

# A study on knowledge and attitude towards organ donation among students of Medical, Physiotherapy, and Nursing colleges in a tertiary care hospital, Central Gujarat

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## ABSTRACT

### Background

Organ donation (OD) is one of the most significant scientific achievements and a great source of hope. As a result of severe organ scarcity in India, many people on the waiting list pass away before receiving an organ. The low rate of OD is exacerbated by a lack of awareness, ignorance, religious views, as well as myths and prejudices. The objectives of this study were to assess the knowledge and attitudes towards OD among Medical, Physiotherapy, and Nursing students.

### Methodology

A cross-sectional study was conducted among 300 medical, physiotherapy, and nursing college students. Data from a total of 100 first- and second-year undergraduate students from each student stream were collected using Google Forms, after gaining consent. The data was entered into the Excel sheet and analysed using Epi-info7 Software.

### Results

Though most of the study participants (97%) were aware of the term "organ donation", knowledge about the different aspects of OD was low. Nearly all (90.7%) were unaware that OD was suitable only after brain death of the potential donor. Approximately, one-third of students (37.3%) were willing to be a donor, and their preferences of recipient were 38.3% for family members and 13.7% for those sharing the same religion.

### Conclusion

This study suggests the need for a more focused and sustained education campaign in the medical & paramedical curriculum to increase student's awareness about OD and the constraints around its practice.

**Keywords:** Organ Donation, Knowledge, Attitude, Students

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GJMEDPH 2024; Vol. 13, issue 2 | OPEN ACCESS

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Conflict of Interest—none | Funding—none

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## INTRODUCTION

Organ donation (OD) has been one of the most significant scientific achievements and its practice is a great source of hope to recipients.<sup>[1]</sup> Organ donation is defined as "... the process of giving an organ or part of an organ for the purpose of transplantation into another person(s)." <sup>[2]</sup> The need for donations for transplant is high and the gap between the number of organs available for transplantation and patients waiting for a transplant is expanding globally.<sup>[3]</sup> After a patient is confirmed brain dead, almost 37 different organs and tissues can be donated including the heart, kidney, liver, lungs, pancreas, etc. The kidney is the most transplanted organ worldwide followed by the liver and heart. In 2022, there were a total of 157,494 organ transplants worldwide.<sup>[4]</sup> India's organ donation rate is 0.86 per million population. According to ORGAN India, around 500,000 people need an organ transplantation every year. Barely 2–3 percent of demand is met, and many people die due to organ failure annually across India. If numbers of potential donors increased, organ transplantation crisis in India would be resolved.<sup>[5]</sup> Awareness, a favourable attitude, and consent by relatives for organ donation in brain-dead patients are the prerequisites for organ donation.<sup>[6]</sup> Lack of knowledge concerning organ donation, religious attitudes, and superstitious beliefs have generated fear and mistrust in the minds of the general public.<sup>[7,8]</sup>

The National Organ and Tissue Transplant Organization (NOTTO) is a national networking organization established as a mandate of the Transplantation of Human Organs and Tissues Act 10, in 1994, to perform the functions of the National Human Organs and Tissues Removal and Storage Network. NOTTO also serves as the Indian national registry for organ donation and transplantation, with the goal to boost the number of donations. To increase the number of donor pledges, NOTTO collaborates with numerous NGOs, regional organizations (ROTTOS), and state organizations (SOTTOs) to carry out nationwide and year-round awareness campaigns.<sup>[9]</sup>

According to Wig et al., there is a need to educate the public about OD so that they are aware of the demand for donors and the availability of organs.<sup>[10]</sup> Medical and paramedical students will be the healthcare providers at the forefront of influencing the levels of donations in the future. Hence, their improved knowledge, positive attitude and perceptions toward OD are essential to improve this field in the future. Therefore, this study was conducted to assess the knowledge and attitude about OD among Medical, Physiotherapy, and Nursing students.

