

Knowledge, Awareness and Perceptions of Undergraduate Medical Students Towards Organ and Body Donation: A Cross-sectional Study

MAANYA MEHRA¹, TANAY AGARWAL¹, RONY REJI¹ AND ANOUSHKA KAPILA²

¹MBBS Students, University College of Medical Sciences, University of Delhi, Delhi, India and

²Post-graduate Resident, Department of Pediatrics, University College of Medical Sciences, University of Delhi, Delhi

Correspondence to Dr. Anoushka Kapila, Post-graduate Resident, Department of Pediatrics, University College of Medical Sciences, University of Delhi, Delhi 110095, India. anoushka.kapila@gmail.com, ORCID iD: 0000-0002-2512-876X

Date of initial submission: 18 April, 2023; Date of acceptance: 30 May, 2023

ABSTRACT

Background: There is a wide gap between the number of patients who need transplant and the availability of organ donors in our country. The problem is further compounded by widespread myths surrounding organ donation and lack of awareness among the masses. Medical students being the future doctors can serve as the key links with the society and play a major role in improving this situation.

Materials and Methods: A 20 item interviewer-developed pre-tested and pre-validated questionnaire was administered to undergraduate students pursuing Bachelor of Medicine and Bachelor of Surgery (MBBS) course in the first, second and third professional years of University College of Medical Sciences, Delhi. The questions assessed the students' knowledge (10 items), awareness (5 items) and perceptions (5 items) regarding organ and body donation. Each question had a single correct response. The maximum possible score regarding knowledge and awareness was 15; rated as good (score 11-15), fair (6-10) and poor (0-5). Perceptions were presented as *n* (%) for various possible responses.

Results: A total of 335 responses were analyzed. The mean (\pm SD) score obtained by students was 6.6 (\pm 2.2). The average scores obtained by first, second and third professional year students were 6.5 (\pm 1.7), 6.5 (\pm 2.3) and 6.8 (\pm 2.6) respectively; ($P=0.24$). Increasing education was considered the most important way of improving awareness about organ and body donation while a lack of consensus among family members was regarded as a major deterrent to organ donation. Although, the majority (79.7%) of the students were willing for organ donation or had a positive attitude towards it, very few were willing for body donation (21.8%). A higher proportion of female participants (48%) were willing to opt for organ donation under all circumstances compared to their male counterparts (41.37%), $P=0.26$.

Conclusion: Undergraduate medical students are not appropriately sensitized in the area of organ and body donation. Undergraduate medical training needs to focus on improving students' knowledge and awareness pertaining to organ and body donation and the same must be emphasized in the MBBS curriculum from the very beginning.

Keywords: Cadaver, Donor, Living, Medical curriculum, Transplantation.

INTRODUCTION

Organ donation is a noble act by which a single person can save up to eight lives and leave behind a legacy of hope and selflessness. It has been more than half a century since the first human kidney transplant took place in India in 1965, but the rates of organ donation in our country still remain dismal, as depicted in **Box I**.¹ The living donor organ transplant (LDOT) rates in India are amongst the world's highest. In contrast, the deceased donor organ transplant (DDOT) rate in India is 0.34/million population as of 2016 which is amongst the world's lowest, accounting for <10% of all transplants in India.^{2,3} Such poor rates of DDOT

have been attributed to illiteracy and poverty resulting in poor awareness, as well as religious and socio-cultural factors which prove to be barriers to organ donation and transplantation (ODT). In some southern states of India like Tamil Nadu, the organ donation rates are much better, higher literacy rates being the probable reason.⁴

Doctors and nursing staff serve as the key links with the society and can play a major role in encouraging families of deceased and healthy volunteers to consider organ donation. Medical students, being the future doctors, play an equally important role towards this cause. Unfortunately, studies have revealed that Indian medical

Box I. Organ Donation & Transplantation Status in India

1. Number of patients with renal failure: 1,80,000
2. Number of renal transplants done: 6,000
3. Number of patients who die of liver failure or cancer annually: 2,00,000 (about 10-15% of whom can be saved with a timely liver transplant)
4. Number of liver transplants needed annually: 30,000
5. Number of liver transplants performed: 1500
6. Annual cases of heart failure: 50,000
7. Number of heart transplants are performed annually: 10-15
8. Annual corneal transplant requirement: 1,00,000
9. Number of annual corneal transplants: 25,000

students lack adequate knowledge and awareness regarding organ donation.⁵⁻⁷ This lack of sensitization may be attributed to limited academic and clinical exposure in this area from the beginning of their medical career.

