Aathiyoga Indian Journal of Ancient Medicine and Yoga
Volume 4, Issue 04, June 2026
Peer-Reviewed | Open Access | Crossref DOI & Global Indexing |
Google Scholar Impact Factor | Multidisciplinary
eISSN: 3048-9822

Knowledge and Attitude Regarding Voluntary Blood Donation Among Urban People in Sellur, Madurai: A Cross-Sectional Study

Rajalakshmi N[1], Mr. Kalidas[2], Ms A. Kanagapadmapriya[3], Ms K. Karthika[4*], Ms A. Lathicha[5], Ms M. Mangaiyarkarasi[6],

[1]*Guide & Nursing Tutor, College of Nursing, Madurai Medical College, Madurai, India*
[2-6]*Researchers, Seventh Semester B.Sc. Nursing, College of Nursing, Madurai Medical College, Madurai, India.*
**Corresponding Author: kk2675488@gmail.com*

Date of Submission: 25-05-2026 Date of Acceptance: 29-05-2026

Abstract

Voluntary non-remunerated blood donation is widely recognized as the safest and most sustainable source of national blood supplies.[1] Despite substantial institutional and governmental advancements in blood banking infrastructure across India, regional shortages and localized deficits continue to pose challenges to healthcare delivery systems.[3] This descriptive, non-experimental, cross-sectional study was conducted to evaluate the level of knowledge and attitude toward voluntary blood donation among urban residents in Sellur, Madurai, and to assess whether these variables are significantly associated with selected sociodemographic factors.[1]

A sample of 40 participants was selected from the Sellur urban community using a non-probability convenience sampling technique.[1] Data collection was executed utilizing structured knowledge and Likert-scale attitude questionnaires.[1] The empirical findings revealed that the vast majority of the study population (90.0%, $n = 36$) possessed an average level of knowledge, while 7.5% ($n = 3$) exhibited above-average knowledge and 2.5% ($n = 1$) demonstrated below-average knowledge.[1] Regarding attitude, 92.5% ($n = 37$) of the participants demonstrated a positive attitude toward voluntary blood donation, with the remaining 7.5% ($n = 3$) exhibiting a neutral attitude.[1]

Inferential analysis using the chi-square (χ^2) test established that there was no statistically significant association ($p >$) between participants' knowledge or attitude and their selected sociodemographic variables, leading to the rejection of the study's research hypotheses.[1] These findings indicate a baseline of positive community willingness and moderate procedural awareness that is uniform across different demographic sub-strata.[1] This uniform distribution suggests that public health interventions should focus on community-wide strategies to convert this highly favorable attitude into regular donation practices, bridging the pervasive gap between blood donation awareness and actual clinical donation rates.[4]

Keywords: Knowledge, attitude, voluntary blood donation, urban population, blood donors, community health, Tamil Nadu.

Introduction

Human blood is a vital, irreplaceable, and life-saving biological therapeutic agent essential for modern healthcare delivery systems.[6] It plays a critical role in managing trauma from road traffic accidents, facilitating complex elective surgeries, supporting oncology therapies, and treating severe maternal complications and chronic hematological disorders.[1] The World

Aathiyoga Indian Journal of Ancient Medicine and Yoga
Volume 4, Issue 04, June 2026
Peer-Reviewed | Open Access | Crossref DOI & Global Indexing |
Google Scholar Impact Factor | Multidisciplinary
eISSN: 3048-9822

Health Organization (WHO) and international transfusion bodies emphasize that voluntary, non-remunerated, unpaid blood donors represent the safest possible source of blood supply, exhibiting significantly lower rates of transfusion-transmissible infections (TTIs) such as HIV, Hepatitis B, Hepatitis C, and syphilis compared to replacement or paid donors.[7] To maintain a stable and self-sufficient blood supply, the WHO recommends that at least 1% of a country's population should donate blood regularly.[1]

In the Indian context, managing blood supplies is a complex task. Nationally, the annual clinical demand for blood is estimated at approximately 14.6 million units.[12] In the 2024–2025 fiscal period, national collections reached 14.6 million units, representing a 15% increase from the previous year, with voluntary blood donations accounting for roughly 70% to 74.5% of total collections.[12] Despite this parity in overall national numbers, a chronic estimated deficit of approximately one million units persists annually due to structural issues.[3] These issues include a highly unorganized and fragmented blood transfusion network consisting of over 2,760 blood banks across public, private, and charitable sectors.[3] There are also significant geographic disparities in donor access, a lack of real-time centralized data systems to coordinate hospital inventories, and severe blood storage deficits in rural primary health centers.[3] Clinical utilization data indicates that the medicine specialty accounts for the largest proportion of blood demand (41.2%), followed by general surgery (27.9%), obstetrics and gynecology (22.4%), and pediatrics (8.5%).[3]

