



RESEARCH ARTICLE

Assessment of Knowledge, Attitude, and Practice Regarding Blood Donation Among Students of a Nursing College in Central Karnataka: A Cross-Sectional Study

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ABSTRACT

Background : Blood transfusion is an essential component of modern healthcare, supporting the management of trauma, obstetric emergencies, major surgeries, hematological disorders, and various chronic illnesses. Maintaining an adequate supply of safe blood depends largely on regular voluntary blood donors. Nursing students, as future healthcare professionals, are expected to possess appropriate knowledge regarding blood donation, develop positive attitudes toward voluntary donation, and motivate the community through health education. However, misconceptions, fear, and inadequate awareness often limit actual blood donation practices. Assessing the knowledge, attitude, and practice (KAP) of nursing students can help identify educational gaps and guide interventions to improve voluntary blood donation.

Methodology: An institution-based cross-sectional study was conducted over three months among 300 undergraduate nursing students at SS Institute of Medical Sciences and Research Centre, Central Karnataka. Participants were selected using universal sampling after obtaining informed consent. Data were collected using a pre-tested, structured, self-administered questionnaire assessing socio-demographic characteristics, knowledge, attitude, and practice regarding blood donation. Statistical analysis was performed using SPSS version 29. Descriptive statistics were presented as frequencies, percentages, means, and standard deviations. Associations between variables were evaluated using the Chi-square test, and a p-value of <0.05 was considered statistically significant.

Results: The mean age of the participants was 20.8 ± 1.6 years, with females comprising 78.0% of the study population. Good knowledge regarding blood donation was observed in 68.3% of students, while 81.3% demonstrated a positive attitude toward voluntary blood donation. Only 36.7% had previously donated blood. The most common reasons for not donating blood were fear of needle pain, lack of opportunity, fear of weakness after donation, and medical ineligibility. Students with good knowledge were significantly more likely to have a positive attitude and previous blood donation experience ($p < 0.05$).

Conclusion: Nursing students demonstrated satisfactory knowledge and favorable attitudes regarding voluntary blood donation; however, actual donation practices remained inadequate. Strengthening educational initiatives and increasing opportunities for voluntary blood donation within nursing institutions may improve donor participation.

Keywords: Blood donation, Knowledge, Attitude, Practice, Nursing students, Voluntary blood donation.

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INTRODUCTION

Blood is an irreplaceable therapeutic resource that plays a fundamental role in modern healthcare. Safe blood transfusion is indispensable for the management of trauma, obstetric hemorrhage, major surgical procedures, hematological disorders, malignancies, organ transplantation, and several chronic medical conditions. The availability of an adequate and safe blood supply is therefore considered an essential component of every healthcare system and is directly associated with improved patient survival and quality of care[1,2].

According to the World Health Organization (WHO), voluntary non-remunerated blood donation remains the safest and most sustainable source of blood because regular

voluntary donors have a significantly lower prevalence of transfusion-transmissible infections compared with replacement or paid donors. Countries that achieve high rates of voluntary blood donation are better equipped to maintain uninterrupted blood supplies during emergencies, disasters, and periods of increased healthcare demand[3,4].

Globally, more than one hundred million units of blood are collected annually; however, the distribution of blood donation remains highly unequal. High-income countries contribute a disproportionately large share of voluntary blood donations despite representing a smaller proportion of the world's population, whereas low- and middle-income countries continue to experience shortages of safe blood owing to inadequate donor recruitment and

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retention. These shortages frequently affect emergency obstetric care, trauma management, pediatric services, and cancer treatment[5].

India has made remarkable progress in strengthening its blood transfusion services through the National Blood Transfusion Council, State Blood Transfusion Councils, and the implementation of standardized blood safety policies. Nevertheless, maintaining an adequate reserve of voluntary blood donors continues to be challenging because of increasing population growth, rising numbers of surgical interventions, road traffic injuries, obstetric complications, and patients requiring repeated blood transfusions. Seasonal variations, infectious disease outbreaks, and reduced donor participation further contribute to fluctuations in blood availability[6].

