Life after Death: Knowledge, Attitude and Ethical Perceptions of Medical and Engineering Students on Voluntary Body Donation

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ABSTRACT

Introduction: In the medical curriculum of undergraduate and postgraduate medical students, the sound knowledge of anatomy forms the cornerstone for the foundation of medicine. Due to the budding of many medical colleges and increased demands of cadavers in medical colleges, voluntary body donation programmes have gained more importance in our country.

Aim/Objective: To assess and compare the knowledge and attitude of medical and engineering students on voluntary body donation.

To determine and compare the knowledge and attitude of medical and engineering students on various ethical issues associated with voluntary body donation.

Material and Methods: This study was conducted on consented 75 medical students (8th and 9th terms) and 75 (final year) engineering students by distributing structured questionnaires covering the various ethical principles involved in body donation such as vulnerability, informed consent, autonomy, dignity, confidentiality and post act benefit. The obtained data were analyzed through descriptive statistics.

Result: The data analysis showed that there is a difference in the knowledge, attitude and ethical perception of body donation among the students of both the groups.

Conclusion: A comprehensive understanding of ethical and legal issues associated with the procurement of cadavers and its dissection is very important for the successful outcome of voluntary body donation programmes. Hence this study to assess the level of knowledge and attitude of medical and engineering students about voluntary body donation with special emphasis on ethical issues associated with body donation such as vulnerability, informed consent, dignity, autonomy, confidentiality, post act benefits.

Key Words: Body donation, Informed consent, Autonomy, Dignity, Confidentiality, Post act benefit

INTRODUCTION

Comprehensive knowledge of anatomy is an essential part of the medical curriculum, for which medical students need human bodies for dissection¹. The unclaimed bodies and few voluntarily donated bodies are the main source of human bodies for dissection purpose in medical institution². These cadavers in addition to teaching anatomy cover different aspects of ethics like respect for human bodies, professionalism, informed consent, vulnerability, bodily integrity, dignity etc. Ethical restrictions concerning a dead person do not cross the mind of health care professionals because it appears unusual to give attention to the moral values related to the dead body or to ethical issues surrounding the dead body

or a cadaver.³ But the main ethical concern of human cadaver dissection lies in respect to human life. According to the autonomy principles, each individual should have freedom, to act independently when it comes to the disposition of his or her body after death. Each person has closely identified with his /her body to the point that practically it is very difficult to separate the two. A human body even after death maintains a recognizable form that motivates the respects for the person's identity.⁴

According to the principle of ethics, the best morally and ethically accepted cadaver source for dissection would be by a voluntarily donated body of a person during the lifetime.⁵ The act of voluntary body donation will protect the

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fundamental principle of autonomy. The inspiration for such a gesture is strictly altruistic, showing gratitude to the medical field. But recently the use of unclaimed bodies in medical institutions has become so much an intrinsic part of the anatomy that they generally ignore the ethical dimensions provided by the autonomy principle.⁶ Even though these unclaimed bodies are used in the greater interest of humanity by educating the young budding medical professionals, the fact remains that the body was rubbed off from a person who had no choice of protecting his/her autonomy and integrity⁷.

The current scenario of increased use of unclaimed bodies in a medical institution is mainly because of the sudden budding of new medical schools in India. Although voluntary body donation remains as the most important requirement for medical education, the willingness of people for this noble cause remains very low.

In our country, the major barrier for voluntary body donation is lack of awareness. Only 22% of the general population is aware that the body can be donated to the medical institution after death for medical education⁹. The fear of lack of respectful and dignified treatment of the donated cadaver was an important factor that prevented body donation especially among the medical faculties in medical schools.

Although numerous studies have been undertaken to assess the knowledge, attitude, and practice about whole body donation among people of different social and religious backgrounds, there are very few studies done in the past which concentrate the ethical issues associated with the act of voluntary body donation.