## Materials and Methods

A cross-sectional study was conducted among first- and second-year undergraduate (UG) students from Government Medical, Physiotherapy, and Nursing colleges that are located in S.S.G. (Sir Sayajirao Gaekwad) hospital campus in Vadodara district of the city of Gujarat. There are 22 medical and paramedical colleges in the Vadodara district of Gujarat. Of these, 3 government colleges of 3 different streams were selected. A purposive sampling technique was used for the selection of students. There were approximately 1000 Medical, 480 Physiotherapy and 240 Nursing undergraduate students studying under S.S.G. Hospital of Vadodara. Of them, a total of 300 undergraduate first- and second-year students from the Medical (n=100), Physiotherapy (n=100), and Nursing colleges (n=100) were included in the study to assess the level of knowledge and attitudes toward OD in the beginning of their study years. On the basis of that, provide education regarding organ donation and give continuous motivation for the same. So that, they can help the people during their postings and then after in their lives. The total study duration was from July to September 2022. The study/data collection was completed after getting permission from The Institutional Ethics Committee for Human Research-PG Research (IECHR-PGR). A Google Form-based, self-administered questionnaire was used to perform the study. The questionnaire contained three sections. Section A included socio-demographic information such as age,

gender, religion, marital status, and history of OD in the family. Section B assessed the level of knowledge regarding OD, and Section C contained questions relating to their attitude toward organ donation.

The participants were informed about the purpose of the study and data were collected after obtaining verbal consent. All 300 of the randomly selected students gave their willingness to participate in this study.

### Statistical analysis

The data was entered into a Microsoft Excel sheet and analysed using the Epi info 7 (latest version). Qualitative variables were described in

terms of proportions and percentages. Results were expressed with appropriate graphs and tables. The association between qualitative variables was evaluated by the chi-squared test. p-values less than 0.05 were considered significant.

### Results

A total of 300 students were included in the study. Of these, 203 (67.7%) were females. The median age was 21 years (IQR: 18–25). The majority (95.0%) of students were Hindu. Only 15 (5.0%) had a history of OD in the family. The socio-demographic profile of the participants is summarized in **Table 1**.

**Table 1: Socio-demographic data of participants. (n=300)**

Socio-demographic variables	Frequency N	Percentage (%)
Age (years)		
<20	195	65.0
20–25	97	32.40
>25	8	2.60
Gender		
Female	203	67.70
Male	97	32.30
Religion		
Hindu	285	95.0
Muslim	6	2.0
Christian	5	1.67
Jain	3	1.0
Sikh	1	0.33
Marital Status		
Unmarried	297	99.0
Married	3	1.0
History of organ donation in family		
No	285	95.0
Yes	15	5.0

### Knowledge

Student knowledge regarding OD is shown in Table 2. Most of the participants (97.0%) have heard the term 'Organ Donation'. Almost 88.0% of students were aware that consent is essential for OD, ideal organ donor criteria and that it is legal by Indian law. Participants cited that the most common reason for OD is to save someone's life (58.1%) followed by as a part of societal responsibility (16.1%). About three-

quarters of the participants knew that only major organs could be donated. Only 9.3% of students knew about the legislation associated with the determination of brain death. Out of 300 students, 240 participants (80.0%) believed that there are risks associated with OD. Among the perceived health risks, infection (47.5%) was most commonly stated followed by bodily weakness (27.6%) and pain (15.7%).

Table 2: Comparison of knowledge regarding OD among students from different streams