Young adults represent one of the most suitable populations for voluntary blood donation because they are generally healthy, physically fit, and capable of becoming regular long-term donors. Educational institutions provide an ideal platform for promoting voluntary blood donation by creating awareness, correcting misconceptions, and encouraging students to participate in donor recruitment activities. Developing positive attitudes toward blood donation during early adulthood can substantially improve lifelong voluntary donor retention[7].

Among healthcare students, nursing students occupy a unique position because they receive formal education

regarding patient care, public health, health promotion, and community education. As future nursing professionals, they are expected to possess adequate scientific knowledge regarding blood donation, donor eligibility criteria, blood safety, and transfusion practices. Their attitudes and personal experiences regarding blood donation may influence not only their own willingness to donate but also their ability to educate patients, families, and the general public regarding the importance of voluntary blood donation[8].

Knowledge regarding blood donation includes understanding donor eligibility criteria, minimum age and body weight requirements, donation intervals, blood grouping, screening procedures, storage of donated blood, and the prevention of transfusion-transmissible infections. Adequate knowledge is essential for eliminating myths and misconceptions that discourage eligible individuals from donating blood voluntarily. Common misconceptions include fear of developing weakness, acquiring infections, excessive blood loss, infertility, or long-term health problems following blood donation[9].

Attitude toward blood donation reflects an individual's beliefs, perceptions, motivation, and willingness to donate

Table 1: Socio-demographic characteristics of the study participants (N = 300)

<i>Variable</i>	<i>Frequency (n)</i>	<i>Percentage (%)</i>
<i>Age (years)</i>		
18–19	82	27.3
20–21	136	45.3
22–23	61	20.3
≥24	21	7.0
Mean ± SD	20.8 ± 1.6 years	
Gender		
Male	66	22.0
Female	234	78.0
Year of Study		
First Year	74	24.7
Second Year	81	27.0
Third Year	78	26.0
Fourth Year	67	22.3
Residence		
Urban	171	57.0
Rural	129	43.0

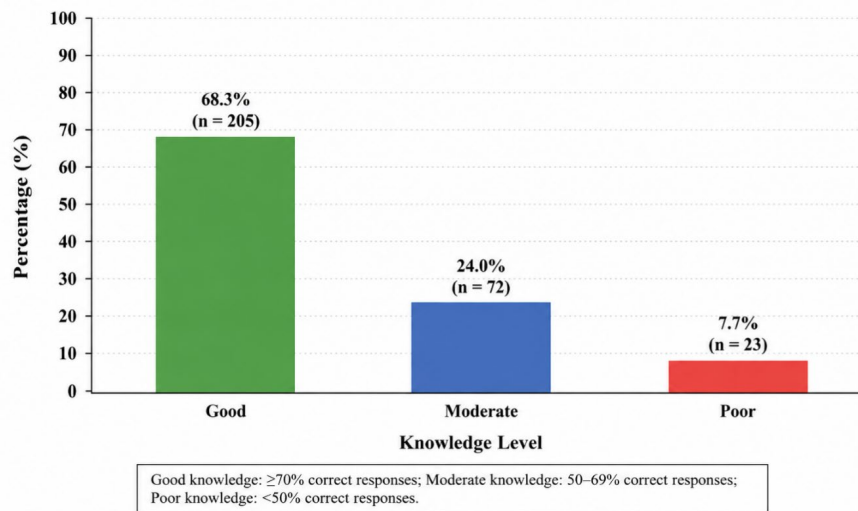


Figure 1: Distribution of knowledge regarding blood donation among nursing students.

blood voluntarily without expecting financial incentives. Positive attitudes are often associated with altruism, empathy, humanitarian values, and social responsibility. However, a favorable attitude does not always translate into actual blood donation because several psychological, cultural, and practical barriers continue to influence donor behaviour[10].

