent was obtained through the online questionnaire before responses were included in the analysis. Responses from individuals who did not consent were excluded.

RESULTS:

The study included 401 undergraduate medical students, with a mean age of 21.19 ± 1.48 years. Females constituted 55.4% of participants, and most students belonged to III Year Part 1 or Part 2. Although 91.3% knew their blood group, only 17.2% had previously donated blood. (Table 1)

Table 1. Sociodemographic characteristics of participants

Characteristic	Frequency (n)	Percentage (%)
Sex		
Female	222	55.4
Male	179	44.6
MBBS academic year		
I Year	13	3.2
II Year	123	30.7
III Year Part 1	128	31.9
III Year Part 2	137	34.2
Knows own blood group		
Yes	366	91.3
Previous blood donation		
Yes	69	17.2
No	332	82.8

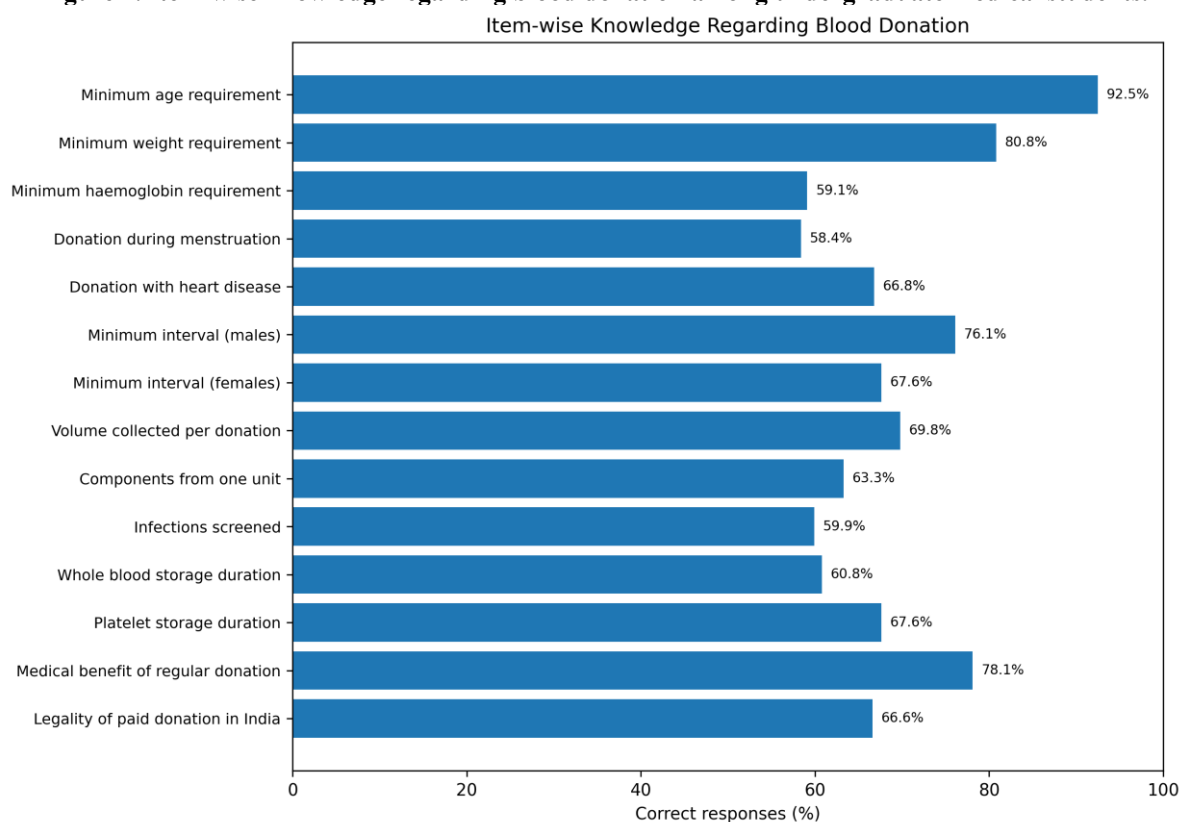
The highest correct-response rate was observed for the minimum age requirement (92.5%), followed by the minimum weight requirement (80.8%). Knowledge gaps were noted regarding blood donation during menstruation (58.4%) and the minimum haemoglobin requirement (59.1%). The mean knowledge score was 9.67 ± 3.23 out of 14. (Table 2 & Fig.1)

Table 2. Item-wise knowledge regarding blood donation

Knowledge item	Correct response (%)
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Minimum age for blood donation	92.5
Minimum weight requirement	80.8
Minimum haemoglobin requirement	59.1
Blood donation during menstruation	58.4
Blood donation by a person with heart disease	66.8
Minimum interval between donations for males	76.1
Minimum interval between donations for females	67.6
Volume of blood collected per donation	69.8
Components prepared from one unit of whole blood	63.3
Number of infections screened in donated blood	59.9
Storage duration of whole blood	60.8
Storage duration of platelets	67.6
Medical benefit of regular blood donation	78.1
Legality of paid blood donation in India	66.6

Figure 1. Item-wise knowledge regarding blood donation among undergraduate medical students.



