

# Assessment of Knowledge, Attitudes, and Practices toward Organ Donation and Transplantation among the General Population of India: A Community-Based Study

Aman Rajadhyaksha<sup>1</sup>, Amit Dias<sup>2</sup>, Siddhi Savoiverekar<sup>1</sup>, Anisha Sukhtankar<sup>1</sup>, Dhruv Shah<sup>1</sup>, Gargi Manerkar<sup>1</sup>, Pratiksha Kerkar<sup>1</sup>, Shruthi Naik<sup>1</sup>, Lydia Dias<sup>3</sup>

<sup>1</sup>Medical Intern, Goa Medical College, Bambolim, Goa, India, <sup>2</sup>Assistant Professor, Department of Preventive and Social Medicine, Goa Medical College, Bambolim, Goa, India, <sup>3</sup>Assistant Lecturer, Department of Microbiology, Goa Medical College, Bambolim, Goa, India

## Abstract

**Background:** Organ donation is yet to gain momentum in India. One of the major concerns of organ shortage in the country is the lack of knowledge among public and various myths and misconceptions. This study aimed to assess the knowledge, attitude, and practices toward organ donation among the general population of India.

**Methods:** It was a cross-sectional study conducted on 800 participants from various parts of India. Data was collected using an online questionnaire on Google Forms which comprised closed and open-ended questions assessing knowledge, attitudes, and practices regarding organ donation in the community.

**Results:** Out of 800 participants, 43.87% were males and 56.12% were females. Majority belonged to the younger age group (72.25%). Most of the respondents (98%) were aware of the term organ donation while only 65.5% actually understood the concept. Despite 48.4% of the respondents showing their willingness to donate, only 10.4% of the participants had pledged. Internet (64.1%) and mass media (57.2%) were the sought-after sources of information regarding organ donation.

**Conclusion:** Several gaps in knowledge, attitudes, and practices were found and reiterates the need for a more intensified interdisciplinary discussion and planning to educate and motivate the general population to pledge to donate their organs.

**Key words:** Organ donation, Gaps in knowledge, Attitudes, Practices, Religion, Sources of information

## INTRODUCTION

Organ transplantation is the process of replacing diseased organs or tissues with healthy one's for therapeutic purposes.<sup>[1]</sup> According to a survey in India, every year about 5 lakh people die because of non-availability of organs, and 1.5 lakh people await a kidney transplant, but only 5,000 among them get it and the bottleneck is the availability of organs.<sup>[2]</sup> Organ donation is yet to gain momentum in India

and organ donation following brainstem death is abysmally infrequent since the need for organ transplantation is much higher than availability.<sup>[3]</sup> Organ shortage in the country can be attributed to lack of awareness among public, myths, and misconceptions hampering organ donation due to religious and cultural barriers.<sup>[3,4]</sup> Hence, imparting the correct knowledge is quintessential for the success of organ donation program in India. Health-care professionals are the critical link in augmenting public awareness about organ donation. Their attitudes and beliefs can influence the public opinion. Knowledge, attitude, and actions are interrelated and external influences also participate in decision-making.

In India, the Transplantation of Human Organs Act (THOA) was enacted in 1994.<sup>[4]</sup> Yet the rate of organ donation in India is poor (0.08/million population/year) as

### Access this article online



www.ijss-sn.com

Month of Submission : 04-2023  
Month of Peer Review : 04-2023  
Month of Acceptance : 05-2023  
Month of Publishing : 05-2023

**Corresponding Author:** Dr. Amit Dias, Assistant Professor, Department of Preventive and Social Medicine, Goa Medical College, Bambolim, Goa, India.

compared to developed countries.<sup>[5,6]</sup> Even after getting on the waiting list there is still a 10–30% chance for not getting a transplant.<sup>[7]</sup> THOA defines brainstem death as “the stage at which all functions of the brainstem have permanently and irreversibly ceased.”<sup>[8]</sup> People can sign up as a donor after the age of 18. Any individual under 18 years of age can register as a donor only after family’s consent.

This study was conducted with the aim of understanding the knowledge, attitudes, and practices regarding organ donation among the general population. We also evaluated the sociodemographic factors associated with this behavior, to suggest solutions and interventions to overcome them.

## MATERIALS AND METHODS

### Study Setting

The study based in Goa was conducted on 800 participants from all over India over a period of 3 months (July–October 2020). Based on a review of similar literature, it was found that 56.67% (p) of people were willing to donate their organs.<sup>[9]</sup> Taking a 95% confidence level ( $z\alpha$ ), 2.5% relative error(d) of 56.67% prevalence rate(p), a sample size of approximately 770 participants was calculated by applying the formula:-

$$N = (z\alpha)^2 * \frac{p * q}{d^2}$$

### Study Design

The study was a descriptive cross-sectional study. The study population included all adults ( $\geq 18$  years), who gave their consent. The exclusion factors in the study were, if the participant denied giving consent, was not a resident of India or was  $< 18$  years. A pre-designed and pretested structured questionnaire was developed and circulated online through the Google Forms portal to abide by the social distancing norms owing to the Covid-19 crisis. The questionnaire was in English and captured the socio-demographic information and assessed the knowledge, attitudes, and practices regarding organ donation in the community.

### Sampling

Data collected were cleaned for any errors and duly transferred into Microsoft Excel 2019 (v.16.0.12026.20174) and SPSS (v.1.0.0.1406). Simple proportions and percentages were calculated and suitable tests of significance were used to study associations between the attributes. *P* value of  $< 0.05$  was considered significant. Four major domains in the study were, socio-demographic characteristics which included variables such as name, age, and sex; knowledge of the respondents was assessed through questions regarding meanings of the terms “organ donation” and

“brain death” etc.; attitudes regarding organ donation was determined through questions such as willingness to donate and influence of religion; practices were measured by enquiring about actual donations, possession of organ donor card, etc.