Blood donation practice represents the actual participation of individuals in voluntary blood donation programmes. Previous studies have demonstrated that although healthcare students generally possess satisfactory knowledge and favorable attitudes, the proportion who have voluntarily donated blood remains considerably lower. Fear of needle pain, fear of adverse health effects, lack of

opportunity, inadequate motivation, parental concerns, and misconceptions regarding donor eligibility continue to be major barriers preventing voluntary blood donation among young adults[11,12].

Several studies conducted among medical, nursing, dental, and allied health science students in India and other countries have consistently reported a significant gap between knowledge and actual blood donation practice. Educational interventions, awareness campaigns, and institution-based blood donation camps have been shown to improve donor participation by addressing misconceptions and enhancing confidence regarding the safety of blood donation[13].

Although studies assessing knowledge, attitude, and practice regarding blood donation have been conducted in different regions of India, published evidence from nursing students in Central Karnataka remains limited. Institution-specific information is essential because socio-cultural characteristics, educational exposure, and accessibility to voluntary blood donation programmes may vary considerably between regions. Understanding the existing level of knowledge, attitude, and practice among nursing students can assist policymakers and educational institutions in developing targeted strategies to strengthen voluntary blood donation programmes and improve future donor recruitment.

Therefore, the present study was undertaken to assess the knowledge, attitude, and practice regarding blood donation among students of a nursing college at SS

Table 2:. Distribution of knowledge regarding blood donation among nursing students (N = 300)

Knowledge Level	Frequency (n)	Percentage (%)
Good	205	68.3
Moderate	72	24.0
Poor	23	7.7

Table 3: Attitude towards voluntary blood donation among nursing students (N = 300)

Attitude	Frequency (n)	Percentage (%)
Positive	244	81.3
Negative	56	18.7

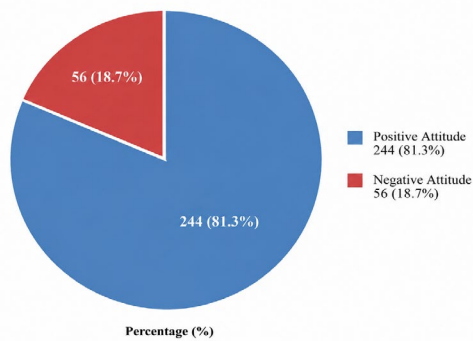


Figure 2: Attitude towards voluntary blood donation among nursing students.

Institute of Medical Sciences and Research Centre, Central Karnataka, and to identify factors influencing voluntary blood donation among this important group of future healthcare professionals.

METHODOLOGY

Study Design

An institution-based cross-sectional study was conducted to assess the knowledge, attitude, and practice regarding blood donation among nursing students.

Study Setting

The study was carried out at the College of Nursing, SS Institute of Medical Sciences and Research Centre, Central Karnataka, a tertiary care teaching institution that provides undergraduate nursing education and clinical training.

Study Duration

The study was conducted over a period of three months.

Study Population

The study population comprised undergraduate Bachelor

Table 4: Blood donation practices among nursing students (N = 300)

Practice Variable	Frequency (n)	Percentage (%)
Ever donated blood		
Yes	110	36.7
No	190	63.3
Willing to donate in future		
Yes	257	85.7
No	43	14.3

Table 5: Reasons for not donating blood among non-donors (n = 190)

Reason	Frequency (n)	Percentage (%)
Fear of needle pain	62	32.6
Lack of opportunity	54	28.4
Fear of weakness after donation	37	19.5
Medically ineligible	22	11.6
Family objection	9	4.7
Other reasons	6	3.2

of Science (B.Sc.) Nursing students enrolled at SS Institute of Medical Sciences and Research Centre during the study period.

Sample Size

A total of 300 undergraduate nursing students participated in the study.

Sampling Technique

A universal sampling technique was employed. All eligible nursing students who fulfilled the inclusion criteria and were available during the study period were invited to participate. Students who provided written informed consent were included until the required sample size of 300 was achieved.

