

Original Research Article

A cross sectional study to assess concerns and commitment for organ donation among students of arts, science and commerce streams in degree colleges in a metropolitan city**Amol Kinge¹, Kamaxi Bhate², Vikrant Pagar¹, Sushant Chavan¹**¹Assistant Professor, Department of Community Medicine, Shri Bhausaheb Hire Government Medical College, Dhule, Maharashtra, India²Professor, Department of Community Medicine, Seth GSMC & KEMH, Parel, Mumbai, India

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Abstract

Background: Organ Donation has been one of the greatest advances of modern science that has resulted in many patients getting a renewed lease of life. Organs can be donated by a living person, after natural death & much more organs can be donated after brain Stem Death is "Cadaver Transplant" or "Deceased Donor Transplant". It is believed that youths are the leading decision makers in families. So identifying their concerns regarding organ donation, creating awareness in them and changing their beliefs may increase number of consents for organ donation in long run. **Materials and methods:** A prospective interventional study was done among 206 students of nine degree colleges (arts, science and commerce streams) using random sampling during the study duration of 18 months. **Results:** 102 (48.57%) participants were willing to donate their organs after their BSD while after the session in post test the number increased significantly to 163 (77.61%). And when this increase was compared within streams, it was found that there was no significant difference in knowledge of students of Arts, Science and Commerce streams. ($P > 0.05$) **Conclusions:** Willingness to donate their Own Organs or that of the Relatives in case of brain stem death had increased significantly after session in the post test. And there was no significant difference found in the increase in knowledge when compared within all the three streams, religions and boys and girls, which indicates that the level of increase in knowledge amongst Arts, Commerce students is comparable to Science students.

Keywords: Organ donation, renal failure, liver failure, Organ and tissue transplant, willingness, concerns.

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Introduction

Organ Donation has been one of the greatest advances of modern science that has resulted in many patients getting a renewed lease of life. Organs can be donated by a living person, after natural death & much more organs can be donated after Brain Stem Death is "Cadaver Transplant" or "Deceased Donor Transplant". Healthy organ or even tissues are taken from a donor, to be transplanted in the body of a needy individual. The expert opinion is that organ donation from one Brain Dead individual can save the life of up to 50 people[1]. Organs which can be donated include: kidneys, heart, liver, pancreas, intestines, lungs, skin, bone and bone marrow, cornea, etc. Most people can be organ donors. Many people donate an organ upon their death or when they are brain dead. These people are called 'Deceased Organ Donors'. In Spain and Portugal the deceased donor rate is found to be highest (more than 30 donors per million populations)[2]. But as compared to above statistics, India lags far behind. Even in the better performing regions of the country the deceased or cadaver renal transplantation rate is only 0.08 per million per year. In India, 1,33,938 people have died of road traffic accidents in 2010 and of that 70% are brain dead[3]. This means that every year there are almost 93,000 persons who become brain dead, and are therefore potential organ donors. Hence we have potentially a huge pool of Brain Dead Donors available in India, whereas the actual Organ Donation is very less. It is estimated that in India every year

over 175,000 people are diagnosed to have kidney failure and would require organ transplant. Due to non-availability of organs only about 5,500 kidney transplants are done. The Transplantation of Human Organs Act (1994)⁴ provides for the regulation of removal, storage and transplantation of human organs for therapeutic purposes, to prevent commercial dealings in human organs and accept brain death and make it possible to use these patients as potential organs donors. In fact, the need far exceeds the supply of transplantable organs. The lack of awareness and apathy of governmental organization to mobilize the masses have led to a poor scenario. India lags behind in the implementation of a cadaveric donation program[5]. Here again the vital issue which complicates the situation is the lack of awareness among people. Without awareness it is going to be difficult to convince the relatives of the deceased patients to donate the organs for transplantation. Contrary to logical understanding, educational status, socio-economic status, language barrier, cultural and religious factors do not affect the decision for or against donation. It is believed that youths are the leading decision makers in families. So identifying their concerns regarding organ donation, creating awareness in them and changing their beliefs may increase number of consents for organ donation in long run.

This present study aimed at assessing concerns regarding organ donation among youths of various streams in degree colleges and hence to see their commitment towards organ donation.

Materials and methods

A prospective interventional study was done among nine degree colleges (arts, science and commerce streams) using random sampling during the study duration of 18 months. Assuming prevalence of awareness of 50% among people, sample size calculated as 206 (including 15% non-response rate). 206 students

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selected using multistage sampling approach. In first stage we apply Quota sampling & from each stream (Arts, Science, Commerce) we select 70 samples. In second stage these 70 samples selected using convenient sampling.

