

Knowledge, Attitude, and Willingness Towards Organ Donation Among Medical and Health Sciences Students in Central Region, Saudi Arabia

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Sulaiman Almutairi

Department of Urology, College of
Medicine, Majmaah University, Al-Majmaah
11952, Saudi Arabia

Purpose: In this modern era, organ transplantation has become an important treatment method for certain diseases. Doctors and allied health professionals play important roles in continuing its advocacy and sharing knowledge within the community; thus, educating the public on organ donation is paramount. The present study aimed to understand the knowledge, attitude, and willingness toward organ donation of medical and health sciences students.

Materials and Methods: We conducted a cross-sectional questionnaire-based study from January to March 2020. The pretested questionnaire was prepared on Google Forms, and the link was shared with 467 students graduating in medicine, dentistry, nursing, physiotherapy, and paramedical studies to analyze their knowledge, attitudes, and willingness towards organ donation. Of 467 students, 425 students provided complete answers and were included in data analysis.

Results: We found that knowledge scores were uniformly low among students in all specialties except for those studying medicine and physiotherapy ($p = 0.001$). Moreover, female students scored higher than male students in all the three domains of knowledge, attitude, and willingness toward organ donation, and such was statistically significant ($p = 0.001$).

Conclusion: Since final-year medical and health sciences students will soon graduate and join their respective professions, we recommend the integration of the topic of organ donation into their final-year curriculum to provide them with adequate knowledge so that they can provide proper guidance to the general public. Similarly, the advocacy in promoting organ donation should be increased through the use of appropriate mediums to change the attitudes and enhance the willingness of people.

Keywords: organ donation, knowledge, attitude, donation barriers

Introduction

The demand for organ transplantation worldwide has risen exponentially in the last two decades due to the increasing incidences of non-communicable illnesses, especially diabetes, hypertension, and obesity. Since these metabolic disorders have been found to be associated with multiple organ failure, organ transplantation is recognized as a life-saving procedure for patients with potentially terminal illnesses.¹ However, long waiting lists for organ transplantation mean that many patients with end-stage organ failure will die before they even receive a donated organ. The Kingdom of Saudi Arabia (KSA) has a small rate of organ donation at 2–4/million population compared to more than 20/million population in countries like the United States and Spain.² The steeply

Correspondence: Sulaiman Almutairi
Department of Urology, College of
Medicine, Majmaah University, Al-
Majmaah 11952, Saudi Arabia
Tel +00966504897956
Fax +0096614321218
Email sa.almutairi@mu.edu.sa

increasing gap between patients who need transplantation and the availability of eligible donors is a major cause for concern which requires multisegmented approaches.

According to available estimates, a total of 140,993 organ donations were made globally in 2018. However, only 1350 transplantations were performed in KSA, which accounts for nearly 0.95% of the total share worldwide.³ Among those 1350 transplantation surgeries performed within the KSA, the majority were kidney (1006) transplants, followed by liver (270) and heart (96) transplants.⁴ Despite the fact that more patients are added to the waiting list every year, the number of donors lags behind, thus there is an inability to proportionately meet the patients' needs. Moreover, patients on the transplant waiting list often face high medical expenses as they receive care for end-stage diseases.

Literature reviews suggest that organ donation is not popular in KSA. Some studies have reported that the major reasons for this are social stigma, ignorance, and lack of information.^{5,6} Moreover, the Saudi population will be increasingly at risk for multiple organ failure in the coming years due to the increasing shortage of donors.² Thus, there is an urgent need to promote organ transplantation in KSA. However, there are few studies conducted in KSA with regard to knowledge, attitude, and willingness toward organ donation, especially among medical professionals.^{7,8} Therefore, the present study was conducted in Majmaah, Saudi Arabia, to address the need to analyze the knowledge, attitude, and willingness of medical and health sciences students toward organ donation.

