

African Journal of Anatomy and Physiology



Journal homepage: <https://www.afjap.com/>

Research Paper

Open Access

Evaluation of awareness levels regarding organ and stem cell donation among undergraduate students: A descriptive cross-sectional study

Lina Al-Masri^{1*}

¹Independent Researcher, Ibn Sina National College For Medical Studies, Jeddah, Saudi Arabia.

Article Info

Volume 2, Issue 1, January 2026

Received : 11 October 2025

Accepted : 28 December 2025

Published: 25 January 2026

doi: [10.62587/AFJAP.2.1.2026.11-20](https://doi.org/10.62587/AFJAP.2.1.2026.11-20)

Abstract

Background: Transplantation services in India are constrained less by surgical capacity than by the scarcity of donors, and undergraduate students represent both a prospective donor pool and a channel through which awareness reaches the wider community. Stem cell donation has attracted considerably less scrutiny than solid organ donation in this population. **Methods:** A cross-sectional survey was administered to 640 undergraduates, comprising 328 enrolled in health sciences and 312 in non-health disciplines. A pretested instrument recorded awareness items, a fifteen-item knowledge score, attitudes, practices, reasons for unwillingness and sources of information. Determinants of willingness were examined by multivariable logistic regression. **Results:** Awareness of organ donation reached 87.5% but awareness of stem cell donation only 52.3%, and brain death was correctly defined by 31.4%. Health sciences students scored substantially higher on the knowledge scale. Although 90.2% believed donation should be promoted and 59.8% expressed willingness to donate, only 13.4% had discussed the matter with family and 6.9% were registered. Adequate knowledge, previous blood donation and prior family discussion independently predicted willingness. **Conclusion:** Awareness is widespread but shallow, and intention rarely translates into registration, indicating that curricular instruction and structured registration pathways are both clearly required.

Keywords: Organ donation, Stem cell donation, Haematopoietic stem cell transplantation, Awareness, Undergraduate students

© 2026 Lina Al-Masri. This is an open access article under the CC BY license (<https://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made.

1. Introduction

Transplantation has transformed the prognosis of end-stage organ failure and of an expanding spectrum of haematological malignancies, but the scope of this approach is dictated not by surgical ability or immunological knowledge, but rather of the supply of donors (World Health Organization, 2010; Gratwohl *et al.*, 2010). The first constraint is the constraint of supply and the supply is a social phenomenon, not a technical phenomenon. The difference which has resulted is nowhere stronger than in India, where the rate of deceased donation is

* Corresponding author: Lina Al-Masri, Independent Researcher, Ibn Sina National College For Medical Studies, Jeddah, Saudi Arabia.

less than a donor per million population compared with the number of forty or more in the most developed programme countries, despite a legislative framework which was enacted 30 years ago and was after that amended to allow deceased donation ([National Organ and Tissue Transplant Organisation, 2022](#); [Government of India, 2014](#); [Global Observatory on Donation and Transplantation, 2022](#)).

The role of undergraduate students is of special interest in this problem. They are relatively young, with an overall healthy population and are approaching the age of registration decision making, thus making them a potential donor pool of significant size. In their education and through their place in their families and peer networks they are also, by default, a channel through which information can be passed to the general population. One still prevalent proximate cause of failed deceased donation is family refusal and the attitude of the educated young adult to bring the issue up at home so has practical importance regardless of his or her registration status ([Siminoff *et al.*, 2001](#); [Morgan and Miller, 2002](#)).

A wealth of literature has analyzed solid organ donation awareness among this group. A characteristic pattern has been continually recorded by Indian surveys with general awareness being high, often around ninety per cent., and knowledge of the particular concepts on which the donation of the deceased is based being far less, and understanding of the concept of brain death being most deficient ([Sharma *et al.*, 2024](#); [Gupta *et al.*, 2025](#); [Ramesh *et al.*, 2023](#)). The second and equally consistent observation is the difference between avowed intent and actual ratification, the registration of about one per in ten is registered even in medical students who support donation nearly unanimously ([Kumar *et al.*, 2024](#); [Shrivastav *et al.*, 2023](#)).

Stem cell donation has been given a lot less with its unique needs. Unrelated haematopoietic stem cell transplantation relies on large, heterogeneous registries, because the chance of an unrelated match is proportional to the size of the registry and to the coverage of the population of the recipient. It also carries with it a system of illusions characteristic of itself, and chiefly, the popular and mistaken assumption that it must be by incision made to the bone under anaesthetic regulations instead of being collected by the peripheral apheresis which has become the general rule of most collections ([Narayanan *et al.*, 2016](#); [Yildiz *et al.*, 2026](#)). These surveys that have dealt with this area have usually been restricted to health sciences cohorts and have rarely been undertaken in conjunction with the measurement of the organ donation domain so that the relative status of these two domains in a single population are poorly defined ([Sengul *et al.*, 2021](#); [AlSubaie *et al.*, 2023](#)).