Inclusion Criteria

- Undergraduate B.Sc. Nursing students studying at SS Institute of Medical Sciences and Research Centre.
- Students aged 18 years and above.

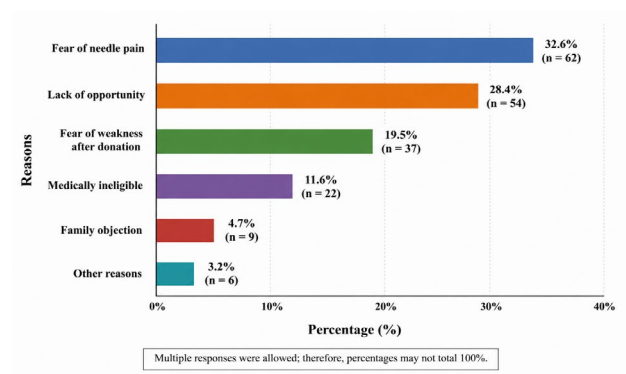


Figure 3: Reasons for not donating blood among non-donor nursing students.

Table 6: Association between knowledge level and previous blood donation practice (N = 300)

Knowledge Level	Donated Blood n (%)	Never Donated n (%)	χ^2	p-value
Good (n=205)	92 (44.9)	113 (55.1)		
Moderate (n=72)	15 (20.8)	57 (79.2)		
Poor (n=23)	3 (13.0)	20 (87.0)	18.74	<0.001

- Students willing to participate and providing written informed consent.

Exclusion Criteria

- Students who were absent during the data collection period.
- Students unwilling to participate.
- Students who submitted incomplete questionnaires.
- Study Instrument

Data were collected using a pre-tested, structured, self-administered questionnaire developed after reviewing previously published literature and standard guidelines on blood donation knowledge, attitude, and practice[15-17]. The questionnaire was prepared in English and consisted of four sections.

Section I: Socio-demographic characteristics

This section included age, gender, year of study, place of residence, blood group, family history of blood donation, and previous participation in blood donation awareness programmes.

Section II: Knowledge regarding blood donation

Knowledge was assessed using 20 multiple-choice questions covering

- Eligibility criteria for blood donation

Table 7: Association between year of study and previous blood donation practice (N = 300)

Year of Study	Donated n (%)	Never Donated n (%)	χ^2	p-value
First Year	13 (17.6)	61 (82.4)		
Second Year	24 (29.6)	57 (70.4)		
Third Year	35 (44.9)	43 (55.1)		
Fourth Year	38 (56.7)	29 (43.3)	24.62	<0.001

- Minimum age and body weight requirements
- Frequency of blood donation
- Volume of blood collected
- Blood component separation
- Screening for transfusion-transmissible infections
- Blood storage and shelf life
- Benefits and safety of voluntary blood donation
- Each correct response was awarded one mark, whereas incorrect or “Don’t know” responses received zero marks. The maximum attainable score was 20.

Knowledge scores were categorized as

- Good knowledge: 16–20 ($\geq 80\%$)
- Moderate knowledge: 12–15 (60–79%)
- Poor knowledge: <12 (<60%)
- Assessment of Attitude

Attitude toward voluntary blood donation was assessed using 10 statements measured on a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5). Statements evaluated altruism, willingness to donate blood, confidence in blood donation safety, social responsibility, and intention to become a regular blood donor.

Participants scoring at or above the median attitude score were categorized as having a positive attitude, while those scoring below the median were considered to have a negative attitude.