Materials and Methods

We conducted a cross-sectional study from January to March 2020 among 467 final-year students from different healthcare specialties, which includes medicine, dentistry, nursing, physiotherapy, and paramedical sciences. This is for the purpose of evaluating the differences in knowledge, attitude, and willingness toward organ donation between the various groups who are classified in terms of gender and specialty. All final-year students across various specialties were approached, as it was expected that they would be entering the job market and become professionals in the near future, and it was assumed that the students would have knowledge relating to organ donation and its practice. As such, there is currently no formal course in the university curriculum dedicated to teaching organ transplantation. With an average intake of 60 students per year across the nine healthcare specialties

included in the present study, the total number of final-year students inclusive of all disciplines was 467 students. The questionnaire was distributed among all final-year batches of nine streams with prior intimation to their respective class representatives. Out of 467 students, 42 students were excluded from the study, in which 16 students did not give consent for participation and the rest 26 students did not complete the questionnaire. As a result, 425 participants were included in the study with prior consent. In order to execute the study, proper approval was sought from the ethics committee of the Majmaah University for Research (Approval number: MURIC 2020/28-1).

The pretested self-report questionnaire had three sections to assess participants' knowledge, attitude, and willingness toward organ donation, as well as collected data on general demographics, such as age, gender, specialty, marital status, and number of dependents.^{6,9-11} The questionnaire included a total of 32 questions, with questions 1 to 8, 9 to 15, 16 to 23, and 24 to 32 pertaining to general demographics, knowledge, attitude, and willingness, respectively.

The questions on knowledge and willingness had a box-checking format consisting of the options "yes," "no," and "don't know." The questions on attitude were rated using a Likert scale, with answer choices of "strongly agree," "agree," "neither agree nor disagree," "disagree," and "strongly disagree." Higher scores indicated higher degrees of knowledge, positive attitude, and willingness regarding organ donation. Scores higher than or equal to 50% of the maximum score were categorized as high scores, and those that fell below the 50% cutoff were categorized as low scores.

The questionnaire was distributed to medical and health sciences students during lectures. The data were entered into a Microsoft Excel spreadsheet, and only the completed questionnaires were analyzed for comparisons using SPSS software (version 22.0, IBM Corp., Armonk, NY, USA). A Chi-square test was used to analyze the discrete variables, and P-values < 0.05 were considered significant.

Results

Out of the 467 students who participated in the study, 425 completed the questionnaire which corresponds to a response rate of 91%. The study population consisted of 225 men (53%) and 200 women (47%). The respondents' baseline characteristics are shown in [Table 1](#).

Table 1 Distribution of Participant Characteristics for Final-Year Medical and Health Sciences Students

Category	n = 425 (in %)
Age in Years	
< 30	298 (70%)
31–40	95 (22.3%)
41–50	32 (7.7%)
> 50	0 (0%)
Gender	
Male	225 (53%)
Female	200 (47%)
Specialty	
Medicine	51 (12%)
Dentistry	47 (11%)
Nursing	49 (11.5%)
Physiotherapy	54 (12.7%)
Paramedical & Allied Sciences (MLT, MET, PH, and Radiology)*	224 (52.7%)
Marital Status	
Single	242 (57%)
Married	143 (33.6%)
Divorced	40 (9.4%)
No. of Dependent Family Members	
2	75 (17.6)
3	43 (10%)
4	59 (13.8%)
5	49 (11.5%)
6	59 (13.8%)
> 6	140 (33.1%)

Abbreviations: *MLT, Medical Lab Technology; MET, Medical Equipment Technology; PH, Public Health.

For knowledge scores in the medicine specialty, 2.6% of participants had low scores (< 50% of maximum score), whereas 23.5% had high scores (\geq 50% of maximum score), which was statistically significant ($p = 0.001^{**}$). For physiotherapy students, about 8.1% and 18.3% of participants had low scores and high scores, respectively ($p = 0.001^{**}$). No significant difference was noted between low scorers and high scorers for dentistry and nursing students. Statistically significant high scores for attitude were seen in medicine and physiotherapy students of about 22.5% and 20.4%, respectively. The same was reflected in high scores for willingness found in 21.9% and 19.3% of medicine and physiotherapy students, respectively. A considerably high percentage of paramedical and allied sciences students had low scores, with 66.2%, 67.5%, and 70% for knowledge, attitude, and willingness, respectively, as seen in Table 2.

