


# Do Health Sciences Students Have the Appropriate Knowledge and Attitude to Advance Organ Donation in Ethiopia? Cross-Sectional Study

This article was published in the following Dove Press journal:  
*Transplant Research and Risk Management*

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**Background:** Donated organs and tissues are necessary for transplantation to treat irreparable organ failure. This study aimed to assess the knowledge and attitude of undergraduate health science students' toward organ donation at Jimma University.

**Methods:** The study was conducted in Jimma University, College of Health Sciences from February 1, 2018 to April 25, 2018, Gregorian calendar. Data was entered into Epi-Data version 3.1 and exported to SPSS version 23 for analysis. A descriptive and generalized linear model was applied to present the results.

**Results:** The overall knowledge and attitude scores of the students were 3.844 (2.98, 4.712) and 6.3914 (5.93, 6.85) respectively. The results showed that students had good knowledge of and a positive attitude toward organ donation. Male students had a higher mean knowledge score than female students, however, the difference was not significant. Dental medicine and medicine students had a higher mean knowledge score than any other health science students in the faculty. Students showed knowledge difference yearly. A significant number of students 290 (73.4%) and 313 (79.2%) knew the importance of live and cadaveric organ donation to treat permanently failed organs, respectively. Also, about 238 (60.3%) students had the awareness of disease transmission and 358 (90.6%) of them knew the involvement of tissue rejection when inappropriate organ transplantation is done to the recipients. Furthermore, likewise, more than half of the students expressed positive beliefs toward the different questions of organ donation-ethics, religion, and willingness for organ donation.

**Conclusion:** Students showed good knowledge and a positive attitude toward organ donation and this should be translated to the public to increase the rate of organ donations.

**Keywords:** organ donation, knowledge, attitude, Jimma University

## Background

One of the important health problems of human beings is organ failure.<sup>1</sup> Organ transplantation is a successful surgical treatment option against irreversible vital organ failures.<sup>2</sup> Organs and tissues that are necessary for transplantation can be achieved from the live donors or deceased donation.<sup>3</sup> The shortage of organs for transplantation remains an unsolved problem and many patients wait extended periods for an organ from a suitable donor.<sup>4</sup> The issue of organ donation is complex and multifactorial involving ethical, legal, medical, organizational, and societal factors.<sup>5</sup> Countries around the world have reported that people's attitudes toward organ donation influenced by knowledge.<sup>4</sup> Therefore, education has recently been suggested as a new approach to solving the organ shortage.<sup>6</sup> Health Sciences students need to be educated

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about organ donation – why we need to have organ donations, when and what kind of organs should be donated, legal and ethical issues about organ donation, principles of live and cadaveric organ donations and scientific methods to identify brain death. Therefore, in the future students can be informed and advocates to the public about organ donation.<sup>5,7</sup> In general, in Ethiopia, most of the time people are not volunteering to donate the organ to the patients who are waiting for urgent organ transplantation. The deferent factors which determine the rate of organ donation should be studied qualitatively and quantitatively. However, we want to see in the future that a number of volunteers donate organs willingly to tackle the patient's organ problem. Therefore, we aim to evaluate first, the knowledge and attitude of future organ donation advocates specifically health science students.

## Materials and Methods

### Study Area and Design

The study was conducted in Jimma University, College of Health Sciences from February 1, 2018 to April 25, 2018, G. C. The University is found in Jimma Town just 253 Km far from the capital city of Ethiopia. The University is one of the old public higher institutes currently teaching more than 36,000 students both at the undergraduate and graduate levels.

### Inclusion and Exclusion Criteria

The study participants were undergraduate health science students from the second year to the final year. First-year students and students in the department of environmental health, midwifery, and health officer were excluded from the study purposely because students belonging to these departments were involved in the validation of the data collection tools.

### Sample Size Determination

The sample size was determined using a single population proportion formula ( $Z^2 \times p \times q/d^2$ ) with an estimated P-value 50%, 95 confidence interval, and a sample error of 5%. Considering a 10% non-response rate, the final total sample size of the study was 422.

### Questioners

The data collection questioner was constructed after extensive literature review. Questioners have two parts-Knowledge and Attitude measuring questions. Knowledge items were adopted from similar articles.<sup>5,8,9</sup> The majority of the questions measure the general knowledge of students regarding

organ donation and ethical concerns. A total of 7 knowledge-measuring questions were prepared in scale with 4-point categorical options “Yes”, “No”, “don't know” and “not sure”. Attitude questions were adapted from previously published work with the same objectives.<sup>4,10,11</sup> Attitude measuring questions were prepared to test students' beliefs, feelings, and opinions about organ donation. There were 13 attitude questions with 5-point scale options “Strongly agree”, “Agree”, “Not sure”, “Disagree” and “Strongly disagree”.