The discussion on body donation starts as first professional year students step foot into the Anatomical Dissection Laboratory and undertake the Cadaveric Oath (**Box II**), pledging to always treat the cadaver with respect and dignity. In the second professional year, the immunological basis of organ donation is discussed along with immunosuppressive drugs. Community Medicine and Forensic Medicine deal with the ethical and legal aspects of organ donation, including Transplantation of Human Organs Act, while the concept of eye bank and bone bank is also introduced. In the final year, medico-legal, socio-economic and ethical issues pertaining to organ donation are discussed in Internal Medicine while in General

Box II. The Cadaveric Oath

I, (name), a student of first year MBBS, (Batch) of (college) solemnly pledge-

- To respect the cadaver and treat this once living person with compassion and dignity as I use it to further my professional goals.
- To show due respect and gratitude towards this cadaver who will always remain my first teacher.
- To pay gratitude towards the next of kin of the donors for their endeavours in serving society selflessly.
- To always emulate this act of the donor to provide quality health service to the society and to enhance the lives of all mankind.

Surgery, students are taught the indications, principles and management of organ transplantation. However, often there are limited teaching hours devoted to this topic with even lesser time for discussion and problem solving.⁸ Students pursuing Bachelor of Medicine and Bachelor of Surgery (MBBS) in the final professional year have been shown to lack in-depth knowledge about organ donation and are not adequately equipped to deal with practical encounters wherein they can act as promoters for organ donation.⁴

This study was conducted to assess and compare the basic knowledge, awareness and perceptions regarding organ and body donation among first, second and third professional year undergraduate medical students with an intent to identify the lacunae in the MBBS curriculum regarding organ and tissue donation.

MATERIALS AND METHODS

A cross-sectional study was conducted over a period of one month (February 2023) among the undergraduate students pursuing Bachelor of Medicine and Bachelor of Surgery (MBBS) at the University College of Medical Sciences, Delhi. The study was approved by the Institutional Ethics Committee for Human Research of University College of Medical Sciences, Delhi (IECHR-2023-58-9).

Students of the first year, second year and third professional years (*viz.* MBBS admission year 2022, 2021 and 2020) were enrolled. All batches had been sensitized to organ donation during the Foundation Course in the first year of MBBS training under the new CBME curriculum. Additionally, the second and third professional year MBBS students had also been exposed to the concepts of organ and tissue donation and transplantation during their clinical exposure sessions of their MBBS curriculum.

The questionnaire was designed, keeping in mind the knowledge gained by students regarding organ and body donation in the first three professional years of undergraduate MBBS training. The questionnaire had been validated by administering it to five senior faculty members experienced in organ donation and was then pre-tested on a group of 10 undergraduate students to refine it further. The final questionnaire consisted of 20 items which assessed their knowledge (10 questions), awareness (5 questions) and perceptions (5 questions) regarding organ and body donation. A single response was permitted for questions assessing perception and the response with which the students identified the most was captured; questions on knowledge and awareness also had a single correct answer. The questionnaire was administered using an online google form, the link for which was shared in the WhatsApp groups of the three

MBBS batches at the end of a large group teaching session. An informed consent was integrated in the google form and was obtained from all participants to use the data for study purposes.

The students were then given 20 minutes to respond and submit their responses. The anonymity of responses from all participants was ensured. The correct responses of the questions on knowledge and awareness regarding organ donation practices were scored as 1, while the incorrect responses were given a score of 0. The maximum possible score regarding knowledge and awareness was 15. A score of 11-15 was regarded as good while a score of 6-10 was rated as fair and a score ≤ 5 as poor. The questions pertaining to perceptions were not scored but responses were recorded as n (%).

Sample size estimation: Based on previous studies amongst medical under-graduate students from India, wherein the prevalence of knowledge regarding organ donation practices in India has varied widely from 48% to 88%.^{4,5,7} Assuming an average prevalence of knowledge regarding organ donation practices in India as 70% amongst medical students, a sample size of 323 was needed to have a confidence interval of 95% with 5% alpha error.