Knowledge questions	Option	Medical n (%)	Physiotherapy n (%)	Nursing n (%)	Total n (%)	X <sup>2</sup> value P-value
Heard the term OD	Yes	98 (98.0)	98 (98.0)	95 (95.0)	291 (97.0)	X <sup>2</sup> = 2.06 p = 0.35
	No	2 (2.0)	2 (2.0)	5 (5.0)	9 (3.0)	
Do you know that consent is essential for OD	Yes	98 (98.0)	80 (80.0)	86 (86.0)	264 (88.0)	X <sup>2</sup> = 20.64 p = 0.0004
	No	2 (2.0)	3 (3.0)	0	5 (1.67)	
	Don't know	0	17 (17.0)	14 (14.0)	31 (10.33)	X <sup>2</sup> = 9.417 p = 0.05
What organs can be donated?	All the organs	9 (9.0)	10 (10.0)	13 (13.0)	32 (10.67)	
	Major organs such as kidney, liver, heart & eye	79 (79.0)	85 (85.0)	85 (85.0)	249 (83)	
	I am not sure	12 (12.0)	5 (5.0)	2 (2.0)	19 (6.33)	
When can you donate organs?	When alive and after death	75 (75.0)	77 (77.0)	80 (80.0)	232 (77.34)	X <sup>2</sup> = 2.56 p = 0.86
	Only when alive	3 (3.0)	2 (2.0)	1 (1.0)	6 (2.0)	
	Only after brain death	8 (8.0)	10 (10.0)	10 (10.0)	28 (9.33)	
	I am not sure	14 (14.0)	11 (11.0)	9 (9.0)	34 (11.33)	
Do you know the criteria for ideal organ donation?	Donor should be free of blood-borne diseases or	6 (6.0)	4 (4.0)	4 (4.0)	14 (4.66)	X <sup>2</sup> = 13.05 p = 0.11

	STD					
	Donor should not have active cancer	1 (1.0)	2(2.0)	0	3 (1.0)	
	Donor's death should not be related to any active legal case	1 (1.0)	3(3.0)	0	4 (1.33)	
	All of the above	81 (81.0)	70 (70.0)	86 (86.0)	237 (79.0)	
	I am not sure	11 (11.0)	21 (21.0)	10 (10.0)	42 (14.0)	
<b>Does OD involve any risk?</b>	Yes	85 (85.0)	89 (89.0)	66 (66.0)	240 (80.0)	$X^2=19.44$ $p=0.0006$
	No	7 (7.0)	4 (4.0)	12 (12.0)	23 (7.67)	
	Don't know	8 (8.0)	7 (7.0)	22(22.0)	37 (12.33)	
<b>Do you have knowledge about the OD centre</b>	Yes	19 (19.0)	25 (25.0)	28 (28.0)	72 (24.0)	$X^2=20.63$ $p=0.0004$
	No	51 (51.0)	22 (22.0)	32 (32.0)	105 (35.0)	
	Only heard about it	30 (30.0)	53 (53.0)	40 (40.0)	123 (41.0)	
<b>Do you have knowledge regarding</b>	Yes	18 (18.0)	18 (18.0)	20 (20.0)	56 (18.67)	$X^2=10.94$ $p=0.02$
	No	63 (63.0)	43 (43.0)	50 (50.0)	156 (52.0)	

the OD card?	Only heard about it	19 (19.0)	39 (39.0)	30 (30.0)	88 (29.33)	
OD is legal by Indian Law	Yes	90 (90.0)	81 (81.0)	94 (94.0)	265 (88.33)	$X^2 = 11.75$ $p = 0.01$
	No	0	3 (3.0)	0	3 (1.0)	
	Don't know	10 (10.0)	16 (16.0)	6 (6.0)	32 (10.66)	
Family of a deceased person can pledge his/her organs	Yes	44 (44.0)	42 (42.0)	29 (29.0)	115 (38.33)	$X^2 = 6.40$ $p = 0.17$
	No	19 (19.0)	23 (23.0)	23 (23.0)	65 (21.67)	
	Don't know	37 (37.0)	35 (35.0)	48 (48.0)	120 (40.0)	
Is it an offence in law to accept monetary / other benefits for OD?	Yes	26 (26.0)	24 (24.0)	42 (42.0)	92 (30.67)	$X^2 = 10.40$ $p = 0.03$
	No	27 (27.0)	22 (22.0)	17 (17.0)	66 (22.0)	
	Don't know	47 (47.0)	54 (54.0)	41 (41.0)	142 (47.33)	
Is there regular funeral service following OD?	Yes	40 (40.0)	28 (28.0)	36 (36.0)	104 (34.67)	$X^2 = 4.96$ $p = 0.29$
	No	10 (10.0)	7 (7.0)	10 (10.0)	27 (9.0)	
	I am not sure	50 (50.0)	65 (65.0)	54 (54.0)	169 (56.33)	