Hence this study is undertaken to assess the knowledge and attitude of medical students on body donation as they belonging to a class of people in society who are getting the maximum benefit from the act of voluntary body donation. Further, in the same study, we are comparing their knowledge and attitude with non-medical engineering students as they represent the literate general population.

MATERIALS AND METHOD

After taking the ethical clearance from the Institutional ethical committee, a cross-sectional study was conducted by distributing the questionnaires structured on knowledge and attitude of body donation to 75 MBBS students belonging to the 8th and 9th term and 75 final year engineering students of Bangalore. The questions were validated by a subject expert and ethical expert before data collection. It was ensured that participation in the questionnaire-based study was voluntary and the identities of the participants were kept strictly confidential.

Written informed consent was taken from the participants.

The questionnaires consist of 22 questions -10 questions on knowledge and 12 questions on the attitude of body donation with 5 –points response options. (Likert scale- Strongly agree-5, Agree-4, Don't Know-3, Disagree-2, Strongly disagree-1). Knowledge of participant was assessed through questionnaires structured on the significance of term body donation, source of information regarding body donation, source of bodies to medical institutions for medical education, use of unclaimed bodies, knowledge on legal requirements for body donation like informed consent and death certificates, the act of dignity associated with body donation, opinion on public display of donated bodies. Questionnaires on attitude included willingness of participant to donate their bodies in future, acceptance of dissection on their donated bodies, opinions on incentive-based body donation, belief in the usefulness of body donation and expectations with regards to the general public's duty to donate bodies. The response of the participant was recorded in the form of 5 point response Likert scale. The Chi-square test was done to compare the knowledge and attitude of medical and engineering students and p-value less than 0.05 was considered as significant.

RESULTS

The total participants in the present study were 150 consisting of two groups of 75 each. The analysis was done on knowledge, attitude and ethical perception of body donation.

Table 1: Knowledge and attitude of medical students and engineering students on-awareness, Vulnerability, informed consent, dignity.

Items	MED (n=75)	ENG (n=75)	Total (n=150)	P-value
Knowledge and attitude of participants towards body donation(1-4)				
Q1: Body donation as a noble and gracious act				
• 1	1(1.3%)	0(0%)	1(0.7%)	0.020-sig- nificant
• 2	4(5.3%)	1(1.3%)	5(3.3%)	
• 3	7(9.3%)	19(25.3%)	26(17.3%)	
• 4	28(37.3%)	31(41.3%)	59(39.3%)	
• 5	35(46.7%)	24(32%)	59(39.3%)	
Q2: Source of information about voluntary body dona- tion				
Media	24(32%)	53(70.7%)	77(51.3%)	
Medi- cal person	50(66.7%)	14(18.7%)	64(42.7%)	
Family person	1(1.3%)	8(10.7%)	9(6%)	
Q3: Voluntarily donated body as the source of the ca- daver in medical institution-Response of medical and engineering students				

Table 1: (Continued)

