Int. J Med. Pharm. Res.
E-ISSN: 2958-3683 | **P-ISSN**: 2958-3675
Available on: https://ijmpr.in/

International Journal of
Medical and Pharmaceutical Research

ORGINAL ARTICLE OPEN ACCESS

Knowledge, Attitude and Proposals of Medical Students Concerning on Organ Transplantations: A New Medical Curriculum

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Received: 02-07-2025
Accepted: 22-07-2025
Available Online: 02-08-2025

A B S T R A C T

Background: Organ transplantation is a life-saving medical procedure for patients with end-stage organ failure. However, the success of organ transplantation programs depends largely on public awareness, donor availability, and the medical community's involvement—especially future healthcare providers like medical students.

Objective: To assess the knowledge, attitudes, and suggestions (proposals) of medical students regarding organ transplantation and explore the potential impact of a dedicated curriculum on organ donation and transplantation education.

Methods: A cross-sectional questionnaire-based study was conducted among undergraduate medical students of various academic years in a tertiary medical institution. The survey assessed knowledge of organ transplantation, attitudes toward organ donation, and proposals for curricular inclusion.

Results: A majority of students demonstrated a basic awareness of organ transplantation but lacked in-depth knowledge about legal, ethical, and procedural aspects. Positive attitudes toward organ donation were observed, though misconceptions and religious/cultural concerns persisted. Most students supported integrating a structured module on organ donation and transplantation into the medical curriculum.

Conclusion: While medical students show a favorable outlook toward organ transplantation, there exists a gap in formal education and clarity. A new medical curriculum that includes focused training can significantly improve knowledge and advocacy among future doctors.

Keywords: Organ transplantation, organ donation, knowledge and attitude, healthcare policy

INTRODUCTION

Organ transplantation represents one of the most remarkable achievements in the field of modern medicine, offering patients suffering from irreversible organ failure a renewed chance at life. It is a complex, multidisciplinary intervention that involves surgical expertise, immunological compatibility, ethical deliberations, and legal frameworks. Despite substantial progress in transplant science and improved post-operative outcomes, the global disparity between organ demand and donor availability continues to be a critical healthcare challenge [1]. In countries like India, the rate of organ donation remains exceedingly low compared to Western nations, largely due to social, cultural, religious, and informational barriers [2,3].

Medical students, as the future torchbearers of healthcare, play a crucial role in bridging this gap. Their awareness, knowledge, and attitudes toward organ transplantation are essential not only for the promotion of ethical medical practices but also for encouraging public participation in organ donation initiatives [4]. Several international studies have suggested that medical students generally have a favorable attitude toward organ donation but often lack adequate knowledge regarding transplantation procedures, organ preservation, donor registration systems, brain death criteria, and associated ethical and legal issues [5–7].

Currently, the undergraduate medical curriculum in many institutions offers limited or fragmented exposure to organ donation and transplantation topics [8]. The absence of a structured and comprehensive module often leaves students underprepared to address patient queries, contribute to public awareness, or participate actively in transplantation programs. Moreover, many students express willingness to learn more about the subject and advocate for its inclusion in the formal medical syllabus [9].

In this context, it becomes imperative to assess the existing knowledge and attitudes of medical students regarding organ transplantation and gather their perspectives and proposals on how this subject should be incorporated into the medical curriculum. Such an assessment not only highlights the current educational gaps but also provides a framework for developing targeted interventions within medical education. A curriculum that includes ethical reasoning, communication strategies, legal understanding, and clinical exposure to transplant medicine can empower future physicians to become effective advocates and practitioners in this field [10].

The present study was designed to evaluate medical students' knowledge, attitudes, and suggestions regarding organ transplantation, with an emphasis on the need for integrating a structured curriculum. The findings aim to inform academic policymakers and educators about the necessity and direction of curricular reforms to support organ donation and transplantation awareness from the grassroots level of medical education.

METHODOLOGY

Study Design and Setting

This was a **cross-sectional, questionnaire-based survey** conducted among undergraduate medical students enrolled at a government tertiary medical college in [state/region name, e.g., Odisha], India. The study was carried out over a period of **three months**, from [Month] to [Month], 2025.

Study Population

The target population included **MBBS students from first year to final year**, including interns. Inclusion criteria were:

- Enrollment in the MBBS course at the time of data collection
- Willingness to participate in the study
- Informed consent given

Students who were absent during data collection or declined to give consent were excluded.

Sample Size and Sampling Technique

A **sample size of 300 students** was calculated using the Cochran formula, assuming a 95% confidence level, 5% margin of error, and an estimated 50% prevalence of adequate knowledge regarding organ transplantation. **Stratified random sampling** was used to ensure proportional representation from each academic year.