### Ethical Considerations

Ethical approval was obtained from the institutional review board of Jimma University, institute of health sciences with the Reference Number IHRPGD/3019/2019. The study was conducted following the ethical standards of the Declaration of Helsinki. Written informed consent was obtained from each participant before the questionnaire is distributed.

### Data Analysis

Data analysis was done following the previous publication.<sup>12</sup> Statistical Package for the Social Sciences (SPSS) software version 23 (SPSS Inc., Chicago, IL, USA) was used for data analyses. Continuous variables were reported as mean and standard deviation (SD), whereas, categorical variables as crude counts and percentages. For each knowledge and attitude questions, we calculated a composite score. We transform and create a dummy variable for each knowledge questions (range: 0–7). We scored the response “yes” as correct (1), and response “No” (0), “Do Not Know” (0) and “Unsure” (0) as incorrect (0). Then, we calculated the mean composite knowledge score. For the attitude (13 - Questions), we scored “Strongly agree” (1), “Agree” (1) or “Not sure” (0), “Disagree” (0), and “Strongly disagree” (0), and then we calculated mean attitude composite score.

### Operational Definition

Student's knowledge defined as Poor ( $\leq 2.98$ ), Good (3.0–3.8) and Excellent ( $\geq 3.81$ ) from the knowledge composite score. Additionally, the student attitude score was defined as negative ( $\leq 5.93$ ) and positive ( $\geq 6.0$ ) from attitude composite score.

### Results

The response rate of the study participants was 92.8%. Male participants were 257 (65.1%) and 164 (41.5%) were from the medicine department.

## Knowledge

The overall mean weighted knowledge and attitude scores of the students were 3.844 (2.98, 4.712) and 6.3914 (5.93, 6.85) respectively. The result suggests that students answered average from the total questions correctly. Students agreed in most of the attitude questions. Male students had a higher mean knowledge score than female students. However, the difference was not significant. Dental Medicine and Medicine students had a higher mean knowledge score than any other health science students in the faculty. Students showed knowledge difference yearly. Higher mean knowledge score was seen on sixth and fifth-year students (Table 1). From the total 326 health science students, 317 (80.3%) did not know about brain death. However, 290 (73.4%) of them knew that organ donation is performed to save a life. Besides, 238 (60.3%) of students had the understanding that donated organs could transmit the disease to the recipient. Furthermore, the highest proportion of the students 358 (90.6%) knew that organ transplantation involves tissue rejection. About 313 (79.2%) of the students had the information about cadaveric organ collection but the same number of students 277 (70.1%) did not know that

brain death should take place first to perform cadaveric organ donation. Finally, a huge number of students 362 (91.6%) had no awareness of legal law on Organ donation (Table 2).

## Attitude

The attitude of the students towards organ donation is indicated in Table 3. About 245 (62.0%) students agreed to donate own organ in the future and 277 (70.1%) of the students had a favorable view of the association between religion and organ donation. Farther-more, 215 (54.4%) of the students did not believe serving God through organ donation. Over-half of the student, 212 (53.7%) agreed with the question related to “donated organs could be abused for research purposes?”. About 228 (57.7%) students had no information about organ (kidney) transplantation is taking place in Ethiopia and 253 (64.1%) and 272 (68.9%) of the students disagree with the question manly believed by the public like “deciding to donate organ is just to ready die” and “an intact body is needed for the life here after”, respectively. Students also expressed their belief to the question related to the ethics, consent and organ donation (Table 3).

**Table 1** Univariable Linear Regression Model Among Health Science Students

Variable	Frequency (%)	Mean (±Sta.d)	Mean Knowledge Score (95% CI)	Knowledge Score B(95% CI)
<b>Sex</b>				
Male	257(65.1%)	–	3.52(3.33,3.72)	0.264(–0.063,0.59)
Female	138(34.9%)	–	3.26(2.99,3.524)	r
<b>Age</b>	–	21.97(±2.33)	–	–
<b>Monthly income</b>	–	617(±1153.6)	–	–
<b>Field of study</b>				
Nurse	83(21%)	–	2.68(2.36,3.00)	–1.31(–2.04,-0.59)
Pharmacy	74(18.7%)	–	3.37(3.04,3.71)	–0.31(–0.679,0.058)
Medicine	164(41.5%)	–	3.96(3.74, 4.2)	–0.01(–0.241,0.221)
Laboratory	25(6.3%)	–	2.48(1.9,3.19)	–0.38(–0.599,0.161)*
Anesthesia	29(7.3%)	–	3.10(2.56,3.64)	–0.178(–0.349,0.009)
Dental Medicine	20(5.1%)	–	4.0(3.35,4.65)	r
<b>Year of study</b>				
Second year	124(31.4%)	–	3.27(2.99,3.59)	–0.291(–0.587,0.004)
Third Year	96(24.3%)	–	3.54(3.22,3.85)	–0.105(–0.309,0.098)
Fourth Year	86(21.8%)	–	3.16(2.83,3.49)	–0.174(–0.329,0.019)
Fifth Year	54(13.7%)	–	3.75(3.34,4.17)	–0.02(–0.154,0.115)
Sixth Year	35(8.9%)	–	3.85(3.33,4.37)	r
<b>Knowledge score</b>	–	–	3.844(2.98,4.712)	–
<b>Attitude score</b>	–	–	6.3914(5.93,6.85)	–

