



Knowledge and attitude toward blood donation among adults, Odisha: A community-based cross-sectional study

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Abstract

Background: Blood donation is an essential component of modern healthcare services and plays a vital role in saving millions of lives every year. Adequate knowledge and a positive attitude among community members are important factors influencing voluntary blood donation practices. Despite advancements in medical science, shortage of voluntary blood donors remains a major public health concern. Hence, the present study was undertaken to assess the knowledge and attitude regarding blood donation among adults residing in a community area, Odisha.

Aim: The objectives of the study were to assess the level of knowledge and attitude regarding blood donation among adults, determine the association between knowledge and attitude with selected socio-demographic variables, and identify the correlation between knowledge and attitude regarding blood donation.

Methods: A quantitative research approach with a descriptive cross-sectional design was adopted for the study. The research was conducted among 60 adults residing in a selected community of Sambalpur, Odisha, who were selected using a non-probability convenience sampling technique. Data were collected using a structured questionnaire comprising socio-demographic characteristics, a knowledge questionnaire, and an attitude rating scale regarding blood donation. The tool was validated by experts and tested for reliability. Data were analyzed using descriptive and inferential statistics, including frequency, percentage, mean, standard deviation, chi-square test, and correlation analysis.

Results: Data were collected using a structured interview schedule, which consisted of three sections: demographic variables, structured knowledge questionnaire, and attitude rating scale regarding blood donation. Content validity of the tool was established by experts in nursing and community health. Reliability of the tool was determined using Cronbach's alpha method and was found to be reliable.

Conclusion: adults possess acceptable awareness, there is still a need for continuous community education programs to improve knowledge and promote voluntary blood donation practices. Community health nurses play a key role in motivating individuals, organizing awareness campaigns, and strengthening voluntary blood donation programs to ensure adequate blood availability.

Keywords: Blood donation, knowledge, attitude, adults, community health nursing, voluntary blood donor

Introduction

Globally, approximately 120 million units of blood are collected each year; however, disparities in blood availability persist between high-income and low- and middle-income countries. The increasing burden of road traffic injuries, complex surgical procedures, maternal complications, malignancies, and chronic diseases has substantially increased the demand for blood and blood components.^[1]

In India, ensuring an adequate and safe blood supply remains a major public health priority. Recent national efforts have strengthened blood transfusion services through quality assurance, digital integration, and promotion of voluntary blood donation, although regional shortages continue to occur.^[2]

Knowledge and attitude toward blood donation are among the most important determinants of voluntary blood donation behavior. Individuals with adequate knowledge regarding donor eligibility, donation procedures, health benefits, and safety measures are more likely to develop positive attitudes and participate in voluntary blood donation. Conversely, misconceptions regarding pain,

weakness, infection, infertility, or adverse health effects often discourage eligible individuals from donating blood. Therefore, improving public awareness and addressing myths through health education are essential strategies for increasing voluntary blood donation rates.^[3-6]

Several studies conducted during the past five years have demonstrated considerable variation in knowledge and attitudes toward blood donation across different populations. Studies among students, healthcare professionals, and community members have consistently shown that higher educational status, previous donation experience, and exposure to awareness campaigns are associated with better knowledge and more favorable attitudes. Nevertheless, actual donation practices remain considerably lower than knowledge levels, indicating the persistence of psychological, cultural, and logistical barriers to blood donation.^[4-10]

Community-based evidence from India also suggests that adults residing in rural and semi-urban settings often possess inadequate knowledge regarding blood donation eligibility, donation frequency, and the safety of the donation process. Fear of needles, misconceptions regarding

loss of strength, lack of awareness about donation camps, and insufficient motivation continue to hinder voluntary blood donation. These findings highlight the need for targeted educational interventions and community awareness programmes to improve participation in voluntary blood donation. [6-12]

Odisha has experienced increasing healthcare demands due to population growth, expanding tertiary care services, and the rising need for emergency medical care. Maintaining an adequate supply of safe blood is therefore essential for effective healthcare delivery in the state. However, limited published community-based evidence is available regarding the knowledge and attitudes toward blood donation among adults in Sambalpur district. Assessing these factors is essential for identifying knowledge gaps, understanding community perceptions, and planning evidence-based awareness programmes to strengthen voluntary blood donation services. [13]

India requires approximately 15 million units of blood annually; however, a gap between demand and availability persists in several states and districts. Although significant progress has been made in promoting voluntary blood donation through government initiatives, awareness campaigns, and the involvement of educational institutions and non-governmental organizations, misconceptions, fear, inadequate knowledge, and negative attitudes continue to discourage many eligible individuals from donating blood.