When evaluating knowledge, attitude, and willingness toward organ donation based on gender, it was observed that female medical and health sciences students generally

Table 2 Specialty-Wise Comparisons of Knowledge, Attitude, and Willingness Scores for Organ Donation Among Final-Year Medical and Health Sciences Students

Knowledge	Low Score (< 50% of Maximum Score) n = 234 (%)	High Score (\geq 50% of Maximum Score) n = 191 (%)	P-value
Medicine	6 (2.6%)	45 (23.5%)	0.001
Dentistry	25 (10.6%)	22 (11.5%)	0.080
Nursing	29 (12.3%)	20 (10.4%)	0.562
Physiotherapy	19 (8.1%)	35 (18.3%)	0.001
Paramedical & Allied Sciences	155 (66.2%)	69 (36.1%)	0.001
Attitude			
Medicine	8 (3.4%)	43 (22.5%)	0.001
Dentistry	28 (11.9%)	19 (9.9%)	0.781
Nursing	31 (13.2%)	18 (9.4%)	0.0960
Physiotherapy	15 (6.4%)	39 (20.4%)	0.001
Paramedical & Allied Sciences	158 (67.5%)	66 (34.5%)	0.001
Willingness			
Medicine	9 (3.8%)	42 (21.9%)	0.001
Dentistry	26 (11.1%)	21 (10.9%)	0.140
Nursing	32 (13.6%)	17 (8.9%)	0.060
Physiotherapy	17 (7.2%)	37 (19.3%)	0.001
Paramedical & Allied Sciences	164 (70.1%)	60 (31.4%)	0.001

Abbreviation: N, number of students.

had higher scores in all three domains compared to their male counterparts, and such was found to be statistically significant ($p < 0.001$).

Discussion

This study was conducted to assess knowledge, attitudes, and willingness towards organ donation among medical and health sciences students of Majmaah university in the Majmaah district of Central KSA. The study showed that medicine and physiotherapy students who are in their final-year ($p < 0.001^{**}$) scored higher in all categories compared to their dentistry, nursing, and paramedical counterparts as shown in Table 3. This could possibly be attributed to the fact that medicine and physiotherapy students gained substantial interest regarding the topic from quite early in their studies.

The findings of our study were similar to the findings of another study by Bharambe et al¹² where it was observed that medical students in their final year had high levels of awareness and positive attitude toward organ donation. However, the Bharambe study in India was conducted to highlight the differences among medical

Table 3 Gender-Wise Comparisons of Knowledge, Attitude, and Willingness Scores for Organ Donation Among Final-Year Medical and Health Sciences Students

Knowledge	Low Score (< 50% of Maximum Score) n = 234 (%)	High Score (≥ 50% of Maximum Score) n = 191 (%)	P-value
Male	136 (58.1%)	89 (46.6%)	0.001
Female	98 (41.9%)	102 (53.4%)	
Attitude	n = 240(%)	n = 185(%)	0.001
Male	149 (62.08%)	76 (41.08%)	
Female	91(37.92%)	109 (58.9%)	
Willingness	n = 248	n = 177	0.001
Male	155 (62.5%)	70 (39.55%)	
Female	93 (37.5%)	107 (60.45%)	

students studying in various semesters/years, while the present study was aimed toward final-year students studying in KSA across various medical and health science disciplines. Moreover, the Bharambe study showed a score of 100% in Knowledge domain among Indian medical students while our study only showed a score of 88.2%, followed by physiotherapy students with 68.4%.

Regarding physiotherapy students, the results of our study were in line with another study conducted at a prominent physiotherapy school in New Delhi, India, where it was observed that final-year physiotherapy students scored higher than students in their first, second, and third years. While our physiotherapy students scored 68.4%, the final-year bachelor of physiotherapy students in India scored 54.54%.¹³

A study carried out in Erciyes University School of Medicine among 464 students including first and sixth-grade students noted 50% of students consider donating their organs and think organ donation is appropriate in terms of religion. Gender and grades had no effect on knowledge regarding organ donation.¹⁴ A similar study done in Puerto Rico found the congruent knowledge and attitude of medical students with a mean score of 6.29 on a 10 point scale and 45.7% of students scoring more than 7 points.¹⁵

Organ donation after brain death is a very important subject that requires sustained efforts to increase awareness, as well as promotion of willingness among the general population of KSA to sustain the ever-growing needs of terminally ill patients.^{1,16} Therefore, the roles of various healthcare professionals are vital in the transplant program, since they are the frontliners across different healthcare institutions which includes hospitals, medical centers, and medical colleges in direct contact with patients.

