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Original Research Article

A cross-sectional study on knowledge, attitude, and willingness regarding organ donation among students pursuing medical healthcare education in India

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ABSTRACT

Background: Organ transplantation is a critical advancement in modern medicine, but a gap exists between organ demand and supply. In India, where awareness and willingness to donate organs remain low, medical students are key stakeholders whose knowledge, attitudes and willingness can significantly influence organ donation rates and public perception. Therefore, the present study was done to assess medical students' knowledge and willingness to donate organs.
Methods: The present study was a Cross-sectional study done on 950 students of a private medical college Rohilkhand Medical College and Hospital, Bareilly, Uttar Pradesh, India. Study was done from June 2023 to August 2024. All students from 1st year to final year and interns were included in the study.
Results: 52.63% students had partial knowledge of organ donation. Awareness increased with education level, with 90.91% of interns reporting partial or full knowledge. There was high awareness of medical (78.63%) and consent (88.52%) aspects but gaps in legal (37.89% unaware) and ethical (25.16% unaware) considerations were present. 58.42% students were partially agreed with myths related to religious restrictions. Majority (31.60%) were probably willing to donate their body. Key predictors of willingness included awareness of medical (OR=2.1) and legal (OR=1.8) aspects and family history of organ transplantation (OR=2.0).
Conclusions: Medical education enhances awareness and willingness regarding organ donation, but gaps in legal and ethical knowledge remain significant. Addressing societal and religious myths through structured educational and sensitization programs is essential among future healthcare professionals.

Keywords: Knowledge gaps in transplantation, Medical student attitudes, Organ donation awareness, Willingness to donate organs

INTRODUCTION

Organ transplantation is among the marvels of modern medicine, offering hope to patients with end-stage organ failure. The need for transplantable organs has grown over the years quite significantly not only in India but also worldwide. The rate of increase in supply, however, does not match this growing demand, therefore creating a wide gap which stretches between organ demand and availability. In fact, India is grappling with the blunt reality that while 500,000 people were on the waiting list, a mere about 16,051 transplantations were performed in 2022 as per National Organ & Tissue Transplantation Organization statistics out of which only 233

transplantation were done in Uttar Pradesh.[1] This growing gap between supply and demand for organs makes it imperative to focus search efforts on understanding the factors involved that may influence organ donation.[2] The development of focused strategies that would help in the bridging of this gap requires an understanding of the perspectives of the various demographic groups. In this respect, medical healthcare students represent a key demographic in that their state of knowledge, attitudes, and willingness regarding organ donation hold grave implications concerning the future of organ transplantation in India. The importance of studying knowledge, attitude, and willingness about organ donation lies in its potential to inform and shape public health policies, educational interventions, and awareness campaigns. By understanding the factors that influence people's attitude and practices to donate organs, strategies may be developed by the policymakers and healthcare professionals to address the root causes of the organ shortage crisis. Moreover, enhancing public awareness and fostering a positive attitude toward organ donation may contribute to creating a more supportive social environment for transplantation.[3]

The medical student, as the future architect of health of the community has a critical role in this. Learning, beliefs, and experiences in their curriculum can deeply influence their views about organ donation, which in turn would affect not only their individual decisions but also the greater echelons of healthcare. Studies indicate that public decisions on organ donation are significantly affected by the opinions of health professionals. Therefore, in developing a positive attitude towards organ donation it becomes very necessary to consider the knowledge, attitude, and the willingness of the medical students.[4] Poor knowledge of the topic often makes professional health workers fail to engage patients and their kin in discussions on the availability of options for organ donation.[5] Positive attitude and willingness among health professionals have also been associated with a better organ procurement rate.[6]

Basic knowledge of the types of transplantable organs and donation criteria is important for the promotion of organ donation awareness. A study by Alex et al on organ donation knowledge among Indian medical students, presented by showed a significant gap. The students had general knowledge, but not in-depth knowledge regarding transplantable organs of different types and donation criteria.[7] The whole medical technical process regarding organ donation, right from identifying the donor to the retrieval of organs and transplantation, requires comprehensive knowledge. A study in South Africa indicated that knowledge is required about the different types of organs, hence the development of selective educational programs should focus on increasing awareness among medical students.[8] A study among Indian Medical Graduates reported that medical students mostly have a lack of awareness about the clinical aspects regarding organ donation.[9] This further underlines the urgency for focused educational interventions targeting the enhancement of comprehensions of procedural intricacies among them. According to a report by the World Health Organization in 2010, all health professionals involved in organ donation should be appropriately trained on the same and given standardized education across medical curricula as a priority.[10] As per Highlights of National Organ and Tissue Transplant Program by Ministry of Health & Family Welfare, Government of India compared the organ donation rate in Western countries and that of Southeast Asia, focusing on the striking discrepancy in the rate. This comparison brings out the dire need for interventions in bridging the gap in organ donation in Southeast Asia, particularly in India.[11]

