

## Assessment of knowledge about organ donation among students of arts, science and commerce streams in a metropolitan city: A Cross Sectional Study

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### Abstract

**Background:** As far as the awareness of people regarding donation of vital organs is concerned it is very low. Donating organs is a great deed as donating life to other. But the lack of awareness among the people and lack of enriching efforts have made the situation even worse. This study intends to assess the awareness about Organ Donation among youth population. **Materials and methods:** A Longitudinal (Interventional) study, conducted among students of nine colleges of Arts, Science & Commerce streams in a metropolitan city were selected using random sampling.

**Results:** About 124 (59%) participants were unaware the organs that are donated when the donor is ALIVE and 87 (41.42%) replied as they know. Even those who said they knew about which organs to be donated did not have correct understanding. Only 27 (12.85%) enumerated correct names of certain organs which can be donated while donor is alive. The number increased to 65 (30.95%) in post test after session taken after two months. **Conclusion:** It is important to have more such session at college levels which will improve awareness about Organ Donation amongst students and youth in particular and the community in general.

**Keywords:** Organ donation, tissues donation, brain stem death, road traffic accidents.

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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. It was included in the top five miracles of the last century. This miracle of Transplantation would not be possible without Organ Donation. 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". There are only few acts in life that are nobler than donating our organs after the death. Donating eyes after we are gone from this world is the closest that we can come to giving life to another individual. Eye donation is wonderful legacy we can leave behind. Your eyes would continue to see the wonders of the world. Eye donation can give precious sight to two individuals. Instead of getting charred or returning to the dust after death, the eyes can breathe life into others. Similarly donating other organs such as liver, kidneys, heart, lungs, etc can be life saving because life is not possible without proper functioning of these organs. Donating these organs after the brain-death to needy-ones is equal to 'Donating a Life' to someone to whom you even do not know. 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'. But a person can donate certain organs while he or she is still living. These people are called 'living organ donors'. Organs can be taken from the body of deceased person if prior consent given by family member. Also a healthy individual can donate organ or a part of it, when the individually willfully wishes to do that. There is no age limit for organ donation. Another issue of vital importance is the medical history of the individual that is if the individual has any history of chronic infectious disease, also if the individual should not have any detrimental effect on his health. If a patient has a normal functioning organ and is in good health, then organ donation is certainly an option. Young people as well as elderly individuals have donated organs, and all the time they have a willful consent for the action. Here again the vital issue which complicates the situation is the lack of awareness among people. 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 Spain and Portugal the deceased donor rate is more than 30 donors per million populations. Lack of organ donation awareness in India is another major barrier for deceased donation. After a much publicized organ donation by the doctor couple of their brain dead son, the organ donation rates in Tamil Nadu had increased exponentially. 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. Organ Transplantation is a boon to medical industry as it has helped in saving the lives of those who would have died otherwise. There is a great need for human organs for transplantation. 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

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of a cadaveric donation program. In India, 1,33,938 people have died of road traffic accidents in 2010 and of that 70% are brain dead[2,3]. 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. Organ Donation rate for cadaver in India is currently 0.05 per million population (50 cadaver donors per year). Spain has highest rate of Organ Donation from Brain Stem Dead Deceased Donors about 32 per million population[4]. In India, Tamilnadu tops with rate of 1.3 million Organ Donors per million population[5]. The gap between Organs available for Transplantation and number of patients waiting for transplant is widening[6]. Lack of knowledge and understanding about organ donations, religious attitudes, and superstitious beliefs have generated fear and mistrust in the minds of the common man and, especially, the terminally ill patients. Studies have been done on Medical and Nursing students towards their perceptions and attitudes about organ donation and to enhance their motivation towards the same[7,8]. As far as the awareness of people regarding donation of vital organs is concerned it is very low. Donating organs is a great deed as donating life to other. But the lack of awareness among the people and lack of enriching efforts have made the situation even worse. 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. In India, less than 0.1% of the population participates in cadaver donation. In India less than 10% patients of ESRD ever get access to renal replacement therapy like dialysis and transplantation, while less than 3% continue the therapy lifelong. In fact, the total number of patients, who have received cadaver kidneys in India from 1995 to 2003 only 524[9,10], an abysmally small figure. So, the major hurdle in transplant surgery currently is the critical shortage of vital transplant organs. Renal Transplantation has better survival, quality of life and is cost effective. The same thing happens for eye and other organ donations as well. Still, the demand

of organ transplant and the availability of organs are difficult to be matched. But now the question is whether the scenario can be improved. This study intends to assess the awareness about Organ Donation among youth population.

#### Material and methods

##### ❖ Study Design

A Longitudinal (Interventional) study, conducted during 2014-2015 among students of nine colleges of Arts, Science & Commerce streams in a metropolitan city were selected using random sampling.

