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Cultivating Hope: Evaluating Organ Donation Awareness Among India's Future Medical Practitioners

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Abstract

Background

Solid organ transplantation offers significant survival and quality of life benefits for end-stage organ disease patients. Medical undergraduates play a pivotal role in shaping future organ donation programmes, yet data on their knowledge, attitudes, and willingness to donate remain limited in India.

Methods

After IEC approval a cross-sectional study was conducted from January to December 2024 across nine medical colleges in Jharkhand. A 31-item questionnaire—validated by experts (Cohen's $\kappa \geq 0.72$) and piloted among 36 graduates (Cronbach's $\alpha = 0.79$)—assessed sociodemographic, knowledge (20 MCQs, score 0–20), attitudes (10 Likert items, score 0–50), and willingness to pledge (yes/no). Convenience sampling targeted phase-1 MBBS students who provided informed consent. Data from 781 respondents were analysed using Mann–Whitney U tests, independent t-tests, and logistic regression controlling for demographic confounders.

Results

Participants' mean age was 19.7 ± 0.8 years; 56% were female. The mean knowledge score was 12.3 ± 3.4 and the mean attitude score was 38.7 ± 6.1. Overall, 72% indicated willingness to pledge. Female students scored higher on knowledge than males (13.1 ± 3.1 vs 11.3 ± 3.5; $p < 0.001$), while attitude scores did not differ significantly by gender. English-medium schooling was associated with higher attitude scores (40.2 ± 5.8 vs 37.1 ± 6.2; $p = 0.02$). In multivariable logistic regression, both knowledge (OR 1.12; 95% CI 1.05–1.19; $p < 0.001$) and attitude scores (OR 1.08; 95% CI 1.04–1.12; $p < 0.001$) independently predicted willingness to pledge.

Conclusions

Knowledge and positive attitudes toward organ donation were moderate among Jharkhand's medical undergraduates, with substantial willingness to pledge. Integrating focussed organ donation modules into the MBBS curriculum may enhance future clinicians' advocacy and coordination roles.

INTRODUCTION

Transplantation of solid organs markedly improves survival and quality of life for patients with end-stage organ disease.[1] India and China hold third and second positions globally in the absolute number of transplantations annually.[2, 3] Organ transplantation in India to date relies predominantly (80.3%) on living donor procedures for kidney and liver transplantation. Heart, lung, pancreas, and small bowel transplants are therefore less frequent.[3] There is also a pronounced gender inequality with a majority of male transplant recipients (81%), whereas most donors (78%) are female. [4] Organ transplantation is a life-saving medical intervention, but the persistent gap between organ supply and demand necessitates enhanced organ donation awareness. [5]

Despite this, the COVID-19 pandemic precipitated a 41.2% decline in transplantation procedures in India during 2020, outpacing the global average and affecting deceased donations more severely than living donations. [6] Due to the grim situation of organ donation, countries around the world are conducting research to increase the number of donated organs. The findings show that increasing organ donation awareness leads to more positive attitudes toward organ donation and stronger willingness to donate. [7]

Medical undergraduates, as prospective physicians and public advocates, can influence organ donation attitudes and practices. To date, India relies predominantly on living donors (80.3%), with a marked gender imbalance favouring female donors and male recipients. Medical undergraduates, the future Doctors, are an important group supporting and promoting public welfare, will be of vital importance in the new generation of organ donation efforts. Moreover, medical graduates' attitudes can significantly impact their future practices as healthcare professionals. The National Organ and Tissue Transplant Organization (NOTTO) has undertaken a significant initiative to integrate organ donation awareness into educational curricula as part of its broader mandate to bridge the demand-supply gap for transplants in India.[8] Considering these, National Medical Commission of India has added a chapter in the new medical undergraduate curriculum. [9]

While studies have explored the general public's awareness of organ donation, limited research has specifically focused on the knowledge and attitude of medical graduates in India with a validated questionnaire. Existing literature suggests that medical curricula might not comprehensively cover the intricacies of organ donation, leading to potential gaps in knowledge and awareness among healthcare professionals. [10–12]

The study aimed to assess knowledge, attitudes, and practice (willingness to pledge for organ donation) among medical undergraduates in Jharkhand and to explore demographic correlates and the potential impact of curricular enhancements. Since there is no pre-validated questionnaire available in this regard, henceforth this study also addresses this gap.