Statistical analysis: Demographic characteristics were presented as descriptive statistics. The mean (\pm SD) scores obtained by the medical students in the three admission years were compared using ANOVA test. The mean (\pm SD) scores obtained by the male and female participants were compared using the Student's t-test. The students' perception regarding organ and body donation were presented as n (%).

RESULTS

Out of a total of 170, 171 and 172 medical students in the first, second and third year MBBS batches respectively, we were able to approach 138 (81.1%), 95 (55.5%) and 102 (59.3%) students in their respective teaching sessions, all of whom consented and submitted their responses. A total of 335 responses were analyzed. The demographic characteristics of study participants are shown in **Table I**. Overall, the age of the participants of the study ranged from 17 to 25 years with a mean (\pm SD) age of 20.1 (\pm 1.4) years. Majority of the participants were males (69.3%) and most of the respondents were residents of Delhi and National Capital Region (54%). Majority of the respondents were Hindu by religion (85.7%) followed by Islamic faith (8.7%).

Table II depicts the comparative knowledge and awareness scores achieved by students in the three batches. The scores ranged from 0-12 points with an overall mean (\pm SD) score of 6.6 (\pm 2.2). The mean (\pm SD) score was highest in the participants belonging to the third professional year, although the difference in the mean (\pm SD) scores of the three professional years was not statistically significant ($P=0.24$). Overall, only 3.9% ($n=13$) students attained good scores on knowledge and awareness domains, while 62.7% ($n=210$) and 33.4% ($n=112$) students attained fair and poor scores respectively. The proportion of participants with good scores (score ≥ 11) was significantly higher in the second ($n=6$) compared to the first professional year ($n=1$) ($P=0.02$), likewise in the third ($n=6$) compared to the first professional year ($P=0.02$). However, no significant difference was found on comparing the percentage of students receiving poor or fair scores between the first, second and third professional

TABLE I. Demographic Profile of Study Participants

	First Professional Year (Batch 2022, $n=138$)	Second Professional Year (Batch 2021, $n=95$)	Third Professional Year (Batch 2020, $n=102$)	Total ($n=335$)
Age (years)	19.2 (\pm 1.2)	20.3 (\pm 1.1)	21.1 (\pm 1.1)	20.1 (\pm 1.4)
Sex				
Male	96 (69.6%)	60 (63.2%)	76 (74.5%)	232 (69.3%)
Female	42 (30.4%)	35 (36.8%)	25 (24.5%)	103 (30.4%)
Others	0	0	1 (1%)	1 (0.3%)
Religion				
Hinduism	119 (86.2)	80 (84.2%)	88 (86.3%)	287 (85.7%)
Islam	11 (8%)	13 (13.7%)	5 (4.9%)	29 (8.7%)
Others	8 (5.8%)	2 (2.2%)	9 (8.8%)	19 (5.6%)
State/UT				
Delhi/NCR	60 (43.5%)	68 (71.6%)	52 (50.9%)	181 (54.0%)
Others	78 (56.5%)	27 (28.4%)	50 (49.1%)	154 (46%)

TABLE II. Knowledge and Awareness Scores of Study Participants

	<i>First Professional Year (Batch 2022, n=138)</i>	<i>Second Professional Year (Batch 2021, n=95)</i>	<i>Third Professional Year (Batch 2020, n=102)</i>	<i>Total (n=335)</i>	<i>P value</i>
Mean (\pm SD)	6.5 (\pm 1.7)	6.5 (\pm 2.3)	6.8 (\pm 2.6)	6.6 (\pm 2.2)	0.24
Good score [#]	1 (0.7%)	6 (6.3%)	6 (5.9%)	13 (3.9%)	0.04*
Fair score [#]	95 (68.8%)	51 (53.7%)	64 (62.7%)	210 (62.7%)	
Poor score [#]	42 (30.4%)	38 (40%)	32 (31.4%)	112 (33.4%)	

*Statistically significant, [#] Expressed as n (%)

Good score: 11-15, Fair score: 6-10, Poor score: 0-5

years. The percentage of correct responses to the questions administered to evaluate knowledge and awareness of students is depicted in **Table III**.