Thus, baseline knowledge, attitude, and willingness among medical students are important to understand, since this may affect their future practices as health professionals, which might increase the organ donation rates. The importance of this study is that, firstly, medical students represent a relatively new generation that has just received higher education and has been exposed to healthcare systems and is about to go out into their communities. They will become not only active advocates in organ donation themselves but also may influence public perceptions in their professional role as healthcare providers and educators. Insights through this information could thus be used in the designing of targeted interventions, educational curricula, and awareness campaigns aimed at instilling a positive organ donation culture in healthcare professionals of the future. Therefore, this study was done with objective to assess undergraduate medical students knowledge about the organ donation, their willingness to donate the organs of their own and willingness to motivate their relatives for organ donation.

METHODS

Study design

A cross-sectional study was conducted to explore knowledge, attitudes, and willingness regarding organ donation among undergraduate medical students.

Study setting

The research took place at Rohilkhand Medical College and Hospital, Bareilly, Uttar Pradesh.

Study duration

The study spanned three months, commencing from June 2023 to August 2024.

Ethical considerations

Prior to initiation, approval was obtained from the Institutional Ethics Committee at RMCH, Bareilly, U.P.

Informed consent was sought from all participants before the administration of the questionnaire, with a commitment to maintaining the confidentiality of obtained data.

Study population

Participants consisted of undergraduate medical students from the MBBS 2017 to 2022 batches at RMCH, Bareilly.

Inclusion criteria

Students who were enrolled in the MBBS course at RMCH, Bareilly, during the questionnaire administration, and participants providing informed consent to participate in the study were included.

Exclusion criteria

Students admitted before the 2017 admission year were excluded from participation.

Methodology

The study invited MBBS students from batches 2018 to 2022 to participate in this cross-sectional investigation. Participants were thoroughly briefed on their independent involvement in the study, with an assurance of response confidentiality. Non-participation did not impact student-teacher relationships, and withdrawal from the study was permitted without the need for justification. The survey employed a self-administered questionnaire using purposive sampling. All students within each batch were informed about the study's purpose and were requested to gather at a designated location on a specified day and time to maximize participation. Activities were scheduled in consultation with students and relevant authorities. The questionnaire was distributed at the appointed time and place, with each question explained to ensure clarity. The principal investigator personally demonstrated the questionnaire to all batches. Questionnaire completion was ensured during collection. The study aimed to adopt either an online approach via Google Forms shared through WhatsApp or an offline method utilizing a questionnaire attached with informed consent, depending on feasibility.

Sample size

The sample size calculation was based on the anticipated proportion willing to donate an organ after death (p). Using the formula $N=(4pq)/l^2$, with p representing the anticipated proportion, q as 100-p, and l as the absolute error (5%), a minimum of 315 participants was deemed necessary for the study. However, 950 participants including 165 interns participated the study.

Statistical analysis

Data were coded, compiled, and analysed using SPSS (Statistical Package for the Social Sciences) version 23.0. Appropriate statistical tests were applied according to the type and distribution of the data. Results were presented through tables, charts, and figures. A p value less than 0.05 was considered statistically significant.

RESULTS

The present study was done on the 950 students of a private medical college studying from 1st year to final year including interns with an aim to assess their awareness and willingness for organ donation.

Table 1: Self-perception of students regarding their own awareness/knowledge level about organ donation in relationship with various.

