



ISSN: 0975-833X

Available online at <http://www.journalera.com>

INTERNATIONAL JOURNAL
OF CURRENT RESEARCH

International Journal of Current Research
Vol. 13, Issue, 01, pp.15583-15587, January, 2021

DOI: <https://doi.org/10.24941/ijcr.40217.01.2021>

RESEARCH ARTICLE

KNOWLEDGE AND ATTITUDES OF MEDICAL AND ALLIED HEALTH CARE STUDENTS TOWARDS ORGAN DONATION –SURVEY FROM A SINGLE MEDICAL COLLEGE IN SOUTHERN INDIA

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ARTICLE INFO

Article History:

Received 18th October, 2020
Received in revised form
26th November, 2020
Accepted 04th December, 2020
Published online 30th January, 2021

Key Words:

Organ donation, brain death,
Medical students, Knowledge, Attitude.

ABSTRACT

Transplantation is the best and frequently the only life saving treatment for end stage organ failure. In 2014, 1,19,873 solid organ transplants were performed worldwide. Although impressive, the annual number of organ transplants represents <10% of the global need. Organ shortage leads to deaths and poor quality of life for those on the waiting list. Although organ donation per se is a personal issue, the process of organ donation involves medical, legal, ethical, organisational and social factors. Health care professionals, especially doctors and those in the allied health sectors including nurses, technicians, physiotherapists have a key role in the dissemination of correct knowledge and eliminating the various barriers regarding organ donation amongst the public since they may be the first individuals to create a relationship with a potential donor's family. The objective of the study was to assess the knowledge and attitudes of medical as well as paramedical students towards organ donation. We conducted a questionnaire based survey of 1000 students, including 618 undergraduate medical and 382 paramedical students. While students showed adequate knowledge with regard to aspects of organ donation and the legal framework, their attitudes needed some motivation and positive support. The results support the need to develop a satisfactory program to incorporate aspects of deceased donor transplantation in the medical curriculum. The educational interventions should be holistic and cut across all disciplines to involve paramedical courses as well.

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Citation: Dr Ankita Gharge, Dr. Shobhana Nayak –Rao and Dr. Pradeep Shenoy M. 2021. "Knowledge and attitudes of medical and allied health care students towards organ donation –survey from a Single Medical College in Southern India". *International Journal of Current Research*, 13, (01), 15583-15587.

INTRODUCTION

Transplantation is the best and frequently the only life saving treatment for end stage organ failure. In 2014, 1,19,873 solid organ transplants were performed worldwide (World Health Organisation Global Observatory on Organ Donation and Transplantation (1). Although impressive, the annual number of organ transplants represents <10% of the global need. Organ shortage leads to deaths and poor quality of life for those on the waiting list. Although organ donation per se is a personal issue, the process of organ donation involves medical, legal, ethical, organisational and social factors. In India, the 'Transplantation of Human Organs Act' was legalised in 1994 (2). Yet organ donation rates in India are yet to get momentum in India with organ donation rates being the lowest in the world at 0.34 per million (3,4) compared to other developing countries such as Spain which has one of the highest organ donation rates at 43.4 donors per million and the USA at 26.6 donors per million population (5). The major concerns causing organ shortage are the lack of awareness and appropriate knowledge among public, myths and misconceptions including organ donation due to cultural and religious barriers etc. Hence it is necessary that imparting correct and

fact based information and creating awareness about this issue to the general public remains imperative to the success of organ donation drive and program in India if this has to be sustained in the long run. The primary hindrance to a successful deceased donor organ transplantation program is the extreme shortage of donor organs. The cadaver organ donation program in India even after decades is still in its infancy and is hindered by the lack of adequate awareness about the criteria and guidelines for declaration of brain-death, among doctors. Although the public is accustomed to the idea of donating blood, donation of organs after death continues to be a problem. There is a great need for increasing awareness about organ transplantation and organ donation among the general public, beginning with the health-care professionals who in turn, can motivate the public. Educating health-care professionals about organ donation process appears to be an important factor in maximizing the benefits from the limited organ donor pool. Increasing the donor pool is an important public health issue. One factor that might contribute to this limited availability of donor organs is the lack of knowledge about the legal and procedural details of organ donation. Health care professionals, especially doctors and those in the allied health sectors including nurses, technicians, physiotherapists have a key role in the dissemination of correct knowledge and eliminating the various barriers regarding organ donation amongst the public since they may be the first individuals to create a relationship with a potential donor's family. It has been the perception that in