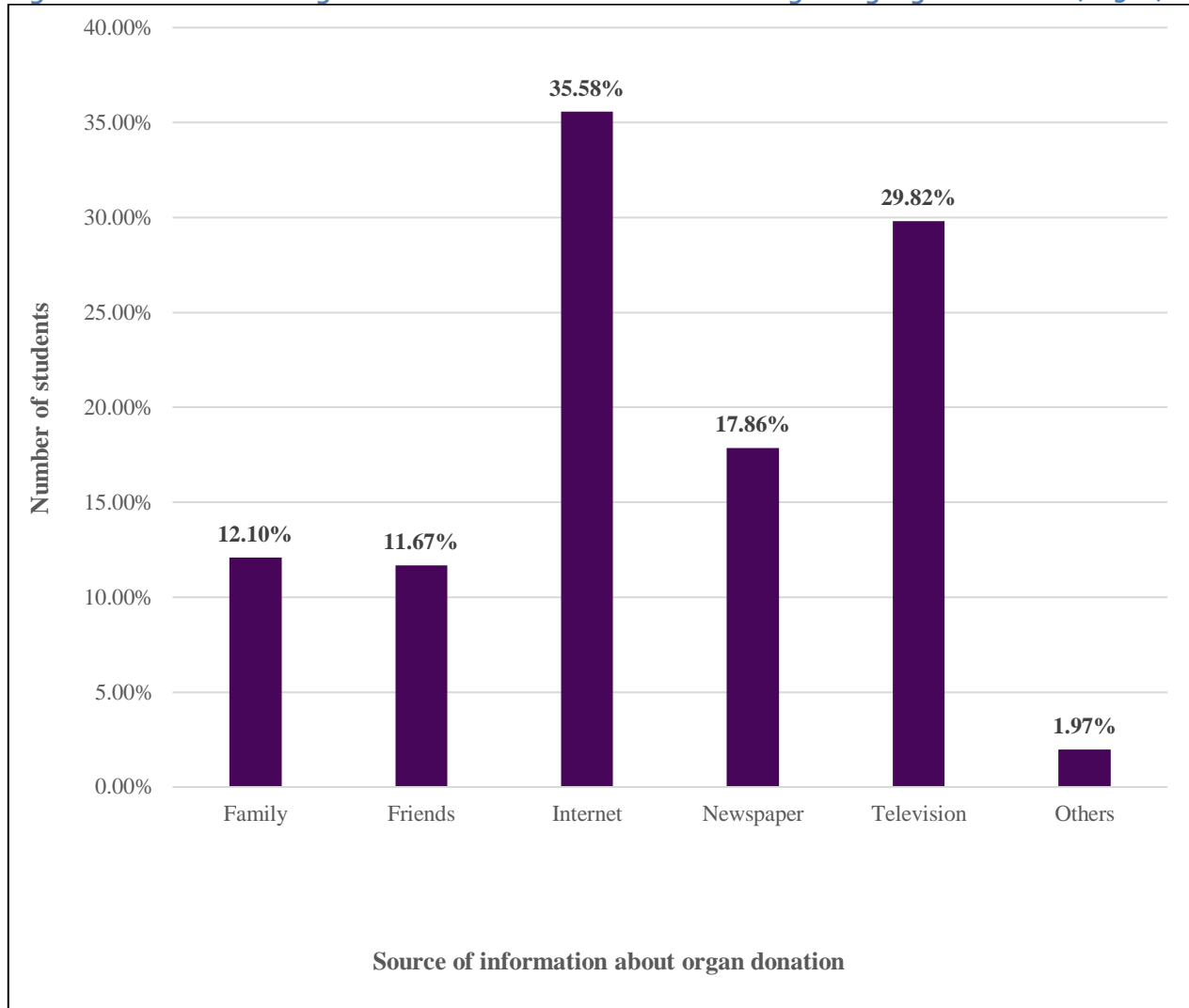
They had poor knowledge about the Organ Donation Centre (24.0%) and the Organ Donation Card (18.7%). Thirty-five percent of students opined that family consent is required