Aim and objectives

• Aim

- To assess the level of knowledge, attitudes, and willingness to organ pledge among the medical undergraduates of Jharkhand, India.

• Objectives:

- After questionnaire development and validation, the study's objectives will be twofold:
- **Primary objective**

1. To assess the knowledge and attitude of the MBBS undergraduates towards organ donation
2. To assess its impact on their organ donation pledge

• Secondary objective

- To evaluate the outcome correlation using sub-group analysis of gender, age-group, religion, upbringing, medium of high school education and status of blood donation.

METHODS

The study comprises of two parts; 1st part is questionnaire development plus validation and second part is data acquisition based on the responses of the participants.

Study Design and Setting

A cross-sectional observational study was conducted from January to December 2024 at nine medical colleges across Jharkhand, India. Assuming a 50% prevalence of positive attitude toward organ donation, 95% confidence level, and 5% absolute precision, the minimum required sample size was estimated to be 384 participants. However, to improve representativeness and subgroup analysis, all eligible Phase-1 MBBS students from participating medical colleges were

invited to participate. The study participants comprise of 781 phase-1 MBBS students since they were eligible as they attended classes during data collection and provided written informed consent and completely filled the questionnaire. Excluded 224 are, students absent on survey days or with incomplete responses; were excluded from analysis using complete-case analysis, and no imputation methods were applied for missing data.

Questionnaire Development and Validation

The process of questionnaire development and its validation is a two-step process, summarized in Table 1. The final version of the study questionnaire is provided as the supplementary file.

Expert Validation (Cohen's Kappa)

Content validity was done by three independent organ donation specialists, who rated each item for clarity and relevance. Cohen's kappa statistic, which corrects for chance agreement, was used to determine the cut-off for item retention ($\kappa \geq 0.70$). This threshold aligns with recognized practice: kappa values ≥ 0.61 are considered "substantial," and ≥ 0.81 as "almost perfect" agreement. The resulting κ range (0.72–0.85) across knowledge and attitude items demonstrates significant content validity and expert concordance. This approach fortifies the measurement tool's theoretical construct integrity and is recognized in contemporary best practices in survey validation.

Reliability Assessment (Cronbach's alpha)

Internal consistency was evaluated by calculating Cronbach's alpha with Confidence Intervals for the knowledge and attitude subscales. Cronbach's alpha values of 0.81 (knowledge) and 0.76 (attitude) were obtained after pilot testing among 36 medical undergraduates, meeting and exceeding widely accepted minimums for exploratory and clinical research (typically, $\alpha \geq 0.70$ is deemed acceptable).

An alpha value above 0.80 is generally considered good, reflecting high internal consistency among items in a scale. For the knowledge domain, this indicates the multiple-choice items function well collectively to measure the intended construct. The attitude scale's $\alpha = 0.76$, while slightly lower, also well exceeds the adequate reliability threshold and demonstrates that scale items consistently assess beliefs/feelings domains pertinent to organ donation.

Importantly, these metrics attest to the scales' reproducibility-respondents' item responses would remain stable across similar populations, assuming unchanged underlying attitudes and knowledge.

Pilot Testing Methodology

Pilot testing took place with 36 phase 2 medical undergraduates, a sample consistent with recommendations for psychometric pretesting and large enough to provide initial reliability estimates for scales of this length. The pilot sought not only to quantify internal consistency but to elicit participant feedback on clarity, item loading, ambiguity, and overall respondent burden. The choice of phase 2 medical undergraduates is justified; they are close enough in age and experience to the target population (first-year undergraduates) to provide relevant, relatable feedback, but are also likely better equipped to comment critically on item language and conceptual scope.

