

An interventional study on knowledge and attitude regarding organ donation among medical students

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Abstract

Background: Organ donation to date remains a sensitive issue among the general public and medical community. In both group's lack of awareness persists despite the significance of organ shortage faced by the health care system. The constant demand for organs must be dealt by increasing the donor pool by generating a positive attitude of public towards donation while curbing illegal activities by stricter laws. This can be brought about by Medical professionals whose opinion makes a significant impact on the prospective belief of public.

Objective: To explore the knowledge and attitude regarding organ donation among undergraduate medical students and to assess the change in variables post intervention.

Materials and Methods: A cross-sectional interventional study was conducted among 382 medical students. Data was collected pre and post intervention using a pre-validated self-administered questionnaire, in a lecture hall setting.

Results: Knowledge regarding organ donation practices was poor but showed good improvement post intervention. Only 3.93% students possessed donor card, but more than 60% were willing for donation in future with preference to deceased donation, though only 37.96% were willing to receive organs; and 48.63% showed distrust against doctors and majority agreed that religion was not against organ donation. Media was stated as the most popular source of information and poor knowledge was claimed to be the major reason for unpopularity.


Conclusion: Intervention does improve knowledge; however positive change in attitude will require a different approach. Appropriate changes in the curriculum are thus indicated to generate well-informed physicians with an optimistic outlook to change the organ donation scenario.

KEY WORDS: Organ Donation, Medical students, Intervention

Introduction

Organ shortage is universal. Many major countries have donation rates of 20–30 per million populations (Italy, France, USA etc).^[1] Being the second most populous country in the world, India's count of organ donors is only 0.34 pmp.^[2]

Transplantation has been proved firmly as the only modality of treatment for many patients with end-stage organ failure.^[1] The continual organ shortage can be overcome by an increase in a number of individuals who are willing to donate. Currently living related and unrelated altruistic donations contribute to the major pool of available organs, supply doesn't meet the huge demand and commerce of living donation has not stopped regardless of the implementation of legislation, nationally and internationally.^[1,3-5] To overcome the above-mentioned drawbacks of living donations, deceased organ transplants are currently the only acceptable means to improve the donor pool. Organs can be donated after Natural or Brain death. The number of organs and tissues that can be donated after natural death is limited whereas following brain death 37 different organs can be transplanted.^[6]

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Review of literature showed that poor knowledge and attitude regarding organ donation among the general public is a global phenomenon.^[7-11] Literature search also indicated poor awareness and attitude of medical students, nursing students, and health care professionals, nationally as well as internationally.^[12-18]

Evidence confirm that positive attitude of doctors towards organ donation reflects upon the public in an encouraging way, which confirms that training the health care professionals to identify and refer potential deceased organ donors after counseling donor families, can boost the donor rates.^[1,2,16-20] Young doctors must be trained to initiate the organ procurement process as they are often the first point of contact between potential donor's family and the procurement team.^[14]

Limited research on undergraduate medical students regarding organ donation is available in India. The understanding and outlook of young physicians will shape the future of organ donation scenario. Hence an interventional study was planned to analyze the knowledge and attitude aspects among medical students. Findings of the study will help in formulating policies regarding organ donation in the institute.

Materials and Methods

The study conducted, is an interventional study [pre-test and post-test] among undergraduate medical students in a private medical college in Kanchipuram district to establish the impact of the intervention on knowledge and attitude involving two sets of cross-sectional data from the same population. The institutional ethics committee approved the study prior to conduction. The study population comprised of all the medical students in years 1 to 4.

Anonymous pre-validated self-administered questionnaires were administered to students as a pre-test and collected back after completion. Then a session on organ donation was conducted. The session focused on the state of persistent organ shortage worldwide and in India, providing statistics on the transplant procedures done nationwide

and the waiting lists, types of organ donation, organs that can be donated while alive and deceased, criteria for deceased donation, organ procurement and allocation procedures, legislations regulating organ donation practices in India, NGOs working towards organ donation, ethical aspects of organ donation and transplantation such as consent, accepting benefits and confidentiality. The intervention was delivered to participants in a lecture hall setting separately for each academic year. Post-tests using same questionnaires were filled after the intervention.

Statistical analysis

Statistical analysis was carried out using SPSS version 17, proportions were calculated for individual observations and Z-tests for the standard error of the difference between two proportions were applied. *P*-values less than 0.05 were considered statistically significant.