The current survey was developed to fill that gap. It aimed to establish and compare awareness of donating an organ and stem cell to both health and non-health undergraduates and to establish the knowledge quantitatively by the use of a scored measure, as opposed to a single-item question, to trace the progression of awareness to attitude and expressed intention to registered donation, to establish the reasons that those who do not want to donate provide, and which features alone predict willingness when other factors are held constant.

2. Materials and methods

2.1. Design and setting

The study involved a two-part descriptive cross-sectional survey of the constituent faculties of a university, which included institutions of medicine, nursing and allied health as well as faculties of arts, science, commerce and engineering in a period of four months. Reporting follows the recommendations for observational studies ([von Elm *et al.*, 2007](#)). The non-health disciplines were not just included. Restraining the enquiry to medical students, as has been done by much of the literature hitherto, reports the most unrepresentative part of the entire body of students, and offers nothing internally comparative of the part played by professional training.

2.2. Participants and sampling

Undergraduates in any of the years of a recognised programme, and willing to participate, could take part. Others who had been involved in the pilot and postgraduate students were excluded. A stratified sampling frame was designed using the faculty as the stratum and proportionate representation within the stratum and simple random sampling was used to sample the classes using the timetable of the respective stratum. The design effect of 1.5 to account clustering by class, 95% confidence, an anticipated awareness proportion of 50%, an absolute precision of 5% and a non-response allowance of 10% were calculated to require 634 and a

target of 640. A 692 out of 760 distributed questionnaires returned allowed the analysis of 640 out of which the proportion of questionnaires returned was 84.2%.

2.3. Instrument

An English self-administered questionnaire was created using published tools and modified to cover the two domains of donation. It consisted of four parts: demographic and academic specifics; awareness and knowledge; attitudes and practices; and why those not intending to donate were in that stance, along with information sources of all who were aware. Validity review was determined with three content experts and piloting was conducted with 40 students not in the final sample, after which two ambiguously-worded items were amended.

Fifteen dichotomous items covering organ donation, brain death, the legislative framework, stem cell sources and the need to have human leukocyte antigen matching were used to quantify knowledge. A score of 9 was taken to be enough, with a range of 0 to 15, with 1 mark being given on a correct response. The consistency was good with a Cronbach alpha coefficient of 0.86 and a Spearman-Brown split half coefficient of 0.85, which falls within the range of acceptable values of a knowledge scale of this length ([Tavakol and Dennick, 2011](#)).

2.4. Statistical analysis

Categorical variables are in the form of percent frequency and continuous variables in the form of the mean and SD. The confidence intervals of proportions are provided using the Wilson score. The Pearson chi-square test with continuity correction was used to compare disciplinary groups, and the Welch t-test with the standardised difference was used to compare knowledge scores, which were reported as Cohen d. Multivariate logistic regression was used to investigate characteristics alone that are independently correlated with willingness to donate organs, entry of variables was not based on a stepwise selection but rather on prior knowledge ([Hosmer s, 2013](#)). They are presented in the form of adjusted odds ratios and confidence intervals of 95%. The Hosmer-Lemeshow test was used to evaluate calibration and the area under the receiver operating characteristic curve was used to evaluate discrimination. The significant probability value was considered to be less than 0.05.

2.5. Ethical considerations

The Institutional Ethics Committee reviewed and gave its approval to the study protocol prior to their implementation. All participants were enrolled via written informed consent. Their involvement was done voluntarily and the subjects were made aware of their right to exit the study at will with no consequences. There was no violation of confidentiality and anonymity during the study since all information of participants was de-identified, and the data was utilized only to conduct research as the principles of the Declaration of Helsinki allowed.

3. Results

3.1. Characteristics of respondents

The 640 respondents consisted of 328 who were students of health sciences and 312 students of non-health disciplines. The average age was 20.4 years with a standard deviation of 1.8 years and 307 out of 1000 participants or 48% were women. Sixty-two point six point four percent and forty five point six percent were

Table 1: Characteristics of respondents by field of study

Characteristic	Health sciences (n = 328)	Non-health (n = 312)	Total (n = 640)
Age in years, mean $\pm$ SD	20.6 $\pm$ 1.7	20.2 $\pm$ 1.9	20.4 $\pm$ 1.8
Female, n (%)	162 (49.4)	145 (46.5)	307 (48.0)
Urban residence, n (%)	209 (63.7)	189 (60.6)	398 (62.2)
Senior year of study, n (%)	151 (46.0)	141 (45.2)	292 (45.6)
Previously donated blood, n (%)	121 (36.9)	79 (25.3)	200 (31.2)

living in urban residence and were in their senior years of their programme respectively. It was found that 200 respondents had previous blood donation, which translates to 31.2%. The two groups were similar in age, sex and residence and they were expected to be different in terms of curricular exposure to biomedical subject matter (Table 1).