Historically, voluntary blood donation in India began during World War II in 1942, primarily driven by government employees and the Anglo-Indian community.[15] Recognizing the safety risks associated with commercial donation, the Supreme Court of India officially banned paid/professional blood donation effective January 1, 1998.[16] State-level blood transfusion services have since developed with varying degrees of success.[1] Tamil Nadu has established a well-structured blood safety network managed by the Tamil Nadu State AIDS Control Society (TANSACS) and the Tamil Nadu State Blood Transfusion Council (TNSBTC).[17] The state collects approximately 8.93 lakh units of blood annually, with government hospital blood banks collecting about 3.31 lakh units.[17] Impressively, approximately 90% of the blood collected in government facilities in Tamil Nadu is obtained through voluntary non-remunerated blood donation drives.[17] TANSACS supports a network of 90 government blood banks, 39 of which are equipped with blood component separation units.[17] This separation capability is crucial, as a single unit of collected whole blood (350 mL or 450 mL) can be separated into packed red blood cells, platelets, fresh frozen plasma, and cryoprecipitate, potentially saving up to four distinct patients.[17] To facilitate localized collection, TANSACS deploys mobile blood collection buses and transportation vans, including a dedicated bus attached to the Government Rajaji Hospital in Madurai.[17]

Despite Tamil Nadu's strong institutional framework, major urban hospitals continue to face persistent pressure to maintain adequate and diverse blood supplies, particularly for rare blood groups and specialized components like single-donor platelets.[1] Madurai is a key healthcare hub in southern Tamil Nadu, relying on major blood banking facilities such as the Government Rajaji Hospital Blood Bank, private institutions like Preethi Hospitals (which processes 100–150 units daily for trauma, critical care, and high-risk obstetrics), and regional blood centers like the Madurai Voluntary Blood Bank Research Centre.[19]

Ensuring a steady influx of voluntary donors requires a precise understanding of the public's awareness, perceptions, and willingness to participate.[6] While extensive research has focused on health professional students in Tamil Nadu, community-level studies among the general urban population remain limited.[1] Therefore, this study was conducted to evaluate the baseline knowledge and attitude regarding voluntary blood donation among urban residents in Sellur, Madurai, to help inform targeted, community-centric public health intervention strategies.[1]

Research Objectives

Aathiyoga Indian Journal of Ancient Medicine and Yoga
Volume 4, Issue 04, June 2026
Peer-Reviewed | Open Access | Crossref DOI & Global Indexing |
Google Scholar Impact Factor | Multidisciplinary
eISSN: 3048-9822

To guide the empirical investigation, the researchers established the following specific objectives [1]:

1. To assess the level of knowledge regarding voluntary blood donation among the urban population residing in Sellur, Madurai.[1]
2. To assess the level of attitude regarding voluntary blood donation among the urban population residing in Sellur, Madurai.[1]
3. To determine the statistical association between the levels of knowledge and attitude regarding voluntary blood donation and selected sociodemographic variables.[1]

Hypotheses

The study formulated and tested the following research hypotheses at a significance level of $p \leq 0.05$ [1]:

- H_1: There is a statistically significant association between knowledge regarding voluntary blood donation and selected demographic variables among urban people in Sellur, Madurai.[1]
- H_2: There is a statistically significant association between attitude regarding voluntary blood donation and selected demographic variables among urban people in Sellur, Madurai.[1]

Research Design and Sample Recruitment

A quantitative, non-experimental, descriptive, cross-sectional research design was adopted for this study.[1] This design allowed for the concurrent assessment of the community's knowledge and attitude at a single point in time, without manipulating the study environment or introducing external interventions. The study was conducted in Sellur, an urban residential area located in northern Madurai, Tamil Nadu, India, which comprises a diverse mix of socioeconomic and educational backgrounds.[1]

The target population consisted of adult urban residents. A sample size of 40 participants was recruited using a non-probability convenience sampling technique.[1] In nursing and public health research, small-scale convenience sampling is frequently used as a practical tool to perform localized community diagnoses, providing baseline data that can guide broader regional health interventions.[25] Data collection was executed through face-to-face interactions where structured, pre-tested questionnaires were administered to participants after obtaining their informed verbal consent.[1]

The collected data were coded and analyzed using descriptive and inferential statistical methods.[1] Descriptive statistics, including frequencies (f) and percentages (%), were used to summarize the sociodemographic characteristics, knowledge scores, and attitude levels.[1] Inferential statistics, specifically the chi-square (χ^2) test of independence, were applied to determine the statistical significance of associations between the demographic characteristics and the participants' levels of knowledge and attitude.[1]

Instrumentation and Data Collection Tools

The researchers utilized a structured data collection tool consisting of three distinct sections designed to capture comprehensive demographic and behavioral parameters [1]:

- **Section A: Sociodemographic Variables:** This section gathered baseline demographic characteristics of the participants, including age, gender, educational status, religion,

Aathiyoga Indian Journal of Ancient Medicine and Yoga
Volume 4, Issue 04, June 2026
Peer-Reviewed | Open Access | Crossref DOI & Global Indexing |
Google Scholar Impact Factor | Multidisciplinary
eISSN: 3048-9822

marital status, monthly family income, family history of blood donation, and personal history of previous blood donation.[1]