##### ❖ Study Participants

Undergraduate Students from Arts, Science and Commerce colleges fulfilling the inclusion criteria in the study were selected.

##### ❖ Sample Size

Assuming prevalence of awareness of 50% among people, sample size calculated using formula  $n = 4pqN / 4pq + e^2(N-1)$  where, N = reference population = 100000

p = prevalence (50%),

q = (100 - p),

e = precision (15% of p).

Using the formula, n is calculated as 178.

This was adjusted for 15% non-response rate; bringing the sample size to 206.

So, 206 students 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.

##### ❖ Sampling Method

**Stratified random sampling method** was used for enrolling the required sample of students from arts, science & commerce colleges.

List was made of degree colleges in urban area and three colleges each from Arts, Science & Commerce streams were selected by using stratified random technique. Out of them, students fulfilling the inclusion criteria & consenting to participate in the study were enrolled for the study.

Table 1: Streams and colleges

	Arts	Science	Commerce
Total selected Colleges	(A) 23	(D) 23	(G) 23
	(B) 23	(E) 23	(H) 23
	(C) 23	(F) 23	(I) 23
<b>Total</b>	69	69	69

Note: A to I represents randomly selected colleges

##### ❖ Inclusion Criteria

- Out of more than 1000 students from degree colleges (Arts, Science and Commerce) were given the information about Organ donation but only those participants filling complete Performa for pre and post training were included in this study.
- Students willing to consent to participate in the study.

❖ **Exclusion Criteria:** Individuals not willing to participate in Post-test and those filling incomplete post-test Performa were excluded from the study.

##### ❖ Study Period

Data collection was conducted over 12 months after approval of Institutional Ethics Committee.

##### ❖ Study Procedure

It was carried out as follows.

**Step I: Pilot Study:** A pilot study was carried out in medical students to study the extent of awareness about organ donation among them.

**Step II: Designing of Questionnaire:** A semi-structured questionnaire was prepared in accordance with the study objectives which is pre tested & modified.

**Step III: Validation of Questionnaire:** This questionnaire was modified and validated by authorities from regional ZTCC (Zonal Transplant coordination committee).

**Step IV: Necessary permissions:** Necessary permissions were taken from Principals of degree colleges.

**Step V- Pre-test:** A pre-test was conducted to assess the knowledge & concerns of degree college students about Organ Donation.

A pretested, semi-structured questionnaire was used to collect information on knowledge and concerns about Organ Donation.

##### Step VI- Program:

- A talk was Organized at all the selected degree colleges followed by discussion on Organ Donation with the interesting & informative slide show (Annexure: 2) in English or Marathi as the case may be. Informative posters were displayed to raise the emotional appeal towards organ donation. (Annexure: 3) (Annexure: Photograph 2)
- At the end of talk, students were encouraged to ask questions. Concerns and queries were addressed.
- At the end of the talk, Donor Cards and Pledge forms prepared with the help of ZTCC were provided to determine extent of Organ Donation commitment with reference to filling it as per ZTCC strategy. (Annexure: 5 & 6)
- Necessary Further reading material was prepared with the help of Zonal Transplant Coordination committee (ZTCC) was distributed to the students. (Annexure: 4)

**Step VII: Post Test Follow-Up:** A follow up post-test was done after 2 months to assess knowledge retention about important aspects of Organ Donation among the students.

❖ **Statistical Analysis**

Data analysis included following steps:

- 1) Descriptive statistical analysis for both pre-test & post-test was used.
- 2) Various graphical methods were used to show distribution of results.

- 3) Approach towards Organ Donation was assessed using Mc-Nemar test.
- 4) To find association between categorical variables Chi-square test was used.

**Results and observations**

Calculated Sample size was of total 210 students, from degree colleges which were selected by using random sampling method.

**Table 2: Distribution of participants based on their streams and Gender**

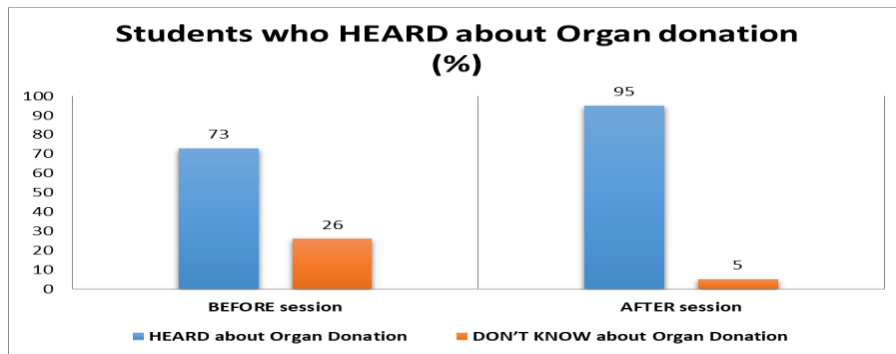
Distribution of Participants	Boys	Girls	Total
Arts	33	38	71 (33.8%)
Science	28	42	70 (33.33%)
Commerce	35	34	69 (32.85%)
Total	96 (45.7%)	114 (54.28%)	210 (100%)

Above table reveals that Out of these 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.