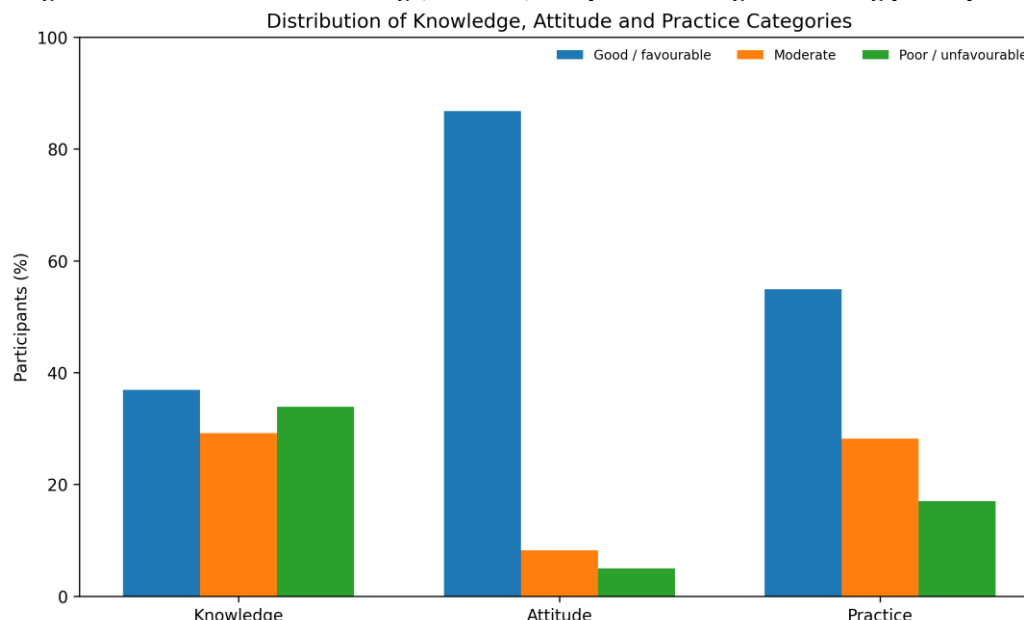
Good knowledge was observed in 36.9% of students, while 33.9% had poor knowledge. Most students (86.8%) demonstrated a favourable attitude toward blood donation. Good practice scores were observed in 54.9% of participants, although only 17.2% had donated blood previously. (Table 3 & Fig.2)

Table 3. Distribution of knowledge, attitude, and practice categories

Domain and category	Frequency (n)	Percentage (%)
Knowledge		
Good	148	36.9
Moderate	117	29.2
Poor	136	33.9
Attitude		
Favourable	348	86.8
Moderately favourable	33	8.2

Unfavourable	20	5.0
Practice		
Good	220	54.9
Moderate	113	28.2
Poor	68	17.0

Figure 2. Distribution of knowledge, attitude, and practice categories among participants.



Knowledge category was significantly associated with sex and academic year. Female students had higher mean knowledge scores than male students. Practice category and previous donation history also differed significantly by sex and academic year. However, attitude category showed no significant association with either sex or academic year. (Table 4)

Table 4. Association of knowledge, attitude, and practice with sex and academic year

Outcome and comparison	Statistical test	Test statistic	p-value	Interpretation
Knowledge category vs academic year	Chi-square	$\chi^2 = 16.72$; df = 6	0.0104	Significant
Knowledge category vs sex	Chi-square	$\chi^2 = 11.212$; df = 2	0.0037	Significant
Knowledge score vs academic year	One-way ANOVA	F = 3.911	0.009	Significant
Knowledge score vs sex	Independent t-test	t = -2.973	0.0031	Significant
Attitude category vs academic year	Chi-square	$\chi^2 = 5.29$; df = 6	0.5072	Not significant
Attitude category vs sex	Chi-square	$\chi^2 = 0.22$; df = 2	0.896	Not significant

Previous blood donation was not significantly associated with knowledge category ($p=0.1207$) or attitude category ($p=0.5256$). Thus, previous donation experience was not associated with significant differences in these two categorical outcomes in the study sample. (Table 5)

Table 5. Association of previous blood donation with knowledge and attitude

Comparison	χ^2	df	p-value	Cramer's V
Previous donation vs knowledge category	4.229	2	0.1207	0.103
Previous donation vs attitude category	1.286	2	0.5256	0.057

Knowledge and attitude scores showed a weak positive correlation ($\rho=0.226$), as did attitude and practice scores ($\rho=0.168$). Knowledge and practice scores showed a weak negative correlation ($\rho=-0.105$). These findings suggest that the relationships between the three domains were weak. (Table 6)