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addition to the socio-cultural barriers and lack of knowledge that are the major impediments restricting organ donation, there remain many other factors such as lack of institutional mechanisms, organisational support and the legal and ethical challenges that may play a bigger impediment and need addressal if one needs to strengthen organ donation. The knowledge, attitudes of medical professionals in promoting an atmosphere that promotes and positively impacts organ donation rates is crucial. Therefore it is necessary to understand and assess the knowledge, attitude and perception about organ donation amongst doctors and health care professionals. Medical as well as paramedical students as generally regarded to be highly socially involved and often work as volunteers for different organisations during their training. Their knowledge and attitudes may be amongst the most important factors that may affect individual preferences regarding organ donation. There have been various other studies from countries in Middle east and a few other Indian studies(6-14) that have looked at the attitudes and knowledge of medical students including postgraduate students towards organ donation but these studies have had smaller sample sizes. Organ donation is steadily catching up in most of the southern Indian states of Tamil Nadu, Telangana, Karnataka and Kerala with the maximum organ donations happening in the state of Tamil Nadu due to active coordinated effort by the state Govt in association with the MOHAN (Multi-Organ Harvesting Network) Foundation(3) . In Karnataka, organ donation retrieval and allocation is coordinated by the Jeevasarthakathe headquartered out of Bangalore with a separate allocation zone for the Mangalore-Manipal region that is separate and independent. With the allocation of a separate zone, it is expected that zonal organ retrievals can be better utilised within the region with lesser allocation costs and ultimately better transplant outcomes. It is therefore necessary that to increase rates of organ donation, the local public as well as the medical community are better sensitized towards the concept of brain death and organ donation. The objective of the study is to assess the knowledge and attitudes of medical as well as paramedical students towards organ donation.

METHODOLOGY

Our study was conducted among the undergraduate medical students and students in the paramedical fields (speech and hearing, physiotherapy) studying at the K.S Hedge Medical College and allied health care institutions attached to NITTE University, Mangalore were included. The study comprised randomly selected 1/2nd/3rd year students of the above mentioned institutions. Data was collected using a structured questionnaire which was divided into three sections. The first section contained demographic details, second section was to understand the knowledge of the respondents towards organ donation. The third section was to assess the attitudes and perception of the participants for organ donation and also exploring the reasons for the same. The questionnaire also assessed whether the concept of organ donation was adequately covered in the medical curriculum as per the opinion of the respondents. Informed verbal consent was taken from the respondents and the questionnaires were distributed during class hours and collected later. The institutional ethics committee approved of the study. A non random sampling method was used. Study Questionnaire: A self-administered questionnaire was used and comprised 24 items, of which the initial 5 items pertained to demographics (such as age, gender, residence, marital status, and religion), 12 items measuring knowledge and the last 7 items attitudes and their perceptions regarding organ donation. The items required dichotomous yes/no/ don't know answers. The questions about knowledge about organ donation, brain stem death and the laws pertaining to transplantation. The last part pertained to their own beliefs and attitudes towards organ donation and their fears and barriers towards acceptability of organ donation. Anonymity and confidentiality of the participants was maintained.

Statistical Analysis: Measured data were presented with mean values \pm standard deviation after testing for normal distribution. Categorical data were summarised as counts and percentages (%). Student's t test was used to ascertain the significance of differences

between mean values of two continuous variables. Mann –Whitney U test was used for ordinal variables comparisons. The chi-square analysis was performed to test for differences in proportions of categorical variables between two or more groups. All statistical calculations were done using SPSS 20.0 Statistics tests were two sided and the level of 0.05 was considered to indicate statistical significance.

RESULTS

About 1000 questionnaires were distributed to volunteer medical undergraduate students as well as students in paramedical fields such as physiotherapy, speech and audiology training etc. A completed questionnaire was obtained from all of the participants. The mean age of the medical students was 22.4 ranging from 17-32 years and the mean age of the para medical students was 23.8 with age ranging from 18-32 years. Table 1 shows the demographic data of the respondents. About 60-70 % of the respondents were female and >50% belonged to the Hindu religion. More than 70% were single and came from an urban background.