Table IV depicts the perceptions of students regarding organ and body donation. Increasing education and awareness among masses was regarded as the most important element required to increase organ donation rates by all the three batches. Lack of consensus among family members was regarded as the major deterrent to organ donation. 43.3% of respondents were willing to pledge their organs after death (irrespective of any situation)

while 20.3% were not willing at all. In contrast, a minor proportion of 21.8% medical students were willing to donate their bodies for cadaveric dissection and medical research. A higher proportion of female participants (48%) were inclined to donate their organs under all circumstances compared to their male counterparts (41.37%), $P=0.26$.

DISCUSSION

We found that the undergraduate MBBS students across the first, second and third professional years only have a

TABLE III. Knowledge and Awareness About Organ and Body Donation Amongst Study Participants

<i>Questions</i>	<i>Correct responses</i>			
	<i>First Professional Year (Batch 2022, n=138)</i>	<i>Second Professional Year (Batch 2021, n=95)</i>	<i>Third Professional Year (Batch 2020, n=102)</i>	<i>Total (n=335)</i>
1. Final death is defined as ^{#,^}	26 (18.8%)	22 (23.1%)	66 (64.7%)	114 (34%)
a) Putrefaction of all tissues				
b) Complete unresponsiveness				
c) Coma, apnea, brainstem areflexia				
d) Pulselessness				
2. Organs can be retrieved in ^{\$.#}	74 (53.6%)	68 (71.5%)	48 (47.1%)	190 (56.7%)
a) Cardiac death only				
b) Respiratory arrest only				
c) Brain death only				
d) Either a or c				
3. Which of the following diseases is cured by organ transplantation?	86 (62.3%)	62 (65.3%)	60 (58.7%)	208 (62.1%)
a) Acute Kidney Injury				
b) Pneumonia				
c) Myocardial infarction				
d) Acute liver failure				
4. Which of the following organs has the shortest viability after organ retrieval?	56 (40.6%)	35 (36.8%)	46 (45.1%)	137 (40.1%)
a) Liver				
b) Kidney				
c) Heart				
d) Cornea				

contd....

Table III *contd. from pre-page*

Questions	Correct responses			
	First Professional Year (Batch 2022, n=138)	Second Professional Year (Batch 2021, n=95)	Third Professional Year (Batch 2020, n=102)	Total (n=335)
5. Which of the following organs can regenerate after donation? ^{§, #} a) Liver b) Kidney c) Pancreas d) Cornea	118 (85.5%)	70 (73.7%)	92 (90.2%)	280 (83.6%)
6. What is the apex body for activities relating to procurement, allotment and distribution of organs in India? [#] a) National Organ and Tissue Transplantation Organization b) Donation and Transplantation Regulation Authority of India c) Transplantation Organization of India d) Organ and Blood Donation Organization of India	81 (58.7%)	46 (48.4%)	69 (67.6%)	196 (58.5%)
7. How many lives can be saved by a live and deceased donor respectively? [§] a) 2,8 b) 3,7 c) 3,8 d) 2,7	34 (24.6%)	34 (35.8%)	31 (30.4%)	99 (29.5%)
8. What is the eligibility age for being a live donor in India? a) ≥21 years b) ≥18 years c) ≥12 years d) No minimum age specified	79 (57.2%)	51 (53.7%)	56 (54.9%)	186 (55.5%)
9. State if True or False ^{§, ^} If I register as a donor, I am making a legal decision that cannot be revoked by my parents/ legal guardians once I turn 18 True False	30 (21.7%)	31 (32.6%)	37 (36.3%)	98 (29.2%)
10. Which is the preferred source of organ donation? a) Living genetically related b) Living unrelated c) Deceased genetically related d) Deceased unrelated	25 (18.1%)	19 (20%)	28 (27.5%)	72 (21.5%)
11. Which of the following laws relates to organ donation in India? a) Uniform Anatomical Gift Act (1968) b) Presumed Consent Legislation (1979) c) Organ Donation Act (1991) d) Transplantation of Human Organs and Tissue Act (1994)	50 (36.2%)	28 (29.5%)	27 (26.5%)	105 (31.3%)

contd....