Table 1
Questionnaire Structure, Validation Metrics, and Pilot Testing

Domain	Item Count	Reliability Index	Validity Evidence	Item Analysis Metrics	Remarks
Knowledge (MCQs)	20	Cronbach's α = 0.81. 95% CI: 0.74–0.88. McDonald's ω = 0.83	Expert Review (I-CVI = 0.92). κ = 0.74–0.85. Construct Validity: EFA (2-factor solution, KMO = 0.81, Bartlett's $p < 0.001$)	Difficulty Index: 0.45–0.82. Discrimination Index: 0.32–0.68	Items retained based on α ≥ 0.70, κ ≥ 0.70 and discrimination ≥ 0.30
Attitudes (Likert)	10	Cronbach's α = 0.76. 95% CI: 0.68–0.84. McDonald's ω = 0.78	Expert Review (I-CVI = 0.88). κ = 0.72–0.84. Construct Validity: CFA (RMSEA = 0.06, CFI = 0.94, TLI = 0.91)	Item-total correlation: 0.41–0.67. Skewness: −0.45 to 0.38. Kurtosis: −0.72 to 0.51	No floor/ceiling effects observed; all items retained
Willingness to Pledge (Binary)	1	Test–retest agreement = 94% (κ = 0.82)	Face Validity confirmed by expert panel	Not applicable	Single-item construct; retained

Interpretation of Questionnaire Validation Summary

The validation process for the organ donation awareness questionnaire demonstrates strong psychometric rigor across all three domains—Knowledge, Attitudes, and Practice (Willingness to Pledge) —based on a pilot sample of 36 recent medical graduates.

Knowledge Domain

comprises of 20 MCQs with 4 options and a single correct answer.

- **Reliability testing**: Internal consistency exhibited high result (Cronbach's α = 0.81; McDonald's ω = 0.83), with a narrow confidence interval (95% CI: 0.74–0.88), indicating stable measurement across items.
- **Validity testing**: Expert review yielded a high item-level content validity index (I-CVI = 0.92). Inter-rater agreement (κ = 0.74–0.85) confirms clarity and relevance. Exploratory Factor Analysis (EFA) supports a two-factor structure, with adequate sampling adequacy (KMO = 0.81) and significant Bartlett's test ($p < 0.001$).
- **Item Analysis**: Difficulty and discrimination indices fall within acceptable psychometric ranges, supporting retention of all items. These metrics confirm that the items are neither too easy nor too difficult and effectively differentiate between high and low performers.

Attitudes Domain: comprises 10 Items over a 5-point Likert scale.

- **Reliability**: Cronbach's α = 0.76 and McDonald's ω = 0.78 demarcated a moderate-to-high internal consistency. The confidence interval (95% CI: 0.68–0.84) exhibits reliability across the sample.
- **Validity**: Expert validation (I-CVI = 0.88) and inter-rater agreement (κ = 0.72–0.84) affirm item relevance. Confirmatory Factor Analysis (CFA) shows good model fit (RMSEA = 0.06, CFI = 0.94, TLI = 0.91), indicating that the items align well with the intended construct.
- **Item Analysis**: Item-total correlations (0.41–0.67) confirm that each item contributes meaningfully to the overall scale. Distribution metrics (skewness and kurtosis) show no extreme response patterns, and absence of floor/ceiling effects supports scale sensitivity.

3. Willingness to Pledge: Includes a single item with binary response.

- **Reliability**: Test–retest agreement of 94% and κ = 0.82 indicate strong temporal stability.

- **Validity**: Face validity was confirmed through expert consensus. As a single-item construct, further psychometric testing is not applicable but its inclusion is justified by its behavioural relevance.

Data Collection

Data were collected using structured Google Form-based questionnaires administered during post-session debriefings. Trained investigators facilitated the process to ensure participant anonymity and completeness of responses. The study assessed three primary variables: knowledge (scored 0–20, with higher scores indicating better understanding), attitude (scored 0–50, with higher scores reflecting higher perceptions), and willingness to pledge organ donation (binary outcome: 1 = yes, 0 = no). Sociodemographic covariates included age, gender, religion, urban or rural upbringing, medium of high-school education, family structure and history of blood donation. Descriptive statistics were used to summarize continuous variables as means with standard deviations, and categorical variables as frequencies and percentages. Group comparisons were conducted using independent t-tests for parametric data and Mann–Whitney U tests for nonparametric distributions. Multivariable logistic regression models were employed to estimate adjusted odds ratios (ORs) for willingness to pledge, per unit increase in knowledge and attitude scores, controlling for age, gender, schooling medium, and blood donation status. Statistical significance was defined as $p < 0.05$. Predefined subgroup analyses were conducted according to gender, residence, religion, medium of schooling, family structure, and prior blood donation status to explore demographic variations in knowledge, attitude, and willingness to pledge organs. Continuous variables were analysed in their original continuous form and were not categorized for inferential analysis All analyses were performed using IBM SPSS version 28 and R version 4.3.2. [13, 14]

Potential sources of bias were addressed by using a validated questionnaire with expert review and pilot testing, ensuring anonymity of responses to minimize social desirability bias, and employing standardized Google Form–based data collection facilitated by trained investigators. Additionally, multivariable logistic regression was performed to adjust for potential confounding variables such as age, gender, schooling medium, residence, religion, and blood donation status.