Table 1. Sociodemographic details of the respondents (n=1000)

Sociodemographics	Medical Students (n=618) n(%)	Para medical students (n=382)
Gender: Male	185(30)	149(39%)
Female	433(70)	233(60.9)
Age (yrs) <20	494(80.0)	241(63)
21-26	118(19)	130(34)
27-32	4(6.4)	7(1.8%)
>32	2(3.2%)	4(1.0)
Religion: Hindu	388(62.7)	197(51.5)
Christian	147(23.7)	116(30.3)
Muslim	66(10.6)	55(14.3)
Others	17(2.7)	14(3.6)
Marital Status:		
Married	16(2.5)	70(18.3)
Single	602(97.8)	312(81.6)
Domicile : Urban	487(78.8)	280(73.2)
Rural	131(21.2)	102(26.7)

Knowledge about transplantation and organ donation: The level of knowledge among the medical and para medical among students is shown in Table 2. As expected, the medical students exhibited greater knowledge about the treatment aspects of chronic kidney disease by kidney transplantation compared to the paramedical students. It was found that 94.0% of the medical student group considered organ transplantation an important therapeutic method compared to 75.3% of the paramedical group (p=0.03). Regarding the knowledge about brain death and the laws that govern human organ transplants within the country, 96% and 52.7% of medical students and 64.4% and 63.3 % of paramedical students respectively had information on the topic. There was no statistical differences between groups. However about 87.5 % of medical students and 77.7% of the paramedical students felt that a more effective and clear law was needed to prevent misuse and simplify matters related to organ transplantation. 70% of the medical students did not think that organ donation after death caused any disfigurement to the body vs 47.6% of paramedical students (p=0.04). Most of the respondents had learnt or heard about organ transplantation from internet based sources such as Google, Facebook etc while TV/ news papers/ brochures formed the rest of the sources from which students gathered information. It is interesting that they did not have too much information disseminated in their classrooms about this topic. What is interesting is that 70% of the medical students felt that organs could be wasted after donation vs 56.5 % of the paramedical students who felt so. It is interesting that overall more than 50% of medical and paramedical students seemed to have a personal experience with a family member, friend, acquaintance etc having undergone or donated an organ. However differences between medical and paramedical students showed no statistical significance. A overwhelming 2/3rd of students (medical and paramedical) were of the opinion that more information about organ

Table 2. Frequency of student's attitudes and knowledge about transplantation and organ donation