Assessment of Practice

Practice regarding blood donation was evaluated using questions related to

- Previous history of blood donation
- Frequency of donation
- Place of blood donation
- Reasons for donating blood
- Reasons for not donating blood
- Willingness to donate blood in the future
- Participation in blood donation awareness programmes
- Pilot Study

Table 8: Binary logistic regression analysis showing predictors of previous blood donation (N = 300)

Variable	AOR	95% CI	p-value
Good knowledge	2.81	1.58–5.02	<0.001
Positive attitude	2.19	1.16–4.12	0.015
Fourth-year study	3.42	1.81–6.48	<0.001
Previous participation in awareness programme	1.94	1.09–3.47	0.024

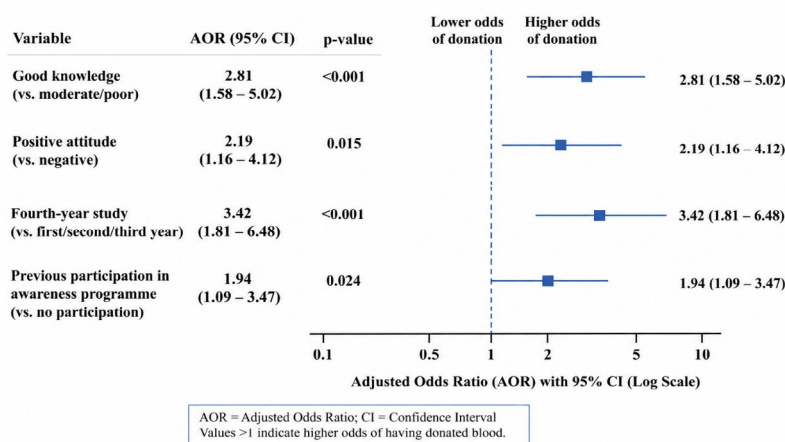


Figure 4: Independent predictors of previous blood donation among nursing students.

Prior to the main study, a pilot study was conducted among **30 nursing students** to assess the clarity, relevance, and feasibility of the questionnaire. The responses obtained during the pilot study were excluded from the final analysis. Based on participant feedback, minor modifications in wording and sequencing of questions were made to improve clarity.

Data Collection Procedure

After obtaining institutional permission and ethical approval, eligible students were approached during scheduled class hours. The objectives and purpose of the study were explained in detail, and written informed consent was obtained from each participant.

Participants completed the anonymous questionnaire individually without discussion. The average time required to complete the questionnaire was approximately 15–20 minutes. Completed questionnaires were collected immediately and checked for completeness before data entry.

Outcome Variables

- Primary Outcome
- Knowledge regarding blood donation
- Attitude toward voluntary blood donation
- Practice of voluntary blood donation

Secondary Outcome

- Association of socio-demographic characteristics with knowledge, attitude, and practice.
- Factors influencing voluntary blood donation among nursing students.

Statistical Analysis

Data were entered into Microsoft Excel and analyzed using Statistical Package for the Social Sciences (SPSS) version 29.0 (IBM Corp., Armonk, NY, USA).

Continuous variables were summarized using mean and standard deviation (SD), whereas categorical variables were presented as frequency and percentage.

Associations between categorical variables were assessed using the Chi-square test or Fisher's exact test, wherever appropriate. Variables significantly associated with previous blood donation on univariate analysis were entered into binary logistic regression analysis to identify independent predictors of voluntary blood donation. Results were expressed as adjusted odds ratios (AORs) with 95% confidence intervals (95% CIs).

A two-tailed p-value <0.05 was considered statistically significant.

Ethical Considerations

Ethical clearance for the study was obtained from the Institutional Ethics Committee of SS Institute of Medical Sciences and Research Centre, Central Karnataka, before commencement of the study. Written informed consent was obtained from all participants after explaining the objectives of the study. Participation was voluntary, and confidentiality and anonymity of all collected information were strictly maintained throughout the study. Students were informed that refusal to participate or withdrawal from the study at any stage would not affect their academic activities.

RESULTS

A total of 300 undergraduate nursing students participated

in the study, yielding a response rate of 100%. The mean age of the participants was 20.8 ± 1.6 years (range: 18–25 years). Female students constituted the majority (78.0%), and the largest proportion belonged to the 20–21-year age group (45.3%). Students from all four academic years were represented, with second-year students forming the largest group (27.0%). More than half of the participants (57.0%) were from urban areas (Table 1).