when donating organs, even if the deceased had signed for OD. Only 30.0% were aware that it is an offence in law to accept monetary or other benefits for OD, and 35.0% believed that regular

funeral services could be conducted following organ donation. The most common source for information about OD was the Internet (35.6%)

followed by television (29.8%), and newspapers (17.9%), (Figure 1).

**Figure 1: Bar chart showing the different sources of information regarding organ donation (n=300)**



**Attitude**

Table 3 shows the attitude of students towards OD. More than half of the students (66.3%) showed their readiness to accept donated organs. However, only 112 (37.3%) students had a strong willingness to donate their organs in the future. About three-quarters of students (76.0%) believed that donated organs may be misused or

abused. The main reasons for opting against OD are the potential misuse of organs that have been donated (28.3%) followed by lack of information about donation and procedures (24.6%), thinking that family members would not approve (17.9%), and not wishing to go through the disfigurement involved (8.9%).

**Table 3: Attitude towards organ donation among students of different streams**

Attitude questions	Options	Medical n (%)	Physio-therap	Nursing n (%)	Total n (%)	X <sup>2</sup> value P-value

n (%)						
Willingness to donate organ	Strong	28 (28.0)	46 (46.0)	38 (38.0)	112 (37.33)	$X^2=6.95$ $p=0.03$
	Willing	9 (9.0)	0	4 (4.0)	13 (4.33)	
	Unwilling	63 (63.0)	54 (54.0)	58 (58.0)	175 (58.33)	
Readiness to accept organ	Will think about it	74 (74.0)	58 (58.0)	67 (67.0)	199 (66.33)	$X^2=12.44$ $p=0.01$
	Yes	8 (8.0)	3 (3.0)	4 (4.0)	15 (5.0)	
	No	18 (18.0)	39 (39.0)	29 (29.0)	86 (28.67)	
Feel that donated organ may be misused or abused	Don't know	2 (2.0)	1 (1.0)	0	3 (1.0)	$X^2=6.52$ $p=0.36$
	All the time	76 (76.0)	68 (68.0)	81 (81.0)	225 (75.0)	
	Sometim es	7 (7.0)	11 (11.0)	6 (6.0)	24 (8.0)	
	Never	15 (15.0)	20 (20.0)	13 (13.0)	48 (16.0)	