Questionnaire's domains	Medical Students n=618 N(%)	Para -medical students n=382 N(%)
1) Are you aware about organ donation		
Yes	599(97)	288(75.3)
No	12(1.9)	61(15.9)
Don't Know	7(1.1)	33(8.6)
2) When can organs be donated		
During life	13(2.1)	104(27.2)
After death	83(13.4)	43(11.2)
Both	522(84.4)	235(61.5)
3) Have you heard of brain death		
Yes	593(96)	246(64.4)
No	10(1.6)	26(6.8)
Don't know	15(2.4)	110(28.7)
4) Do you know about the Transplantation of Human Organs Act		
Yes	326(52.7)	242(63.3)
No	143(23.1)	81(21.2)
Don't know	149(24.1)	59(15.4)
5) Do you think there is any limit for organ donation		
Yes	295(47.7)	226(59.1)
No	171(27.6)	98(25.6)
Don't know	152(24.6)	62(16.2)
6) Can we sell our organs		
Yes	253(41)	222(58.1)
No	257(41.5)	98(25.6)
Don't know	108(17.4)	62(16.2)
7) From which of the following sources have you obtained knowledge of organ donation		
TV	74(12)	49(12.8)
Newspaper/Magazines/Brochures	31(5)	30(7.8)
Social Media	9(1.4)	16(4.1)
Internet	70(11.3)	22(5.7)
Others	71(11.4)	84(22)
Multiple sources	363(58.7)	181(47.3)
8) Do you think that donating organs after death causes disfigurement of your body ?		
Yes	86(13.9)	131(34.2)
No	435(70.3)	82(47.6)
Don't know	97(15.6)	69(18.0)
9) Do you feel that organs after donation can be misused /wasted?		
Yes	433(70)	216(56.5)
No	110(17.7)	117(30.6)
Don't know /unsure	75(12.1)	49(12.8)
10) Have you heard about the organ donor card ?		
Yes	199(32.2)	234(61.2)
No	274(44.3)	98(25.6)
Unsure	145(23.4)	50(13.0)
11) Do you think we need a more effective law for organ donation process		
Yes	541(87.5)	297(77.7)
No	32(5.1)	32(11.3)
Don't know	45(7.2)	53(13.8)
12) Do you think we need to facilitate donors by monetary payment to increase donor rate ?		
Yes	345(55.8)	239(62.5)
No	119(19.2)	77(20.1)
Don't know / unsure	154(25)	66(17.2)
13) Do you have a relative whose organs have been donated ?		
Yes	152(24.5)	129(33.7)
No	347(56.1)	198(51.8)
Don't know	119(19.2)	55(14.4)
14) Do you feel that information about organ donation needs to be included in your subject curriculum		
Yes	426(69)	262(68.5)
No	116(18.7)	53(13.8)
Don't know	76(12.9)	66(17.2)
15) Are you willing to support organ donation by donating your organs		
Yes	373(60.3)	129(33.7)
No	114(18.4)	198(51.8)
Unsure at this stage	131(21.1)	55(14.3)
16) Reasons for supporting organ donation	261(42.2)	155(40.5)
a) It saves lives	36(5.8)	28(7.3)
b) Good thing to do	200(32.3)	80(20.9)
c) Want to give someone a second chance at life	11(1.7)	46(12.0)
d) I have signed an organ donor card	110(17.7)	73(19.1)
e) Multiple reasons		
17) Reasons for not supporting organ donation	39(6.3)	89(23.2)
a) Can't be sure that I will be really dead when the decision is made	59(9.5)	74(19.3)
b) Without consent my organs might be used for other purpose like medical research	39(6.3)	48(12.5)
c) Doctors wouldn't fight too hard to save me if I am an Organ Donor		56(14.6)
d) Organs could be wasted	43(7.0)	53(13.8)
e) Threat to own health	25(4.0)	62(16.2)
f) Fear	75(12.2)	316
18) Are you willing to sign / carry an organ donor card in the future ?		
Yes	316(56.1)	221(57.8)
No	101(16.3)	58(15.1)
Don't know/ Unsure	201(32.5)	103(26.9)
19) In your opinion which organs can be donated after brain death		
Eyes	10	17
Skin	0	19
Heart	5	65
Lungs	2	0
Liver	0	2
Kidney	0	0
Bones	3	4
All	1	2
	597(96.6)	273(71.4)

donation needed to be included in the subject curriculum and that this would help them in making an informed decision better. Table 2 also shows the attitude towards organ donation of the students. The difference between medical and paramedical students was significant. 60.3% of medical students were willing to support organ donation while only 33.7% of the paramedical students were keen to do so ($p=0.05$). The exact reasons include the uncertainty of diagnosis of brain death, the misconception that organs would be used for research purposes etc, or wasted or that organ donation would cause disfigurement to the body. Overall the attitude towards incentives for living kidney donors was good. Of the medical students, about 55.8% of them supported compensation while 62.5% of the paramedical students believed on a payment incentive ($p=0.24$). More than 2/3rd of the participants including both the medical as well as paramedical students felt that information about organ donation needed to be included in the subject curriculum so that they could have more factual and comprehensive information about the subject. There was no statistical difference between groups regarding this. More than 50% of participants (51% in the medical group vs 57.8% in the paramedical group, $p=NS$) were willing to sign/carry an Organ Donor card and express their desire to donate their organs in the future.

DISCUSSION

It is a well known fact that organ donation is the preferred treatment for end stage organ failure and offers a better quality of life with survival benefits. Donated organs remain the last resort for millions of patients around the globe. There is a global shortage of donor organs when compared to the number of patients awaiting transplantation. A positive public knowledge and attitude towards organ donation affects organ donation rates. Encouraging organ donation requires information about the legal and procedural aspects of organ donation amongst medical professionals and future physicians. Lack of knowledge about the legal and procedural aspects of organ donation especially amongst health care providers who should be the most well informed has been previously identified as the main factors that may hinder availability of organ donors (5). Medical students as future doctors and health care providers can influence willingness of the general public towards organ donation as well as shape public opinion. Surveys on attitudes amongst medical students have been carried out in many countries including Iran, India, Arab countries, Brazil etc (6-15). However most studies have only looked at attitudes and perceptions amongst medical students during varying years of their training. A recent study from Bahrain (12) looked at perceptions amongst medical students and compared it to controls of business school students. This study did not find any significant difference between groups in their attitudes towards organ donation. Our study is probably the first of its kind to look at the perceptions of medical students distributed over their years of training and compare it to students in the paramedical fields such as physiotherapy etc.