Common barriers include fear of needles, concerns about weakness after donation, misconceptions regarding health risks, lack of awareness about eligibility criteria, and limited access to donation facilities. [14]

Knowledge and attitude are important determinants of blood donation behavior. Adequate knowledge regarding the eligibility criteria, donation process, benefits, frequency of donation, and safety measures can positively influence individuals' willingness to donate blood. Similarly, a favorable attitude toward blood donation, including a sense of social responsibility, altruism, and confidence in the safety of the donation process, has been associated with increased voluntary blood donation practices. Conversely, poor knowledge and unfavorable attitudes may lead to reluctance, misconceptions, and reduced participation in blood donation activities. [15]

Therefore, the present community-based cross-sectional study was undertaken to assess the knowledge and attitude toward blood donation among adults residing in selected community areas of Sambalpur district, Odisha. The findings of this study are expected to provide baseline evidence for healthcare professionals, nursing personnel, blood transfusion services, and policymakers in developing targeted educational interventions and community mobilization strategies to promote voluntary blood donation and ensure an adequate and safe blood supply.

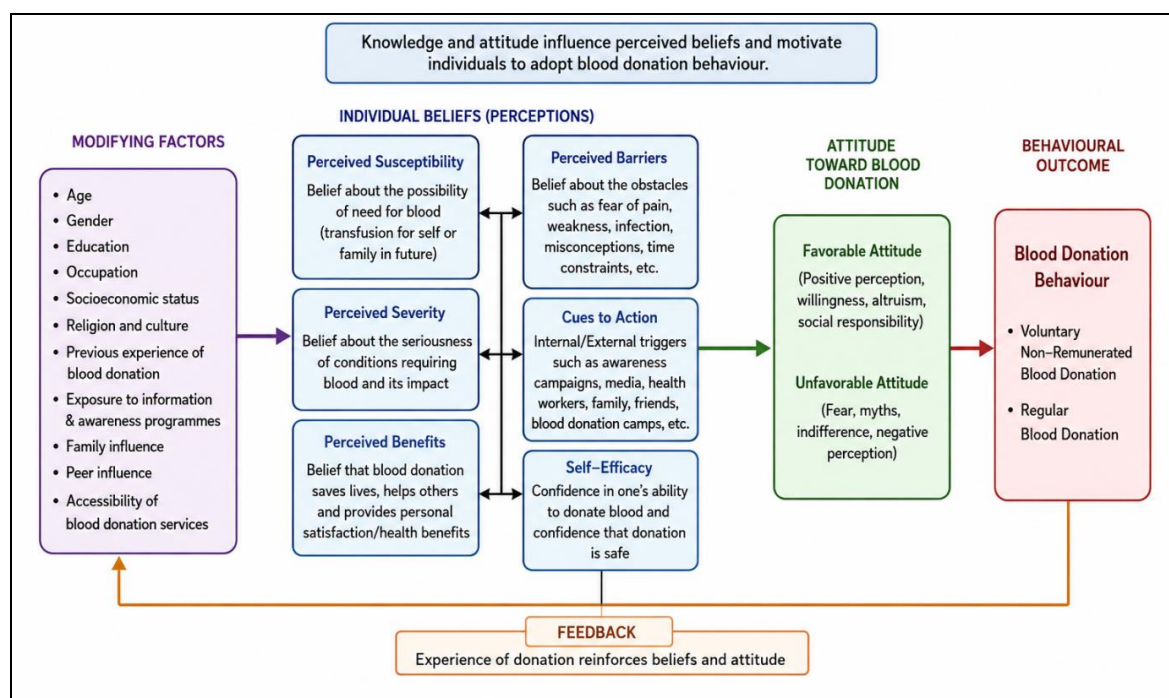


Fig 1: Health Belief Model

In the context of blood donation, the Health Belief Model explains that adults are more likely to donate blood if they perceive that blood is essential for saving lives (perceived severity), recognize that they or their family members may someday require blood (perceived susceptibility), believe that donating blood benefits both society and recipients (perceived benefits), and perceive few obstacles such as fear of pain, weakness, infection, or misconceptions (perceived barriers). External influences, including health education, awareness campaigns, recommendations from healthcare professionals, media messages, and encouragement from

family or friends, serve as cues to action, motivating individuals to donate blood. Furthermore, self-efficacy, or an individual's confidence in their ability to donate blood safely and successfully, plays a significant role in translating knowledge into actual donation behavior.

Materials and methods

Research Design and Setting

A quantitative research approach was adopted for the present study, as it is appropriate for measuring the level of knowledge and attitude regarding blood donation among

adults and for examining their association with selected socio-demographic variables. The quantitative approach enables the researcher to obtain objective, measurable, and statistically analyzable data from a defined population. The study employed a descriptive community-based cross-sectional research design. A descriptive design was chosen because it facilitates the systematic assessment of the existing level of knowledge and attitude regarding blood donation without manipulating any variables. The cross-sectional design involves collecting data from participants at a single point in time, thereby providing