- **Section B: Structured Knowledge Questionnaire:** This component comprised 10 structured, objective items designed to evaluate participants' awareness of key aspects of blood donation.[1] These items covered basic physiological requirements for donation, minimum body weight and hemoglobin thresholds, interval periods between successive donations, transmission risks of infectious diseases, and the general benefits of donation.[28] Each correct response was awarded 1 point, while incorrect or "don't know" responses received 0 points, yielding a total possible score range of 0 to 10.[1]
- **Section C: Structured Attitude Questionnaire:** To evaluate participants' underlying beliefs and disposition toward donation, a Likert-scale questionnaire was used.[1] The tool contained statements addressing the social responsibility of donation, perceived fear of pain or needles, safety of the donation process, and beliefs regarding post-donation physical health.[30] Responses were scored on a 4-point scale: Strongly Agree = 4, Agree = 3, Disagree = 2, and Strongly Disagree = 1.[1] To maintain construct validity and control for response bias, negative statements (e.g., statements regarding fears of physical weakness or disease contraction) were reverse-scored (Strongly Agree = 1, Agree = 2, Disagree = 3, and Strongly Disagree = 4).[1]

The scoring keys and interpretations for both knowledge and attitude were predefined to ensure objective classification of the participants' responses, as outlined in Table 1.[1]

Table 1: Knowledge Score Interpretation and Classification

S.No.	Score Range	Level of Knowledge
1	0–3	Below average
2	4–7	Average
3	8–10	Above average

Source: Study assessment tool.[1]

Statistical Data Analysis

Descriptive statistics, including frequencies (f) and percentage distributions (%), were computed to characterize the sample's baseline knowledge levels and attitude categories.[1] Inferential statistical analysis was conducted using the chi-square (χ^2) test of independence to examine the relationships between the independent sociodemographic variables (age, gender, educational status, religion, marital status, monthly income, family history of blood donation, and previous blood donation history) and the dependent variables (levels of knowledge and attitude regarding voluntary blood donation).[1] The critical threshold for statistical significance was pre-established at $p \leq 0.05$. All quantitative analyses were modeled after standard biometric procedures described in nursing research literature.[25]

Results and Key Findings

The study analyzed the responses of 40 urban residents from the Sellur community to evaluate their knowledge and attitude toward voluntary blood donation.[1]

Level of Knowledge

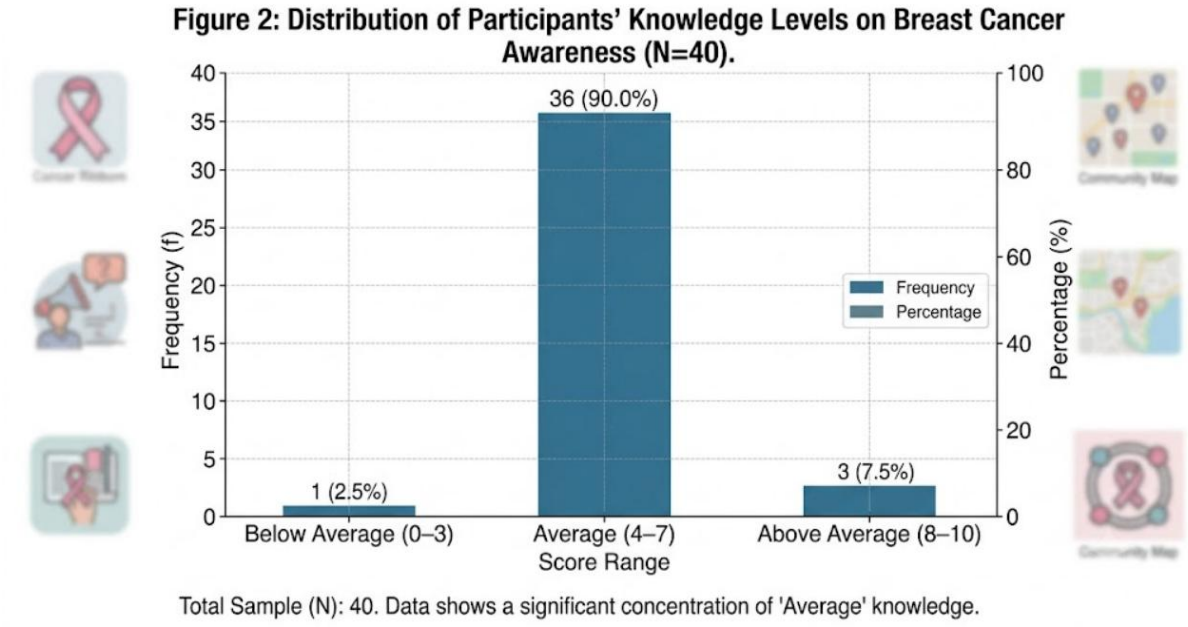
Aathiyoga Indian Journal of Ancient Medicine and Yoga
Volume 4, Issue 04, June 2026
Peer-Reviewed | Open Access | Crossref DOI & Global Indexing |
Google Scholar Impact Factor | Multidisciplinary
eISSN: 3048-9822

The structured knowledge questionnaire (Section B) indicated that the majority of the participants had a moderate understanding of voluntary blood donation.[1] Ninety percent ($n = 36$) of the respondents scored in the average range (4–7 points).[1] A small group of 7.5% ($n = 3$) demonstrated above-average knowledge (8–10 points), while only 2.5% ($n = 1$) fell into the below-average category (0–3 points).[1] These results suggest that basic concepts of blood donation are widely recognized in the community, though detailed technical knowledge may be limited.[1] This distribution is summarized in Table 2.