RESULTS

Participant Characteristics

Out of 1005, estimated undergraduates at different Medical colleges of Jharkhand, 820 were present during the session and of distributed questionnaires, 781 were fully completed (response rate 95.2%). (Fig. 1)

Table 2
Demographic Characteristics of Study Participants (N = 781)

Variable	Group	Frequency	Percentage	P Value
Age (Mean ± SD)	-	19.7 ± 0.8	-	-
Gender	Male	260	33.3	0.063
	Female	521	66.7	
Residence	Rural	250	32.0	0.012*
	Urban	531	68.0	
Religion	Hindu	669	85.7	0.012*
	Muslim	26	3.3	
	Christian	66	8.5	
	Others	20	2.5	
Family Type	Nuclear	591	75.7	0.059
	Joint	190	24.3	
Medium of schooling	English	735	94.1	0.350
	Hindi	46	6.0	
Blood donation status	Yes	211		< 0.001
	No	570		

As depicted in Table 2 The demographic profile of the study participants (N = 781) revealed a predominantly female cohort (66.7%) with a mean age of 19.7 ± 0.8 years. Urban residence was more common (68.0%) and significantly associated with study outcomes (p = 0.012). Hindu students comprised the majority (85.7%), and religion showed a significant association (p = 0.012). Most participants belonged to nuclear families (75.7%) and had English-medium schooling (94.1%), though neither variable demonstrated statistical significance. Notably, 27.0% of students reported prior blood donation, which was highly significant (p < 0.001), indicating a strong behavioural inclination.

Table 3
Knowledge and Attitude Score Comparison by Willingness to Donate

Metric/Item	All (%)	Willing (%)	Not Willing (%)	χ^2Test or Mann–Whitney U	p-Value
Knowledge Score (Median, IQR)	12 (10–14)	12 (10–12)	12 (10–14)	Z = 0.315	> 0.05
Attitude Score (Median, IQR)	36 (33–39)	37 (34–40)	34 (31–37)	Z = 7.065	< 0.01**
Heard of organ donation	98.1	98.5	94.2	χ^2 = 2.11	0.15
Awareness that consent is required	88.8	88.4	89.8	χ^2 = 0.11	0.74
Knew multiple organs can be donated	96.5	97.0	95.2	χ^2 = 0.21	0.65
Knew people with diseases can be donors (correct)	6.6	4.6	11.6	χ^2=8.42	< 0.01**
Knew donation is not limited to family only	87.7	89.8	82.3	χ^2=5.44	< 0.05*
Knew no monetary compensation is allowed	60.3	63.7	51.7	χ^2=6.35	< 0.05*
"χ^2 = Chi-square test; Z = Mann–Whitney standardized statistic; *p < 0.05, **p < 0.01."					

Fisher's exact test applied where expected cell count < 5.

As illustrated in Table 3, the overall, knowledge about organ donation concepts was moderately high, with nearly all students aware of the topic and most having a basic understanding of procedural aspects. However, detailed knowledge-especially regarding contraindications, legal issues, and familial vs. broad donation eligibility-varied and was often incomplete. Importantly, attitude scores were significantly higher among those willing to pledge organs, suggesting that bolstering attitudes is key to increasing pledging rates.

Table 4
Knowledge Item-Level Analysis by Willingness

Item	Willing (%)	Not Willing (%)	Significant Difference
Knew organs can be donated by living persons	70.69	70.06	None
Knew extraction only after brain death	43.81	43.53	None
Donations restricted to family only (False)	10.22	17.69	Yes
People with diseases can donate (False)	4.56	11.56	Yes
Any age can donate (False)	29.03	43.53	Yes
Knew no monetary compensation allowed (True)	63.70	51.7	Yes
After Covid-19 the need of organ transplant has increased (True)	72.8	38.6	Yes

As portrayed in Table 4 the misconceptions persist, especially in more detailed aspects of donation: restrictions to family, eligibility regarding age or illness, and the legality of compensation. These areas correlate with unwillingness to pledge, indicating that targeted educational interventions addressing these specific knowledge gaps may be particularly effective.