Self-perception of students regarding their awareness/knowledge level about organ donation										
Factors	**Fully aware/ complete knowledge**		**Partial knowledge but not fully confident**		**Limited knowledge/general awareness only**		**No awareness/no knowledge**		**Total**	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
	290	30.53	500	52.63	100	10.52	60	6.32	950	100.00
Self-perception of knowledge in relation to level of education										
1st year MBBS	50	20.00	120	48.00	40	16.00	40	16.00	250	100.00
2nd year MBBS	80	32.00	130	52.00	30	12.00	10	4.00	250	100.00
3rd year MBBS	60	40.00	80	53.33	5	3.33	5	3.33	150	100.00
4th year MBBS	50	37.04	70	51.85	10	7.41	5	3.70	135	100.00
Interns	50	30.30	100	60.61	15	9.09	0	0.00	165	100.00
P value	<0.001 (Fisher's Exact test for count data with simulated p-value)									
Self-perception of knowledge in relation to gender										
Male	140	23.33	330	55.00	80	13.33	50	8.33	600	100.00
Female	150	42.86	170	48.57	20	5.71	10	2.86	350	100.00
P value	<0.001 (Chi square test)									

Table 2: Knowledge of students regarding various aspect of the organ donation process.

Aspect of the organ donation process	Full knowledge		Partial knowledge		No knowledge		Total	
	N	%	N	%	N	%	N	%
Legal aspects of organ donation	56	5.89	534	56.21	360	37.89	950	100.00
Ethical aspects of organ donation	176	18.53	535	56.32	239	25.16	950	100.00
Consent process for organ donation	303	31.89	538	56.63	109	11.47	950	100.00
Medical criteria for donation	90	9.47	657	69.16	203	21.37	950	100.00
P value	<0.05 (Chi Square test for trends in proportions)							
Over all knowledge	40	2.95	813	85.58	97	11.47	950	100.00

Table 1 shows that 52.63% of students agreed that they had awareness regarding organ donation but felt their knowledge incomplete. However, 16.84% of respondents expressed their unawareness and non-understanding level of knowledge.

Students' self-perception about their knowledge improved with increasing education level. No awareness level improved from 16% in 1st year to 0.00% in internship. 90.91% interns perceived that they had full or partial knowledge in comparison to 68% among 1st year students. This increase in self-perception of own knowledge after getting more medical education/ increasing years of course completion was found statistically significant.

Similarly, the proportion of female students perceived their knowledge full/partial was higher than male students.

Table 2 shows that students have varied levels of knowledge about the organ donation process. Regarding specific aspects of the organ donation process, the highest level of awareness was for the consent process (88.52%), followed by medical knowledge (78.63%) relevant to organ donation like cadaveric vs live donation and brain death etc. Complete unawareness regarding Legal aspects (37.89%) and ethical aspects (25.16%) like rights of family members, role of hospital and coordinator, cost of maintaining viability of organ and role of government administrative committee indicating gaps in medical curriculum to sensitize regarding the legal and ethical consideration related to organ donation. Overall majority of the students (85.58%) had partial knowledge about organ donation process and its various aspects. It was observed that statistically higher proportions of students having knowledge about medical and consent regarded aspects in comparison to legal and ethical aspects.

Table 3: Students perception regarding common myths prevalent in community about organ donation.

Aspect of the organ donation process	Agree		Partially agree		Disagree		Total	
	N	%	N	%	N	%	N	%
Organ donation can lead to body misuse	67	7.05	368	38.74	515	54.21	950	100.00
Only wealthy people can receive organs	156	16.42	555	58.42	239	25.16	950	100.00
Religious restrictions prohibit donation	307	32.32	554	58.32	89	9.37	950	100.00
P value	<0.001 (Chi square Test)							

Table 4: Multivariate analysis for level of awareness about organ donation process.

Factors	Coefficient (β)	Standard Error	Odds Ratio (OR)	95% Confidence Interval (CI)	p value
Gender (female/male)	0.12	0.05	1.13	1.02-1.30	0.03
Education level (e.g. 1st year, 2nd year, etc.)	0.2	0.08	1.22	1.05-1.40	0.02
Awareness of legal process	0.65	0.15	1.9	1.60-2.40	<0.01
Agreement with religious restrictions	-0.1	0.05	0.9	0.80-1.05	0.15
Family history of organ transplant (yes/no)	0.8	0.1	2.25	1.90-2.75	<0.01

Table 3 shows agreement of student perceptions with common myths prevalent in the community. Most of the students (54.21%) were disagree with medical process related myths prevalent in the community. Regarding ethical and law related concerns, largest proportion of students were partially agreed (58.42%) with community believes. Whereas 32.32% of respondents agreeing that religious restrictions prohibit organ donation.