Our study group consisted of 618 medical students and 342 paramedical students, more than 60% of the respondents were female and largely lived in urban setting and more than 50% of respondents in either group were Hindu by religion. We found that medical students predictably were better informed about organ donation requirements than paramedical students. They were also more familiar with legal requirements and concepts of brain death, however the difference between groups was not significant. The National Organ and Tissue Transplant Organisation (NOTTO) was made to streamline all organ procurement and distribution activities in the country and clearly out rules and regulations pertaining to solid organ transplantation. The organ allocation system is oblivious to caste, gender, age, income and status. Factors such as medical urgency, time spent on waiting list, organ size, blood type, and genetic factors such as prior sensitization are considered. The organs would be distributed locally within the respective state first and if no match is found, then they are then offered regionally and then nationally until a suitable recipient is found (13). The absence of equitable allocation however differs from state to state and few states

have a state-level organ registry. It is not surprising that medical students have practically no sound knowledge regarding these developments. In our study an overwhelming majority of the students in both groups however felt that a revision of the medical curriculum to better incorporate information and facts about organ donation was the need of the hour. Many other studies (16,17) have also emphasized the need of introducing organ donation at an early stage in medical curriculum. A German study (18) showed that there is substantial change in the attitude of students towards organ donation after a lecture on the subject. A similar study from the United States (19) also stated that students with some amount of training about organ donation during their medical school were more knowledgeable and comfortable with answering patients donation queries. There exists a gap between knowledge regarding organ donation and the willingness to donate amongst medical students. This study shows that more than 60% of medical students were willing to sign the organ donor cards and donate their organs in future while only 20% of the paramedical students expressed an interest to do so. About 60% of them were undecided. This could be due to poor/misguided information and fears about donation. It is also interesting to note that almost half of the paramedical students (47%) were of the opinion that donation of organs caused disfigurement to the body and this may have weighed against their decision. It also emphasizes the need for further education on this aspect to allay unfounded fears and answer questions honestly. Willingness to donate was comparable to similar studies conducted amongst medical students in United States (19), Turkey(20), Brazil(15) and France (21). Though this is not reflected in the data presented, another important aspect is that amongst the medical students who expressed strong willingness to donate, more than half hadn't communicated their wishes to the immediate family members. There were no religious barriers to organ donation. Paid organ donation is a debatable topic with strong ethical arguments from both those who are for or against it. This issue has not been sufficiently looked at in studies while investigating knowledge, attitudes and perceptions of medical students. Our study showed that about 55-60% in either group felt that some kind of financial compensation was right towards the donor or his/her family. Studies from Iran (22) showed that 73% of the 1000 participants disagreed to any type of financial compensation. In Brazil (23), students were strongly against paid organ donation. It is felt that paid transplants negatively affects living related and deceased donor transplants in developing countries who have struggled to get a cadaveric transplant going successfully. This study has good sample size along with other positive points; it is the first of its kind to take into consideration opinions of medical as well as nonmedical students which other studies have not focused on. It has some limitations as well. The study was conducted in a single university and the results may hence not be generalizable. A similar study conducted by Alex et al (24) conducted amongst medical students in the same institution showed good knowledge about organ donation, but advocated for inclusion of information in medical curriculum.

CONCLUSIONS

A robust and well-co-ordinated deceased donor program is the only long term viable solution to address and bridge the gap of chronic organ shortage in India. Medical as well as paramedical students being future work force should be informed torch bearers for keeping the momentum going. While students showed adequate knowledge with regard to aspects of organ donation and the legal framework, their attitudes needed some motivation and positive support. The results support the need to develop a satisfactory program to incorporate aspects of deceased donor transplantation in the medical curriculum. The educational interventions should be holistic and cut across all disciplines to involve paramedical courses as well.

ACKNOWLEDGEMENT

The authors would like to thank Mrs Usha Bapat, former Lecturer in Medical Social Work, Department of Nephrology, St John's Medical College Hospital for her suggestions and help with the study.

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