### Ethical Requirements

Ethical clearance was obtained from the Institutional Ethics Committee of Goa Medical College, Bambolim, Goa. Confidentiality of responses and informed consent were maintained.

A pilot study was conducted on 10 volunteers, out of which, 5 were males and 5 females; 5 belonged to the younger age group, 3 were middle-aged and 2 were elderly individuals. All the volunteers were made to answer the questionnaire and provide feedback on the same. The suggestions were then studied, and discussed with experts in the field and the questionnaire was suitably modified for the main study.

## RESULTS

Of 822 individuals that were approached in the study, 800 gave their consent and met the criteria. Most of the respondents, 611 (76.4%) were residents of Goa and a few, 189 (23.6%) of them belonged to other states such as Maharashtra (7.5%), Karnataka (4%), and Tamil Nadu (3.6%).

As shown in Table 1, among the respondents, 578 (72.2%) belonged to the younger age group followed by 157 (19.6%) adults and 65 (8.2%) elderly. The sample included 351 (43.8%) males and 449 (56.2%) females. As for religion, 612 (77%) were Hindus, 127 (15.5%) were Christians, 39 (4.8%) were Muslims and 15 (1.8%) of the respondents considered themselves to be atheists, along with small proportions of other religions which resemble the religion distribution of our country. Regarding the maximum educational qualification of each respondent of our study, we can conclude that most, i.e., 498 (62.3%) of the respondents have a basic educational degree (undergraduate) and 305 (38.2%) of our respondents were related to the medical field. Out of which, 211 (69%) belonged to Allopathic sciences, 35 (11.5%) from Dentistry, 44 (14.4) from the Allied Health Sciences, 10 (3.5%) belonged to Nursing and 5 (1.6%) of the people belong to AYUSH and related disciplines.

### Assessment of Knowledge

Table 2 summarizes the participants’ knowledge with regard to organ donation and 784 (98%) were aware of the term “organ donation”. Only 524 (65.5%) participants could

**Table 1: Socio-demographic characteristics**

Sociodemographic variable	Responses	Frequency (n=800) (%)
Age group	18–36 years	578 (72.2)
	36–55 years	157 (19.6)
	>55 years	65 (8.2)
Gender	Male	351 (43.8)
	Female	449 (56.2)
Resident of Goa	Yes	611 (76.4)
	No	189 (23.6)
Type of residence	Municipality/Corporation (Urban background)	417 (52.2)
	Village Panchayat (rural background)	383 (47.8)
Marital status	Unmarried	554 (69.2)
	Married	242 (30.2)
	Divorced	4 (0.6)
Employment status	Employed	280 (35)
	Unemployed	520 (65)
Place of work/education from a medical background	Belong to the medical field	305 (38.2)
	Not at all related to the medical field	495 (61.8)
Religion	Hindu	612 (77)
	Christian	127 (15.5)
	Muslim	39 (4.8)
	Atheist	15 (1.8)
	Others	7 (0.9)
Educational qualifications	Professional degree (post graduate/diploma/masters or higher)	202 (25.3)
	Degree (undergraduate/bachelors)	498 (62.3)
	Higher secondary (till 12 <sup>th</sup> grade)	91 (11.4)
	Secondary (till 10 <sup>th</sup> grade)	5 (0.6)
	Primary (literate)	2 (0.2)
	Illiterate	2 (0.2)

accurately identify that it encompasses all the procedures, i.e., the transfer of tissues or organs from a dead body to a patient in need, the transfer of tissues or organs from a living donor to a patient as well as the removal of organs from the human body for the purpose of immediate transplantation into another body.

As far as having an understanding of consent in organ donation, only 177 (22.1%) respondents had accurate knowledge regarding consent for a living donation, i.e., donor themselves can give consent and the donor's spouse or family members can give consent if the donor is a minor/is of unsound mind. As for consent after brain stem death, only 392 (49%) respondents were aware that donor themselves can pledge beforehand to donate their organs in good faith after their demise, while consent is taken from the donor's spouse/family members.

Most of the respondents of our study, i.e., 747 (93.4%) knew that organ donation is legal and were aware THOA. When asked about the criteria required to qualify as an organ donor, 525 (65.6%) participants rightly identified all the prerequisites while 82 (10.2%) respondents were totally unaware.

As for the understanding of the concept of brain-stem death, only a few i.e., 184 (23%) respondents actually

understood brain-stem death as irreversible damage of vital respiratory and cardiac centers of the brain where the patient will not live without external life support. Furthermore, 135 (16.9%) respondents had the false impression that a brain-dead patient can recover from their injuries. When enquired about an ideal situation for organ donation, only 423 (52.9%) participants knew that brain stem death in a controlled ICU setting is conducive.

When asked to arrange in order of priority as the “next of kin” having legal rights over the body of the deceased, only 356 (44.5%) respondents could tell accurately that it is spouse > siblings > parents > friends. Only 28.6% of participants could tell accurately that a single deceased donor can save more than 8 lives.

With regard to certain facts about organ donation, 668 (83.5%) respondents knew that different solid organs upon retrieval have different viability periods beyond which they are rendered useless. Most i.e., 664 (83%) respondents were aware of the severe shortage of available deceased donated organs in our country. A lot many, i.e., 728 (91%) respondents knew that cross-matching of blood is done before transplantation. Out of the respondents, 442 (55.3%) were unfamiliar with the system of green corridors to make way for the organ donation ambulance. Furthermore, 428 (55.5%) respondents were not aware