Table 4 shows the results of a multivariate analysis for factors affecting knowledge about organ donation process. Students with more medical education and those with a family history of organ transplant were significantly more likely to be aware of organ donation (OR=1.22 and 2.25, respectively, p<0.01). Awareness of the legal process also showed a strong positive association with overall awareness (OR=1.90, p<0.01), while religious beliefs/restrictions were not significantly associated with awareness.

Table 5: Willingness to sign consent form for organ donation.

Response	No	Percentage
Definitely will sign	100	10.50
Probably will sign	300	31.60
Unsure	400	42.10
Probably will not sign	90	9.50
Definitely will not sign	60	6.30
Total	950	100

Table 5 shows that 10.50% of respondents are definitely willing to sign an organ donation consent form, and an additional 31.6% would probably sign. However, about 16% are either unsure or unwilling to sign the form, indicating that a significant minority remains hesitant.

Table 6: Logistic regression analysis for willingness to donate.

Independent variables (predictors)	Odds Ratio (OR)	95% Confidence Interval (CI)	p value
Gender	1.25	0.95-1.65	0.1
Education level (e.g. 1st year, 2nd year, etc.)	0.85	0.60-1.10	0.25
Awareness about medical aspects	2.1	1.65-3.00	<0.01
Awareness of legal process	1.8	1.20-2.50	<0.01
Agreement with religious restrictions	0.7	0.50-1.00	0.05
Family history of organ transplant (yes/no)	2	1.50-2.80	<0.01

Table 6 shows the logistic regression analysis for factors affecting the willingness to donate organs. Students who were unsure were removed from the analysis. Awareness of the donation process, family history of organ transplantation and legal aspects significantly increased the likelihood of donating (OR=2.10, 2.0 and 1.80, respectively, p<0.01). Religious beliefs were negatively associated (OR=0.7, p=0.05) whereas high education didn't have any significant effect on willingness to donate the organ.

DISCUSSION

Our study revealed that 52.63% of students perceived themselves as aware of organ donation but acknowledged incomplete knowledge. Awareness levels improved with the advancement of medical education, with no interns reporting complete unawareness, compared to 16% of first-year students. This trend aligns with the findings of Chakradhar et al (2016), who observed that medical education significantly increases awareness and self-perceived knowledge regarding organ donation.[12] However, the observed gaps in understanding legal (37.89% complete unawareness) and ethical aspects (25.16% unawareness) underscore deficiencies in medical education system. Similar gaps were reported by Puri et al (2023), who reported that 64% students were not aware about regulations.[13] This emphasis the need for integrating legal and ethical considerations into medical education to prepare students for comprehensive patient counseling.

The statistically significant improvement in self-perception of knowledge with increasing education level supports the hypothesis that medical education positively correlates with awareness levels. These findings parallel the results of Puri et al (2023) & Chakradhar et al (2016), who reported that while medical students displayed strong knowledge in technical areas (64%), their understanding of ethical and legal dimensions was limited.[12,13]

Furthermore, agreement with community myths was observed in ethical and legal areas, where 58.42% partially aligned with societal misconceptions. The findings corroborate the study by Shrivastav et al (2024), who reported that societal myths heavily influence student perceptions, necessitating community-oriented education programs.[14]

The study observed that 10.50% of respondents were definitely willing, and 31.6% were probably willing to donate organs. Factors positively influencing willingness included awareness of the donation process (OR = 2.10), family history of organ transplantation (OR = 2.00), and legal awareness (OR = 1.80). Misra et al (2021) in their study found that high proportion of students (71.5%) were willing to donate and motivate their family members to donate the organs in contrast to our study but in coherence with our finding, education and familial exposure to transplantation were key predictors of willingness.[15] However, the negative association of religious beliefs (OR = 0.7) with willingness underscores the persistent barrier posed by cultural and religious concerns, consistent with findings by Mithra et al (2013).[16] Major limitation of this study is inclusion of students of only one medical college. Study including multiple medical colleges (both government and private) may give more clear picture.

CONCLUSION

The study underscores the role of medical education in improving awareness and knowledge of organ donation while highlighting persistent gaps in understanding legal and ethical dimensions. The findings emphasize the need for comprehensive, structured educational programs that include experiential learning and myth-busting components. Addressing religious and societal barriers through sensitization campaigns will further enhance willingness to donate, contributing to increased organ donation rates.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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