The study was conducted in a selected community area of Sambalpur district, Odisha. The community was selected based on accessibility, feasibility, and availability of adult population.

Population, Sample and Sampling Technique

The target population for the present study comprised all adults aged 18–60 years residing in community areas of Sambalpur district, Odisha, while the accessible population included adults residing in the selected community who were available during the period of data collection and met the inclusion criteria. The sample consisted of 60 adults selected from the study area. A non-probability convenience sampling technique was adopted to recruit the participants. Adults who fulfilled the inclusion criteria and were readily available at the time of data collection were approached by the researcher. The purpose of the study was explained to each participant, and written informed consent was obtained before data collection. Convenience sampling was considered appropriate for the present study because it was simple, economical, feasible, and enabled the researcher to recruit the required number of participants within the stipulated time. The selected sample was considered adequate to assess the knowledge and attitude regarding blood donation among adults in the selected community of Sambalpur district, Odisha.

Inclusion Criteria

Adults who:

- Were aged between 18–60 years
- Were residing in selected community
- Were willing to participate
- Were available during data collection

Exclusion Criteria

Adults who:

- Were severely ill during data collection
- Had communication difficulties
- Refused participation

Variables

Independent Variable: Knowledge regarding blood donation

Dependent Variable: Attitude regarding blood donation

Socio-demographic Variables: Age, Gender, Educational status, Occupation, Religion, Marital status, Type of family, previous blood donation history, Source of information

Tool for Data Collection

The research instrument was developed after an extensive review of literature and expert consultation. The tool consisted of three sections:

Section A: Demographic Data Proforma

This section collected information regarding: Age, Gender, Educational status, Occupation, Religion, Marital status, Type of family, previous blood donation history, Source of information

Section B: Knowledge Questionnaire

- Structured multiple-choice questions
- Total items: 20
- Each correct answer: 1 mark
- Wrong answer: 0 mark

Knowledge Score Interpretation

Score	Level of Knowledge
0–7	Poor
8–14	Moderate
15–20	Good

Section C: Attitude Scale

- 5-point Likert scale
- Strongly Agree to Strongly Disagree
- Total items: 15

Attitude Score Interpretation

Score	Attitude Level
Low score	Unfavourable attitude
Moderate score	Neutral attitude
High score	Favourable attitude

Validity and Reliability

Content validity of the instrument was established through review by five nursing experts:

- Community Health Nursing- 2
- Medical-Surgical Nursing- 1
- Nursing Research -1
- Public Health Experts-1

Necessary modifications were made according to expert recommendations.