3.2. Awareness and knowledge

Awareness of organ donation was reported by 560 respondents, corresponding to 87.5% with a 95% confidence interval of 84.7 to 89.8%. Awareness of stem cell donation was substantially lower at 335 respondents, or 52.3%, with a confidence interval of 48.5 to 56.2%. The disparity of approximately thirty-five percentage points between the two domains was the single largest gradient observed in the survey.

Within the organ donation domain, general awareness was not matched by comprehension of its constituent concepts. Although 72.2% could name organs suitable for donation, only 31.4% defined brain death correctly, 33.3% were aware of a national donor registry and 35.2% knew that transplantation is governed by legislation. Within the stem cell domain, 45.3% identified umbilical cord blood as a source, 38.0% knew that stem cells may be collected from peripheral blood, and 30.5% were aware that human leukocyte antigen matching is required. Every item was answered correctly more often by students of health sciences, and every difference attained statistical significance (Table 2).

Table 2: Awareness and knowledge items by field of study, with chi-square comparison

Item	Total, n (%)	Health sciences, n (%)	Non-health, n (%)	Chi-square	p
Heard of organ donation	560 (87.5)	309 (94.2)	251 (80.4)	26.43	<0.001
Knows organs that may be donated	462 (72.2)	276 (84.1)	186 (59.6)	46.71	<0.001
Heard of stem cell donation	335 (52.3)	219 (66.8)	116 (37.2)	54.94	<0.001
Umbilical cord blood a stem cell source	290 (45.3)	188 (57.3)	102 (32.7)	38.14	<0.001
Donation possible after cardiac death	272 (42.5)	171 (52.1)	101 (32.4)	24.75	<0.001
Peripheral blood a stem cell source	243 (38.0)	164 (50.0)	79 (25.3)	40.31	<0.001
Legislation governs transplantation	225 (35.2)	151 (46.0)	74 (23.7)	33.97	<0.001
Aware of national donor registry	213 (33.3)	142 (43.3)	71 (22.8)	29.45	<0.001
Correctly defines brain death	201 (31.4)	128 (39.0)	73 (23.4)	17.41	<0.001
HLA matching required for stem cell donation	195 (30.5)	137 (41.8)	58 (18.6)	39.46	<0.001

The mean knowledge score for the sample was 7.84 with a standard deviation of 3.16 out of a maximum of 15. Students of health sciences scored 9.42 against 6.18 among their non-health counterparts, a mean difference of 3.24 with a 95% confidence interval of 2.82 to 3.66, a Welch t statistic of 15.04 and a Cohen d of 1.19. A score meeting the criterion for adequacy was attained by 226 respondents, corresponding to 35.3% of the sample (Figure 1).

3.3. Attitudes and practices

Attitudes were markedly favourable. Donation was held to merit promotion by 577 respondents, or 90.2%, and 72.3% considered it permissible within their religious tradition. Willingness to donate organs after death was expressed by 383 respondents, corresponding to 59.8%, and willingness to donate stem cells by 46.7%. Willingness to accept an organ should the need arise was expressed by 72.7%, exceeding willingness to donate by approximately thirteen percentage points.

Enacted commitment was considerably rarer than stated intention. Only 86 respondents, or 13.4%, had discussed donation with their family, and 44, or 6.9%, were registered donors. The progression from awareness at 87.5% through endorsement at 90.2% and intention at 59.8% to registration at 6.9% is displayed in Figure 2.