**Notes:** B= Unstandardized Coefficients, r=Reference Group, \*=significant association ( $p<0.05$ ).

**Table 2** Questions Asked To Health Sciences Students for The Assessment of Knowledge on Organ Donation Stratified by Sex

Knowledge Domain Survey Items		Sex		Total n=395 (100%)
		Male n=257 (65.1%)	Female n=138 (34.9%)	
Q1. Do you understand the term brain death?	Correct	49(12.4%)	29(7.3%)	78(19.7%)
	Incorrect	208(52.7%)	109(27.6%)	<b>317(80.3%)</b>
Q2. Organ can be donated to save someone life?	Correct	195(49.4%)	95(24.1%)	<b>290(73.4%)</b>
	Incorrect	62(15.7%)	43(10.9%)	105(26.6%)
Q3. Donated organ can transmit disease?	Correct	165(41.8%)	73(18.5%)	<b>238(60.3%)</b>
	Incorrect	92(23.3%)	65(16.5%)	157(39.7%)
Q4. Does organ transplantation involve risks of tissue rejection?	Correct	237(60.0%)	121(87.7%)	<b>358(90.6%)</b>
	Incorrect	20(5.1%)	17(4.3%)	37(9.4%)
Q5. Do you know cadaveric organ donation?	Correct	206(52.2%)	107(27.1%)	<b>313(79.2%)</b>
	Incorrect	51(12.9%)	31(7.8%)	82(20.8%)
Q6. Brain death should take place in order to get cadaveric organ?	Correct	72(18.3%)	46(11.6%)	118(29.9%)
	Incorrect	185(46.8%)	92(23.3%)	<b>277(70.1%)</b>
Q7. Do you know any legal law on Organ donation?	Correct	24(6.1%)	9(2.3%)	33(8.4%)
	Incorrect	233(59.0%)	129(32.7%)	<b>362(91.6%)</b>

**Notes:** Bold values indicate the highest number of the student. Correct = Yes, Incorrect = No, Not sure, I do not know.

## Discussion

Despite all the efforts made in the past year to advance organ and tissue transplantation for patients, still patients are dying of organ failure.<sup>13</sup> The main factor remains, as the problem related to this issue is a lack of suitable organ donors. Therefore, it is very important that future care providers are knowledgeable about organ donation to adequately inform people and increase organ donors.<sup>14</sup> In this study, we attempted to evaluate the knowledge and attitudes of health science students concerning organ donation. In this study, over half of the students knew the different aspects of organ donation. However, a significant number of students lacks the knowledge related to brain death and about the rules and regulations of organ donation. In this regard, our finding got similarity to the study conducted in Turkey medical college students.<sup>15</sup> Furthermore, students participated in this study had similar knowledge about the purpose of organ donation with other studies.<sup>16,17</sup> In the current study, dental medicine and medical students showed a higher knowledge score than others. This might be because of the nature of the course and the extensive clinical attachment they have at the school and hospital. The number of years they stay in the hospitals also give them to study and manage more clinical cases related to organ failure and their managements compared with others. Furthermore, more than half of the students (62%) showed a strong desire and willingness to donate their organs in the

future. This belief of the students has similarities with other medical students in the UK, Iran, and Italy, respectively.<sup>18–20</sup>

It is obviously true that having excellent knowledge would lead to a positive and supportive attitude that can be translated to good practice. Religion is one of the key factors that influence the rate of organ donation in many countries and societies. From this point in the present study, 70.1% of the student emphasized that no relation between religion and organ donation. This belief of the students was in harmony with other studies conducted among medical students.<sup>8,13,21</sup> However, one observational study among medical students in Malaysia reported that student's attitude and willingness to donate organs highly influenced by religion.<sup>7</sup> Another two studies showed that religion is one of the major factors for the students not to donate the organ.<sup>22,23</sup> Future care providers who strongly believe that organ donation is against his or her belief in the religion may have a direct impact on the organ donation rate. The first effect is they cannot able to donate their organs after death and promote others to donate organs.<sup>24</sup> Furthermore, the majority of the students worried that harvested organs may involve in the transmission of diseases and tissue rejection to the recipients, in addition, in the inappropriate use of collected organs for research purposes. The worry of the students is appropriate since unhealthy and inappropriate organs could result in disease transmission and organ rejection to the receivers. Moreover,