Table III *contd. from pre-page*

Questions	Correct responses			
	First Professional Year (Batch 2022, n=138)	Second Professional Year (Batch 2021, n=95)	Third Professional Year (Batch 2020, n=102)	Total (n=335)
12. Who decides the legitimacy of organ donation in India? [^]	57 (41.3%)	35 (36.8%)	26 (25.5%)	118 (35.2%)
a) Near relative				
b) Religious head				
c) Medical Superintendent of Hospital				
d) Act of Law				
13. Which is the usual place for donating organs after death	55 (39.9%)	44 (46.3%)	38 (37.3%)	137 (40.9%)
a) Hospital morgue				
b) Medical ICU				
c) Embalming center				
d) Funeral ground				
14. Which is the NGO for organ donation in India?	56 (40.6%)	40 (42.1%)	46 (45.1%)	142 (42.4%)
a) Goonj				
b) MOHAN Foundation				
c) Care India				
d) Smile Foundation				
15. Which is the most common solid organ transplant in India? ^{#,^}	68 (49.3%)	39 (41.4%)	25 (24.5%)	132 (39.4%)
a) Kidney				
b) Liver				
c) Heart				
d) Cornea				

Correct response is mentioned in bold font.

[§] $P < 0.05$ between Batch 2022 and Batch 2021

[#] $P < 0.05$ between Batch 2021 and Batch 2020

[^] $P < 0.05$ between Batch 2022 and Batch 2020

fair level of knowledge of this topic. It's heartening to note that the majority of students are willing to sign up for organ donation or have a positive attitude towards it (79.7%). These findings are similar to those obtained in other studies.¹⁰⁻¹² Although, majority of the students were familiar with National Organ and Tissue Transplantation Organisation (NOTTO) as the chief organization for regulating organ donation and transplantation in India, only 29.5% of students were aware of the number of lives a person is capable of saving through living and deceased organ donation. Despite studying in one of the premier colleges of India, students lacked in-depth knowledge about organ donation which emphasises the need to make the curriculum of MBBS students more robust.

Majority students were of the perception that a person's decision of organ donation cannot be revoked later. According to the Indian Law, next of kin/close relatives of the patients hold complete right to opt out of

organ/body donation even if the deceased person was a registered donor. Students are aware of the preferred source of organ donation and about brain death being the eligibility criteria for deceased organ donation.

The common perception across all three batches was that improving education is the best way forward to promote organ and body donation in the society. Legal coercion has also been considered a viable option, that is, implementation of the opt-out system in place of the present opt-in system of organ donation in India, as is a practice in several other countries like Spain, Austria and Belgium with better organ donation rates.¹³ Monetary incentives to increase organ donation rates was not considered a good measure by the students which contradicts the study by Chandrasekaran, *et al.*¹⁴ Even though 26.9% students believed that a person's religious and cultural beliefs can be an impediment to organ donation, using religious authorities to promote organ donation was not