Table 6. Correlation between knowledge, attitude, and practice scores

Variables	Spearman's correlation coefficient (ρ)	Direction and strength
Knowledge and attitude	0.226	Weak positive

Knowledge and practice	-0.105	Weak negative
Attitude and practice	0.168	Weak positive

The knowledge scale demonstrated acceptable internal consistency, with a Cronbach's alpha of 0.780. The attitude scale showed lower internal consistency, with an alpha of 0.549. Therefore, the attitude findings should be interpreted cautiously, considering the limited reliability of the scale. (Table 7)

Table 7. Reliability analysis of the questionnaire scales

Scale	Number of items	Cronbach's alpha	Interpretation
Knowledge	14	0.780	Acceptable internal consistency
Attitude	6	0.549	Low internal consistency

DISCUSSION:

The present cross-sectional study assessed knowledge, attitude, and practices regarding blood donation among 401 undergraduate medical students. The major findings were that most students demonstrated a favourable attitude toward blood donation, while only a minority had donated blood previously. Knowledge varied across questionnaire items and was associated with sex and academic year, whereas attitude categories showed no significant differences across these groups.

Knowledge Regarding Blood Donation

The mean knowledge score was 9.67 ± 3.23 out of 14, with 36.9% of students demonstrating good knowledge and 33.9% showing poor knowledge. Gaps were particularly evident regarding blood donation during menstruation, minimum haemoglobin requirements, and screening of donated blood. Similar knowledge gaps have been reported among medical students in Puducherry and North India. [6,7]

A 2021 study among undergraduate medical students at UPUMS, Saifai, also reported inadequate knowledge despite generally positive attitudes toward blood donation. [9] A more recent study of 478 medical students in Central India found that only 46.2% had good overall knowledge. [10]

These findings highlight the importance of reinforcing donor eligibility criteria and blood safety information through structured educational activities.

Attitude Toward Blood Donation

In the present study, 86.8% of students demonstrated a favourable attitude toward blood donation. This is consistent with Chauhan et al., who reported that 91% of medical students were willing to donate blood. Their study also found an increase in willingness following an interactive awareness session. [7]

No significant association was observed between attitude category and sex or academic year in the present study. However, the attitude scale demonstrated low internal consistency (Cronbach's alpha = 0.549). Therefore, these findings should be interpreted cautiously, and the attitude questionnaire should be reviewed before it is used as a validated measurement instrument.

Blood Donation Practices and the Knowledge–Attitude–Practice Gap

Only 17.2% of students in the present study had donated blood previously, despite 87.8% expressing willingness to donate in the future. Kowsalya et al. reported previous donation in 13.2% of medical students, while Chauhan et al. reported a prevalence of 22.9%. [6,7]

Although the prevalence differs between studies, all three demonstrate that actual donation may remain less common than positive attitudes or willingness to donate.

Lownik et al., in their review of knowledge, attitude, and practice surveys from developing countries, also described the importance of understanding the factors that influence actual donation behaviour. [8] The World Health Organization emphasises the importance of stable, regular, voluntary, unpaid donors for maintaining a safe and adequate blood supply. [11]

In the present study, male students reported previous donation more frequently than female students (32.4% versus 5.0%). Previous donation also differed significantly across academic years. These differences may reflect variations in donor

eligibility, opportunities, and other individual or social factors; however, the present study cannot establish the reasons for these differences.

Relationship Between Knowledge, Attitude, and Practice

Knowledge and attitude scores showed a weak positive correlation ($\rho=0.226$), while attitude and practice scores had a weak positive correlation ($\rho=0.168$). Knowledge and practice scores showed a weak negative correlation ($\rho=-0.105$). These findings suggest that better knowledge or favourable attitudes do not necessarily translate into actual donation behaviour. However, the statistical significance of these correlations was not available in the supplied report, and the findings should therefore be interpreted descriptively.

Implications for Medical Education

The findings support the inclusion of targeted blood-donation awareness activities in undergraduate medical education. Interactive teaching sessions, blood-bank visits, and voluntary donation camps may improve awareness and provide eligible students with opportunities to donate. WHO guidance supports strengthening voluntary, unpaid blood-donation programmes to ensure a safe and sustainable blood supply. [11]

CONCLUSION:

The present study revealed that undergraduate medical students had predominantly favourable attitudes toward blood donation, although actual donation practices remained low. Only 17.2% of students had donated blood previously, despite 87.8% expressing willingness to donate in the future. Knowledge varied across specific aspects of blood donation and was significantly associated with sex and academic year. These findings highlight the need for targeted educational programmes, awareness campaigns, and accessible voluntary blood-donation opportunities within medical colleges. Strengthening such initiatives may help bridge the gap between willingness and actual blood donation and promote a culture of regular voluntary blood donation among future healthcare professional

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