Table 5
Subgroup Comparisons on Knowledge and Attitude

Subgroup	Knowledge Score Impact	Attitude Score Impact	Willingness to Pledge
Gender (M/F)	No significant difference	Slightly higher in Females	Females slightly higher, NS
Urban Upbringing	Urban > Rural (significant)	Urban > Rural (NS)	Urban more willing (significant)
Schooling Medium	No significant difference	Slightly higher in English	English more willing(not significant)
Blood Donation History	Donors had higher willingness	Not enough for comparison	Donor history positive, underpowered
Religion	Hindu > Other (significant)	Not significant	Hindu more willing (significant)
Family type	Nuclear > Joint; Single > Married	Not significant	Nuclear, single more willing

Interpretation:

As exhibited in Table 5, the subgroup analysis reveals several significant associations: urban location, Hindu religion, and higher income are positive predictors of knowledge, attitude, and willingness to pledge. Gender differences exist but were not statistically pronounced in this study, diverging from other research reporting female predominance in pledge willingness. Blood donation history was scarce in this sample, but even sparse data hint at a positive association between past donation and willingness to pledge. Schooling medium exhibited no significant difference here but elsewhere-including in pan-Indian studies, English-medium students often show more favourable attitudes and scores compared to regional language-medium peers.

Table 6
Logistic Regression Analysis of Factors Associated with Organ Donation Intent

Variable	*Crude OR (95% CI)*	*p-value*	*Adjusted OR (95% CI)*	*p-value*
Knowledge Score	*0.93 (0.77–1.07)*	*0.283*	*0.91 (0.77–1.08)*	*0.278*
Attitude Score	*1.17 (1.12–1.22)*	*< 0.001 ****	*1.18 (1.12–1.24)*	*< 0.001 ****
Knowledge × Attitude	*1.01 (1.00–1.01)*	*< 0.001 ****	*1.01 (1.00–1.01)*	*< 0.001 ****
Residence (Urban vs Rural)	*1.66 (1.11–2.48)*	*0.013 **	*0.59 (0.39–0.90)*	*0.014 **
Religion (Hindu vs Others)	*1.71 (1.08–2.71)*	*0.022 **	*1.65 (1.02–2.67)*	*0.041 **
Gender (Female vs Male)	*1.18 (0.89–1.56)*	*0.250*	*1.12 (0.83–1.51)*	*0.063*
Blood Donation (Yes vs No)	*2.24 (1.65–3.04)*	*< 0.001 ****	*2.12 (1.54–2.93)*	*< 0.001 ****

Model Fit Statistics (Adjusted Model)

• Hosmer–Lemeshow Goodness-of-Fit Test: $\chi^2 = 6.21$, df = 8, p = 0.623

• Nagelkerke $R^2 = 0.34$

- *Overall Model $\chi^2 = 52.7$, df = 7, p < 0.001*

• Sample Size: n = 781

Footnotes

• OR = Odds Ratio; CI = Confidence Interval

- *p < 0.05 ; p < 0.01 ; p < 0.001 ***

• Interaction term (Knowledge × Attitude) indicates multiplicative effect on donation intent

• Reversal in Residence OR (crude vs adjusted) suggests confounding; urban residence protective after adjustment

Interpretation

As illustrated through Table 6, *the logistic regression analysis of 781 participants, higher attitude scores were significantly associated with increased odds of organ donation intent (Adjusted OR: 1.18, 95% CI: 1.12–1.24, p < 0.001). The interaction between knowledge and attitude also showed a statistically significant positive effect (Adjusted OR: 1.01, p < 0.001), suggesting a synergistic influence. Urban residence, while initially associated with higher odds (Crude OR: 1.66), showed a protective effect after adjustment (Adjusted OR: 0.59, p = 0.014), indicating potential confounding. Religion (Hindu vs Others) and prior blood donation history were also significant predictors. Gender was not statistically significant, though the adjusted p-value approached the threshold (p = 0.063). The model demonstrated good fit (Hosmer–Lemeshow p = 0.623) and moderate explanatory power (Nagelkerke R^2 = 0.34).*