**Table 2: Knowledge on various aspects about organ donation**

Knowledge assessment field	Responses	Frequency (n=800) (%)
Aware of the term organ donation	Yes*	784 (98)
	No	16 (2)
Understands the term organ donation	Transfer of tissues or organs from a dead body to a patient in need	124 (15.5)
	Transfer of tissues or organs from a living donor to a patient in need	29 (3.6)
	The removal of organs from the human body for the purpose of immediate transplantation into another body	112 (14)
	All of the above*	524 (65.5)
Knows as to who gives consent for a living donation	Don't know about organ donation	11 (1.4)
	Organs can't be donated before death	24 (3.00)
	Donor themselves, if not mentally ill or a minor*	687 (85.9)
	Donor's spouse/family members always	73 (9.1)
	Donor's spouse/family only if donor is of unsound mind or is a minor*	221 (27.6)
Knows as to who gives consent for a donation after death	Doctor	62 (7.7)
	Don't know	54 (6.7)
	Donor themselves can pledge beforehand to donate their organs in good faith after their demise*	691 (86.3)
	Donor's spouse/family members or next of kin*	447 (55.9)
	Donor's doctor who certified and confirmed the death	51 (6.2)
Aware if organ donation and transplantation is legal in India	Registrar at municipality/village panchayat who records the death	17 (2.1)
	Don't know	36 (4.5)
	Yes, it is legal, and I am aware of the parliamentary THOA which governs the process*	747 (93.4)
	Organ donation and transplantation is absolutely illegal in India	8 (1)
Knows the criteria to qualify as an organ donor	Don't Know	45 (5.6)
	The donor should be free of any blood borne diseases or STD (e.g., AIDS)	144 (18)
	The donor should not have active metastatic cancer of any kind	33 (4.1)
	The donor should not be badly injured or mutilated	7 (0.9)
	The donor's death should not be related to any active legal police case	9 (1.2)
Understands what the term brain stem death means	All of the above*	525 (65.6)
	Don't know	82 (10.2)
	Brain stem death is similar to a comatose patient where patient's heart and lungs are still functioning	82 (10.3)
	Brain stem death means that there is an irreversible damage of vital respiratory and cardiac centers of the brain and that patient won't live without external life support	184 (23)
	Both A and B encompass brain stem death*	292 (36.5)
Is it possible for a declared brain-dead patient to recover from their injuries?	Don't know	242 (30.3)
	Yes	135 (16.9)
	No*	406 (50.7)
	Don't Know	259 (32.4)
What would be an ideal situation for organ donation?	Cardiac death, where heart stops beating and there is no sign of active breathing at their home	94 (11.8)
	Brain stem death in which an artificial system keeps heart beating so as to maintain circulation and breathing*	423 (52.9)
	Donor is alive and apparently healthy	122 (15.2)
	Don't know	161 (20.1)
Arrange the following in order of priority as the 'next of kin' having legal rights of the body of the deceased individual	Friends>Parents>Siblings>Spouse	7 (0.9)
	Siblings>Parents>Spouse>Friends	33 (4.1)
	Parents>Siblings>Spouse>Friends	404 (50.5)
	Spouse>Siblings>Parents>Friends*	356 (44.5)
How many individual's lives' can one deceased organ donor improve?	1 only	89 (11.2)
	1-4	264 (33)
	4-8	18 (2.2)
	More than 8*	229 (28.6)

The (\*) indicates the most appropriate answer. THOA: Transplantation of human organs act, STD: Sexually transmitted diseases

that the relatives of a deceased, who has pledged to donate their organs before their demise, can still legally revoke the decision of the same.

As far as myths and misconceptions about organ donation, 530 (66.3%) participants were of the impression that possessing an organ donor card also increases one's chances of

receiving organs. A few i.e., 82 (10.3%) respondents thought that one can buy/sell organs. When asked about their views regarding the process leading to the severe disfigurement of the donor's body, 109 (13.7) respondents were in agreement. A vast majority, i.e., 505 (63.1%) participants were of the impression that on the waiting list, financial discrimination prevents eligible patients from getting the transplant they need.

Figure 1 depicts the various organs that the respondents thought can be donated after death. Majority of the respondents thought that the kidney 688 (86%), liver 616 (77%), heart 568 (71%), cornea 557 (69.6%), lungs 430 (53.8%), and pancreas 361 (45.1%) can be donated after death; while a few thought that skin (42.6%), bone marrow (39.3%), intestine (23.9%), and nerves and tendons (16.2%) can also be donated and were all correct about their opinions. A few of the respondents thought that the uterus (15.8%) and brain (10.4%), can also be donated and were incorrect.

Figure 2 depicts various organs that the respondents thought can be donated before death. Majority thought that the kidney 712 (89%), liver 442 (55.2%), and skin 338 (42.2%) can be donated before death; while a few thought that pancreas (19.9%), lungs (21.4%), cornea (23.1%), intestine (13.25%), nerves and tendons (11%), and uterus (13.4%) can also be donated and were all correct about their opinions. A few of the respondents thought that heart (9.6%) and brain (3%) can also be donated and were incorrect.

338 (42.2%) can be donated. Few respondents thought that heart (9.6%) and brain (3%) can also be donated, while 5.4% were certain that organs cannot be donated when the patient is alive.

Figure 3 shows the various sources of information that the respondents utilize to get information about organ donation. The major sources according to the respondents were the internet 513 (64.1%), followed by television 458 (57.2%), newspaper articles 415 (51.8%), and health-care professionals 392 (49%).