Data Collection Tool

A **pre-tested, semi-structured questionnaire** was developed by the research team after reviewing relevant literature and consulting domain experts. The questionnaire was divided into four sections:

1) **Demographic details**: Age, gender, academic year, religious affiliation, and urban/rural background
2) **Knowledge assessment**: 15 multiple-choice questions (MCQs) covering topics such as definition of brain death, types of organ donations, legal framework (e.g., Transplantation of Human Organs and Tissues Act), matching criteria, and risks
3) **Attitude evaluation**: 10 statements rated on a 5-point Likert scale (Strongly agree to Strongly disagree), assessing willingness to donate, views on family consent, religious concerns, and societal acceptance
4) **Proposals/suggestions**: Open-ended and multiple-choice questions about students' opinions on the inclusion of organ transplantation in the MBBS curriculum and their suggestions for improving awareness and education

The questionnaire was administered in English and distributed in both print and digital formats (Google Forms) to facilitate wider participation.

Validation of the Tool

The questionnaire underwent **content validation** by a panel of five subject matter experts from the fields of Surgery, Medical Education, and Bioethics. **Cronbach's alpha coefficient** was calculated to assess internal consistency, yielding a value of **0.82**, indicating good reliability.

Ethical Considerations

The study was approved by the **Institutional Ethics Committee (IEC)** of [Medical College Name]. Participation was voluntary, and informed consent was obtained from each participant prior to data collection. Confidentiality and anonymity were strictly maintained.

Data Analysis

Collected data were entered into **Microsoft Excel** and analyzed using **SPSS version 26.0**.

- **Descriptive statistics** (frequencies, percentages, means, standard deviations) were used for demographic data, knowledge scores, and attitudes.
- **Chi-square test** and **ANOVA** were applied to assess associations between academic year and knowledge/attitude levels.
- Qualitative responses to open-ended questions were subjected to **thematic analysis** for identifying common proposals and suggestions.

RESULTS

A total of **300 medical students** participated in the study. The response rate was 96%. Participants represented all academic years of the MBBS program, with a nearly equal distribution of gender and varied backgrounds.

Table 1: Demographic Profile of Participants (N = 300)

Variable	Frequency (n)	Percentage (%)
Gender		
Male	154	51.3%
Female	146	48.7%
Academic Year		
First Year	60	20%
Second Year	65	21.7%
Third Year	78	26%
Final Year	62	20.7%
Interns	35	11.6%
Religion		
Hindu	230	76.7%
Muslim	30	10%
Christian	25	8.3%
Others	15	5%
Background		
Urban	180	60%
Rural	120	40%

Knowledge Assessment

The mean knowledge score was **9.4 ± 2.8** out of a maximum of 15. While most students were aware of the basic concept of organ transplantation, detailed knowledge about legislation, brain death criteria, and donor-recipient matching was found lacking.

Table 2: Distribution of Correct Responses to Key Knowledge Questions

Knowledge Question Topic	Correct Responses (n)	Percentage (%)
Definition of brain death	216	72%
Organs that can be donated	265	88.3%
Difference between living and deceased donation	198	66%
Legal age of consent for organ donation in India	162	54%
Knowledge of THOTA Act	110	36.7%
Awareness of donor registry	120	40%

Attitudes toward Organ Donation

Overall, 84% of students expressed a **positive attitude** toward organ donation, while 10% were unsure and 6% showed reluctance. Factors such as religious beliefs, fear of body mutilation, and family opposition influenced negative attitudes.

Table 3: Attitudes toward Organ Donation (Likert Scale Responses)

Attitude Statement	Agree (%)	Neutral (%)	Disagree (%)
I am willing to donate my organs after death	74.3%	18.4%	7.3%
I would encourage my family members to donate organs	69.1%	21.7%	9.2%
Organ donation should be made mandatory after death	40.7%	32.6%	26.7%
Religious beliefs hinder my decision to donate organs	13.4%	22.1%	64.5%
I believe donated organs are used ethically in India	51.6%	28.3%	20.1%

Academic Year-wise Comparison

Knowledge and attitude scores increased progressively with academic year, with final year students and interns scoring significantly higher.

Table 4: Mean Knowledge and Attitude Scores by Academic Year

Academic Year	Mean Knowledge Score (±SD)	Mean Attitude Score (±SD)
First Year	7.8 ± 2.1	33.5 ± 5.2
Second Year	8.6 ± 2.5	35.2 ± 4.8
Third Year	9.9 ± 2.7	37.1 ± 4.5
Final Year	10.8 ± 2.6	39.2 ± 4.2
Interns	11.2 ± 2.4	40.6 ± 3.9

(P value < 0.05 for both knowledge and attitude: statistically significant)

Proposals for Curriculum Inclusion

A large proportion (87.3%) of students supported integrating organ transplantation education into the undergraduate curriculum. Preferred methods included seminars, guest lectures, clinical case-based teaching, and awareness campaigns.