The obtained reliability coefficient was calculated using the Spearman–Brown prophecy formula, which yielded a reliability value of $r = 0.82$, indicating good reliability. The reliability of the attitude scale was established using Cronbach's alpha method, and the reliability coefficient obtained was $r = 0.86$, demonstrating high internal consistency. Since the reliability coefficients were greater than 0.7, the tool was considered reliable and suitable for data collection in the main study.

Data Collection Procedure

Step 1: Administrative Permission

Prior to data collection, formal administrative permission was obtained from the concerned authorities of the selected community in Sambalpur district, Odisha, to conduct the study.

Step 2: Ethical Clearance

Ethical approval was obtained from the Institutional Ethics Committee of the respective institution before the

commencement of the study. The study was conducted in accordance with ethical principles governing research involving human participants.

Step 3: Selection of Participants

The researcher visited the selected community and identified adults who fulfilled the inclusion criteria. A non-probability convenience sampling technique was used to select a total of 60 participants.

Step 4: Obtaining Informed Consent and Assurance of Confidentiality

Written informed consent was obtained from each participant after explaining the nature of the study. Participants were informed that their participation was voluntary and that they were free to withdraw from the study at any time without any consequences.

Step 5: Collection of Socio-demographic Data

Socio-demographic information such as age, gender, educational status, occupation, monthly family income, religion, type of family, previous blood donation history, and source of information regarding blood donation was collected using Section A of the structured interview schedule.

Step 6: Assessment of Knowledge and Attitude

The participants' knowledge regarding blood donation was assessed using a structured knowledge questionnaire (Section B). Each participant was asked the same set of questions, and their responses were recorded by the researcher. The attitude of the participants toward blood donation was assessed using a structured five-point Likert attitude rating scale (Section C). Participants indicated their level of agreement with each statement, and their responses were recorded accordingly.

Step 7: Duration of Data Collection

Each interview took approximately 20–25 minutes to complete. Data collection was conducted over a period of four weeks until the required sample size of 60 adults was achieved.

Step 8: Completion of Data Collection

At the end of each interview, the participants were thanked for their valuable time and cooperation. The collected data were coded, organized, and prepared for statistical analysis using appropriate descriptive and inferential statistical methods.

Ethical Considerations

Ethical principles were strictly maintained throughout the study:

- Permission obtained from concerned authorities.
- Ethical clearance obtained from institutional ethical committee.
- Informed consent taken from participants.
- Confidentiality and anonymity maintained.
- Participation was voluntary.

Data Analysis

Data was carried out using SPSS version 21. Descriptive statistics: frequency, percentage, mean, Standard deviation. Inferential: Chi-square test — association between

knowledge/attitude and socio-demographic variables. Correlation test — relationship between knowledge and attitude. A p-value less than 0.05 were considered statistically significant.

Results

Table 1: Distribution of Adults According to demographic variable. (n=60)

Sociodemographic Variables	Frequency (n)	Percentage (%)
Age group (in years)		
18- 30 years	22	36.7%
31- 45 years	24	40%
46- 60 years	14	23.3%
Gender		
Male	34	56.7%
Female	26	43.3%
Educational status		
Primary education	14	23.3%
Secondary education	20	33.3%
Higher secondary education	16	26.7%
Graduate & above	10	16.7%
Occupation		
Govt. Employee	10	16.7%
Private employee	18	30%
Self employed	12	20%
Homemaker	14	23.3%
Unemployed	6	10%
Family of income		
<10,000	14	23.3%
10,001- 20,000	20	33.3%
20,001- 30,000	16	26.7%
>30,000	10	16.7%
Type of family		
Nuclear	36	60%
Joint	18	30%
Single parents	6	10%
Religion		
Hindu	42	70%
Muslim	8	13.3%
Christian	6	10%
Others	4	6.7%
Previous blood donation history		
Yes	18	30%
No	42	70%
Source of information about blood donation		
Health personnel	12	20%
Media	16	26.7%
Friends/ Relatives	14	23.3%
Social media	10	16.7%
Others	8	13.3%

The above table shows that the frequency and percentage value of sociodemographic variables.