Results

The estimated total sample size was 440. The number of students who participated in the study $n=382$. Rest of the missing samples are attributed to incorrectly filled questionnaires and those who were absent on the day of intervention. Total participation rate considering the previous sample size of 440 is 86.9%. All the participants completed the pre-test and post-test questionnaires.

The mean age of participants was found to be 20.5 ± 1.5 , ages ranging from 17-24 years. Of the total participants ($n=382$), 201 of them were females (52.62%) and 181 were males (47.38%). The highest number of students belonged to Hindu religion (87.70%).

(Table 1) shows awareness of the students about the various organs that can be donated either when alive or on death. Regarding organs that can be donated live only kidney (98.95%) and to some extent liver (14.66%) were known. Students possessed very poor knowledge about other important organs like lungs, bone marrow, blood etc. Cornea

Table 1: Organs that can be donated when alive / on death (Multiple responses)

Organs (As per key)	Organs that can be donated when alive			Organs that can be donated on death		
	Pre test %	Post Test %	Test of Significance	Pre test %	Post Test %	Test of Significance
Kidney	98.95	97.38	Z=1.62	18.06	51.31	Z=10.29 [†]
Liver	14.66	53.66	Z=12.46 [†]	---	---	---
Blood	7.59	48.43	Z=14.13 [†]	---	---	---
Bone Marrow	3.14	41.88	Z=14.45 [†]	8.38	32.98	Z=8.82 [†]
Lung	1.83	36.13	Z=13.45 [†]	2.62	30.63	Z=11.2 [†]
Pancreas	1.05	37.7	Z=14.49 [†]	1.83	25.92	Z=10.05 [†]
Intestine	1.31	26.96	Z=10.96 [†]	---	---	---
Cornea	---	---	---	93.72	92.15	Z=0.86
Heart	---	---	---	53.66	75.65	Z=6.53 [†]

Significant * $p<0.05$ † $p<0.01$ ‡ $p<0.001$

(93.72%) heart (53.66%) and kidney (18.06%) were the best known among organs that can be donated on death. There was an extremely poor orientation about bone marrow, lung, and pancreas. However, in both the criteria, the number of correct responses significantly increased post intervention.

Awareness regarding legislations (Table 2) was very low, with only 7.33% students being aware of THO Act. Also, only 11.42% of the students were able to define an organ donor card. Accepting monetary benefits for organ donation, confidentiality, and reversal of one's own decision, family's decision, and organ allocation priorities received a moderate response prior to intervention; 24.61% students could correctly answer all four criteria of death acceptable for organ donation. All aspects of awareness about various aspects of organ donation showed statistically significant increase post intervention.

Only fifteen students (3.93%) possessed a donor card (Figure 1). However, 67.02% students were willing to donate their organs even before intervention (Table 3). Also, 65.45% students were willing to sign up for a donor card post intervention. There was a significant increase in the number of

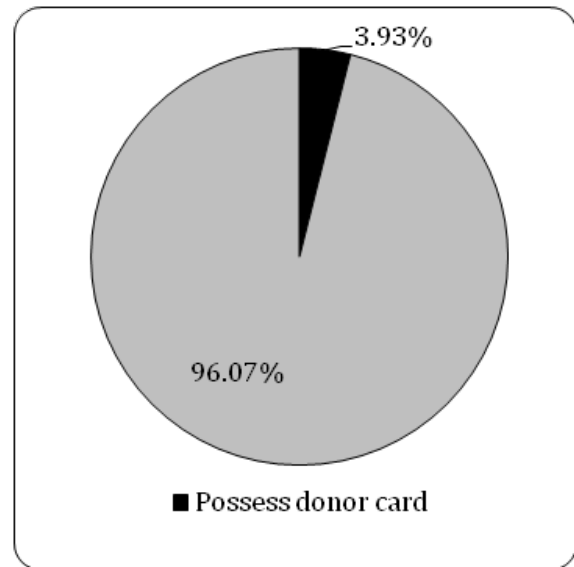


Figure 1: Possession of Organ Donor Card (n=382) Pre-test only

Table 2: Awareness about various aspects of organ donation (n=382)