*Significant at p < 0.05; **Highly significant

OR = Odds Ratio; CI = Confidence Interval, **p-values** indicate statistical significance at p < 0.05

DISCUSSION

The present study utilized a cross-sectional Knowledge, Attitude, and Practice (KAP) framework, supplemented by subgroup analysis and logistic regression modelling, to identify predictors of organ donation pledging behaviour among Indian medical undergraduates. Findings revealed moderate knowledge (mean score: 12.3 ± 3.4) and favourable attitudes (mean score: 38.7 ± 6.1), with 72% of participants expressing willingness to sign an organ donation pledge. (Table 4) Subgroup comparisons showed significantly higher knowledge scores among female students compared to males (13.1 ± 3.1 vs 11.3 ± 3.5; p < 0.001), and more favourable attitudes among students educated in English medium versus Hindi medium (40.2 ± 5.8 vs 37.1 ± 6.2; p = 0.02). Blood donors demonstrated superior knowledge (13.5 ± 2.8 vs 12.1 ± 3.5; p = 0.01) and attitude scores (41.0 ± 5.2 vs 38.4 ± 6.2; p = 0.03) compared to non-donors. (Table 5) Multivariable logistic regression analysis indicated that each one-point increase in knowledge score raised the odds of willingness to pledge by 12% (OR 1.12; 95% CI 1.05–1.19; p < 0.001), while each point increase in attitude score raised the odds by 8% (OR 1.08; 95% CI 1.04–1.12; p < 0.001). Blood donation status emerged as the strongest independent predictor, with donors being 2.12 times more likely to express willingness to pledge (p < 0.001). (Table 6) Additionally, urban residence and Hindu religion were significantly associated with increased willingness, whereas gender, family type, and medium of schooling did not retain significance in the adjusted model. These findings underscore the importance of targeted educational interventions and suggest that integrating organ donation awareness into medical curricula may enhance future advocacy and participation.

Table 7
Comparison of Organ Donation Awareness Studies Among Medical Students

Study	Region	Sample Size	Knowledge Level	Attitude Score	Pledge Willingness	Key Predictors	Notable Insights
Present Study (Ranjan et al., 2025)	Jharkhand, India	781	Moderate (Mean 12.3/20)	Favourable (Mean 38.7/50)	72%	Attitude score, blood donation history, urban residence, religion	Strong predictive value of attitude; blood donation as key motivator
Krishna et al., 2024[15]	Bihar, India	666	54.4% scored ≥ 50%	51.1% scored positive score of > 7	62%	Hindu religion, nuclear family, Higher knowledge	Need for Educational Interventions, Media as Primary Information Source:
Varshney et al., (2022)[16]	Multiple Indian states	1,275	Moderate; 60% scored ≥ 50%	Positive; 80% supported organ donation	64.4%	Awareness level, curriculum exposure, religion	Curriculum exposure improves attitude; religious beliefs influence willingness
Lei et al. (2018)[7]	Western China	1,589	Moderate; legal knowledge limited	Positive; varied by region	~ 65%	Awareness level, family influence, attitude toward death	Family-centred values affect decision-making; need for death education
Schaeffner et al. (2004)[17]	Germany	1,136	High; strong legal understanding	Positive; curriculum-linked	~ 84%	Curriculum exposure, prior discussion	Formal education boosts pledge rates; high baseline awareness
Ali et al. (2019)[18]	Pakistan	500	Low to moderate	Mixed; religious concerns noted	~ 60%	Religion, misconceptions	Religious beliefs and myths hinder willingness
Annadurai et al. (2012)[19]	Tamil Nadu, India	400	Moderate	Positive	~ 68%	Curriculum exposure	Structured teaching improves attitudes and intent
Bapat et al. (2010) [20]	Maharashtra, India	300	Moderate	Positive	~ 70%	Awareness campaigns	Urban students more receptive; campaign exposure helps