Table 2: Frequency and percentage value of level of knowledge and attitude (n=60)

Pre- test	Level of knowledge		Level of attitude	
	n	%	n	%
Poor knowledge	26	43.3%	10	16.7%
Average knowledge	24	40%	28	46.6%
Good knowledge	10	16.7%	22	36.7%

The pre-test knowledge assessment of senior citizens regarding the importance of spiritual life in improving psychological wellbeing showed that a considerable

proportion of participants had inadequate knowledge before the implementation of the video-assisted teaching programme. Among the 60 participants, 26 (43.3%) had poor knowledge, 24 (40%) had average knowledge, and only 10 (16.7%) demonstrated good knowledge. These findings indicate that most senior citizens possessed insufficient knowledge prior to the intervention, highlighting the need for structured educational programmes to improve awareness regarding spiritual life and psychological wellbeing.

Table 3: Association between post- test of Knowledge and Socio-Demographic Variables. (n=60)

Sociodemographic Variables	df	Chi square	P value
Age group (in years)	4	3.12	0.53
Gender	2	1.84	0.39
Educational status	8	15.42	0.04*
Occupation	8	6.21	0.62
Family of income	6	5.36	0.49
Type of family	4	2.74	0.60
Religion	6	4.18	0.65
Previous blood donation history	2	6.82	0.03*
Source of information about blood donation	8	7.16	0.52

Chi-square analysis was performed to determine the association between knowledge level regarding blood donation and selected socio-demographic variables among adults. The findings revealed that educational status ($\chi^2 = 15.42$, $p = 0.04$) and previous blood donation history ($\chi^2 = 6.82$, $p = 0.03$) showed statistically significant association with knowledge level at 0.05 level of significance. This indicates that higher education and prior experience of blood donation contributed to better knowledge among participants.

However, other variables such as age group, gender, occupation, family income, type of family, religion, and source of information did not show statistically significant association with knowledge level ($p > 0.05$).

Table 4: Association between post- test of Attitude and Socio-Demographic Variables. (n=60)

Sociodemographic Variables	df	Chi square	P value
Age group (in years)	4	2.96	0.56
Gender	2	1.72	0.42
Educational status	8	13.18	0.04*
Occupation	8	7.02	0.53
Family of income	6	5.44	0.49
Type of family	4	3.21	0.52
Religion	6	4.37	0.63
Previous blood donation history	2	8.64	0.01*
Source of information about blood donation	8	6.85	0.55

* Significant at $p < 0.05$ level

Chi-square analysis was performed to determine the association between post-test attitude towards blood donation and selected socio-demographic variables among adults. The findings revealed that educational status ($\chi^2 = 13.18$, $p = 0.04$) and previous blood donation history ($\chi^2 = 8.64$, $p = 0.01$) had a statistically significant association with post-test attitude at the 0.05 level of significance. This indicates that participants with higher education and those who had previously donated blood demonstrated more favourable attitudes towards blood donation.

However, other socio-demographic variables such as age group, gender, occupation, family income, type of family, religion, and source of information did not show significant association with post-test attitude level ($p > 0.05$).

Comparison of Knowledge and Attitude Scores Using t-Test

An independent *t*-test was used to determine the statistical significance between the study variables. The analysis showed that the calculated *t* value was statistically significant at the 0.05 level of significance, indicating a meaningful difference in the mean scores of knowledge and attitude regarding blood donation among adults.

The obtained findings suggest that improvement in knowledge level has a significant influence on the attitude of adults toward blood donation. Participants with higher knowledge scores demonstrated more favourable attitudes compared to those with lower knowledge scores. Therefore, the research hypothesis was accepted and the null hypothesis was rejected.

These results emphasize that increasing awareness and educational interventions can positively influence individuals' attitudes and willingness to participate in voluntary blood donation programs.