Table 2: Level of Knowledge Regarding Voluntary Blood Donation (N = 40)

Level of Knowledge	Score Range	Frequency (f)	Percentage (%)
Below average	0–3	1	2.5%
Average	4–7	36	90.0%
Above average	8–10	3	7.5%
Total	—	**40**	**100.0%**

Source: Primary study data.[1]



Level of Attitude

The attitude assessment (Section C) revealed highly positive perceptions of voluntary blood donation among the participants.[1] A substantial majority of 92.5% ($n = 37$) demonstrated a positive attitude.[1] The remaining 7.5% ($n = 3$) expressed a neutral attitude, and no participants (0.0%) exhibited a negative attitude.[1] These findings suggest that the community strongly supports the concept of blood donation as an altruistic and socially responsible act.[32] This distribution is presented in Table 3.

Table 3: Level of Attitude Regarding Voluntary Blood Donation (N = 40)

Level of Attitude	Classification	Frequency (f)	Percentage (%)

Aathiyoga Indian Journal of Ancient Medicine and Yoga
Volume 4, Issue 04, June 2026
Peer-Reviewed | Open Access | Crossref DOI & Global Indexing |
Google Scholar Impact Factor | Multidisciplinary
eISSN: 3048-9822

Positive attitude	Favorable disposition	37	92.5%
Neutral attitude	Indifferent/Uncommitted	3	7.5%
Negative attitude	Unfavorable disposition	0	0.0%
Total	—	**40**	**100.0%**

Source: Primary study data.[1]

Chi-Square Associations

To test the research hypotheses, chi-square (χ^2) analyses were conducted to evaluate the relationships between the participants' sociodemographic variables and their knowledge and attitude levels.[1]

The statistical analyses showed no significant associations ($p >$) between the participants' levels of knowledge or attitude and any of the selected sociodemographic factors, including age, gender, educational status, religion, marital status, monthly income, family history of blood donation, and previous blood donation history.[1] Consequently, both research hypotheses—H_1 (proposing a significant association between knowledge and demographic variables) and H_2 (proposing a significant association between attitude and demographic variables)—were rejected.[1]

These findings indicate that positive attitudes and average knowledge are distributed relatively evenly across different demographic groups in Sellur.[1] This uniform distribution suggests that broad-based, community-wide public health campaigns may be highly effective in this population, rather than highly segmented demographic strategies.[1]

Discussion and Comparative Analysis

The findings of this study, indicating that 90.0% of Sellur's urban residents have an average level of knowledge and 92.5% possess a positive attitude, align with other community and institutional studies across India while highlighting the persistent gap between awareness, positive attitudes, and actual blood donation rates.[1]

The Pervasive Knowledge-Attitude-Practice (KAP) Gap

A major theme in voluntary blood donation research is the discrepancy between high levels of awareness, positive attitudes, and actual blood donation rates.[4] For instance, a community-based study conducted among 200 adults in Delhi reported that while 90% of participants recognized the importance of blood donation to save lives and 78% expressed a highly favorable attitude, fewer than 5% had ever donated blood.[4] Similarly, an urban community study in Bangalore indicated that 92% of the residents possessed a fair level of knowledge and 70.9% maintained a favorable attitude, yet only 14.2% had actually donated blood.[5]

In Tamil Nadu, studies among health professional students—who are expected to have higher medical awareness—show a similar trend.[8] In a study among medical students in Chennai, 53.3% possessed adequate technical knowledge and 57.8% had a positive attitude, but only 31.4% had ever donated blood.[8] These comparisons suggest that while the residents of Sellur, Madurai, have average baseline knowledge and highly positive attitudes, actual donation rates likely remain low due to unaddressed barriers.[1]

Psychological and Societal Barriers to Donation

The transition from a positive attitude to the physical act of blood donation is often hindered by deep-seated psychological and societal barriers.[4] Trypanophobia (fear of needles) and the fear of physical pain during venipuncture are consistently cited as primary deterrents in Indian studies, affecting 15% to 35% of potential donors.[5] Furthermore, community misconceptions

Aathiyoga Indian Journal of Ancient Medicine and Yoga
Volume 4, Issue 04, June 2026
Peer-Reviewed | Open Access | Crossref DOI & Global Indexing |
Google Scholar Impact Factor | Multidisciplinary
eISSN: 3048-9822

regarding the health consequences of donation remain common.[4] Many individuals believe that blood donation leads to physical weakness, loss of vitality, premature aging, or permanent anemia.[4]