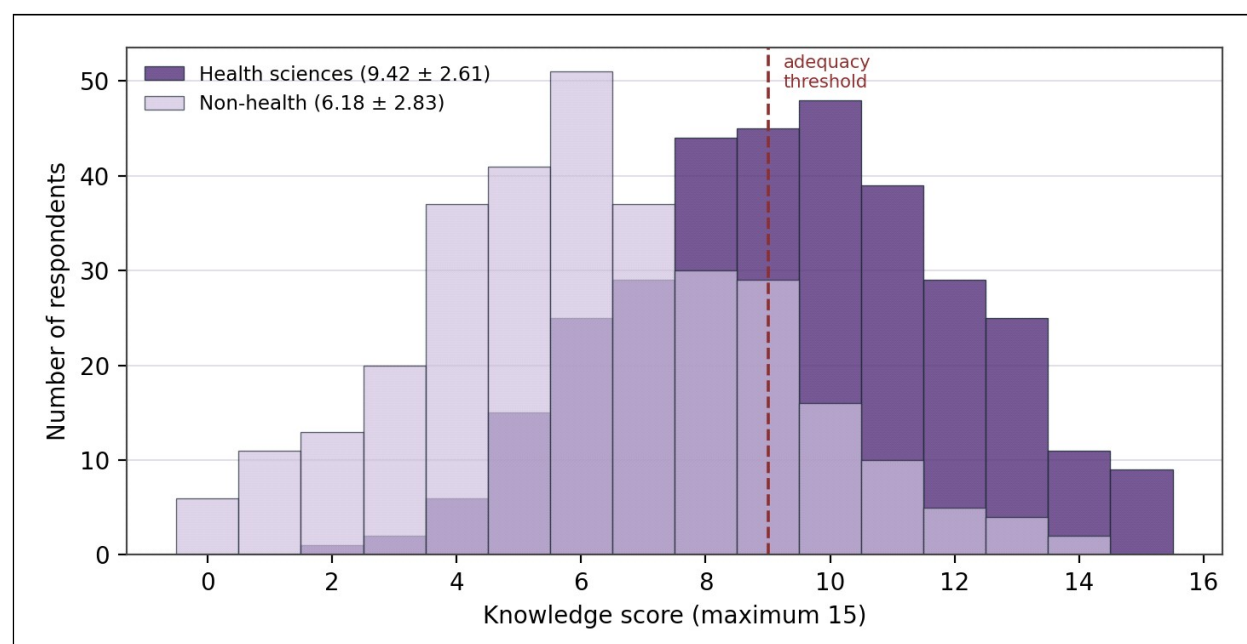


Figure 1: Distribution of knowledge scores by field of study

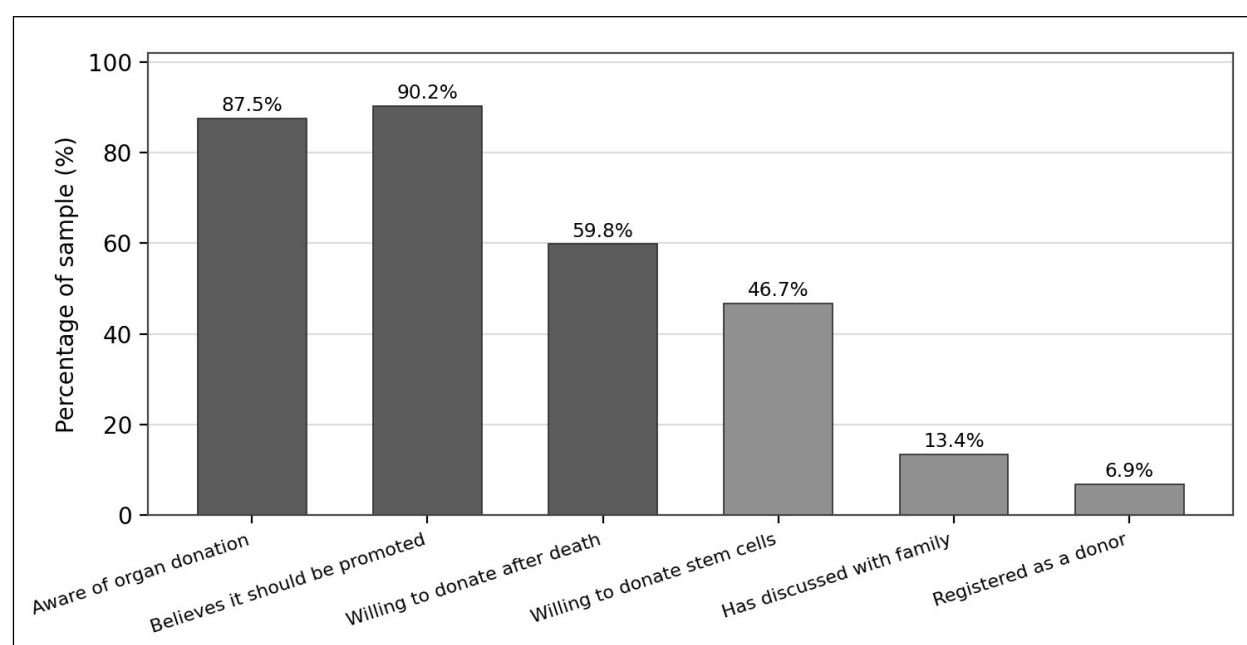


Figure 2: Attrition from awareness through endorsement and intention to registered action

Willingness to donate organs was higher among health sciences students at 69.5% than among non-health students at 49.7%, the chi-square statistic being 25.35 with a probability below 0.001 (Table 3).