Awareness about various aspects of organ donation (n=382)	Pre test %	Post Test %	Test of Significance
THO Act(n=382)	7.33	95.55	Z=51.89 [†]
Organ Donation Card	11.42	86.91	Z=31.68 [†]
Whether it is legal to accept benefits for organ donation(NO)	54.71	74.35	Z=5.79 [†]
Decision of organ donation is reversible(YES)	56.54	76.7	Z=6.05 [†]
Awareness of donor regarding recipient and vice versa(NO)	50.52	81.41	Z=9.53 [†]
Can family decide on organ donation of kin(YES)	60.21	80.89	Z=6.44 [†]
Preferences as of who receives the organ(CENTRAL WAITING LIST)	25.39	71.2	Z=14.27 [†]
Criteria of deaths acceptable for Organ Donation (Correct Response for all four criteria - Cardiac death, Brain death, Persistent vegetative state, Irreversible coma)	24.61	87.96	Z=22.95 [†]

Significant * $p < 0.05$ [†] $p < 0.01$ [‡] $p < 0.001$

Table 3: Multiple Aspects of Attitude regarding Organ Donation (n=382)

Multiple Aspects of Attitude regarding Organ Donation (n=382)	Pre-test (%)	Post-Test (%)	Test of Significance
Willingness to donate (YES)	67.02	71.73	Z=1.41
Whether relatives should have a final say at time of donation (YES)	25.39	51.31	Z=7.65 [†]
Willingness to receive an organ (YES)	31.94	37.96	Z=1.75
Willingness to sign up for a donor card	58.38	65.45	Z=2.02 [*]
Chances of doctors declaring the death of a donor prematurely. (NO)	51.57	56.54	Z=1.38
Organ donation being against their own religion (NO)	80.37	82.98	Z=0.93
Self Confidence of counseling and motivating patients and their kin for organ donation	69.9	74.35	Z=1.37
Timing preferred if willing for organ donation			
• Living	3.66	5.76	Z=1.37
• Dead	55.76	57.59	Z=0.51
• Not Sure	12.83	14.14	Z=0.53

Significant * $p < 0.05$ [†] $p < 0.01$ [‡] $p < 0.001$

Table 4: Personal Opinion regarding Organ Donation (Multiple Responses)

Reasons for not willing to donate	Pre-test %	Post-Test %	Test of Significance
• Personal	8.12	9.16	Z=0.51
• Regarding medical attention	1.05	1.83	Z=0.91
• Religious	3.14	2.36	Z=0.66
• Others	2.36	1.05	Z=1.41
Reasons for Organ Donation not being popular in India			
• Inconvenience to relatives	44.5	45.29	Z=0.22
• Socio cultural factors	45.29	50.26	Z=1.38
• Lack of knowledge among general population	77.75	80.37	Z=0.89
• Fear of disfigurement of dead body	18.85	19.63	Z=0.27
• Expensive	17.28	15.71	Z=0.58

Significant * $p < 0.05$ † $p < 0.01$ ‡ $p < 0.001$

students with the opinion that relatives should be having a final say with regard to organ donation of their deceased kin post intervention. Almost half the students (48.43%) were of the opinion that doctors might declare the death of a prospective organ donor prematurely, for the benefit of a recipient individual. There was no statistically significant change in this opinion on intervention. Eighty percent of students considered that organ donation was not against their religion and almost seventy percent of the students were confident of counseling and motivating patients and their relatives. However, the intervention did not have a positive effect on both these aspects.

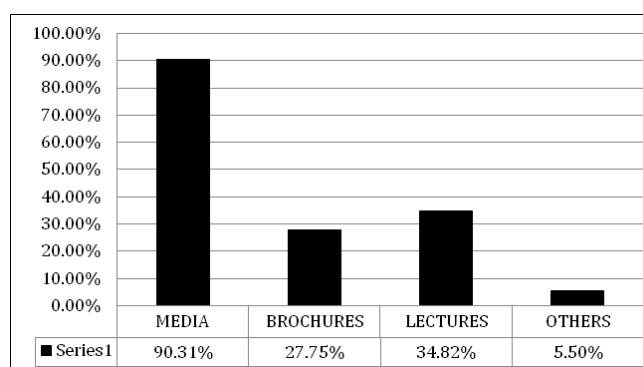
Very few students (31.94%) were open to the idea of receiving organs themselves. As far as organ donation by them is considered, for more than half of the sample (55.76%), the preferred timing for organ donation was post-death, with only 3.66% willing to donate organs when alive and 12.83% not sure of their preferences. In spite of intervention none of the aspects related to receiving as well as donating organs showed any significant change.