Discussion

In the present study, most participants belonged to the 26–35 years age group, indicating that young and middle-aged adults formed the major population of respondents. Majority were educated up to secondary or higher secondary level and belonged to nuclear families. These findings are consistent with the study conducted by Singh *et al.*, which reported that young adults represented the most active group for voluntary blood donation awareness studies.^[16] Similarly, Ahmed *et al.* found that education level plays a significant role in participation in blood donation programs.^[17]

This result is comparable with the study conducted by Kumari *et al.*, which reported moderate knowledge levels among community adults regarding voluntary blood donation.^[18] Similarly, Rout *et al.* observed that awareness about blood donation eligibility and screening procedures was insufficient among rural populations.^[19]

The present study showed that the majority of participants possessed a favourable attitude towards blood donation, expressing willingness to donate blood for humanitarian reasons.

These findings support the study conducted by Lakshmi *et al.*, who found that community members demonstrated positive attitudes despite inadequate knowledge levels.^[20] Similarly, Sharma *et al.* reported that positive attitude was strongly influenced by social responsibility and altruistic motivation.^[21]

The present study identified a statistically significant association between educational status and knowledge level. This finding is supported by Patel *et al.*, who concluded that higher educational attainment significantly improves knowledge regarding blood donation safety and procedures.^[22] No significant association was observed between gender and knowledge level, which is similar to findings reported by Das *et al.*^[23]

The present study revealed that previous blood donation experience showed a significant association with favorable attitude.

This observation agrees with the findings of Gupta *et al.*, who reported that individuals with prior donation experience demonstrated more positive attitudes and willingness for repeat donation ^[24] Similarly, Joseph *et al.* emphasized that exposure to blood donation campaigns improves perception and acceptance among adults.^[25]

Implications of the study

Integrate spiritual care into routine geriatric services. Include spirituality and audiovisual teaching methods in nursing curricula. Organize regular spiritual health education programmes. Conduct longitudinal and experimental studies to strengthen evidence.

Limitation

1. Study limited to one selected community area.
2. Small sample size limits generalization.
3. Self-reported responses may cause bias.
4. Time constraints during data collection.

Conclusion

The present community-based cross-sectional study assessed the knowledge and attitude regarding blood donation among adults residing in selected community areas of Sambalpur, Odisha. The findings revealed that although a considerable proportion of participants possessed average knowledge regarding blood donation, the majority demonstrated a favourable attitude toward voluntary blood donation. Educational status and previous blood donation history were significantly associated with both knowledge and attitude, indicating that education and prior donation experience positively influence awareness and willingness to donate blood. The study also demonstrated that improved knowledge was associated with a more positive attitude towards blood donation. These findings emphasize the need for continuous community-based health education, awareness campaigns, and motivation programmes to dispel misconceptions and encourage voluntary blood donation. Community health nurses, healthcare professionals, and policymakers should collaborate to strengthen educational interventions and promote regular voluntary blood donation, thereby contributing to an adequate and safe blood supply for the healthcare system.

Acknowledgements

The authors gratefully acknowledge all participants for their response and their sharing the perceptions.

Funding

No external funding was received; the study was self-supported

Conflicts of interest

The author declares that no any conflict in this study.

Declaration of Generative AI and AI Assisted Technologies in the Writing Process

The authors declare that generative artificial intelligence (AI) and AI-assisted technologies were used only to improve the language, grammar, and readability of the manuscript. The authors reviewed and edited the content carefully and take full responsibility for the accuracy, originality, and integrity of the final manuscript. No AI tools

were used for data analysis, interpretation of results, or generation of scientific conclusions.

Ethics Approval

Permission obtained from concerned authorities. Informed consent taken from participants. Confidentiality maintained.

Data availability

The data are available and may be obtained upon reasonable request.

Abbreviation

Abbreviation	Full Form
WHO	World Health Organization
NBTC	National Blood Transfusion Council
IEC	Information, Education and Communication
HIV	Human Immunodeficiency Virus
AIDS	Acquired Immunodeficiency Syndrome
HB	Hemoglobin
SD	Standard Deviation
df	Degree of Freedom
χ^2	Chi-square Test
r	Correlation Coefficient
OPD	Out Patient Department
IPD	In Patient Department
SPSS	Statistical Package for Social Sciences
KAP	Knowledge, Attitude and Practice
VBD	Voluntary Blood Donation
H ₀	Null Hypothesis
H ₁	Research Hypothesis
N	Sample Size

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