Assessment of knowledge regarding blood donation revealed that 205 (68.3%) students had good knowledge, 72 (24.0%) had moderate knowledge, while only 23 (7.7%) demonstrated poor knowledge regarding blood donation (Table 2). The distribution of knowledge levels is shown in Figure 1.

Regarding attitude towards voluntary blood donation, the majority of students (81.3%) exhibited a positive attitude, whereas 18.7% demonstrated a negative attitude (Table 3). The attitude distribution is illustrated in Figure 2.

Evaluation of blood donation practices showed that 110 (36.7%) students had previously donated blood, while 190 (63.3%) had never donated blood. Despite the relatively low proportion of previous donors, 257 (85.7%) participants expressed willingness to donate blood in the future (Table 4).

Among the 190 students who had never donated blood, the most frequently reported barriers were fear of needle pain (32.6%), followed by lack of opportunity (28.4%), fear of weakness after blood donation (19.5%), and medical ineligibility (11.6%). Family objection and other miscellaneous reasons were less commonly reported (Table 5). These barriers are illustrated in Figure 3.

A statistically significant association was observed between knowledge level and previous blood donation practice. Students with good knowledge were significantly more likely to have donated blood than those with moderate or poor knowledge ($\chi^2 = 18.74$, $p < 0.001$) (Table 6).

Previous blood donation practice also showed a significant association with the year of study. The proportion of students who had donated blood increased progressively from 17.6% in first-year students to 56.7% among fourth-year students ($\chi^2 = 24.62$, $p < 0.001$) (Table 7).

Binary logistic regression analysis demonstrated that good knowledge (AOR = 2.81; 95% CI: 1.58–5.02; $p < 0.001$), positive attitude (AOR = 2.19; 95% CI: 1.16–4.12; $p = 0.015$), being in the fourth year of study (AOR = 3.42; 95% CI: 1.81–6.48; $p < 0.001$), and previous participation in blood donation awareness programmes (AOR = 1.94; 95% CI: 1.09–3.47; $p = 0.024$) were independent predictors

of voluntary blood donation among the study participants (Table 8). The adjusted odds ratios are presented in Figure 4.

DISCUSSION

The present study assessed the knowledge, attitude, and practice regarding blood donation among nursing students at SS Institute of Medical Sciences and Research Centre, Central Karnataka. The findings demonstrated that most participants possessed good knowledge (68.3%) and exhibited a positive attitude (81.3%) toward voluntary blood donation. However, only 36.7% had previously donated blood, indicating a substantial gap between awareness and actual donation practice. Similar discrepancies between knowledge, attitude, and practice have been consistently reported among healthcare students in India and other countries[13-15].

In the present study, more than two-thirds of the participants demonstrated good knowledge regarding blood donation. This finding is comparable to that reported by Gebresilase et al., who observed satisfactory knowledge among health science students and emphasized that academic exposure and health education programmes significantly improve awareness regarding donor eligibility, blood safety, and transfusion practices[14]. Likewise, Al-Drees reported that undergraduate health science students generally possess adequate knowledge because blood transfusion forms an important component of their professional education[15]. The relatively high knowledge level observed in the present study may therefore be attributed to structured classroom teaching, clinical postings, and institutional awareness activities.

A positive attitude toward voluntary blood donation was observed in 81.3% of the participants. Similar findings have been reported by Mohammed and Essel and Alfouzan, who found that university students generally considered blood donation a humanitarian and socially responsible act and expressed willingness to donate blood for saving lives[16,19]. Positive attitudes among nursing students are particularly encouraging because they are expected to educate patients and the community regarding voluntary blood donation. Nevertheless, positive attitudes alone are insufficient unless they are translated into actual donation behavior.

Despite satisfactory knowledge and favorable attitudes, only 36.7% of students had previously donated blood. Similar findings have been documented by Melku et al. and Nigatu and Demissie, who reported that although healthcare students often possess adequate knowledge,

actual blood donation rates remain relatively low[10,11]. This persistent gap suggests that barriers beyond knowledge continue to influence voluntary blood donation among young adults.