(Table 4) shows students have mentioned vague reasons for their personal unwillingness to donate. However, they gave specific reasons for the unpopularity of organ donation in India. Lack of knowledge among the general population (77.75%), socio-cultural factors (45.29%) and inconvenience to relatives (44.5%) were the commonest reasons perceived. None of the findings showed any effect of the intervention.

Ninety percent of students stated media as the major source of information (Fig 2). Under the option "others" students have mentioned hearing it from fellow students, having a family history of organ donation and researching on the subject of their own interest.

Discussion

This cross-sectional interventional study was conducted among 382 medical students to explore their knowledge and attitude regarding organ donation and to assess the impact of health education intervention. Knowledge regarding various aspects of organ donation was poor but the impact of the intervention was observed to be good.

**Figure 2:** Source of information (Pre-test only)

Though transplantations can take place for various organs, tissues, and cells, kidneys are the most commonly transplanted organs posthumously, followed by livers and hearts.^[21] Reflecting this situation, the current study also shows maximum awareness regarding kidney for live donation and cornea for deceased donation. Awareness regarding all other organs and tissues is observed to be very poor though showing good effect post intervention. Highest knowledge regarding kidneys followed by other tissues and organs has been observed in other studies conducted on medical students, non-medical students as well as general population.^[9,11,17] A positive effect of intervention has also been observed in research conducted in Northern Ireland^[22]

Various rules and regulations exist for organ donation nationally (THO Act, NOTTO) and internationally (WHA 2010).^[3,4,5] The Government of India has taken numerous proactive measures like a National Helpline, National organ donation registries, development of green corridors etc.^[23] In spite of this, very poor awareness regarding legislation has been observed in this study. Similar findings have been observed in multiple studies.^[9,11,13,22] Comparable to this study it has been observed in other intervention studies that notable improvements occur in understanding the fundamental medico-legal issues, namely how the law operates with regard to donation etc. when knowledge is imparted.^[22]

Students had a fair general knowledge about accepting benefits for organ donation, reversal of the decision of donation, confidentiality among donors and recipients which all increased to notably higher levels post intervention. One study conducted in Turkey found out that almost 31.8% of students strongly felt that financial incentives might actually improve donor rates while in a study conducted by Maroof *et al.* among the general population, 25% thought that organ vending might be considered in times of dire need.^[8,15]

Students lacked awareness regarding the existence of a central waiting list that allocates organs based on the severity of illness before intervention (25.39%). This increased to 71.2% post intervention. This particular finding correlates with students' need to acquire knowledge regarding legislations and procedures because the existing Act in India clearly explains all the above-mentioned variables.^[3] However, in a survey of medical students in Puerto Rico, 92.6% students were aware that patients on the waiting list who are in critical condition have priority over other patients.^[16]

Awareness regarding various criteria of death acceptable for organ donation was extremely low, which improved well post intervention. Lack of awareness has been observed in multiple studies among medical students as well as general population.^[10,11,22] This lack of knowledge is more worrisome when it occurs on the doctors' side because failure to recognize and approach potential donors will definitely contribute a huge decrease in donor pool emphasizing the need for education to improve efficiency.

Of all 11.42%, students could specify an organ donor card and only fifteen students (3.93%) possessed a donor card. Though the majority of the students expressed willingness to donate (67.02%), the intervention did not have a statistically significant impact on this number. This is a cause for concern, because if the medical community is refractory to show a more positive attitude, it is doubtful if the public will embrace organ donation with more enthusiasm. Varying levels of acceptance to the idea of organ donation has been observed in studies conducted nationally and internationally among various types of population. In general organ donation is accepted as a very pious type of endowment; however, its acceptance is far from universal.^[8,9,11-13,15-17,22]

However, a significant increase was observed in readiness to sign for a donor card. This could be because of awareness of the concept of donor card post intervention. This is favorable cause certain studies showed that despite a considerable increase in knowledge, health care professionals were not keen enough to sign up for organ donation.^[22,24] This phenomenon has been also observed in a study conducted in South India among general population where despite the high level of awareness about organ donation, positive attitude towards organ donation was not high.^[9]

In spite of informative session, the idea of receiving organs was not popularly appreciated and posthumous organ donation remained the most accepted choice (57.59%) with only 5.76%, students consenting for living donation even post intervention. Contrary findings have been observed in other

studies where the majority of the respondents are agreeable to the idea of receiving organs.^[9,12,14]

Satisfyingly the self-confidence of students in counseling patients for organ donation was fairly good. In a study conducted in Germany, only 8% out of 1136 medical students and physicians felt sufficiently prepared for approaching relatives of potential organ donors.^[25] Teaching about organ donation and student's comfort with approaching a family for organ donation was found to be predictive of higher knowledge scores in a study conducted by Bardell T at Queen's University in Kingston.^[20] Thus, with adequate training medical professionals will be well equipped with knowledge and confidence to approach and counsel potential donor families.