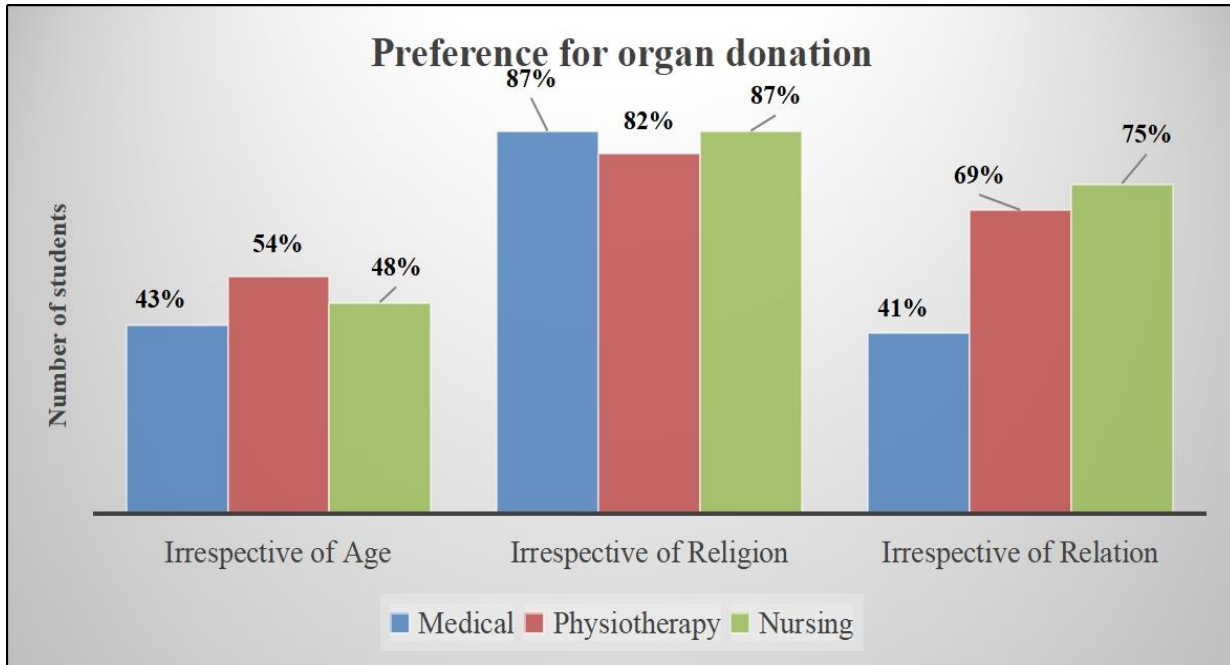
### Preference for organ donation

Figure 2 provides information about the age, religion, and relative's preference for organ donation. Nearly half of the students would be willing to donate their organs irrespective of the age of the recipient while the remaining ones expressed their preference to donate to a specific age group: 18.0% for the younger age group, 26.0% for middle-aged persons, and only 7.0% for the elderly age group. Most of the students (85.0%) did not give any preference to the religious status of recipients. Sixty-one percent of

students would prefer to donate their organs to anyone irrespective of their relationship with that person and the rest of the participants would be willing to donate their organs to family members only. There was a statistically significant difference in knowledge about consent for organ donation, what practices were legally acceptable under Indian law, that it was an offence to accept money, and attitudes relating to the willingness level for organ donation with the level of education.



Figure 2: Impact of age, religion, and relative's preference on organ donation



## DISCUSSION

Organ transplantation is the most effective treatment modality for end-stage organ disease and organ failure. The scarcity of organs suitable for this purpose has increased the necessity for raising public knowledge of organ donation while dispelling societal myths and misconceptions. The dissemination of favourable information about OD among the public is greatly aided by healthcare professionals.<sup>[1]</sup> Therefore, the present study was performed to assess the knowledge and attitude regarding OD among first- and second-year students of medical, physiotherapy, and nursing colleges in a tertiary care hospital. In this cross-sectional study, 97.0% of the participants were shown to have heard the term 'organ donation' which is similar to the studies reported by Bapat et al.<sup>[11]</sup> and Ali, et al.<sup>[12]</sup> These studies were conducted in medical colleges in South India and Karachi, Pakistan where the level of recognition was 97.0% and 97.5%, respectively. According to the findings of this study, 35.6% of the students cited the internet, 29.8% television, 17.9% newspapers, and 12.0% family and friends as their main sources of information regarding organ donation. While a study by Bilgel et al.<sup>[13]</sup> revealed that media (72.1%) and medical education (22.7%) as sources of knowledge, the study conducted by