In addition to physiological fears, systemic concerns also discourage potential donors.[34] A study surveying donor concerns highlighted that 16.8% of individuals feared contracting infectious diseases (such as HIV or hepatitis) through reuse of medical equipment during the donation process.[35] There are also persistent concerns that donated blood might be wasted, mismanaged, or commercialized for profit by private blood banks rather than used for charity.[30]

Socio-cultural factors further influence donor behavior.[32] For example, studies in Kanchipuram, Tamil Nadu, show that religious leaders and family members are highly influential in motivating individuals to donate.[36] Within Hindu and Muslim communities, blood donation is widely viewed as a virtuous act of charity that is spiritually encouraged.[32] However, specific religious or philosophical beliefs, such as certain interpretations of Jainism, may advise against donation if it is perceived as causing harm or physical violence to one's own body.[32]

Gender Disparities in Transfusion Systems

A prominent trend in Indian blood donation systems is the low participation rate of female donors.[3] Nationally, women contribute only about 6% to 18% of total blood donations.[3] This disparity is driven by both physiological and socio-cultural factors.[38]

Physiologically, high rates of iron-deficiency anemia among Indian women represent a major medical barrier to donation.[3] According to the National Family Health Survey (NFHS-5), over 57% of Indian women aged 15–49 are anemic.[38] Under Indian guidelines, donors of all genders must meet a strict minimum hemoglobin threshold of 12.5 g/dL.[38] This requirement leads to high medical deferral rates among willing female donors, often accounting for up to 77.9% of all female donor exclusions.[3]

Socio-culturally, traditional gender roles and patriarchal family structures can restrict women's exposure to public health drives and community donation camps, limiting their opportunities to participate.[38] Addressing these nutritional and structural disparities is essential to expanding the national donor pool.[38]

A comparative analysis of the primary barriers to voluntary blood donation documented across diverse Indian populations highlights these trends, as detailed in Table 4.

Table 4: Comparative Breakdown of Barriers and Deterrents to Voluntary Blood Donation across Indian Populations

Study Location & Population	Primary Barriers Identified (%)	Secondary Barriers Identified (%)	Major Recommendations
Sellur, Madurai (Urban Adults) [1]	Non-significant demographic variance ($p >$); average knowledge limits practice conversion.[1]	General community misconceptions, localized access constraints, and lack of systemic cues.[1]	Broad-based public awareness campaigns, mobile donation drives, and community-centric health education.[1]
Bangalore, Karnataka	Laziness and lack of information	Medical ineligibility (17.6%);	Contextualized behavioral change

Aathiyoga Indian Journal of Ancient Medicine and Yoga
Volume 4, Issue 04, June 2026
Peer-Reviewed | Open Access | Crossref DOI & Global Indexing |
Google Scholar Impact Factor | Multidisciplinary
eISSN: 3048-9822

(Urban Residents) [5]	(27.2%); fear of infection transmission (21.0%).[5]	trypanophobia/needle fear (15.0%); fear for personal health (13.2%).[5]	communication to dismantle misconceptions and fear of contagion.[5]
Sivagangai, Tamil Nadu (Government Blood Bank) [39]	Anemia-related deferrals in female populations; low repeat donor conversion rates.[39]	Socioeconomic educational gaps; lack of follow-up opportunity and institutional reminders.[39]	Nutritional interventions for female populations; post-donation SMS tracking, birthday wishes, and tokens.[39]
Chennai, Tamil Nadu (Health Science Students) [22]	Negative beliefs regarding weakness (12.61%) and post-donation anemia (19.61%).[22]	Lack of structural information regarding where to donate (24.37%); perceived lack of facility privacy (34.88%).[22]	Campus education programs; institutional improvements in donor privacy and safety protocols.[22]
Delhi Region (Semi-Urban Adults) [4]	Trypanophobia and needle prick pain; hesitation based on cultural custom and traditional beliefs.[4]	Perceived physical weakness after donation; physiological anemia deferrals.[4]	Interactive motivational community sessions to reduce fear; early diagnostic hemoglobin screening.[4]

Source: Synthesized from multi-centric comparative regional studies.[1]

Physiological Responses and Adverse Reactions

Understanding physiological concerns and managing donor safety is essential for encouraging repeat donations.[35] A retrospective analysis of 10,524 blood donations at a teaching hospital blood bank reported an adverse event rate of 0.42% ($n = 45$), with the vast majority of reactions being vasovagal in nature.[35] These vasovagal reactions (VVRs) primarily presented as dizziness (57.7%), sweating, and nausea.[35] The study also noted that first-time donors had a significantly higher reaction rate ($n = 31$) than repeat donors ($n = 14$), indicating that anxiety and unfamiliarity with the procedure can increase physical discomfort.[35]

Clinical research shows that pre-donation interventions can help reduce the risk of these adverse reactions.[41] For example, a randomized study demonstrated that administering a saltwater loading protocol combined with Applied Muscle Tension (AMT) techniques significantly reduced the incidence of VVRs to just 3.0%, compared to 17.0% in the control group that received plain water alone.[41] These interventions help maintain stable heart rate and blood pressure parameters during and after the donation process, improving the overall donor experience and encouraging repeat participation.[41]