### Assessment of Attitudes

Table 3 shows the assessment of the attitudes of the respondents. Majority of the participants, i.e., 797 (99.6%) agreed to the fact that organ donation is a good thing which

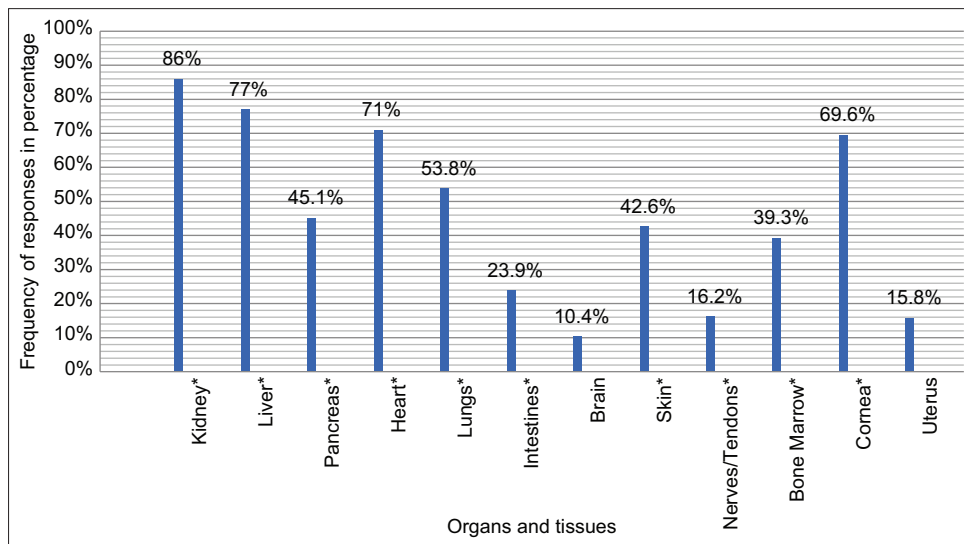


Figure 1: Organs that can be donated after death according to the respondents. The (\*) indicates the most appropriate answer

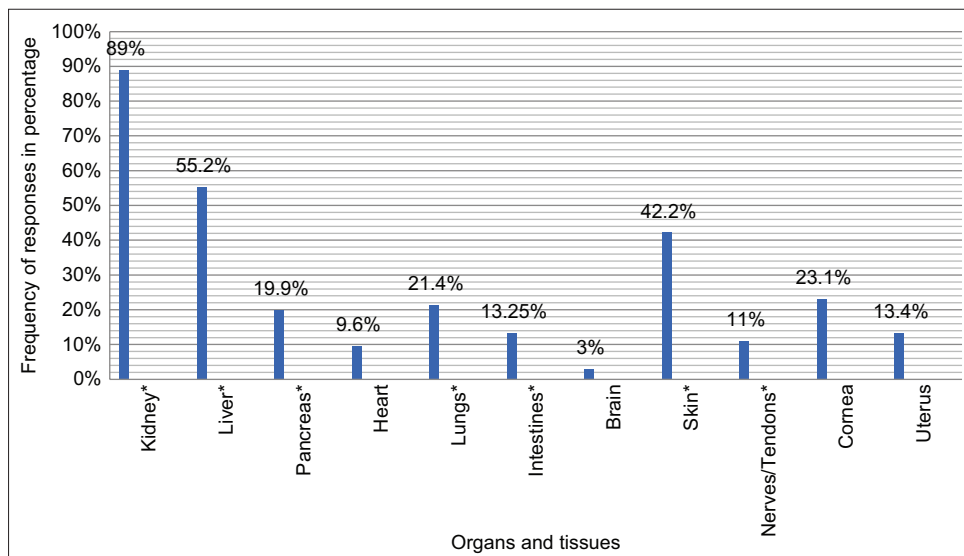


Figure 2: Organs that can be donated before death according to the respondents. The (\*) indicates the most appropriate answer

should be promoted and that, registering as an organ donor can save somebody’s life. A large number of respondents, i.e., 653 (81.6%) would be more willing to pledge if they knew their family’s opinion.

Most respondents, i.e., 669 (83.6%) believed they would be more willing to donate if more information was available about the viewpoint of their religion. When asked about

live donations, 547 (68.4%) respondents were worried - that organ donation might leave them weak/about surgical complications. A small group, i.e., 225 (28.1%) agreed that they did not trust the healthcare system in India with regard to organ donation. A large number of respondents, i.e., 453 (56.6%) were comfortable with organ donation and 648 (81%) were comfortable talking about it. Though the donor has no choice to reflect upon their attitudes,

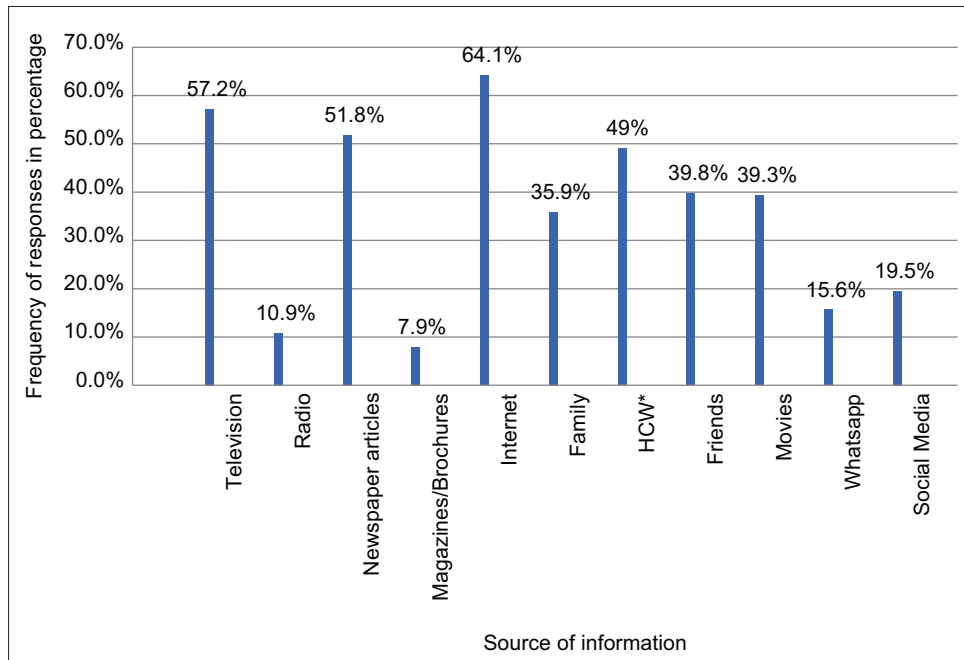


Figure 3: Preferred sources of information about organ donation. \*HCW: Health care workers