**Table 3: Distribution of participants based on their Religion**

Religion wise distribution of Participants	Number of Participants	Percentage
Hindu	157	74.76%
Muslim	13	6.1%
Buddhist	34	16.2%
Christians	6	2.8%
Total	210	100%

Above table reveals that Out of 210 students, majority of students 162 (77.14%) were Hindus, 34 (16.19) were Buddhists, 8 (3.8%) were Muslims, and 6 (2.8%) were Christians.



**Fig 1: Comparison of number of Participants who heard the term ORGAN DONATION in Pre-test and Post-test**

The above figure shows that terminology of ORGAN DONATION was not heard by 54 (25.71%), while 154 students heard somehow (73.33%), though they said that they know still they did not have correct information regarding organ donation. The percentage increased to 95% after session in the post test after two months of educational session, and the percentage of participants ignore about the

term organ donation was reduced from 26% to 5% as shown in above figure. When the increase in percentage is compared within the streams, it was not found statistically significant. This means that there was no significant difference between awareness of Arts, Science and Commerce students.

[Chi Square test:  $P_{(pre\ test)}=0.440$  &  $P_{(post\ test)}=0.697$ ]

**Table 4: Distribution of participants Correctly enumerating names of organs that may be donated when the donor is Alive, compared with their streams, before and after session**

Participants who could enumerate Correctly the Organs that can be donated while the donor is Alive (Stream wise comparison)	Percentage of Participants Before session	Percentage of Participants After session
Arts	7 (9.8%)	17 (23.9%)
Science	12 (17.14%)	25 (38.71%)
Commerce	8 (11.59%)	23 (33.33%)
Total	27 (12.85%)	65 (30.95%)
Chi-square value*	2.076	2.017

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

About 124 (59%) participants were unaware the organs that are donated when the donor is ALIVE and 87 (41.42%) replied as they KNOW. Even those who said they knew about which organs to be donated did not have correct understanding. Only 27 (12.85%) enumerated correct names of certain organs which can be donated while donor is alive. The number increased to 65 (30.95%) in post test after session taken after two months.

Above table reveals stream wise distribution of participants enumerating the names of organs that can be donated when the donor is ALIVE.

**Table 5: Distribution of participants responding some organs names that can be donated by a Living Donor, before and after session**

Organs that may be donated by Living donor	Entries responded with Percentage of Participants Before session	Entries responded with Percentage of Participants After session
Correct entries	Kidney- 31% Liver- 18% Blood- 6%	Kidney- 55% Liver- 39% Blood- 48% Bone Marrow- 8%
Incorrect entries	Eyes- 29% Heart- 9% Skin- 5% Lungs- 2%	Eyes- 10% Heart- 4%

(Percentages in above table are in comparison with number of participants who enumerated the names of organs that may be donated by LIVING donor)

The above table shows participants response to the organs that may be donated when the donor is alive compared before and after test, and it can be seen from above table that in pre

When compared above data within the streams, it can be seen that the increase in awareness of students about the organs that can be donated while the donor is alive, is not statistically significant within the streams. It means that there is no difference in knowledge of students of Arts, Science and Commerce.(At 2 d.f at 5% level of significance the critical value is: 5.991 and the calculated values are less than critical value, so the inter-stream difference is not significant)

test most of the participants had wrong understanding about organs donated by LIVING donor which reduced in post test after two months.

**Table 6: Distribution of participants enumerating names of organs that can be donated After Death, based on their streams, before and after session**

Students who could enumerate Correctly the Organs that can be donated After Death	Percentage of students Before session	Percentage of students After session
Arts	12 (16.9%)	31 (43.66%)
Science	17 (24.28%)	39 (44.28%)
Commerce	15 (21.73%)	36 (50.72%)
Total	44 (20.95%)	105 (50%)
Chi-square value	1.199	2.162

The above table reveals that before session 44 (20.95%) out of 210 enumerated the names of organs donated after death on an individual. The number increased to 105 (50%) after the session in post test.

When compared above data within the streams, it can be seen that the increase in awareness of students about the organs that can be donated while the donor is alive, is not

statistically significant within the streams. It means that there is no difference in knowledge of students of Arts, Science and Commerce.

(At 2 d.f at 5% level of significance the critical value is: 5.991 and the calculated values are less than critical value, so the inter-stream difference is not significant)



**Fig 2: Word cloud showing most commonly enumerated organs donated After Death, by participants Before session.**

The above Word cloud shows that most of the participants responded Kidney, Eyes, and Liver as the organs that are donated after death of a person.