The Role of Institutional and Technological Interventions

To bridge the gap between positive community attitudes and actual donation practices, blood banking systems must implement active engagement and recruitment strategies.[9] Higher levels of formal education are strongly associated with increased technical knowledge of donation

Aathiyoga Indian Journal of Ancient Medicine and Yoga
Volume 4, Issue 04, June 2026
Peer-Reviewed | Open Access | Crossref DOI & Global Indexing |
Google Scholar Impact Factor | Multidisciplinary
eISSN: 3048-9822

guidelines and higher rates of repeat donation.[39] This highlights the need for targeted educational campaigns in schools and universities.[16]

Furthermore, community-based mobilization and convenient collection facilities are highly effective at converting willing individuals into active donors.[17] The presence of mobile blood collection units, such as the TANSACS mobile bus operated by the Government Rajaji Hospital in Madurai, helps reduce physical accessibility barriers.[17] Additionally, local medical camps and collaborations with community organizations, such as the Madura College Blood Donors Club, provide structured opportunities for first-time donors.[19]

Research also demonstrates that modern communication technologies are highly effective at donor retention.[36] Implementing automated SMS reminders, email updates, and direct telephone calls has been shown to increase repeat donation rates among younger, tech-savvy demographics.[36] Personalized outreach, such as birthday greetings or community recognition awards, helps foster a sense of civic identity and encourages long-term donor retention.[39]

Conclusions and Public Health Recommendations

This cross-sectional study demonstrates that the urban population of Sellur, Madurai, possesses a solid foundation of average knowledge (90.0%) and an overwhelmingly positive attitude (92.5%) toward voluntary blood donation.[1] Because no statistically significant demographic associations were found, these positive sentiments appear to be uniform across the different age groups, genders, and socioeconomic strata of the community.[1] This uniform distribution indicates that public health strategies do not need to be highly segmented, but can instead focus on broad, community-wide campaigns designed to translate this positive disposition into regular donation practices.[1]

To enhance voluntary blood donation rates and support the regional transfusion infrastructure in Madurai, the following public health measures are recommended:

- **Implement Targeted Educational Campaigns:** Community health programs should focus on addressing common fears and misconceptions, such as trypanophobia and concerns regarding post-donation weakness or infection risk.[4] Educational materials should emphasize the strict safety protocols used in modern blood banking, including the use of sterile, single-use, disposable equipment.[35]
- **Address Nutritional Deferrals Among Women:** To encourage greater participation among female donors, community-wide iron supplementation and nutritional counseling initiatives should be integrated with blood donation campaigns, helping potential donors meet the mandatory 12.5 g/dL hemoglobin threshold.[38]
- **Enhance Localized Accessibility:** TANSACS and regional hospitals should increase the frequency of mobile blood collection drives in urban residential areas like Sellur, using dedicated mobile collection buses to provide convenient donation opportunities.[17]
- **Utilize Digital Communication for Donor Retention:** Regional blood banks should adopt digital outreach tools, such as personalized SMS reminders, email campaigns, and community recognition initiatives, to maintain regular contact with voluntary donors and encourage repeat donations.[36]
- **Strengthen Institutional Partnerships:** Collaboration between public health agencies, local educational institutions (such as Madura College), and private healthcare facilities (such as Preethi Hospitals) should be expanded to establish a consistent calendar of voluntary blood donation camps throughout the year.[19]

Reference List

[1.] Burns, N., & Grove, S. K. (2019). *The practice of nursing research: Appraisal, synthesis, and generation of evidence* (9th ed.). Elsevier.
[2.] Govindasamy, V., Ponmari, J. S., Sivaraman, M., & Balasubramanian, A. (2019). Knowledge, attitude and practice regarding blood donation among medical students of Tamil Nadu - a cross sectional study. *International Journal of Community Medicine and Public Health*, *6*(10), 4583–4587.
[3.] Grove, S. K., Gray, J., & Burns, N. (2018). *Understanding nursing research: Building an evidence-based practice* (7th ed.). Elsevier.
[4.] LoBiondo-Wood, G., & Haber, J. (2021). *Nursing research: Methods and critical appraisal for evidence-based practice* (10th ed.). Elsevier.
[5.] Manikandan, S., Srikumar, R., & Ruvanthika, P. N. (2018). A study on knowledge, attitude and practice on blood donation among health professional students in Chennai, Tamil Nadu, South India. *International Journal of Scientific Research Publications*, *3*(3), 2250–3153.
[6.] Polit, D. F., & Beck, C. T. (2021). *Nursing research: Generating and assessing evidence for nursing practice* (11th ed.). Wolters Kluwer.
[7.] Ponmari, J. S., Sivaraman, M., & Balasubramanian, A. (2016). A study on knowledge, attitude and practice on blood donation among medical students in a tertiary care teaching hospital, Chennai, Tamil Nadu, India. *International Journal of Basic & Clinical Pharmacology*, *5*(3), 802–804.
[8.] Sharma, S. K. (2018). *Nursing research and statistics* (3rd ed.). Reed Elsevier India Private Limited.
[9.] Siromani, U., Thasian, T., Selvaraj, K. G., Daniel, D., Mammen, J. J., Nair, S. C., & Isaac, R. (2014). Determinants which influence to donate blood voluntarily, in Kanchipuram district, Tamil Nadu, South India. *Indian Journal of Community Medicine*, *39*(4), 250–254.