Table 3: Attitudes toward organ donation

Attitudes assessment field	Responses	
	Agree (%)	Disagree (%)
What the participant felt		
Organ donation is a good thing and should be promoted	797 (99.6)	3 (0.4)
Registering as an organ donor could save somebody’s life	797 (99.6)	3 (0.4)
I would be more willing to register as an organ donor		
If I knew my family would have no objection to allowing donation of my organs at the time of my death	653 (81.6)	147 (18.4)
If more information was available about the viewpoint of my religion with regard to organ donation	669 (83.6)	131 (16.4)
Regarding live donation		
I am worried that the organ donation might leave me weak and disabled or about the surgical complications of the same	547 (68.4)	253 (31.6)
I don’t trust the healthcare system and believe that it is better to go abroad for organ donation and transplantation	225 (28.1)	575 (71.9)
Statement	Responses	Frequency (n=800)
Any preference of a recipient for donating your organs if you were to donate your organs?	A. Would donate only to a family member or a close friend	145 (18.1)
	B. Would donate to anyone irrespective of my relation with the same	620 (77.5)
	C. Would donate to someone of the same religion	6 (0.7)
	D. Haven’t considered donating	29 (3.7)

respondents were asked about the preferences of a recipient and 145 (18.1%) would donate only to relatives, 620 (77.5%)

would donate to anyone and only 6 (0.7%) participants wanted to donate to someone of the same religion.

**Table 4: Practices toward organ donation**

Practices assessment field	Responses		
	Yes	No	
Already pledged to be an organ donor and/or have a donor ID card?	83 (10.4%)	717 (89.6%)	
Following are certain viewpoints with regard to organ donation, please select whichever view suits you the most			
Statement	Responses		
	Yes (%)	No (%)	
I think my donation, whether living or after death is going to impact my life after death in a good way	581 (72.6)	219 (27.4)	
Organ donation might increase if social support/financial aid are provided to the family of the deceased	678 (84.8)	122 (15.2)	
Opinions of my family members when my organs would be taken after my death preclude me from pledging to donate my organs	422 (52.8)	378 (47.2)	
Statement	Response		
	Yes (%)	No (%)	Don't know (not given a thought yet) (%)
Willing to register as an organ donor	387 (48.4)	23 (2.9)	390 (48.8)
Would spread awareness and promote organ donation when the need comes to do so	593 (74.1)	6 (0.7)	201 (25.1)
Religious basis if any, hindering the participants from donating your organs?			
Statement	Responses (%)		
A. Not applicable/no religious aspects	748 (93.5)		
B. I have personally discussed with a religious leader/clergy	5 (0.6)		
C. I have heard a leader talk against it	7 (0.8)		
D. I have done my own research on the topic	17 (2.1)		
E. I have discussed it with family and friends	27 (3.4)		
F. I know for sure it is against religion or faith	15 (1.9)		
Statement	Responses		
	Donated	Received	None of the above
Have family members who have ever donated/recieved any organ before?	35 (4.4%)	17 (2.1%)	748 (93.5%)

**Table 5: Correlation between religion, medical background, age, gender and willingness to donate**

Variables	Willingness to donate			Chi square test		
	Willing (%)	Not willing (%)	Total (%)	df	X <sup>2</sup> -value	P-value
Religion						
Hindu	306 (38.5)	306 (38.5)	612 (77)	3	13.11	0.004
Christian	56 (7)	71 (8.5)	127 (15.5)			
Muslim	10 (1.2)	29 (3.6)	39 (4.8)			
Others	15 (1.8)	7 (0.9)	22 (2.7)			
Total	387 (48.5)	413 (51.5)	800			
Medical background						
Medical	167 (20.9)	138 (17.3)	305 (38.2)	1	8.03	0.005
Non-medical	220 (27.5)	275 (34.3)	495 (61.8)			
Total	387 (48.4)	413 (51.6)	800			
Age group (in years)						
Young (18–36)	259 (32.3)	319 (39.9)	578 (72.2)	2	10.62	0.005
Adults (37–55)	91 (11.4)	66 (8.2)	157 (19.6)			
Elderly (>55)	37 (4.6)	28 (3.6)	65 (8.2)			
Total	387 (48.3)	413 (51.7)	800			
Gender						
Male	150 (18.7)	201 (25.1)	351 (43.8)	1	7.97	0.005
Female	237 (29.6)	212 (26.6)	449 (56.2)			
Total	387 (48.3)	413 (51.7)	800			

### Assessment of Practices

As shown in Table 4, 387 (48.4%) respondents were willing to register as organ donors, yet only 83 (10.4%) had pledged to do so. None of the respondents had donated/received any organs before our study. Among the respondents, 35 (4.4%) had family members who had donated organs, 17 (2.1%) had family members who had received organs while a large majority i.e., 748 (93.5%) had no relative who had ever donated/received any organs.

Six (0.7%) respondents disagreed to spread awareness and promote organ donation. Only a few respondents, i.e., 52 (6.5%) had a religious bias hindering them from donating their organs. As for reasons for being hesitant to donate, 100 (12.5%) believed that the organs might be misused, 20 (2.5%) opined that the body is sacred even after death and 62 (7.8%) feared that they may be purposely declared brain dead. When asked about their opinion, 678 (84.8%) respondents thought that organ donation might increase, if social support/financial aid is provided to the family of the deceased. More than half, i.e., 422 (52.8%) respondents confirmed that opinions of family members when their organs would be taken preclude them from pledging to donate.

We performed an analysis to look for the associations of socio-demographic variables with attitude of willingness to donate among the respondents; the results of which are provided in Table 5. We found a significant influence of religion ( $P = 0.004$ ), medical background ( $P = 0.005$ ), age ( $P = 0.005$ ), gender ( $P = 0.005$ ) on the participants' willingness to donate.