Stage I: We collected baseline data of the study participants. Data regarding demographic characteristics, their knowledge regarding organ donation, concerns regarding organ donation was collected using pre-designed questionnaire after taking valid permissions from the colleges and participants.

Stage II: After data collection, educational session was held for the study participants using informative slide show presentations, educational pamphlets.

Stage III: Follow up of same participants was taken after 2 months to assess retention of knowledge and commitment for organ donation. Necessary data was collected.

The data was entered using Microsoft excel software, data was presented in the form of tables, graphs. Chi-square and Mac-Nemar tests were applied to test the significance in difference of knowledge.

Results and observations

The present study was done among 210 students of different streams (arts, science and commerce). Among the 210 Participants, 71 were from Arts colleges, 70 from science and 69 from commerce colleges. Out of these students 96 (45.7%) were boys and 114 (54.28%) were girls. Majority of them (77.14%) belonged to Hindu religion, 34 (16.19) were Buddhists, 8 (3.8%) were Muslims, and 6 (2.8%) were Christians. The student were evaluated for common concerns related to organ donation and their willingness to donate their and their relatives organs after unfortunate brain stem death (if any). Table 1 shows that even after teaching sessions, there were concerns regarding disfigurement of body after organ donation / skin donation, and whether Organ donation is done in case of conflicts within close relatives or not. Table number 2 reveals that 26.19% participants were willing to donate their relative’s organs after their BSD while after the session in post test the number increased to 57.14%. And when this increase was compared within streams, it was found that there was no significant difference in knowledge of students of Arts, Science and Commerce streams. (P>0.05). Religion wise distribution of participants who were willing to donate their relative’s organs after their BSD reveals that in total 55 (26.19%) participants were willing to donate their relative’s organs after their BSD while after session in post test the number increased to 120 (57.14%). Gender wise distribution of participants who were willing to donate their relative’s organs after their BSD reveals that in total 24 (25%) Boys before session were willing to donate their relative’s organs after their BSD while after session in post test the number increased to 55 (57.29%) similarly 31 (27.19%) girls before session were willing to donate their relative’s organs after their BSD while after session in

post test the number increased to 65 (57.01%). And when this increase was compared within Gender, it was found that there was no significant difference in knowledge of Boys and Girls (P > 0.05) The table number 3 shows that 102 (48.57%) participants were willing to donate their organs after their BSD while after the session in post test the number increased significantly to 163 (77.61%). And when this increase was compared within streams, it was found that there was no significant difference in knowledge of students of Arts, Science and Commerce streams. (P>0.05). Religion wise distribution of participants who were willing to donate their organs after their BSD reveals that in total 105 (48.57%) participants were willing to donate their relative’s organs after their BSD while after session in post test the number increased to 163 (77.61%) .

Gender wise distribution of participants who were willing to donate their relative’s organs after their BSD reveals that in total 44 (45.83%) Boys before session were willing to donate their relative’s organs after their BSD while after session in post test the number increased to 72 (75%) similarly 58 (50.87%) girls before session were willing to donate their relative’s organs after their BSD while after session in post test the number increased to 91 (70.82%). And when this increase was compared within Gender, it was found that there was no significant difference in knowledge of Boys and Girls (P > 0.05)

In the current study we observed that in pre test 46.47%, 47.14% & 52.17% participants from Arts, Science and commerce streams respectively were willing to pledge for their organs to donate after their BSD. The percentages increased to 80.28%, 70% & 82.6% respectively. Also 114 (54.28%) participants signed the pledge forms after session. And when this increase was compared within streams, it was found that there was no significant difference in knowledge of students of Arts, Science and Commerce streams. (P > 0.05) (Table 3)

It shows religion wise distribution of participants who signed the pledge forms to donate their organs after their BSD. It reveals that after the educational session participants belonging to Hindu (57.96%), Muslim (23.07%), Buddhist (52.94%) & Christian (33.33%) signed the pledge forms to donate their own organs after their BSD. (Table 3) Also we analyse gender wise distribution of participants who signed the pledge forms to donate their organs after their BSD. It showed that in total 51 (53.12%) Boys and 63 (55.26%) girls SIGNED the pledge forms to donate their OWN organs after their brain stem death (BSD). And when this increase was compared within Gender, it was found that there was no significant difference in knowledge of Boys and Girls (P > 0.05). After the session 54.92%, 42.85% & 60.86% participants from Arts, Science and commerce streams respectively signed the pledge forms to donate their own organs after their BSD. (Table 3)