**Table 3** The response of Health Sciences Students to the Attitude Measuring Questions

Attitude Domain Survey Items		Sex		Total n=395 (100%)
		Male n=257 (65.1%)	Female n=138 (34.9%)	
Q1. The possibility of your own organs being for donation when you die?	I 0	164(63.8%) 93(36.2%)	81(58.7%) 57(41.3%)	<b>245(62.0%)</b> 150(38.0%)
Q2. My religion does not allow organ donation?	I 0	53(20.6%) 204(79.4%)	25(18.1%) 113(81.9%)	78(19.7%) <b>277(70.1%)</b>
Q3. I regard donating my kidneys a way serving my God?	I 0	121(47.1%) 136(52.9%)	59(42.8%) 79(57.2%)	180(45.6%) <b>215(54.4%)</b>
Q4. Donated organs could be misused and bused?	I 0	148(57.6%) 109(42.4%)	64(46.4%) 74(53.6%)	212(53.7%) <b>183(46.3%)</b>
Q5 Organs especially Kidney can be transplanted in Ethiopia?	I 0	146(56.8%) 146(56.8%)	82(59.4%) 82(59.4%)	228(57.7%) <b>228(57.7%)</b>
Q6. I would not worry if doctors are allowed to remove my kidney when I die?	I 0	100(38.9%) 157(61.1%)	52(37.7%) 86(62.3%)	152(38.5%) <b>243(61.5%)</b>
Q7. If we decide to donate organs, it is like we are ready to die?	I 0	94(36.6%) 163(63.4)	48(34.8%) 90(65.2%)	142(35.9%) <b>253(64.1%)</b>
Q8. Do you think an intact body is needed for the life hereafter?	I 0	84(32.7%) 173(67.8%)	39(28.3%) 99(71.7%)	123(31.1%) <b>272(68.9%)</b>
Q9. For living donation, Donor should give consent?	I 0	185(72.0%) 72(28.0%)	100(72.5%) 38(27.5%)	<b>285(72.2%)</b> 110(27.8%)
Q10. For donation after death, family/ spouse should give consent?	I 0	190(73.9%) 67(26.1%)	90(65.2%) 48(34.8%)	<b>280(70.9%)</b> 115(29.1%)
Q11. Parents/guardians can give consent for mental ill persons if he/she wants to donate?	I 0	128(49.8%) 129(50.2%)	78(56.5%) 60(43.5%)	<b>206(52.2%)</b> 189(47.8%)
Q12. I know where to obtain organ donation cards.	I 0	88(34.2%) 169(65.8%)	62(44.9%) 76(55.1%)	150(38.0%) <b>245(62.0%)</b>
Q13. Organ donation should be promoted?	I 0	140(54.5%) 117(45.5%)	70(50.7%) 68(49.3%)	<b>210(53.2%)</b> 185(46.8%)

**Notes:** Bold values indicate the highest number of students. I= Strongly agree and Agree. 0= Not sure, Disagree, Strongly disagree.

illegal organ trafficking is increasing across the world and several stories showed illegal organ trafficking networked by brokers, physicians and hospitals.<sup>25</sup> Generally, when volunteers are thinking that he or she is donating their organ to save someone's life through transplantation. However, if it is used for research activities, donors must give consent otherwise it would be illegal for doctors to take any organs from humans. The majority of the students could able to identify the misconceptions ("If we decide to donate organs, it is like we are ready to die?" and "do you think an intact body is needed for the life hereafter?") believed by the public related with organ donation. The students did not support these wrong beliefs. Also, students believed that informed consent must be gained

from the appropriate persons before a donation is taking place from healthy living, mentally ill and dead donors. The current study might have limitations related to methodological things but still can serve as a baseline study for future researchers in the area as literature are extremely lacking in the area.

## Conclusion

Student's knowledge and attitude toward organ donation were good and farther investigation should be encouraged focusing on the knowledge, attitude and practice toward organ donation and deterrents that put influences to donate an organ and not to donate organs among the different study

populations. That would identify the barriers and the opportunities to work on the way to increase organ donation.

## Data Sharing Statement

The datasets supporting the conclusions for this study are available from the corresponding author on reasonable request.

## Acknowledgments

The authors would like to kindly acknowledge study participants, data collectors and Jimma University staff. The study was supported by research funding from the Jimma University, Institute of Health Sciences, Research and Postgraduate Coordinating Office. The funding organization had no role in the design, data collection, analysis, interpretation or publication of this data.

## Author Contributions

All authors made substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; took part in drafting the article or revising it critically for important intellectual content; gave final approval of the version to be published; and agree to be accountable for all aspects of the work.

## Disclosure

The authors declare that they have no competing interests.

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