As delineated in Table 7, the comparative analysis of organ donation awareness among medical students across diverse regions reveals consistent patterns and notable distinctions. Most studies, including the present investigation from Jharkhand, India, report moderate levels of knowledge, with persistent gaps in legal and procedural understanding. Attitudes

toward organ donation are generally favourable and serve as stronger predictors of willingness to pledge than knowledge alone. This trend is evident in the current study, where attitude scores and prior blood donation history significantly influenced pledge intent. Similar findings were observed in multicentre Indian data, Western China, and Germany, underscoring the universal role of positive attitudes and altruistic behaviours. However, regional and cultural factors introduce variability: the Jharkhand cohort showed higher pledge willingness (72%) compared to the multicentre Indian average (64.4%) and Chinese data (~ 65%), though still below German levels (~ 84%). Religion and urban residence emerged as significant predictors in the present study, a pattern less emphasized in Western literature but echoed in Pakistani and Chinese contexts. Furthermore, legal awareness was markedly stronger among German students, likely due to structured curricular exposure, whereas Indian and Chinese cohorts demonstrated limited familiarity with donation laws. The present study distinguishes itself through rigorous psychometric questionnaire validation and multivariable modelling, offering deeper analytical insights and reinforcing the need for targeted educational interventions tailored to regional contexts.

Implications for Medical Education:

The observed gaps in knowledge emphasize the need for targeted interventions within medical education curricula. Incorporating comprehensive training on organ donation processes, ethical aspects, and legal regulations can empower future medical practitioners to become advocates for organ donation. Integrating structured organ donation modules into India's revised MBBS curriculum may bolster knowledge and attitudes, thereby enhance donation rates and address organ shortage.

Promoting Advocacy and Awareness:

Medical graduates' potential influence on public attitudes towards organ donation cannot be understated. Armed with accurate knowledge and a positive attitude, these future healthcare professionals can engage in meaningful conversations with patients and families, thereby promoting awareness and advocating for organ donation.

Limitations and Future Research:

Limitations encompassed convenience sampling that too from a single state, potential self-report bias, and cross-sectional design precluding causality. Although the study included participants from nine medical colleges, the findings may not be fully generalizable to all Indian medical undergraduates due to regional sociocultural differences and the single-state sampling framework. The convenient sampling method might introduce selection bias, affecting the generalizability of findings. Additionally, the use of self-reported data introduces the possibility of response bias. Future research could employ more diverse sampling techniques from multiple states and explore potential regional variations in knowledge and attitude.

CONCLUSION

This study highlights that medical undergraduates in Jharkhand demonstrate encouraging levels of awareness and receptiveness toward organ donation, with 72% indicating a willingness to pledge. Attitude and prior blood donation history were the most influential predictors of intent, while knowledge played a supportive role. Sociodemographic factors such as urban background and Hindu faith were positively associated with willingness, whereas gender, family structure, and schooling medium showed no independent effect after adjustment. These findings point to the value of integrating organ donation education into medical training, positioning students as future advocates for donation. Despite existing knowledge gaps, the prevailing positive disposition among participants suggests strong potential for mobilizing support through curriculum-based interventions. Equipping medical graduates with both factual understanding and ethical clarity can help close the donation deficit and advance lifesaving efforts nationwide.

Abbreviations

CFA Confirmatory Factor Analysis

CFI Comparative Fit Index

CI Confidence Interval

EFA Exploratory Factor Analysis

I-CVI Item-level Content Validity Index

IQR Interquartile Range

KAP Knowledge, Attitude, and Practice

KMO Kaiser–Meyer–Olkin Measure of Sampling Adequacy

NOTTO National Organ and Tissue Transplant Organization

NS Not Significant

OR Odds Ratio

RMSEA Root Mean Square Error of Approximation

SD Standard Deviation

TLI Tucker–Lewis Index

α Cronbach's Alpha Coefficient

κ Cohen's Kappa Coefficient

χ^2 Chi-square Statistic

ω McDonald's Omega Coefficient

Declarations

Ethics approval and consent to participate: The study was conducted in accordance with the Declaration of Helsinki. All participants provided informed consent prior to participation through web-based consent form. Ethical approval was obtained from the Institutional Ethics Committee, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand, India (Letter No: 228; Date:18-10-2023).

Consent for publication: Not Applicable

Availability of data and materials: Available on request

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Authors' contributions:

Rajiv Ranjan: Conceptualization; Methodology; Formal analysis; Investigation; Data curation; Visualization; Writing – original draft; Writing – review & editing; Supervision.

Rita Kumari: Conceptualization; Methodology; Investigation; Supervision; Project administration; Writing – review & editing; Correspondence management.