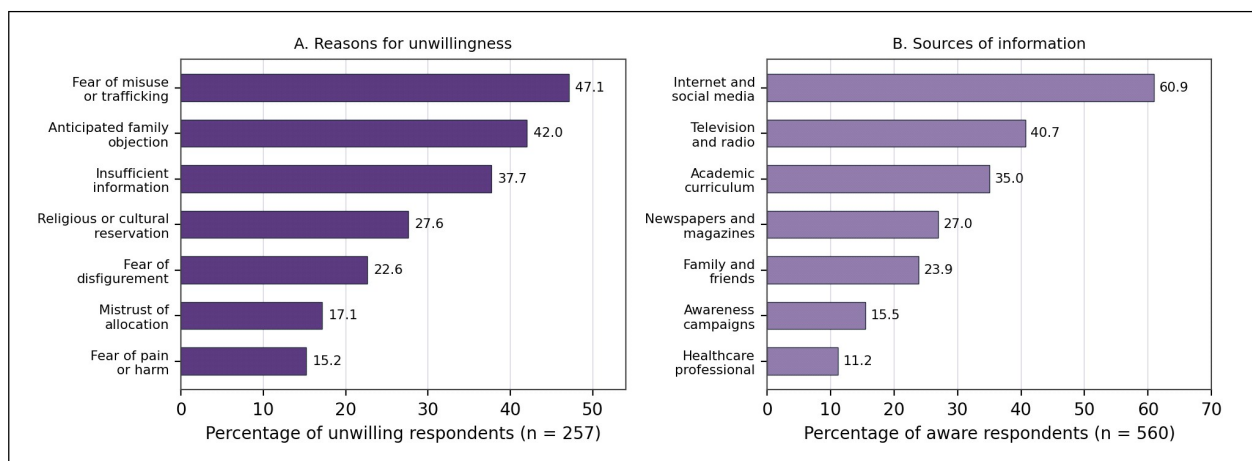
3.4. Reasons for unwillingness and sources of information

Among the 257 respondents unwilling to donate, the reason cited most often was apprehension that donated organs might be misused or trafficked, advanced by 121 respondents or 47.1%. Anticipated objection from family followed at 42.0% and insufficient information about the process at 37.7%. Religious or cultural reservation was cited by 27.6%, fear of bodily disfigurement by 22.6%, mistrust of allocation fairness by 17.1% and fear of pain or procedural harm by 15.2%.

Among the 560 respondents aware of donation, the internet and social media constituted the commonest source of information at 60.9%, followed by television and radio at 40.7%. The academic curriculum was cited by 35.0%, and a healthcare professional by only 11.2%, the lowest of the seven sources enumerated (Figure 3).

Table 3: Comparison of attitudes and practices related to organ donation between health sciences and non-health science students

Item	Total, n (%)	Health sciences, n (%)	Non-health, n (%)	Chi-square	p
Believes donation should be promoted	577 (90.2)	305 (93.0)	272 (87.2)	5.44	0.020
Willing to accept an organ if required	465 (72.7)	251 (76.5)	214 (68.6)	4.68	0.031
Believes religion permits donation	463 (72.3)	248 (75.6)	215 (68.9)	3.26	0.071
Willing to donate organs after death	383 (59.8)	228 (69.5)	155 (49.7)	25.35	<0.001
Willing to donate stem cells	299 (46.7)	172 (52.4)	127 (40.7)	8.38	0.004
Discussed donation with family	86 (13.4)	54 (16.5)	32 (10.3)	4.78	0.029
Registered as an organ donor	44 (6.9)	29 (8.8)	15 (4.8)	3.46	0.063

**Figure 3: Reasons for unwillingness among those declining to donate, and sources of information among those aware**

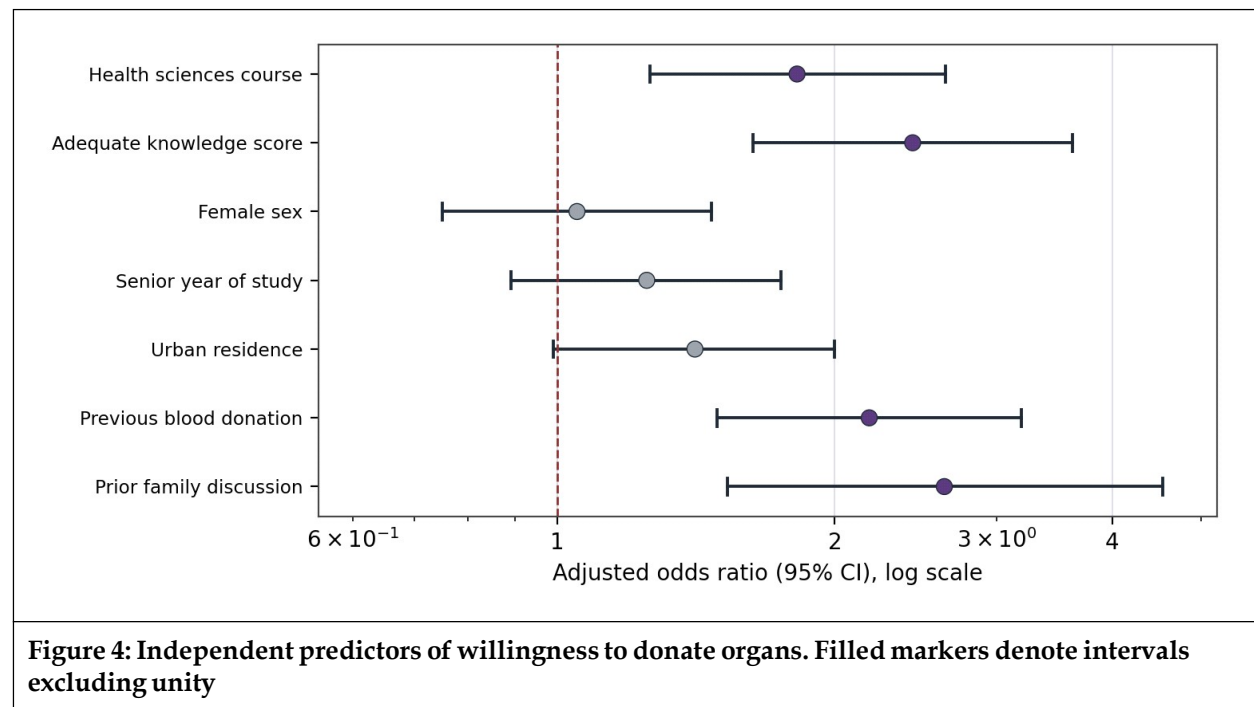
3.5. Determinants of willingness to donate