Items	MED (n=75)	ENG (n=75)	Total (n=150)	P-value
• 1	2(2.7%)	1(1.3%)	3(2%)	<0.001- signifi- cant
• 2	6(8%)	7(9.3%)	13(8.7%)	
• 3	10(13.3%)	29(38.7%)	39(26%)	
• 4	35(46.7%)	31(41.3%)	66(44%)	
• 5	22(29.3%)	7(9.3%)	29(19.3%)	
Q4: Response of medical and engineering student on the importance of conducting campaign programmes by Government to promote body donation				
• 1	3(4%)	2(2.7%)	5(3.3%)	0.348- insignifi- cant
• 2	5(6.7%)	1(1.3%)	6(4%)	
• 3	5(6.7%)	10(13.3%)	15(10%)	
• 4	29(38.7%)	30(40%)	59(39.3%)	
• 5	33(44%)	32(42.7%)	65(43.3%)	
Vulnerability(Q5-Q6)				
Q5: Knowledge of medical and engineering students on vulnerability				
• 1	6(8%)	0(0%)	6(4%)	0.039*- signifi- cant
• 2	5(6.7%)	11(14.7%)	16(10.7%)	
• 3	11(14.7%)	9(12%)	20(13.3%)	
• 4	33(44%)	40(53.3%)	73(48.7%)	
• 5	20(26.7%)	15(20%)	35(23.3%)	
Q6: Attitude of medical and engineering students on vulnerability				
• 1	4(5.3%)	2(2.7%)	6(4%)	0.370- insignifi- cant
• 2	21(28%)	13(17.3%)	34(22.7%)	
• 3	14(18.7%)	21(28%)	35(23.3%)	
• 4	23(30.7%)	27(36%)	50(33.3%)	
• 5	13(17.3%)	12(16%)	25(16.7%)	
Informed consent(Q7-Q10)				
Q7: Knowledge of medical and engineering students on the necessity of signing a donor card				
• 1	0(0%)	2(2.7%)	2(1.3%)	0.014*- signifi- cant
• 2	3(4%)	9(12%)	12(8%)	
• 3	8(10.7%)	18(24%)	26(17.3%)	
• 4	30(40%)	24(32%)	54(36%)	
• 5	34(45.3%)	22(29.3%)	56(37.3%)	
Q8: Knowledge of medical and engineering students on the importance of death certificate				
• 1	2(2.7%)	0(0%)	2(1.3%)	0.691- in- signifi- cant
• 2	3(4%)	2(2.7%)	5(3.3%)	
• 3	6(8%)	9(12%)	15(10%)	
• 4	23(30.7%)	24(32%)	47(31.3%)	
• 5	41(54.7%)	40(53.3%)	81(54%)	
Q9: Attitude of medical and engineering students on informed consent				
• 1	5(6.7%)	0(0%)	5(3.3%)	0.023*- signifi- cant
• 2	3(4%)	5(6.7%)	8(5.3%)	
• 3	8(10.7%)	17(22.7%)	25(16.7%)	
• 4	41(54.7%)	30(40%)	71(47.3%)	
• 5	18(24%)	23(30.7%)	41(27.3%)	

Table 1: (Continued)

Items	MED (n=75)	ENG (n=75)	Total (n=150)	P-value
Q10: Attitude of medical and engineering students on informed consent				
• 1	7(9.3%)	1(1.3%)	8(5.3%)	0.061+ insignifi- cant
• 2	13(17.3%)	24(32%)	37(24.7%)	
• 3	27(36%)	22(29.3%)	49(32.7%)	
• 4	21(28%)	18(24%)	39(26%)	
• 5	7(9.3%)	10(13.3%)	17(11.3%)	
Dignity				
Q11: Knowledge of medical and engineering students on dignity				
• 1	17(22.7%)	3(4%)	20(13.3%)	<0.001**- signifi- cant
• 2	27(36%)	26(34.7%)	53(35.3%)	
• 3	11(14.7%)	31(41.3%)	42(28%)	
• 4	11(14.7%)	11(14.7%)	22(14.7%)	
• 5	9(12%)	4(5.3%)	13(8.7%)	
Q12: Knowledge of medical and engineering students on dignity				
• 1	22(29.3%)	6(8%)	28(18.7%)	0.002**- signifi- cant
• 2	23(30.7%)	20(26.7%)	43(28.7%)	
• 3	11(14.7%)	27(36%)	38(25.3%)	
• 4	16(21.3%)	18(24%)	34(22.7%)	
• 5	3(4%)	4(5.3%)	7(4.7%)	

The attitude of medical and engineering students on voluntary body donation.

In the present study, the major motivational factor for body donation among medical students was to express gratitude to medical sciences, whereas engineering students wanted to donate their body as they felt body donation as dignified act. Participants were not comfortable with the idea of dissection of their own body after death which was found as a major hindering factor for body donation

Table 2: Knowledge and Attitude of medical and engineering students on autonomy, confidentiality and post act benefit.