Table 6 shows the statistical analysis for association of socio-demographic variables with the respondents already having pledged to donate. There was a statistically significant association between religion ( $P = 0.029$ ), medical background ( $P = 0.003$ ), age ( $P = 0.007$ ), gender ( $P = 0.004$ ) and the respondents having pledged to donate their organs.

### DISCUSSION

Organ donation and transplantation is an important treatment modality of many end-organ diseases.<sup>[1]</sup> According to Shah *et al.*,<sup>[10]</sup> "organ donation is a community service, which saves lives and improves quality of life". Shortage of organ donation is a major problem due lack of awareness and false perceptions about organ donation among the population.<sup>[11]</sup> Thus, our study aimed to assess knowledge, attitudes and practices of the general population of India toward organ donation.

Knowledge is an important determinant for willingness to donate organs.<sup>[12]</sup> Most of the respondents (98%) were aware of the term "organ donation" which is similar to studies done by Jothula and Sreeharshika<sup>[2]</sup> and Vijayalakshmi *et al.*,<sup>[8]</sup> and far better than the results obtained by Dasgupta *et al.*<sup>[12]</sup> The above phenomena can be ascribed to the higher literacy rate and higher number of doctors and medical students in our study. The most preferred sources of information were the internet (64.1%), mass media (TV-57.2%, newspaper articles - 51.8%), and health-care workers (49%). This was in direct correlation with many other studies,<sup>[1,2,7,9,10,12]</sup> which emphasizes their

**Table 6: Correlation between religion, medical background, age group and gender and the respondents having pledged to donate**

Variables	Pledged to donate			Chi square test		
	Pledged (%)	Not pledged (%)	Total (%)	df	X <sup>2</sup> -value	P-value
Religion						
Hindu	67 (8.9)	545 (68.1)	612 (77)	8	802.54	0.029
Christian	13 (1.5)	114 (14)	127 (15.5)			
Muslim	2 (0.2)	37 (4.6)	39 (4.8)			
Others	3 (0.3)	19 (2.4)	22 (2.7)			
Total	85 (10.9)	715 (89.1)	800			
Medical background						
Medical	36 (4.6)	269 (33.6)	305 (38.2)	4	801.72	0.003
Non-medical	49 (6.1)	446 (55.7)	495 (61.8)			
Total	85 (10.7)	715 (89.3)	800			
Age group (in years)						
Young (18–36)	56 (7)	522 (65.2)	578 (72.2)	6	803.44	0.007
Adults (37–55)	22 (2.7)	135 (16.9)	157 (19.6)			
Elderly (>55)	7 (0.9)	58 (7.3)	65 (8.2)			
Total	85 (10.6)	715 (89.4)	800			
Gender						
Male	35 (4.3)	316 (39.5)	351 (43.8)	4	801.28	0.004
Female	50 (6.3)	399 (49.9)	449 (56.2)			
Total	85 (10.6)	715 (89.4)	800			



pivotal role in promoting organ donation. Most of the respondents were aware of the organs that can be donated after brainstem death and by a living donor. However, few thought that the uterus (15.8%) and brain (10.4%) can also be donated which is not true, while 5.4% of respondents believed that organs cannot be donated when the donor is alive. Similar findings were seen in various studies,<sup>[1,9,13,14]</sup> which infers that some misconceptions and misinformation about organ donation still prevail. A matter of concern was that hardly 22.1% of the respondents understood consent for living donation when donor is alive, which corresponded with a study by Dasgupta *et al.*<sup>[12]</sup> where only 20% of respondents understood consent. As for organ donation after death, 49% of respondents were aware as to who gives consent while a better response was seen in a study by Jothula and Sreeharshika<sup>[2]</sup> THOA was enacted in 1994 and 93.4% of the respondents were aware of it, which was far better than other studies.<sup>[1,10,11,15,16]</sup> Regarding criteria for organ donation, 65.6% of respondents were well versed in it, which was similar to a study by Sam *et al.*<sup>[11]</sup> As for brain stem death, only 23% of participants were aware of what it entails, while 16.9% were of the belief that a declared brain-dead patient can recover. The responses of our study were better than a previous study done by Vijayalakshmi *et al.*<sup>[8]</sup> where only 4% of participants knew about brainstem death. However, a relatively poor response was obtained when compared to other studies.<sup>[9,13]</sup> When asked about an ideal situation for organ donation, 52.9% of the respondents thought it to be brain-stem death, in which an artificial system maintains circulation and breathing, which paralleled another study.<sup>[9]</sup> Only 44.5% respondents could arrange the next of kin that gives consent for the deceased donor, which was similar to other studies.<sup>[10,11]</sup> Only 28.6% participants could tell, that multiple lives can be saved by a single deceased donor which was similar to other studies.<sup>[3,9]</sup> A majority of 83.5% respondents knew that solid organs have different viability periods which was better than the study done by Sindhu *et al.*<sup>[1]</sup> Most of the respondents (83%) were aware of the shortage of available deceased donated organs. Similar studies,<sup>[3,8]</sup> had insight into the same. Quite a few (91%) respondents of our study knew that cross-matching is done before transplantation which was consistent with a study by Sindhu *et al.*<sup>[1]</sup> In our study, 18.5% respondents were unaware that one can register. A similar study was done by Sindhu *et al.*<sup>[1]</sup> reported that knowledge regarding registration as an organ donor was quite low along with several other studies.<sup>[3,8,14]</sup> Only 46.5% respondents were aware that relatives of the deceased who had pledged before can still revoke the decision, which was similar to a study done by Vijayalakshmi *et al.*<sup>[8]</sup> Most of the respondents (89.7%) knew that one cannot buy or sell organs, which was consistent with other studies.<sup>[8,10]</sup> In our study, 63.1% of respondents had the

impression that financial discrimination prevents the poor from receiving organs which were similar to a study by Adithyan *et al.*<sup>[3]</sup> Most of the participants (55.3%) were unfamiliar with the system of a green corridor. A vast majority i.e., 66.3% had the impression that possessing an organ donation card also increases one's chances of receiving organs, suggesting a poor level of knowledge regarding organ donation.