Table 1: Distribution of participants based on awareness about certain facts related to Organ Donation, before and after session

| Concerns regarding organ donation | Percentage of students giving correct answers | | P value* |
|--|---|---------------|----------|
| | Before session | After session | |
| Which organs can be donated by living individual | 27 (12.85%) | 65 (30.95%) | - |
| Which organs can be donated after natural death | 44 (20.95%) | 105 (50%) | - |
| Which organs can be donated after brain stem death | 29 (13.8%) | 166 (79.04%) | - |
| Organ donation by cancer patients after BSD | 73 (34.76%) | 117 (55.71%) | 0.716 |
| Organ donation by DM/HTN patients after BSD | 26 (12.38%) | 91 (43.33%) | 0.290 |
| Disfigurement of body after organ donation / skin donation | 31 (14.76%) | 97 (46.19%) | <0.001 |
| Organ donation is NOT DONE in case of conflicts within close relatives | 24 (11.42%) | 92 (43.8%) | 0.005 |
| Organ donation can be DONE in ACCIDENT case | 30 (6.67%) | 100 (47.61%) | 0.627 |

Table 2: Willingness to donate organs of their relatives after brain stem death (if any)

| Comparison variables | Number of participants (%) | | P- value** | |
|-----------------------|----------------------------|---------------|-------------|--------|
| | Before session | After session | | |
| Streamwise comparison | Arts | 14 (19.71%) | 43 (60.56%) | <0.001 |
| | Science | 23 (32.85%) | 37 (52.85%) | 0.002 |
| | Commerce | 18 (26.08%) | 40 (57.97%) | 0.001 |
| | P-value* | 0.207 | 0.915 | -- |

| | | | | |
|-------------------------|-----------|-------------|--------------|--------|
| | Total | 55 (26.19%) | 120 (57.14%) | -- |
| Religionwise comparison | Hindu | 42 (26.75%) | 93 (59.23%) | 0.14 |
| | Muslim | 3 (23.07%) | 7 (53.84%) | 0.62 |
| | Buddhist | 8 (23.5%) | 17 (50%) | 0.22 |
| | Christian | 2 (33.33%) | 3 (50%) | 0.34 |
| | Total | 55 (26.19%) | 120 (57.14%) | -- |
| Genderwise comparison | Boys | 24 (25%) | 55 (57.29%) | <0.001 |
| | Girls | 31 (27.19%) | 65 (57.01%) | <0.001 |
| | P-value | 0.532 | 1.0 | -- |
| | Total | 55 (26.19%) | 120 (57.14%) | -- |

Table 3: Willingness to sign pledge form to donate their organs after brain stem death (if any)

| Comparison variables | Number of participants (%) | | P- value** | |
|-------------------------|----------------------------|---------------|--------------|--------|
| | Before session | After session | | |
| Streamwise comparison | Arts | 33 (46.47%) | 57 (80.28%) | <0.001 |
| | Science | 33 (47.14%) | 49 (70%) | <0.001 |
| | Commerce | 36 (52.17%) | 57 (82.6%) | 0.001 |
| | P-value* | 0.763 | 0.743 | -- |
| | Total | 102 (48.57%) | 163 (77.61%) | -- |
| Religionwise comparison | Hindu | 80 (50.95%) | 125 (79.61%) | <0.001 |
| | Muslim | 6 (46.15%) | 7 (53.84%) | 0.69 |
| | Buddhist | 15 (44.11%) | 27 (79.41%) | 0.3 |
| | Christian | 1 (16.66%) | 4 (66.66%) | 0.078 |
| | Total | 102 (48.57%) | 163 (77.61%) | -- |
| Genderwise comparison | Boys | 44 (45.83%) | 72 (75%) | <0.001 |
| | Girls | 58 (50.87%) | 91 (79.82%) | <0.001 |
| | P-value | 0.06 | 0.736 | -- |
| | Total | 102 (48.57%) | 163 (77.61%) | -- |

(* Streams were compared independently in pre /post test using Chi-square test

** Data was compared simultaneously in pre and post-test using Mc Nemar test)

Discussion

The present Longitudinal Interventional study was carried with calculated sample size of 210 students of Degree Colleges amongst Arts, Science and Commerce streams, of a Metropolitan city. Colleges were selected using Stratified Random Sampling method. The knowledge & attitudes of students towards important concepts of Organ Donation was found using a validated questionnaire which was administered to the students before educational session. Our educational sessions were held for students to give scientific knowledge about organ donation to the students and address their concerns regarding organ donation. Two types of Posters were used during sessions, informative posters and emotional appeal posters about organ donation. The same questionnaire was administered to them after 2 months of the educational session, to gauge the retention of knowledge by the students. At the end of the session students were appealed to fill the pledge form for organ donation if they wish to pledge their organs to donate in case of brain stem death.