TABLE IV. Perceptions of Study Participants About Body and Organ Donation

	First Professional Year (Batch 2022, n=138)	Second Professional Year (Batch 2021, n=95)	Third Professional Year (Batch 2020, n=102)	Total (n=335)
1. What is the best way to promote organ donation in the society?				
a) Legal coercion	3 (2.2%)	18 (18.9%)	28 (27.5%)	49 (14.6%)
b) Education	123 (89.1%)	61 (64.2%)	66 (64.7%)	250 (74.6%)
c) Promotion through Religious authorities	4 (2.9%)	11 (11.6%)	2 (2%)	17 (5.1%)
d) Paid remuneration	8 (5.8%)	5 (5.3%)	6 (5.9%)	19 (5.7%)
2. Which factor do you feel hinders organ donation?				
a) Malpractices	21 (15.2%)	24 (25.3%)	24 (23.5%)	69 (20.6%)
b) Legal obstacles	9 (6.5%)	11 (11.6%)	19 (18.6%)	39 (11.6%)
c) Lack of consensus among family members	58 (42%)	36 (37.9%)	42 (41.2%)	136 (40.6%)
d) Religion	50 (36.2%)	24 (25.3%)	16 (15.7%)	90 (26.9%)
e) Lack of Awareness	0	0	1 (1%)	1 (0.3%)
3. Are you willing to pledge your organs after death				
a) Only for my close relatives/friends	26 (18.8%)	18 (18.9%)	23 (22.5%)	67 (20%)
b) Only if my family is paid	17 (12.3%)	16 (16.8%)	22 (21.6%)	55 (16.4%)
c) Yes in all situations	63 (45.7%)	40 (42.1%)	42 (41.2%)	145 (43.3%)
d) No	32 (23.2%)	21 (22.1%)	15 (14.7%)	68 (20.3%)
4a. Are you willing to donate your body for cadaveric dissection for training of medical students?				
a) Yes	26 (18.8%)	12 (12.6%)	35 (34.3%)	73 (21.8%)
b) No	51 (37%)	54 (56.8%)	47 (46.1%)	152 (45.4%)
c) Not sure/Maybe	61 (44.2%)	29 (30.5%)	20 (19.6%)	110 (32.8%)
4b. If, no/not sure, why	112	83	67	262
a) Cadavers are disrespected	27 (24.1%)	5 (6%)	16 (23.9%)	48 (18.4%)
b) I do not want my body mutilated	27 (24.1%)	31 (37.3%)	19 (28.4%)	77 (29.5%)
c) Religious/cultural beliefs	27 (24.1%)	21 (25.3%)	20 (29.8%)	68 (26%)
d) Fear of malpractice and misuse of body	26 (23.2%)	22 (26.5%)	11 (16.4%)	59 (22.5%)
e) Not thought about it	2 (1.8%)	2 (2.4%)	1 (1.5%)	5 (1.9%)
f) Dissection can be learnt virtually	1 (0.9%)	1 (1.2%)	0	2 (0.7%)
g) Family restrictions	2 (1.8%)	1 (1.2%)	0	3 (1%)
5. Do you think it is ethical to use unclaimed bodies for the purpose of cadaveric dissection in medical training?				
a) No	41 (29.7%)	26 (27.4%)	26 (25.5%)	93 (27.8%)
b) Yes	65 (47.1%)	39 (41.1%)	56 (54.9%)	160 (47.8%)
c) Not sure/Maybe	32 (23.2%)	30 (31.6%)	20 (19.6%)	82 (24.5%)

Values expressed as n (%).

^{\$}P<0.05 between Batch 2022 and Batch 2021

[#]P<0.05 between Batch 2021 and Batch 2020

[^]P<0.05 between Batch 2022 and Batch 2020

considered as an effective measure. Lack of consensus among family members was considered the major cause behind lack of donations, followed by fear of malpractice and legal obstacles. These findings are similar to those reported by Rasanian, *et al.*⁷ In order to overcome such concerns, organ donation and transplantation are strictly regulated by the 'Transplantation of Human Organs and Tissue Act (1994)'.¹⁵ However, most students were even unaware of the existence of this act which was established

to strictly regulate illegal practices in organ donation. While the majority of the students supported organ donation and were willing to donate organs irrespective of any situation, some chose to step forward only for their close relatives and friends. In our study, a higher proportion of female participants (48%) were willing to donate their organs under all circumstances compared to males (41.37%). A similar gender disparity has been observed in some studies on kidney donors in India which

showed that the majority of donors were females.^{16,17} The female psyche has been shown to be more associated with altruism, self-sacrifice and discipline in many studies which have studied the impact of gender on organ donation behaviour.

While, majority of the participants believed it is ethical to use unclaimed bodies for the purpose of cadaveric dissection in medical training, which is a common practice, strictly regulated by The Human Anatomy Act, Delhi, 1953.¹⁸ Unfortunately, there was a significant lack of enthusiasm in the responses to body donation with only 21.8% participants showing willingness. The major factors leading to such a result were found to be common across many studies.^{7,19,20} The cadaveric oath in the first year of college does not make us realise that the noble act of pledging one's entire physical being to medical education mostly falls upon the unidentified departed souls, rendering us unable to even give them a suitable eulogy. It is sad and unfair that this act is not amongst the most honourable sacrifices.