Works cited

1. Towards 100% Voluntary Blood Donation - NCBI Bookshelf - NIH, accessed on June 2, 2026, https://www.ncbi.nlm.nih.gov/books/NBK305667/

2. Blood donation in India - Wikipedia, accessed on June 2, 2026, https://en.wikipedia.org/wiki/Blood_donation_in_India

3. Voluntary Blood Donation: Attitude and Practice among Indian Adults - ResearchGate, accessed on June 2, 2026, https://www.researchgate.net/publication/305034779_Voluntary_Blood_Donation_Attitude_and_Practice_among_Indian_Adults

4. Assessment of knowledge, attitude and practice regarding blood, accessed on June 2, 2026, https://www.ijcmph.com/index.php/ijcmph/article/download/12929/7812/62041

5. Knowledge, attitude and practice of blood donation among adult population in an urban field practice area of a tertiary care hospital. | Indian Journal of Public Health Research & Development, accessed on June 2, 2026, https://medicopublication.com/index.php/ijphrd/article/view/20794

6. A Study to Assess the Effectiveness of the Structured Teaching Programme on the Knowledge regarding blood Donation among the college going Students of the selected Colleges of Ludhiana, Punjab - Asian Journal of Nursing Education and Research, accessed on June 2, 2026,

https://ajner.com/HTMLPaper.aspx?Journal=Asian%20Journal%20of%20Nursing%20Education%20and%20Research;PID=2019-9-2-14

7. Knowledge, attitude and practice regarding blood donation among medical students of Tamil Nadu- a cross sectional study - ResearchGate, accessed on June 2, 2026, https://www.researchgate.net/publication/336113318_Knowledge_attitude_and_practice_regarding_blood_donation_among_medical_students_of_Tamil_Nadu-_a_cross_sectional_study
8. Knowledge, attitude and beliefs of people in North India regarding blood donation - PMC, accessed on June 2, 2026, https://pmc.ncbi.nlm.nih.gov/articles/PMC3934261/
9. Blood safety and availability - World Health Organization (WHO), accessed on June 2, 2026, https://www.who.int/news-room/fact-sheets/detail/blood-safety-and-availability
10. Voluntary blood donation: foundation of a safe and sufficient blood supply - NCBI - NIH, accessed on June 2, 2026, https://www.ncbi.nlm.nih.gov/books/NBK305666/
11. GOVERNMENT OF INDIA MINISTRY OF HEALTH AND FAMILY WELFARE DEPARTMENT OF HEALTH AND FAMILY WELFARE RAJYA SABHA UNSTARRED QUESTION, accessed on June 2, 2026, https://sansad.in/getFile/annex/268/AU2995_zdPv2V.pdf?source=pqars
12. The clinical demand and supply of blood in India: A National level estimation study - PMC, accessed on June 2, 2026, https://pmc.ncbi.nlm.nih.gov/articles/PMC8986005/
13. India strengthens blood safety for universal access and quality-assured blood services, accessed on June 2, 2026, https://www.who.int/news-room/feature-stories/detail/india-strengthens-blood-safety-for-universal-access-and-quality-assured-blood-services
14. Knowledge, attitudes, and practices regarding blood donation among rural adults aged 18–59 years in Bihar, India: A community-based cross-sectional study - PMC, accessed on June 2, 2026, https://pmc.ncbi.nlm.nih.gov/articles/PMC12876646/
15. A study to assess the knowledge, attitude, and practices about blood donation among medical students of a medical college in North India - PMC, accessed on June 2, 2026, https://pmc.ncbi.nlm.nih.gov/articles/PMC6132011/
16. Blood Transfusion Services - Tamil Nadu State AIDS Control Society, accessed on June 2, 2026, https://tnsacs.in/bts
17. As Chennai faces an acute shortage of blood, here's what you must know - Citizen Matters, accessed on June 2, 2026, https://citizenmatters.in/blood-shortage-in-chennai-donation-camps-and-banks/
18. Blood Bank - Preethi Hospitals, accessed on June 2, 2026, https://preethihospitals.com/blood-bank/
19. Best Blood Banks in Sellur, Madurai - Top Blood Bank near me - Justdial, accessed on June 2, 2026, https://www.justdial.com/Madurai/Blood-Banks-in-Sellur/nct-10049054

20. Best Blood Donation Centres Near me in Goripalayam, Madurai - Justdial, accessed on June 2, 2026, https://www.justdial.com/Madurai/Blood-Donation-Centres-in-Goripalayam/nct-10049094

21. A Study on Knowledge, Attitude and Practice on Blood Donation among Health Professional Students in Chennai, Tamil Nadu, South India - IJSRP, accessed on June 2, 2026, https://www.ijsrp.org/research-paper-0313.php?rp=P15941