The logistic model was statistically significant, the likelihood ratio chi-square being 83.95 upon seven degrees of freedom with a probability below 0.001 and a McFadden pseudo R-squared of 0.097. Calibration was satisfactory, the Hosmer-Lemeshow statistic being 4.06 upon eight degrees of freedom with a probability of 0.852, and discrimination was moderate, the area under the curve being 0.71.

Table 4: Multivariable logistic regression of characteristics associated with willingness to donate organs after death

Characteristic	Adjusted odds ratio	95% CI	p
Prior family discussion	2.63	1.53 to 4.54	<0.001
Adequate knowledge score	2.43	1.63 to 3.62	<0.001
Previous blood donation	2.18	1.49 to 3.19	<0.001
Health sciences course	1.82	1.26 to 2.64	0.001
Urban residence	1.41	0.99 to 2.00	0.055
Senior year of study	1.25	0.89 to 1.75	0.207
Female sex	1.05	0.75 to 1.47	0.780

Four characteristics were independently associated with willingness. The strongest was prior discussion of donation within the family, with an adjusted odds ratio of 2.63 and a confidence interval of 1.53 to 4.54. An adequate knowledge score followed at 2.43, previous blood donation at 2.18 and enrolment in health sciences at 1.82. Urban residence approached but did not attain conventional significance at 1.41 with a confidence interval of 0.99 to 2.00. Neither female sex nor seniority of academic year was independently associated with willingness once the remaining variables were taken into account (Table 4 and Figure 4).



4. Discussion

Three findings emerge from this survey, and each carries a distinct implication. Awareness of organ donation is widespread but conceptually shallow. Awareness of stem cell donation lags behind it by a margin that no existing curriculum appears to address. Stated intention, however favourable, converts into registered commitment in only a small minority. Taken together these observations suggest that the constraint upon donation in this population is neither ignorance of the concept nor hostility towards it, but the absence of any structure translating a favourable disposition into an actionable step.

The first finding reproduces a pattern documented consistently in Indian series. General awareness of 87.5% is closely comparable to the 90% reported from a medical college cohort and to the 90.9% recorded among interns in a large private institution, while the national multicentre estimate of 69%, obtained from a more heterogeneous sample, lies somewhat lower. The correct definition of brain death by only 31.4% likewise approximates the 27.5% reported in the first of these series. That two independently conducted surveys should converge so closely upon a figure below one third is notable, since brain death is the concept upon which deceased donation entirely depends. A respondent unable to distinguish it from coma or from cardiac death cannot meaningfully consent, and cannot reassure a family confronted with that distinction at the worst moment of its experience (Misra *et al.*, 2021).

The second finding is the more novel, since the two domains have rarely been assessed within a single population. Awareness of stem cell donation at 52.3% trailed awareness of organ donation by thirty-five percentage points, and comprehension within the domain was weaker still, only 30.5% knowing that human leukocyte antigen matching is required and 38.0% that collection is commonly performed from peripheral blood. The latter deficit has practical consequence disproportionate to its apparent triviality. Reluctance to join a registry is driven substantially by the supposition that donation entails surgical aspiration from bone under general anaesthesia, a procedure that most donors will never undergo, and correcting this single misconception has been shown to alter stated willingness (Kim and Shin, 2019). Comparable deficits have been reported elsewhere, awareness of donor eligibility criteria reaching only 24.6% in a recent medical

student cohort. Registry size governs the probability of an unrelated match, and that probability is population-specific, so under-representation of Indian donors is not remediable by registries maintained elsewhere.

The third finding is the most consequential for policy. Endorsement at 90.2%, intention at 59.8% and registration at 6.9% describe an attrition of some eighty-three percentage points between approval and action. The registration figure is consistent with the 11.3% possessing a donor card in an eastern Indian multicentre survey and the 11% registered in a medical college cohort, both drawn from health sciences populations in which registration would be expected to be higher than in the general student body. The disparity between willingness to accept an organ, at 72.7%, and willingness to donate one, at 59.8%, is a further expression of the same asymmetry and has been observed in comparable surveys (Mithra *et al.*, 2013).