**Discussion**

The present study was carried out to impart knowledge about important aspects about Organ donation by conducting sensitization workshop and to address the Concerns about Organ Donation in the minds of college students of Arts, Science & commerce streams in a

metropolitan city and at the end to evaluate the impact of an Organ Donation Sensitization Program in increasing the Knowledge & addressing. Total 210 participants were selected for the study from more than 1000 degree students, who fully answered the pre test and post test case record forms.

#### Demographic characteristics

In the present study, there were 96 (45.7%) Boys and 114 (54.28%) Girls (Table 2). However a study by Annadurai K, Mani K., Ramasamy J. (2013) <sup>(5)</sup> selected 71.8% Boys and 28.2% Girls & Umesh Yamanappa Ramadurg (2014) selected 50% participants as Boys and 50% Girls, this finding was similar with present study. In this study, Out of total 210 participants, 71 (33.8%) were from Arts stream, 70 (33.33%) were from Science stream and 69 (32.85%) were from Commerce stream (Table 1). Annadurai K et al (2013) selected 79% participants from Arts stream and 33.4% from Commerce stream. However they did not include Science stream into their study. In one of our pilot study carried out in medical college, it was found that even medical students (Science) did not have correct knowledge regarding important aspects of organ donation. So, we included Science stream also in this study. In this study there were 157 (74.76%) Hindu, 13 (6.1%) Muslims, 34 (16.2%) Buddhists and 6 (2.8%) Christians (Table 2). So it can be seen that this study included participants of almost all religions in the community. A study by Annadurai K et al [5] had 79.1% Hindu, 12.0% Christian and 8.2% were Muslims. A study by Umesh Yamanappa Ramadurg [11] had 91.4% Hindu and 4.3% were Muslims. In the present study it was found that before the educational intervention was given 73% participants heard about Organ Donation somehow and almost minimal number of the participants were having correct information about organ donation, after session of educational intervention using informative slide show presentation and educational material in form of pamphlets and posters the percentage increased to 95% in the post test taken after two months to find out retention of knowledge of the participants, which indicates increase in awareness about organ donation among students (Figure 1). Lliyasa Z et al (2014) [12] in their study found that 305 of the 383 respondents (79.6%) reported that they had heard about organ donation. Umesh Yamanappa Ramadurg (2014) [11] in his study found that 67 (95.7%) of the students had heard of the term, 'Organ Donation'. Immediately after the educational session in Post test the number increased to 100%. The knowledge was increased to 100% because it was assessed immediately after the educational session. In this present study it was found that before the educational session only 27 (12.85%) students could enumerate the organs that can be donated while the Donor is Alive (Table 6), after session the percentage increased to 30.95%. And 44 (20.95%) students could enumerate the organs that can be donated after death before the session. The number was increased to 105 (50%) after educational session (Table 6). In the present study, responses were (when compared among those who enumerated): The CORRECT entries were Kidney (31%), Liver (18%), Blood (6%), and INCORRECT entries were Eyes (29%), Heart (9%), Skin (5%), Lungs (2%) (Table 4). This shows that most of the participants were having incorrect knowledge about the organs that can be donated by LIVING donor. When post test was done after two months to know the retention of knowledge about organ donation by participants, it was found that participants enumerated names of organs correctly and incorrect entries were reduced. The knowledge about tissues that can be donated after death was increased but still found to be low in post-test. This also recommends more sensitization. Similar result were found in present study regarding organs that can be donated AFTER death (Table 6) Umesh Yamanappa Ramadurg (2014) in his study found that After Pre test only 27.1% Students were aware about the organs that can be donated. This number increased to 80%

immediately after post test [11] Katsari V. et al (2015) in their cross sectional study among 1451 students aged 18- 30 years in 16 Greek public technical schools found that 40.3% students knew which organs can be donated [13] Annadurai K, Mani K., Ramasamy J. (2013): A cross-sectional study was done among 440 students aged 18 years and above in Hindustan Arts & Science College, Chennai, Tamil Nadu. Only 16.1% of the participants said that kidney, blood, heart, eyes, liver, lungs, skin and bone marrow can all be donated. Remaining 83.86% responded with more than one options: Kidney (84.55%), Blood (96.2%), Heart (12.73%), Eyes (94.3%), Liver (1.08%), and Lungs (1.62%) [5]

#### Conclusion

Organ Donation is an important Social Commitment world over, in India still the lack awareness has caused the apathy, but the present study done in degree Colleges showed improvement in the knowledge of students with only single sensitization session. It is important to have more such session at college levels which will improve awareness about Organ Donation amongst students and youth in particular and the community in general.

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