22. A study on knowledge, attitude and practice on blood donation among medical students in a tertiary care teaching hospital, Chennai, Tamil Nadu, India, accessed on June 2, 2026, https://www.ijbcp.com/index.php/ijbcp/article/view/345

23. Best Blood Banks in Madurai North, Madurai - Top Blood Bank near me - Justdial, accessed on June 2, 2026, https://www.justdial.com/Madurai/Blood-Banks-in-Madurai-North/nct-10049054

24. Resource Manual for Nursing Research: Generating and Assessing Evidence for Nursing Practice - Barnes & Noble, accessed on June 2, 2026, https://www.barnesandnoble.com/w/resource-manual-for-nursing-research-denise-polit/1101353360

25. 6649e3e9bada6-burns-and-groves-the-practice-of-nursing-research-compressed.pdf, accessed on June 2, 2026, https://dehaghan.iau.ir/file/download/page/6649e3e9bada6-burns-and-groves-the-practice-of-nursing-research-compressed.pdf

26. Steps of literature review in Nursing Research - Nurseslab, accessed on June 2, 2026, https://nurseslab.in/nursing-notes/research-and-statistics/literature-review/

27. Knowledge, Attitude and Practice on Blood Donation among Health Science Students in a University campus, South India., accessed on June 2, 2026, https://web-archive.southampton.ac.uk/cogprints.org/7962/1/2011-2-6.pdf

28. Knowledge, attitude, and practice of blood donation: A cross-sectional survey in Khulna city, Bangladesh - PMC, accessed on June 2, 2026, https://pmc.ncbi.nlm.nih.gov/articles/PMC10915592/

29. Knowledge, attitude and practice regarding blood donation among medical students of Tamil Nadu- a cross sectional study - International Journal Of Community Medicine And Public Health, accessed on June 2, 2026, https://www.ijcmph.com/index.php/ijcmph/article/download/5467/3471/20641

30. Evaluation of the cultural, health-related, and structural barriers to blood donation among women in Saudi Arabia: a cross-sectional study - Frontiers, accessed on June 2, 2026, https://www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2026.1806754/full

31. Views and attitudes towards blood donation: a qualitative investigation of Indian non-donors living in England | BMJ Open, accessed on June 2, 2026, https://bmjopen.bmj.com/content/7/10/e018279%20

32. Barriers to Blood Donation: Identifying Deterrents in a Tertiary Care Setting - Impactfactor, accessed on June 2, 2026, http://impactfactor.org/PDF/IJPCR/16/IJPCR,Vol16,Issue12,Article247.pdf

33. Motivational factors for blood donation, potential barriers, and knowledge about blood donation in first-time and repeat blood donors - PMC, accessed on June 2, 2026, https://pmc.ncbi.nlm.nih.gov/articles/PMC6302390/

34. TRANSMEDCON 2022: E-Poster Abstracts - PMC, accessed on June 2, 2026, https://pmc.ncbi.nlm.nih.gov/articles/PMC10328112/

35. Determinants which influence to donate blood voluntarily at a Northeast District of the State of Tamil Nadu, South India. - CABI Digital Library, accessed on June 2, 2026, https://www.cabidigitallibrary.org/doi/abs/10.5555/20143388720

36. Determinants Which Influence to Donate Blood Voluntarily at a Northeast District of the State of Tamil Nadu, South India - Semantic Scholar, accessed on June 2, 2026, https://pdfs.semanticscholar.org/4d8c/3750672a32b6ddcc7880996b5dd0e4435dee.pdf

37. Barriers to Women Donating Blood in India | New Delhi Study - Omnicuris, accessed on June 2, 2026, https://www.omnicuris.com/medshots/daily_updates/women-blood-donation-barriers-india

38. A Study Regarding the Profile of Blood Donors Coming To Blood Bank Government Sivagangai Medical College and the Incidence of Re, accessed on June 2, 2026, https://www.saudijournals.com/media/articles/SJM_42_167-168_c.pdf

39. Complications Associated with Blood Donations in a Blood Bank at an Indian Tertiary Care Hospital - PMC, accessed on June 2, 2026, https://pmc.ncbi.nlm.nih.gov/articles/PMC4225916/

40. TRANSMEDCON 2022: Oral Abstracts - PMC - NIH, accessed on June 2, 2026, https://pmc.ncbi.nlm.nih.gov/articles/PMC10328111/

41. Retrospective analysis of whole blood donor demographics at a rural University in India, accessed on June 2, 2026, https://pmc.ncbi.nlm.nih.gov/articles/PMC12357709/

42. BLOOD DONORS CLUB in Madurai | ID: 6746128488 - IndiaMART, accessed on June 2, 2026, https://www.indiamart.com/proddetail/blood-donors-club-6746128488.html

43. Knowledge, Attitude and Practice of Blood Donation among Adult Population in Potheri, Kanchipuram,Tamil Nadu, South India - Semantic Scholar, accessed on June 2, 2026, https://www.semanticscholar.org/paper/Knowledge%2C-Attitude-and-Practice-of-Blood-Donation-Ramraj-Siraja/25820489a02ad8ad6d2bfae63775eacd7473a50c