Items	MED (n=75)	ENG (n=75)	Total (n=150)	P-value
Autonomy				
Q19: India should have a national opt-out policy for body donation				
• 1	8(10.7%)	8(10.7%)	16(10.7%)	0.529- insignificant
• 2	24(32%)	19(25.3%)	43(28.7%)	
• 3	15(20%)	16(21.3%)	31(20.7%)	
• 4	21(28%)	18(24%)	39(26%)	
• 5	7(9.3%)	14(18.7%)	21(14%)	
Confidentiality				
Q20: Donated bodies should not be kept in the museums for the general public				

• 1	7(9.3%)	1(1.3%)	8(5.3%)	0.030* - significant
• 2	25(33.3%)	12(16%)	37(24.7%)	
• 3	15(20%)	14(18.7%)	29(19.3%)	
• 4	22(29.3%)	33(44%)	55(36.7%)	
• 5	6(8%)	15(20%)	21(14%)	

Q21: Identity will be revealed during dissection by students if they donate their bodies to the medical institution

• 1	7(9.3%)	6(8%)	13(8.7%)	0.359- insignificant
• 2	29(38.7%)	20(26.7%)	49(32.7%)	
• 3	20(26.7%)	20(26.7%)	40(26.7%)	
• 4	14(18.7%)	24(32%)	38(25.3%)	
• 5	5(6.7%)	5(6.7%)	10(6.7%)	

POST ACT BENEFIT

Q22: Monetary benefits should be given to donors

• 1	14(18.7%)	5(6.7%)	19(12.7%)	0.029* - significant
• 2	21(28%)	16(21.3%)	37(24.7%)	
• 3	20(26.7%)	19(25.3%)	39(26%)	
• 4	15(20%)	31(41.3%)	46(30.7%)	
• 5	5(6.7%)	4(5.3%)	9(6%)	

DISCUSSION

Anatomy is a unique subject, a sound knowledge of which is very essential for medical students to begin their medical career and to become a competent medical professional. Teaching and research in anatomy are mainly based on cadaver dissection.

Awareness: Body donation is a generous and legal action for those who wish to be useful to the living after death.¹⁰ In the present study, awareness of body donation was less in engineering students as they are not exposed to. In the study conducted by Dattatray Digambarrao et al. (2016), only 7% of the general population was aware that bodies can be voluntarily donated for medical education and research¹¹.

In the present study, the major source of information regarding body donation among medical student was through medical persons and in engineering students via media. In a study by Anubha Saha et al. (2015) the main source of motivation for medical students is by medical

Camps(71.8%)and for engineering students is mainly by media (57.6%) the finding of which is correlated with the present study.¹²

The major reason for less number of body donation in India is lack of awareness. Rokade et al. (2013) suggested that” body donation units” should be mandatory in all medical colleges for the successful conduct of body donation programme. The students should be sensitized for honouring the cadavers at the commencement of medical course session¹³.

Vulnerability: In the present study 70% and 73% of medical and engineering students respectively were aware that unclaimed bodies can be used for dissection purposes. Surveys and previous studies point out the non-willingness to accept the unclaimed bodies even though the scarcity of the cadavers exist throughout the world. The procurement of bodies through the same is regarded as only a temporary solution. In a body donation survey conducted on Italian medical students suggested that the use of unclaimed cadavers may expose the vulnerable individual to dissection in the absence of their consent, hence using unclaimed bodies is the exploitation of those on the margins of the society who can not effectively protest.¹⁴ Peddawad RG strongly supports the urge to educate the people working in medical colleges, hospitals, institutions about the guidelines regarding the use of dead bodies for educational purposes. This helps them to handle the unclaimed bodies as there were loopholes and unawareness about Anatomy act guidelines.¹⁵

Informed consent: According to anatomy act any person can donate his/her body after death to the approved institution for medical education by a written declaration signed in the presence of at least two witnesses during his lifetime or expressed orally during his last illness in the presence of two or more witnesses. No permission is required from the police or coroner or any other Governmental Authority provided a death certificate is issued by a registered medical practitioner stating the cause of death as being natural without any ambiguity. Filling up a will form for body donation accounts to the registration of a donor in the list of the medical university. Any person above the age of 18 years can fill the will form for body donation .¹⁶

In the present study knowledge of informed consent is less in engineering students compared to medical students. Majority of participants in both the groups agree that death certificate is a must for body donation and family members can donate the body in case of an unexpected death of family member with the wish of body donation. There was no major difference in the opinion of two groups regarding the donation of the body by a friend, in case of unexpected death a person with a wish of voluntary body donation.