The Pre and Post test data was compared, it was found that after educational session level of awareness about organ donation had increased significantly. Also knowledge about the term Brain stem death also increased significantly in all the three streams.

In the post test, more students were found aware about the fact that eyes (Cornea) are donated only after death, this change was found statistically significant. After the post test more number of students could enumerate correct names of organs that can be donated by a LIVING donor or after death. The change in awareness was found significant. Though for 100% awareness more such sensitization sessions need to be arranged for youths. When the same data was compared within the streams, there was no significant difference in knowledge of Arts, Science and Commerce students. Awareness about certain facts related to organ donation such as:

Organs cannot be donated in (CASES):

1. Cancer cases,
2. Drowning
3. Unclaimed bodies

4. Rabies
5. HIV / AIDS
6. Septicemia

Organs can be donated in (CASES): Tuberculosis, Diabetes, Hypertension and Person suffering from any other chronic diseases, Death due to Accidents. However the increase in knowledge of students about the most of the above conditions in which Organ Donation may be done or may not be done was not found to be significant, which mean that more sensitization sessions are needed to improve their knowledge. Most of the students were having doubts in difference between Brain stem death and COMA in pre test. After the session in post test students were aware about the difference between BSD and COMA increased significantly. Participants became significantly aware about the importance of letting the relatives know about their wish to donate organs in case of brain stem death and even if they have filled the donor card still organs may not be donated in cases of conflicts between the close relatives. In the present study we found that only 73 (34.76%) students were about the fact that Organs cannot be donated if death of the person is caused by Cancer. After session in post test 117 (55.71%) student found aware about that. The finding was not statistically significant. The reason behind this may be the various questions about cancer and related diseases and organ donation in the minds of youths. It needs to be specially focused upon. In our study before session 37 (17.61%) participants were found aware that TB patients can donate organs after their BSD, while after educational intervention 79 (37.62%) participants were found aware about the same. Which was found statistically significant (P= <0.001). Also 26 (12.38%) participants in pre test were found aware about the fact that Organs can be donated by the Hypertensive or Diabetic person after his BSD. In post test the number increased to 91 (43.33%) which was statistically found NOT significant. The reason to this may be wrong concepts about such diseases in the minds of youths which need to address further. 32 (15.23%) Participants initially found aware about the concept that respiration stops after BSD, while the number

significantly increased to 71 (33.8%). ($P < 0.001$) In present study, 27 (12.85%) participants were found aware that organs cannot be donated in case of death due to Drowning, the number on participants responding correctly in post test increases to 83 (39.53%). Though statistically the change was not found significant ($P = 0.445$). The reason may be difficulty in understanding of concept. However the increase in knowledge of students about the most of the above conditions in which Organ Donation may be done or may not be done was not found to be significant, which mean that more sensitization sessions are needed to improve their knowledge. In pre-test 31 (14.76%) participants were agreed to the fact that body does not disfigure after organ donation. The number of participants who agree to the same increased significantly to 97 (46.19%) ($P < 0.001$). Bapat U. et al (2010) in their study found that 77% of the post graduate medical students did not believe in body disfigurement. Still 23% of the post graduate medical students thought that body may disfigure after organ donation [6]. In this study when compared Willingness to donate organs of relatives of participants after their BSD within streams, it was found that the willingness to donate relatives organs was increased significantly from 55 (26.19%) to 120 (57.14%). Similar findings were found when compared the willingness of participants to donate their own organs after their BSD within streams and within religions.

In this study when comparison was made among participants who signed pledge forms to donate their organs after their BSD within streams. There was significant increase in participants who signed pledge forms to donate their organs after their BSD. ($P < 0.001$) Umesh Yamanappa Ramadurg (2014) found that Before educational intervention the attitude towards the possibility of their own organ being used for donation was found to be 30%, while after educational intervention it increased to 58.5% [7]. Shaheen FA et al (1996) found that 68% agreed to donate organs of relatives in case of brain death, and 91% would donate a kidney to their relatives. However, 38% agreed to donate organs of their own to organ failure patients other than relatives [8]. Al Ghanim SA (2009) found that (70.6%) were willing to donate deceased organs and tissues. None of these students had a donation card, and 66% of them were ready to sign a donor card [9]. Annadurai K, Mani K., Ramasamy J. (2013) found that the majority of them (43%) said that they will think about donation their organs. 16.8% said they won't consider donation of their organ [10]. When compared willingness of organ donation with Gender, it was found that, 77.95% Boys were willing and 22.05% Girls were willing to donate their organs.