Bapat et al.<sup>[11]</sup> stated that television (61%), newspaper (60%), radio (31%), and magazines (51%) were the main sources of information. Hence, media can be said to be the best mode of information regarding OD among the three student groups studied. Only major organs including the eye, heart, liver, and kidney could be donated, according to about 83% of respondents; however, 10.7% believed that all organs could be donated, and 6.3% were unsure. Only 27% of the 70 medical students in Ramadurg and Gupta's<sup>[14]</sup> survey knew all the organs that may be donated. In a different study, Ali et al.<sup>[12]</sup> discovered that according to students' opinions, kidney, cornea, blood, and platelets were the most commonly donated organs and tissues. Satisfactory knowledge was observed regarding consent prior to OD (88.0%), ideal organ donor criteria (86.0%), and risk associated with OD (80.0%). However, only just over a third of students were found to be aware of the legalization of brain death (39.3%), organ donation centres (24.0%), and organ donation cards (18.7%). These statistics reflect the poor knowledge regarding OD among the students, and it is necessary to address this problem. However, Sam et al found that there was a good understanding of the organ transplant act

(54.0%) and the risks involved (49.0%).<sup>[15]</sup> Regarding consent, only 38.3% were aware that even if the deceased has signed for organ donation, the family's consent is still necessary. Notably, this percentage was greater in the study conducted by Karini et al. (53.7%).<sup>[16]</sup> Only 30.7% of people were aware that it is an offence to take money or any other incentives in exchange for organ donation and 34.7% knew that regular funeral services can be conducted following organ donation. Only 38.3% of the participants in the survey said that they would be willing to donate their own organs. This finding was lower than the findings from a study conducted in China by Zhang et al<sup>[17]</sup> where 49.8% of respondents showed their willingness for organ donation. Interestingly, the studies conducted by Odusanya et al<sup>[18]</sup> demonstrated a 30% willingness to donate, and the study from Ohio et al<sup>[19]</sup>, where over 96% of respondents expressed favourable attitudes toward donation. The main reasons for opting against OD were the perception of a misuse of donated organs (28.3%) followed by a lack of information about donation and procedures (24.6%), disapproval of family members (17.9%), and not wishing to go through the disfigurement involved (8.9%). Sam et al reported the same reasons for donation unwillingness. This study showed that 13.6% were not willing to go through the disfigurement, 29.4% had no faith in the legal system, and 49.2% stated that their family would not approve.<sup>[15]</sup> More than half of the students (60.7%) indicated a willingness to donate to any person irrespective of whether it was a family, friend, or stranger while 38.3% said they would donate to their family members only. In total, 85.33% expressed no religious preference regarding organ donation. According to El-Shoubaki et al<sup>[20]</sup> from Qatar, the majority of participants wanted to donate their organs to their close friends and family contrasting with our study. The majority of the participants opted to donate to a younger person i.e., 43% of this population. For 94.5% of the respondents, religion was not a factor in their decision to donate their organs showing a 10% higher preference than expressed in this study. When we compared the education level with various knowledge and attitude variables,

we found that there were significant associations in knowledge variables (such as consent before organ donation, that paid donation is an offence and OD is legal by Indian law) and in the attitude variable (such as willingness level for organ donation). In this study, an attempt was made to demonstrate the lack of knowledge of OD among medical and para-medical students. Hence, the study underlines the need for a good intervention that includes knowledge and encouraging messages to bring about essential changes in the students' views and intentions regarding OD.

## CONCLUSION

There is a gap between knowledge and attitude in various aspects of organ donation among the medical and paramedical students studied. Although the majority have heard about OD, study respondents demonstrated inadequate knowledge of the organs that can be donated, the organ donation centre, and the legislative implications regulating organ donation. Even though many students showed their readiness to accept donated organs, only one-third of students expressed their willingness to become a donor. This study implies that by providing the appropriate information and guidance, medical and paramedical students can become future organ donors who are more easily able to persuade their patients to consider organ donation.

## LIMITATIONS

The present study was based on only single-centre data with a small sample size. Additionally, most of the participants belonged to the Hindu religion. Both these limitations restrict the generalization of the findings.

## RECOMMENDATIONS

Hence, future studies should include larger sample sizes including more educational institutes with various cultural backgrounds. We can also conduct qualitative studies for an in-depth understanding of the issues. Organ donation classes need to be incorporated into the medical/paramedical curriculum and also in non-medical courses, enabling students to acquire adequate knowledge about OD.

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