Act of signing a body donation will form before death is looked upon as a way to keep one’s close relatives away from the burden of deciding on donating a body after death.^{17,18}

Dignity: The main ethical concern of cadaver dissection lies in respect for human life. To create awareness of respect for cadavers among the general population including the medical student’s different countries in the world organizes body donor programme differently. For example, In Thailand respect to voluntary body donor is formalized in a ceremony known as “Waikhru”(ceremony for honouring the teacher). At such ceremonies, booklets are printed and distributed to include the details of voluntary body donors such as their

pictures, address and a short resume and words of condolence and gratitude from faculty and students. So the donor is respected as a person rather than a medical object in the dissection hall.¹⁶

Attitude towards body donation

In the present study engineering students (66%) were more enthusiastic to donate body than medical students (38%). About 37% of medical students did not consider body donation as a dignified act may be due to their unpleasant experience in the dissection hall during their first year of MBBS dissection classes. Majority of medical and engineering students in the present study have disagreed that body donation is the best way to avoid the problems for arranging for funerals. The finding of our study coincides with that of study by Prasad where only 2% Of medical and paramedical students were willing to donate the body to avoid funeral expenses.¹⁹

32% of medical and 31% of engineering students were scared that their body may not be treated respectfully in dissection hall. Students admit that they have witnessed impatient behaviour being observed towards the cadaver in the dissection hall which hinders their willingness towards body donation.²⁰

Prameela et al. (2017) concluded that the main reason for unwillingness to donate body among medical fraternity was not wanting to cut their body into pieces because of their previous experience with dissection hall followed by mistrust or misconception, fear of premature organ removal, religious barrier and monetary benefit.²¹

In a study by Prakash MH et al. (2016) majority of the population wanted to get the last rituals performed on their body as per their religion even though every religion consider body donation as an altruistic act of charity and love²². In the present study, 38% of medical and 29% of engineering students disagree with this concept.

Autonomy: 43% of medical and 36% of engineering students disagree that India should have a national opt-out policy for body donation. Donation is a clear will made by people free and informed. Body donation is a personal decision. It is suggestive of autonomy of thought and every modern outlook on donor's part. Individual who donates his body to science is guided mainly by altruistic attitude. It suggests that compassion of an individual towards society and a determined will be useful even after death.²³

Confidentiality: According to the recommendation by the International Federation Of Association of Anatomy (IFAA) guidelines suggests that it is important to maintain the anonymity of individual. Consent should be taken from donor beforehand only for the public display of images or structures. No individual should be identifiable in images.²³ Digambarrao DD suggested that increasing trend of the irre-

sponsible use of smartphones in the dissection hall and social media hampered the willingness of individual for body donation. Respect for the donated body also means maintaining the confidentiality/identity of the donor.²⁵

Monetary benefit: 46.6% of engineering students agree that bodies can be donated to a medical institution for monetary benefit but only 26.6% of medical students agree with this. A survey was conducted by Richardson and Hurwitz to decide the attitude of 218 donors towards body donation and reported that the notion of monetary incentives to promote body donation was overwhelmingly rejected by participants in his study.²⁶

CONCLUSION

The result from the present study concluded that body donation is a moral and gracious act. It is an unselfish act in allegiance to medical science and country. This altruistic act of donors will help medical students, teaching staff and practising doctors for learning and research. Donation of the bodies after death should be encouraged and people should be motivated to make this a habit. Involvement of media, newspaper, lectures, felicitating donors and their relatives creates an impact on the society

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