Relatives do play an important role in the organ donation scenario. The legislation also mentions the role of relatives or a person in lawful possession of the body.^[3] This study observes that majority of students were of the opinion that family should have a say in the decision-making in the organ donation of the kin and that inconvenience caused to the relatives could be one among the reasons for poor organ donation rates in India. The role of family members has been emphasized in other studies too.^[11] In a study conducted in Karachi, 53.2% of the medical students were of the opinion that even if donor's family was unwilling to give consent, transplantation should be carried out as per the donor's wishes.^[17] A study reports that medical students were of the opinion that requesting organ donation usually does not add to a family's grief, and at the same time, another study shows poor awareness regarding hospitals' role in honoring wishes of donors family.^[16,20]

The rate of students perceiving that doctors might declare premature death in the case of a potential donor increased from 51.57% to 56.54%. This might be probably because post intervention students became aware of the existing organ shortage crisis and malpractices occurring to obtain organs and came to this abysmal conclusion. Contrary findings were observed in other studies, where medical distrust was not observed to be significantly prevalent.^[12,22]

Religion does play an important role in shaping our attitudes. It's heartening to observe that, in the current study, the majority of the students believe that their religion is not in opposition to organ donation. The positive impact of religion has been observed in multiple studies.^[11-13,22] A study conducted in Saudi observed negative attitude among people who believed organ donation was against their religion.^[26] A significant association was found between willingness to donate and knowledge of allowance of organ donation in religion in multiple studies.^[8,17]

In this study, students appear to be quite reluctant to evaluate reasons as to why they are not willing to donate organs. Also, lack of knowledge, sociocultural factors, followed by inconvenience to relatives was stated as the most important reasons for organ donation not being popular in India. A significant percentage of respondents from a European survey (31%) were unable to give a reason for their unwillingness to donate.^[27] Reasons for not willing for organ donation cited in other studies are parental and family refusal; fear for personal

safety, against mutilation of the body, religion, wastage of organs, fear, respect for deceased etc.^[13,15,26,27]

Media has been stated as the most popular (90.31%) source of information, though considering the inadequate levels of knowledge pre-intervention; media has not been successful in imparting correct information. At the same time if the media had such an effect on medical students, it surely would have a significant effect on the public. The positive attitude among general population can be achieved by combined efforts of good media and adequately informed, well-motivated medical professionals.^[2]Media has been stated as the commonest source of information in multiple studies.^[9,11-13,15,17,26]

Strength and Limitations of the study

The study emphasizes poor knowledge on organ donation, the importance of informative intervention, and need of innovative approaches to change in the attitude of medical students.

However, this study was conducted in a rural private medical college. Findings of this study group cannot be generalized to medical students attending various government as well as urban institutions.

Following post-test, no follow up was done to identify if any of the willing students had actually signed up for donor cards and whether the intervention has lead to behavior change among the students.

Conclusion

From the data analyzed it is evident that though there was a significant increase in knowledge following intervention, attitude of students did not change accordingly. These two findings suggest an adequate medical curriculum devised to provide knowledge and impart skills on how to approach donor families, with ethical counseling to students that will bring a change in attitude is essential. The knowledge that is generally attained by the students from the existing medical curriculum is from scattered sources. Forensic medicine explains the concept of brain death as a criterion for organ donation but does not traverse in the medico-legal aspects regarding transplantation procedures. General medicine states the conditions where organ donation is required and General Surgery explains the transplantation surgeries. It would be better if a separate topic was included under Medicine (as a part of intensive care) and Community/ Preventive and Social Medicine which explained the basic concepts of organ donations, the legislatures and covers on the ethics and sensitive issues like how to approach the potential donor families. A qualitative study must be done to assess all attitude aspects in an in-depth manner for a better understanding which will help create a curriculum and a better skill set that will generate a more positive attitude among medical students. Conducting similar studies in government and city-based colleges, and also involving different health care professionals, are needed to get a better idea of the existing scenario.

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