It is important to evaluate the existing level of knowledge and attitude regarding organ donation to come up with effective educational strategies. Our study indicates that the curriculum in the first three years of MBBS is not encouraging students to gain knowledge regarding organ donation. There is no significant difference in the scores achieved by the three batches showing that the curriculum has not helped them gain enough knowledge even though their duration of medical education differs by a span of one year and two years respectively. These results are similar to a study conducted by Bedi, *et al.* who found that the knowledge of the medical students did not improve on progressing through medical school.¹²

There is not just a lack of knowledge among medical professionals but also a sense of discomfort with the subject of organ donation which can only be changed by emphasizing its importance at an early stage of their training.^{21,22} The way doctors communicate with patients and attend to their concerns has shown to have a great impact on their decision making. Essman and Thornton in their study concluded that students exposed to coursework regarding organ donation are better able to handle patients' doubts in a real-life setting.²³ In a study in Cleveland, they developed a course for medical students to familiarise them with the process of organ and tissue donation. Some students were able to observe an organ donor recovery, and all of them described that as a memorable experience and the most powerful and inspirational part of the course was the final class where the recipient and the donor families came together to share their stories.²⁴ A study in Germany showed how one lecture on

organ donation led to a significant change in the perception of students toward organ donation.²²

There is an increasing gap between the demand and availability of organs. Evidently, this issue is shared by many countries as the total number of deceased organ donors after brain death in 2022 were just 303 in all of Southeast Asia.²⁵ Thus, with the rapidly increasing requirement for organ transplants, it is the need of the hour to spread awareness among the health professionals, present and future, and the society at large. Irving, *et al.* proved that knowledge and information level have the greatest influence on taking the decision to become a donor.²⁶ In our country this has become a matter of national health, as highlighted in the National Organ Transplant Programme and also by the honourable Prime Minister Mr. Narendra Modi in his "Mann ki Baat" sessions with the masses.²⁷ In 2012, Facebook allowed its members to mention in their profile if they are "organ donors" and Cameron, *et al.* studied that this significantly increased organ donor registrations.²⁸ In a study on the knowledge and attitude towards organ donation among people in Kozhikode, Kerala, they found that 81% of the respondents had heard about organ donation from electronic media, whereas only 11% had heard from health care workers.²⁹ D'Alessandro, *et al.* demonstrated that social-based communications had an impact on actual donor registration. Students have a very high usage of social media and often use personal and electronic communication to access information about social causes and show their support.³⁰ Medical students should use their technological savviness to their advantage and promote use of social media as a tool to increase awareness and motivate their peers and masses for organ donation. Interestingly, to tackle misinformation in Germany, every health insurance fund is required to inform their clients about organ donation once in every two years.³¹

It was shown that only 47.5% of families of registered potential donors gave consent to organ donation.³² Thus, it is important to encourage students to discuss the idea of organ donation with families and the importance of honouring such decisions after death. For all this to have an impact, we need to establish organ and tissue transplantation facilities in medical colleges as close observation of the process is what influences students the most.

Our study also highlights the important issue of "dehdaan" which is not given its due importance. We need to promote body donation since cadaveric dissection is important not only for medical or surgical education but is the foundation of essential values in the life of a doctor such as respect, dignity and gratitude. This process of sensitization of students must start right at the beginning

of their training because it has many aspects which need to be addressed which include emotional, ethical, legal, medical, logistical and cultural behaviours.

The main strength of our study is the use of a validated tool to assess in-depth knowledge of medical students. Unlike previous studies wherein even knowledge has been assessed using questions with yes or no type of responses, our questionnaire evaluated students using multiple choice questions. However, the limitation of our study is that it did not assess the knowledge of residents and faculty who are the providers of knowledge to these undergraduate students.

Our study emphasizes that undergraduate medical students are not appropriately educated and sensitized in the area of organ and body donation; hence, there is a need to strengthen the MBBS curriculum on this aspect. This may be supported by regular workshops and guest lectures along with innovative teaching-learning methods like quiz and enactment for better understanding and involvement of the students. Introduction of students to basics of *tissue* and *organ* transplantation during their clinical postings as well as offering them exposure during their elective postings can be a way forward to improve the status of organ donation in India.

CONTRIBUTORS: TA, RR, MM: Conceptualization and designing the questionnaire; AK: Provided critical inputs and coordinated with faculty for validation of questionnaire; MM, AK, TA, RR: Acquisition and analysis of data. All authors were involved in drafting the work and revising it. All authors approved the final version and are accountable.

COMPETING INTEREST: None; FUNDING: Nil

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