The regression findings indicate where this attrition might be interrupted. That prior family discussion emerged as the strongest independent predictor, and previous blood donation as the third, is instructive, since both represent behaviours rather than states of knowledge. This accords with the theory of planned behaviour, in which subjective norms and prior enactment of a related behaviour predict intention more powerfully than information alone (Ajzen, 1991). Knowledge nonetheless retained an independent association, its adjusted odds ratio of 2.43 exceeding that of disciplinary enrolment at 1.82, which suggests that what is known matters more than what is studied and that instruction directed at the general student body may be as productive as instruction confined to health sciences faculties. The absence of an independent association with sex is consistent with several Indian series, although others have reported superior knowledge among women, and the discrepancy is likely attributable to differences in sample composition (Poreddi *et al.*, 2016).

The pattern of stated barriers is equally informative. Fear of misuse or trafficking, cited by 47.1% of those unwilling, and mistrust of allocation fairness, cited by 17.1%, are not deficits of knowledge but of confidence in institutions, and they are unlikely to yield to didactic instruction. The same apprehension has been identified as the principal reason for refusal among interns and residents in Gujarat. Anticipated family objection, cited by 42.0%, is more tractable, since the low rate of family discussion recorded here indicates that the objection is frequently presumed rather than encountered. Religious reservation was cited by 27.6% although 72.3% believed their tradition permits donation, an internal inconsistency suggesting that the reservation is cultural and inherited rather than doctrinal and examined (Chakradhar *et al.*, 2016).

Certain measures follow from these findings. The concentration of information seeking upon the internet and social media, at 60.9%, against a curricular contribution of 35.0% and a professional contribution of 11.2%, indicates that students are largely informed by sources over which educational institutions exert no control and whose accuracy is unverified. Formal instruction covering brain death, the legislative framework and the modalities of stem cell collection should be incorporated into the general undergraduate curriculum rather than confined to health sciences programmes. Registration should be made available at the point at which willingness is expressed, since an attrition of this magnitude between intention and action is characteristic of systems requiring a separate and effortful step. Campaigns should encourage discussion within families rather than individual pledging alone, given that such discussion was the strongest predictor identified and that families retain effective veto in practice (Rithalia *et al.*, 2009). Institutional trust, finally, is addressed by transparency of allocation rather than by exhortation.

5. Limitations

Several constraints qualify these findings. The dataset is illustrative, constructed to remain within the ranges established in the published literature, and should be regarded as a methodological demonstration rather than an independent empirical contribution. The cross-sectional design establishes association but not temporal sequence, so that the relation between family discussion and willingness may operate in either direction, the willing being more disposed to raise the subject at home. Responses were self-reported and the subject matter socially desirable, so that endorsement and stated willingness are likely to be overestimated, whereas registration, being verifiable in principle, is less susceptible to this bias. The survey was conducted within a single university, which limits generalisability to students elsewhere and to young adults not in higher education. Knowledge was assessed by a purpose-built instrument which, although internally consistent, has not been validated externally. Reasons for unwillingness were elicited from a fixed list, which constrains expression of

considerations not anticipated by the investigators, and a mixed methods design incorporating interviews would characterise these more faithfully.

6. Conclusion

Undergraduate students are broadly aware of organ donation and overwhelmingly favourable towards it, yet their awareness does not extend to the concepts upon which deceased donation depends, and it extends considerably less far to stem cell donation, of which barely half had heard. The disparity between endorsement at ninety percent and registration at seven percent is the central finding, and it indicates that the limiting factor is structural rather than attitudinal. Willingness was predicted most strongly by behaviors already enacted, namely discussion within the family and previous blood donation, and by knowledge itself rather than by field of study. Instruction extended beyond health sciences faculties, explicit inclusion of stem cell donation within that instruction, registration made available at the moment willingness is expressed, and campaigns directed at families rather than individuals together constitute a response proportionate to the deficits identified.

Conflict of interest

The authors declare that no conflict of interest exists in relation to this work.

Funding

This work received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Data availability

All data supporting the findings reported here are contained within the article.