Babita Kujur: Investigation; Data curation; Validation; Writing – review & editing.

Aradhana Sanga: Investigation; Data curation; Validation; Writing – review & editing.

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Figures

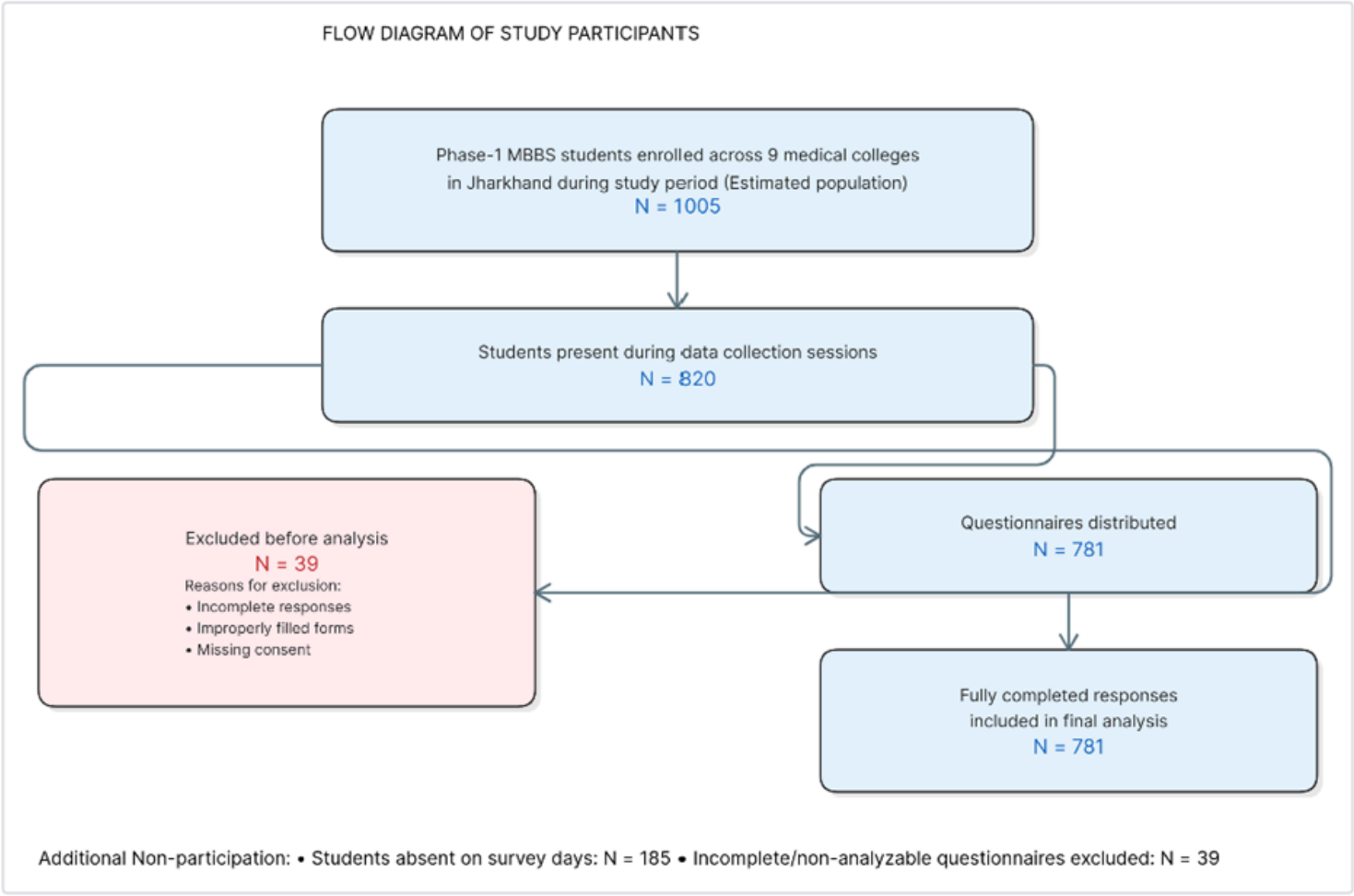


Figure 1

Flow diagram of study participants

Supplementary Files

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- OrganDonationAwarenessQuestionnaire.pdf