Of the participants, 99.6% asserted that organ donation should be promoted and that registering as an organ donor could save lives. This shows a positive attitude as compared to other studies.<sup>[2,7,8,14]</sup> A majority of respondents, i.e., 81.6% would be more willing to register as organ donors if they knew that their families had no objection, which was similar to other studies.<sup>[4,8,11]</sup> Regarding the viewpoint of religion, 83.6% of respondents wanted more information before pledging. In a similar study by Jothula and Sreeharshika<sup>[2]</sup> 88.7% respondents felt that awareness regarding organ donation and knowledge about its procedures is important. Regarding live organ donation, 68.4% respondents felt that organ donation would leave them weak/disabled, while 28.1% felt hesitant to donate because they did not trust the healthcare system. Studies conducted by Dasgupta *et al.*<sup>[12]</sup> and Devi *et al.*<sup>[4]</sup> had similar findings. Another similar study conducted by Sam *et al.*,<sup>[11]</sup> 13.6% respondents wished not to go through the disfigurement involved and 30% of them did not trust the healthcare system. While 81% respondents were comfortable talking about it, only 56.6% respondents were comfortable donating organs. When asked about preference for a recipient, 18% would donate to their relatives only and 0.7% would donate to someone of the same religion while a majority of 77.5% would donate to anyone irrespective of any relation. In a study done by Dasgupta *et al.*,<sup>[12]</sup> 55.5% of respondents preferred donating to a family member only while 29% preferred donating to the same religion. In the meanwhile, several studies<sup>[3,8]</sup> showed a majority of respondents ( $\geq 85\%$ ) being altruistic and willing to donate irrespective of the recipient's religion.

It was interesting that 48.4% of respondents were willing to donate yet only 10.4% possessed a donor card which showed a lack of motivation. Similar findings were seen in other studies,<sup>[4,12,14]</sup> with respondents being uncomfortable to register as a donor. Possible reasons for the unwillingness of participants to pledge could be fear of misuse of organs, objection from family members, lack of knowledge regarding organ donation, myths, and misbeliefs as seen in previous studies.<sup>[2,3,10-12,14,17]</sup> In our study, 74.1% respondents were ready to create awareness and promote organ donation. It was interesting to note that 93.5% of participants were unaffected by religion for donating/receiving an organ. In a study done by Kaistha *et al.*,<sup>[14]</sup> 69.6% wanted to create awareness and promote

organ donation. Studies<sup>[1,4,13]</sup> reveal that religion did not hinder the participants from pledging to donate. As for the reasons for hesitance to donate organs, 12.5% responded that fear of their organs being misused was one of them, which was similar to other studies,<sup>[8,9,13,18]</sup> where the fear prevailed along with a high level of mistrust toward doctors. More than half, (52.8%) respondents confirmed that the opinions of family members, preclude them from pledging to donate, which was similar to other studies.<sup>[1,8,12]</sup> In a study by Seth *et al.*,<sup>[19]</sup> the reason for the refusal of organ donation was lack of consensus among the patient's family members.

There is a strong association between the religion and the participants' willingness and them having pledged to donate which can be attributed to the fact that different religions have a varied outlook on organ donation. Certain religions also condemn the practice and studies by Krupic<sup>[20]</sup> and Oliver *et al.*<sup>[21]</sup> showed similar findings. Comparing the willingness to donate organs and participants having pledged to donate, with their medical background, we found a strong association as, 20.9% of participants from a medical background were willing to donate and 4.6% had pledged to donate. Meanwhile, 27.5% and 6.1% of participants from a non-medical background were willing to and had pledged to donate their organs, respectively. This can be attributed to growing awareness regarding organ donation that makes our participants willing to donate, though the awareness isn't enough. This was synonymous to the results obtained by Siddiqui *et al.*<sup>[8]</sup> and differed when compared to a study by Jothula and Sreeharshika<sup>[2]</sup> As for the association of age group of our participants with willingness to donate and them having pledged to donate, we found a strong association which can be attributed to fear and lack of knowledge in the elderly regarding organ donation. Contradictory results were seen in other studies by Reynolds *et al.*<sup>[22]</sup> and Sarveswaran *et al.*<sup>[23]</sup> where they saw an increased willingness in the elderly age group of above 30 years owing to their acuity to accept knowledge. Finally, on comparing the gender of the participants with their willingness to donate and whether they have pledged to donate, we found that a significant correlation exists. In a study evaluating gender bias in organ donation by Bhuwania *et al.*<sup>[24]</sup> and Vijayalakshmi *et al.*,<sup>[8]</sup> more males were willing to donate and register as organ donors which is contradicting with our study. This can be attributed to changing trends of literacy rate between males and females. However, majority of the participants from the both the groups were still unsure about signing organ donation cards.

## CONCLUSIONS

A consistent organ donation program can bridge the gap for the shortage of deceased organ donors in India. Our study highlights that knowledge was adequate, yet not

enough, and only 10.4% possessed an organ donor card. A considerable number of respondents were victims of myths and misconceptions while many had religious and cultural beliefs hindering them. Thus, well-designed publicity campaigns to address cultural beliefs and correct misconceptions are needed. Two areas of concern were, the lack of understanding of the role of consent before organ donation and the concept of brainstem death. Another setback was the concern about being disabled after a live donation which can be addressed by reassurance about the procedure. A few participants were anxious about their organs being misused and premature termination of medical treatment. Furthermore, according to the World Health Organization, organ trafficking accounts for 5–10% of the kidney transplants annually.<sup>[25]</sup> Ultimately, our findings indicate that organ donation is the need of the hour and a well-organized approach is required to raise awareness about its various aspects to eliminate the paucity of available organs.