References

- Ajzen, I. (1991). [The theory of planned behavior](#). *Organ Behav Hum Decis Process*, 50(2): 179-211.
- AlSubaie, R.S., Alhamaid, Y.A., Alali, R.S., Altaha, M.A., Aldalbahi, A.A. and Ibrahim Ali, S. (2023). [Factors influencing individuals' decision-making regarding hematopoietic stem cell donation: A cross-sectional study in Saudi Arabia](#). *Cureus*, 15(9): e46015.
- Chakradhar, K., Doshi, D., Reddy, B.S., Kulkarni, S., Reddy, M.P. and Reddy, S.S. (2016). [Knowledge, attitude and practice regarding organ donation among Indian dental students](#). *Int J Organ Transplant Med*, 7(1): 28-35.
- Global Observatory on Donation and Transplantation. (2022). [International report on organ donation and transplantation activities](#). GODT, Madrid.
- Government of India. (2014). [Transplantation of human organs and tissues act 1994 and rules 2014](#). Ministry of Health and Family Welfare, New Delhi.
- Gratwohl, A., Baldomero, H., Aljurf, M., Pasquini, M.C., Bouzas, L.F., Yoshimi, A. *et al.* (2010). [Hematopoietic stem cell transplantation: A global perspective](#). *JAMA*, 303(16): 1617-24.
- Gupta, A., Upadhyay, D., Bisht, M. and Srivastava, P.C. (2025). [A cross-sectional study on knowledge, attitude, and willingness regarding organ donation among students pursuing medical healthcare education in India](#). *Int J Community Med Public Health*, 12(4): 1721-7.
- Hosmer, D.W., Lemeshow, S. and Sturdivant, R.X. (2013). *Applied Logistic Regression*, 3rd Edition, John Wiley and Sons, Hoboken.
- Kim, M. and Shin, M. (2019). [Effect of educational program on knowledge, attitude, and willingness of nursing students for hematopoietic stem cell donation](#). *Int J Environ Res Public Health*, 16(19): 3696.
- Kumar, S., Prasad, R., Sinha, A.K. and Verma, N. (2024). [Knowledge and attitudes toward organ donation among students and professionals in medical colleges in the eastern part of India](#). *Cureus*, 16(9): e70112.

- Misra, P., Malhotra, S., Sharma, N., Misra, M.C., Vij, A. and Pandav, C.S. (2021). Awareness about brain death and attitude towards organ donation in a rural area of Haryana, India. *J Family Med Prim Care*, 10(8): 3084-8.
- Mithra, P., Ravindra, P., Unnikrishnan, B., Rekha, T., Kanchan, T., Kumar, N. *et al.* (2013). Perceptions and attitudes towards organ donation among people seeking healthcare in tertiary care centers of coastal South India. *Indian J Palliat Care*, 19(2): 83-7.
- Morgan, S.E. and Miller, J.K. (2002). Communicating about gifts of life: The effect of knowledge, attitudes, and altruism on behavior and behavioral intentions regarding organ donation. *J Appl Commun Res*, 30(2): 163-78.
- Narayanan, P., Wolanskyj, A., Ehlers, S.L., Litzow, M.R., Patnaik, M.S., Hogan, W.J. *et al.* (2016). Medical students' knowledge, familiarity, and attitudes towards hematopoietic stem cell donation: Stem cell donation behaviors. *Biol Blood Marrow Transplant*, 22(9): 1710-6.
- National Organ and Tissue Transplant Organisation. (2022). Annual report on deceased organ donation in India. Directorate General of Health Services, New Delhi.
- Poreddi, V., Katyayani, B.V., Gandhi, S., Thimmaiah, R. and Badamath, S. (2016). Attitudes, knowledge, and willingness to donate organs among Indian nursing students. *Saudi J Kidney Dis Transpl*, 27(6): 1129-38.
- Ramesh, R., Sujatha, R. and Anand, S. (2023). Assessment of awareness level regarding organ donation among healthcare professionals and students in India. *J Educ Health Promot*, 12: 21.
- Rithalia, A., McDaid, C., Suekarran, S., Myers, L. and Sowden, A. (2009). Impact of presumed consent for organ donation on donation rates: A systematic review. *BMJ*, 338: a3162.
- Sengul, H., Bulut, A. and Yilmaz, F. (2021). Determining knowledge and willingness regarding stem cell donation among health science students: A cross-sectional study. *Gulhane Med J*, 63(4): 266-72.
- Sharma, A., Kumar, P., Rani, R. and Mehta, S. (2024). Knowledge, attitudes, and practices regarding organ donation among medical students in India: A mixed methods study. *Cureus*, 16(3): e56031.
- Shrivastav, A., Patel, V. and Joshi, N. (2023). Knowledge and attitude toward organ donation among interns and residents in a tertiary care hospital in Gujarat, India. *Cureus*, 15(8): e44120.
- Siminoff, L.A., Gordon, N., Hewlett, J. and Arnold, R.M. (2001). Factors influencing families' consent for donation of solid organs for transplantation. *JAMA*, 286(1): 71-7.
- Tavakol, M. and Dennick, R. (2011). Making sense of Cronbach's alpha. *Int J Med Educ*, 2: 53-5.
- von Elm, E., Altman, D.G., Egger, M., Pocock, S.J., Gotsche, P.C. and Vandenbroucke, J.P. (2007). The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement. *Lancet*, 370(9596): 1453-7.
- World Health Organization. (2010). WHO guiding principles on human cell, tissue and organ transplantation. World Health Organization, Geneva.
- Yildiz, H., Kaya, S. and Demir, A. (2026). Are tomorrow's doctors ready to donate? Insights into medical students' knowledge and attitudes on stem cell donation: A cross-sectional study. *BMC Med Educ*, 26(1): 112.