In a study of Katsari V. et al (2015) it is found that 60.5% students were ready to be the Deceased donors [11]. In the study in south India by Bapat U. et al (2010), 89% wished to donate their organs after their death [6]. When asked about legislation regarding organ donation in India, before the educational session most of the students were unaware about the fact but in post test a significant number of students were found aware that there is a law for regulation of organ and tissue donation in India. Though more number of participants became aware about legislation in India after the session, the possibility of commercial dealings in organ donation was found to a concern in the minds of students. It may be because of previous cases of illegal organ trafficking happened in the past were running for a long time in news and social media created fear in the minds of people. Multiple sensitization sessions may be required in order to address such concerns of the people and to reduce mistrust and fear in their minds. The awareness about presence of Appropriate Authorization Committee in the Hospitals and law related to Organ Donation in cases of living related / unrelated organ donation was also found increased significantly in the post test.

Conflict of Interest: Nil Source of support: Nil

Conclusion

Willingness to donate their Own Organs or that of the Relatives in case of brain stem death had increased significantly after session in the post test. And there was no significant difference found in the increase in knowledge when compared within all the three streams, religions and boys and girls, which indicates that the level of increase in knowledge amongst Arts, Commerce students is comparable to Science students.

Not very surprisingly, more girls were willing to donate their own organs after their BSD, indicated by filling the Pledge Forms the difference was not found statistically significant, as this tallies with the Organ Donation pattern in the country.

At the end of the session, participants were appealed to fill and sign the Pledge forms in case of BSD. A significant number of students filled the Pledge forms, but the number was less in comparison to those who had said in post test that they were willing to donate their organs in case of BSD. This may indicate that there is still some fear or mistrust regarding organ donation in the minds of youths. So to improve willingness of youths more sensitization sessions need to be arranged. And there was no significant difference found in the increase in knowledge when compared within all the three streams, religions and gender. Though more girls were willing to donate their own organs in case of BSD, the difference was not found statistically significant.

References

1. Donate Life North Carolina. Frequently Asked Questions. <https://www.donatelifenc.org/content/frequently-asked-questions> (accessed 23 November 2015).
2. Journalist Workshop on Organ donation and transplantation., Recent Facts & Figures. Brussels: European Commission, 2014. 2015.
3. Radhakrishnan H. Deceased Donor Transplantation – An Indian Scenario. *J Curr Trends Clin Med Lab Biochem.* 2014; 2(1):14–7.
4. Ministry of Law, Justice and Company Affairs (Legislative Department). The Transplantation of Human Organs Act, 1994. <http://health.bih.nic.in/Rules/THOA-1994.pdf>, 2015.
5. RK Dhiman, Ajay Duseja, SN Mathuriya, Sanjay Jain. Organ Donation– A gift of life!!!
6. Bapat U, Kedlaya PG. Organ donation, awareness, attitudes and beliefs among post graduate medical students. *Saudi J Kidney Dis Transpl [Internet].* 2010; 21(1):174–80.
7. Ramadurg UY, Gupta A. Impact of an Educational Intervention on Increasing the Knowledge and Changing the Attitude and Beliefs towards Organ Donation among Medical Students. *J Clin Diagnostic Res.* 2014; 8(5):1–8.
8. Shaheen F, Souqiyeh M, Al-Atar B. A Survey of opinion of secondary school students on organ donation. *Saudi J Kidney [Internet].* 1996; 7(2):131–4.
9. Al-Ghanim SA. The willingness toward deceased organ donation among university students: Implications for health education in Saudi Arabia. *Saudi Med J.* 2009; 30(10):1340–5
10. Annadurai K, Mani K, Ramasamy J. A study on knowledge, attitude and practices about organ donation among college students in Chennai, Tamil Nadu 2012. *Prog Heal Sci.* 2013; 3(2):59–65
11. Katsari V, Domeyer P, Sarafis P, Souliotis K. Giving Your Last Gift: A Study of the Knowledge, Attitude and Information of Greek Students Regarding Organ Donation. *PubMed Commons. Ann Transpl.* 2015; 20(2):373–80