Among students who had never donated blood, the most frequently reported barriers were fear of needle pain, lack of opportunity, fear of weakness after donation, and medical ineligibility. Comparable observations were reported by Salaudeen and Odeh and Sojka and Sojka, who identified fear of pain, misconceptions regarding adverse health effects, and inadequate opportunities for donation as major obstacles to voluntary blood donation among students and young adults[9,21]. These findings emphasize the need for targeted counselling, myth-dispelling educational programmes, and regular institution-based blood donation camps.

A statistically significant association was observed between knowledge level and previous blood donation practice. Students with good knowledge were significantly more likely to have donated blood than those with moderate or poor knowledge. Similar associations have been reported by Misganaw et al., who demonstrated that better knowledge regarding donor eligibility and blood donation safety significantly increased the likelihood of voluntary blood donation among university students[22]. Improving scientific knowledge through structured educational interventions may therefore enhance donor participation among nursing students.

The present study also demonstrated a significant association between the year of study and previous blood donation practice. Senior students exhibited higher donation rates than first-year students. Similar findings were reported by Urgesa et al., who suggested that increased clinical exposure, maturity, and repeated participation in awareness programmes during professional training contribute to higher voluntary blood donation among senior health science students[23].

Binary logistic regression analysis identified good knowledge, positive attitude, being in the fourth year of study, and previous participation in blood donation awareness programmes as independent predictors of voluntary blood donation. These findings are consistent with previous reports by Bani and Giussani and Abiola et al., who concluded that educational exposure, positive perceptions, and participation in awareness activities significantly improve voluntary blood donation practices among university students[24,25]. Regular educational programmes and institution-based awareness campaigns

therefore remain essential strategies for improving voluntary donor recruitment.

The findings of the present study have important implications for nursing education and public health. Nursing students are future healthcare professionals who play a crucial role in educating patients and the community regarding voluntary blood donation. Strengthening their knowledge, correcting misconceptions, and providing regular opportunities for voluntary blood donation can substantially improve donor recruitment and contribute to maintaining an adequate and safe blood supply. Collaboration between nursing colleges, blood banks, and public health authorities should therefore be strengthened to promote lifelong voluntary blood donation among young adults[26,27].

The present study has several strengths, including a relatively large sample size, inclusion of students from all academic years, and comprehensive assessment of knowledge, attitude, and practice regarding blood donation. However, certain limitations should be acknowledged. The study was conducted in a single nursing institution, which may limit the generalizability of the findings to other settings. In addition, the cross-sectional design precludes causal inference, and the use of self-administered questionnaires may have introduced recall and social desirability bias. Future multicentre longitudinal studies are recommended to evaluate the long-term impact of educational interventions and institutional blood donation programmes on voluntary blood donation practices among healthcare students.

CONCLUSION

The present study demonstrated that nursing students at SS Institute of Medical Sciences and Research Centre, Central Karnataka, possessed satisfactory knowledge and favorable attitudes regarding voluntary blood donation. More than two-thirds of the participants exhibited good knowledge, and the majority expressed positive attitudes toward blood donation. However, actual blood donation practice was considerably lower, with only about one-third of the students having donated blood previously. This disparity indicates that adequate knowledge and positive attitudes alone are insufficient to promote voluntary blood donation unless appropriate opportunities and motivational support are available.

Fear of needle pain, lack of opportunity, fear of post-donation weakness, and medical ineligibility were identified as the principal barriers preventing blood donation

among non-donors. Furthermore, good knowledge, positive attitude, senior year of study, and previous participation in blood donation awareness programmes were found to be significant predictors of voluntary blood donation.

The findings emphasize the need for sustained educational interventions, regular awareness campaigns, and institution-based blood donation initiatives to bridge the gap between knowledge and practice. Strengthening blood donation education among nursing students may not only improve their own participation but also enhance their ability to motivate patients and the community, thereby contributing to a safer and more sustainable voluntary blood donation system.

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