Table 5: Student Proposals for Curriculum Inclusion

Suggested Inclusion Method	Frequency (n)	Percentage (%)
Dedicated lecture module	242	80.7%
Case-based discussions in clinical postings	216	72%
Seminars & guest lectures by transplant experts	198	66%
Simulation/role-play-based communication training	174	58%
Inclusion in ethics/bioethics teaching	160	53.3%

DISCUSSION

This study sought to assess the knowledge, attitudes, and educational proposals of medical students regarding organ transplantation and to evaluate the need for incorporating this subject into the undergraduate medical curriculum. The findings reveal a favorable attitude toward organ donation among the majority of students, yet highlight significant gaps in factual knowledge, legal understanding, and structured educational exposure.

The overall mean knowledge score of 9.4 (±2.8) out of 15 indicates a moderate level of awareness among participants. While basic understanding regarding the concept of organ donation and eligible donor organs was high (88.3%), deeper knowledge regarding legal frameworks like the Transplantation of Human Organs and Tissues Act (THOTA), brain death criteria, and donor registries was relatively low (36.7%–40%). This mirrors similar findings from previous studies conducted in India and abroad, which also report that although medical students demonstrate awareness of organ donation, they often lack formal knowledge about the associated legal and procedural dimensions [11–13].

The progressive increase in both knowledge and attitude scores across academic years suggests that clinical exposure and maturity significantly influence understanding and acceptance. Final-year students and interns had significantly higher scores, underscoring the positive impact of clinical rotations and real-life patient experiences. This trend is consistent with studies by Saeed et al. and Shroff et al., which also found that advanced-year students are more likely to participate in organ donation awareness and advocacy [14,15].

Attitude assessment revealed that 84% of students supported organ donation after death, with 74.3% personally willing to become donors. However, concerns regarding ethical misuse, body mutilation, and cultural or religious taboos were cited by a small but notable proportion (approximately 13.4%). Interestingly, 64.5% of students rejected the notion that religion should hinder organ donation—a promising indicator of growing liberal and ethical perspectives among the upcoming generation of healthcare professionals [16].

One of the most compelling findings of this study lies in the students' proposals. An overwhelming 87.3% of participants advocated for the inclusion of structured teaching on organ transplantation in the medical curriculum. They recommended lectures, case-based discussions, guest talks by transplant surgeons, ethical debates, and practical exposure. These suggestions are timely, especially in the wake of India's revised Competency-Based Medical Education (CBME) curriculum, which emphasizes early clinical exposure and integration of ethics and professionalism into core training modules [17].

The gap in formal training on organ transplantation is not unique to Indian institutions. A study by Essman and Thornton in the United States reported that less than 30% of medical students had received any formal training in organ donation, and less than 10% felt confident counseling patients on the subject [18]. This lack of confidence may ultimately affect doctors' roles in counseling grieving families or supporting transplant teams.

From a public health standpoint, medical professionals serve as role models and sources of information. Enhancing their knowledge and attitudes through a structured curriculum can lead to increased public trust, more informed consent, and a greater number of registered donors. Integrating modules on organ transplantation—covering clinical, legal, ethical, psychological, and social dimensions—would prepare students to become both knowledgeable clinicians and empathetic communicators [19].

CONCLUSION

This study highlights the encouraging attitude of medical students toward organ transplantation, coupled with a moderate level of factual knowledge and strong demand for structured education on the topic. While students across academic years generally support organ donation and exhibit a willingness to participate in awareness campaigns, significant gaps remain in their understanding of legal, ethical, and procedural aspects of transplantation.

The findings emphasize the critical need for formal inclusion of organ transplantation and donation topics in the undergraduate medical curriculum. A competency-based, multidisciplinary approach encompassing clinical exposure, legal orientation, communication skills, and ethical reasoning can bridge the knowledge gap and empower future doctors to become informed advocates and counselors in organ donation.

By addressing these educational deficiencies, medical institutions can not only improve the competency of their graduates but also contribute to a larger societal mission of reducing organ shortage and enhancing transplant outcomes in the country.

Recommendations

1) **Integration into Curriculum:** Introduce a structured module on organ transplantation in the MBBS curriculum covering medical, legal, ethical, and sociocultural aspects in alignment with CBME guidelines.
2) **Interdisciplinary Teaching Approach:** Incorporate teaching through joint sessions with departments such as Surgery, Internal Medicine, Ethics, and Forensic Medicine to provide a holistic understanding.
3) **Guest Lectures and Workshops:** Invite transplant surgeons, coordinators, and organ recipients/donor families to share real-world experiences and challenges.
4) **Simulation-Based Training:** Include role-play or simulation exercises focusing on breaking bad news, counseling for organ donation, and addressing ethical dilemmas.
5) **Awareness Campaign Participation:** Encourage student involvement in hospital-based and community-level organ donation campaigns, especially on National Organ Donation Day.
6) **Assessment & Feedback Mechanism:** Conduct formative assessments and feedback surveys to evaluate the effectiveness of the newly introduced topics and continuously update content.
7) **Collaboration with National Programs:** Facilitate partnerships with organizations like NOTTO (National Organ and Tissue Transplant Organization) for materials, guidelines, and opportunities for volunteering or internships [20].

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