## REFERENCES

1. Sindhu A, Ramakrishnan TS, Khera A, Singh G. A study to assess the knowledge of medical students regarding organ donation in a selected college of Western Maharashtra. *Med J DY Patil Univ* 2017;10:349-53.
2. Jothula KY, Sreeharshika D. Study to assess knowledge, attitude and practice regarding organ donation among interns of a medical college in Telangana, India. *Int J Community Med Public Health* 2018;5:1339-45.
3. Adithyan GS, Mariappan M, Nayana KB. A study on knowledge and attitude about organ donation among medical students in Kerala. *Indian J Transplant* 2017;11:133-7.
4. Devi K, Leandra L, Poovitha R. A community-based study on awareness of organ donation among young adults in rural areas of Pudukcherry. *Int J Community Med Public Health* 2018;5:3469-77.
5. Dsouza D, D'Souza DB, Da Silva KX, Mascarenhas VR, Kankonkar PN, Vaz FS, *et al.* "Perceptions and attitude toward cadaveric organ donation among health-care professionals at a tertiary health-care setting: A cross-sectional study." *Indian J Transpl* 2021;15:56.
6. Jha V. Current status of end-stage renal disease care in South Asia. *Ethn Dis* 2009;19:S1-32.
7. Khalid F, Khalid AB, Muneeb D, Shabir A, Fayyaz D, Khan M. Level of knowledge and attitude regarding organ donation: A community-based study from Karachi, Pakistan. *BMC Res Notes* 2019;12:309.
8. Vijayalakshmi P, Sunitha TS, Gandhi S, Thimmaiah R, Math SB. Knowledge, attitude and behaviour of the general population towards organ donation: An Indian perspective. *Natl Med J India* 2016;29:257-61.
9. Bharambe VK, Arole VU, Puranam V, Kulkarni PP, Kulkarni PB. Knowledge and attitude toward organ donation among people in Lanja: A rural town in India. *Saudi J Kidney Dis Transpl* 2018;29:160-6.
10. Shah R, Patel A, Ramanuj V, Solanki N. Knowledge and Attitudes about Organ Donation among commerce college students. *Natl J Community Med* 2015;6:533-5.
11. Sam N, Ganesh R, Indrapriyadarshini V, Jeyamarthan S, Nandhini CK. Awareness, knowledge, and attitude regarding organ donation among final year students of medical, Dental, Engineering, and Arts and Science Colleges in Thiruvallur and Chennai City, India. *Indian J Transplant* 2018;12:25-9.
12. Dasgupta A, Shahbabu B, Sarkar K, Sarkar I, Das S, Das M. Perception of organ donation among adults: A community based study in an urban community of West Bengal. *Sch J Appl Med Sci* 2014;2:2016-21.
13. Tamuli RP, Sarmah S, Saikia B. Organ donation - "attitude and awareness among undergraduates and postgraduates of North-East India". *J Family*

- Med Prim Care 2019;8:130-6.
14. Kaistha M, Kaistha S, Mahajan A. A study of factors influencing decisions on organ donation among patient attendees in a Tertiary Care Hospital in North India. *Chrimed J Health Res* 2016;3:101-5.
  15. Ali NF, Qureshi A, Jilani BN, Zehra N. Knowledge and ethical perception regarding organ donation among medical students. *BMC Med Ethics* 2013;14:38.
  16. Patthi B, Jain S, Singla A, Singh S, Kundu H, Singh K. Beliefs and barriers for organ donation and influence of educational intervention on dental students: A questionnaire study. *J Indian Assoc Public Health Dent* 2015;13:58-62.
  17. Chung CK, Ng CW, Li JY, Sum KC, Man AH, Chan SP, *et al.* Attitudes, knowledge, and actions with regard to organ donation among Hong Kong medical students. *Hong Kong Med J* 2008;14:278-85.
  18. Siddiqui OT, Nizami S, Raza E, Ali MU, Bikak M, Siddiqui S, *et al.* Deceased-donor organ transplantation: Knowledge and attitudes among health care professionals managing critically ill patients in Karachi. *Exp Clin Transplant* 2012;10:544-50.
  19. Seth AK, Nambiar P, Joshi A, Ramprasad R, Choubey R, Puri P, *et al.* First prospective study on brain stem death and attitudes toward organ donation in India. *Liver Transpl* 2009;15:1443-7.
  20. Krupic F. The impact of religion and provision of information on increasing knowledge and changing attitudes to organ donation: An intervention study. *J Relig Health* 2020;59:2082-95.
  21. Oliver M, Ahmed A, Woywodt A. Donating in good faith or getting into trouble Religion and organ donation revisited. *World J Transplant* 2012;2:69-73.
  22. Reynolds JD, Lecker C, Giardino JC, Takooshian H. Attitudes toward organ donation among elderly adults. *J Soc Distress Homeless* 2012;21:23-43.
  23. Sarveswaran G, Sakthivel MN, Krishnamoorthy Y, Arivarasan Y, Ramakrishnan J. Knowledge, attitude, and practice regarding organ donation among adult population of urban Puducherry, South India. *J Educ Health Promot* 2018;7:117.
  24. Bhuwania S, Saxena S, Bansal R, Goel R. Gender bias in kidney donation in India: Has it changed over the past 2 decades? *Transplant Proc* 2020;52:1665-70.
  25. Budiani-Saberi DA, Delmonico FL. Organ trafficking and transplant tourism: A commentary on the global realities. *Am J Transplant* 2008;8:925-9.

**How to cite this article:** Rajadhyaksha A, Dias A, Savoiverekar S, Sukhtankar A, Shah D, Manerkar G, Kerkar P, Naik S, Dias L. Assessment of Knowledge, Attitudes, and Practices toward Organ Donation and Transplantation among the General Population of India: A Community-Based Study. *Int J Sci Stud* 2023;11(2):50-60.

**Source of Support:** Nil, **Conflicts of Interest:** None declared.