The stability of any transplant program depends on the knowledge and attitudes of the people involved, and can be achieved only if healthcare professionals are well-educated on the various issues regarding organ donation, brain death declaration, myths, and facts, among others, to promote the cause properly. Healthcare professionals have an important task in educating and motivating the general population.^{2,17}

When comparing the various professional groups, it was observed that among all the healthcare workers, nurses and paramedics have maximum hour contact with patients, from their admission until discharge, as well as during follow-up. Their personal knowledge and attitudes on organ donation can play a crucial role in the decision-making process of potential patient/attenders regarding such. The present study showed that knowledge scores in the nursing group were significantly lower, compared to those in other groups such as medicine, physiotherapy, and dentistry, as can be seen in Table 3. Moreover, in another study conducted in KSA regarding knowledge levels of nursing students, it was observed that they had comparatively lower scores than their medical student counterparts.⁸ Hence, we need to exert more effort to increase the awareness level of nursing graduates as regards organ donation.

The majority of the studies conducted in KSA have emphasized on evaluating knowledge and attitudes regarding organ donation among the general population, or in a specific medical or health sciences group such as medicine or nursing.^{2,7} However, this study is likely the first cross-sectional study conducted in KSA across a wide range of healthcare professions, which includes medicine, dentistry, nursing, physiotherapy and paramedical sciences. Therefore, it is crucial for healthcare providers to be aware of existing laws and procedures pertaining to organ donation. It is immensely important for healthcare professionals to understand specific terminology, vital criteria for donation and transplantation, and standard operational procedures so they can address the misconceptions of the relatives of their patients on critical issues such as brain death to help them make end-of-life decisions.⁸

Regarding attitudes and willingness toward organ donation, it was predominantly found that medical and physiotherapy students scored better than their counterparts in dentistry, nursing, and paramedical sciences (Table 3). This may be attributed to the fact that nearly majority of the students cited religious beliefs as a cause for the shortage of donor organs. Moreover, this argument is supported by a series of studies which found that although the interviewed

participants supported organ donation, many also believed it to be incompatible with Islam since they believe that violating the human body, whether living or dead, is forbidden.⁷ However, this view does not take into account the ruling of the Islamic Jurisprudence Assembly Council in Saudi Arabia which states that organ transplantation is not precluded by Islamic beliefs since it is in keeping with the highest priority placed on saving a life in the Qur'an, and the principle of necessity overrides prohibition.¹⁸

When evaluating knowledge, attitude, and willingness toward organ donation based on gender, it was found that women scored uniformly higher compared to men. This could be because women are often more empathic, sensitive, and caring in nature. Thus, emotional quotient might play a greater role in women's responses, especially in cases of adversity or crisis. Women are generally considered to be more willing to make sacrifices, and probably respond more favorably toward donating an organ, especially if a need arises within their families. It is generally considered in society that men, being the "breadwinners," may be more reluctant to donate their organs as compared to women whose decision to donate is heavily influenced by their parents, spouses, or both. However, organ donation is ultimately a family decision, as supported by majority of the students in the present study, as well as another study conducted among medical students in KSA.^{19,20}

The merit of this study is that it was conducted with a large number of final-year students across a range of disciplines with a high response rate. However, its limitations are its questionnaire-based nature, and that the data were only collected from a single center.

Conclusion

In the coming years, a large number of patients with chronic diseases in KSA could face a scarcity in donated organs necessary for transplantation. Therefore, this need should be addressed by using a multipronged approach in which healthcare professionals play a major role in advocating and guiding the general population toward organ donation. Even though dentistry, nursing, paramedical, and allied health sciences students had lower scores as compared to medical and physiotherapy students, their concern and optimistic approach toward this emerging issue suggests a potentially brighter future for organ donation. Moreover, positive attitude toward organ donation was found in both medical and physiotherapy groups which revealed their concern and optimistic approach toward this emerging issue as well. As regards knowledge, attitude, and willingness toward

organ donation based on gender, female medical and health sciences students scored higher in all three domains than male students. In addition, multidisciplinary approaches toward educating the general population are needed to meet the increasing demand for organ donation. Similarly, appropriate educational programs should be developed to enhance knowledge, improve attitudes, and increase willingness toward organ donation among medical and health sciences students as well as the general public.

Data Sharing Statement

The data used to support the findings of this study are available from the corresponding author upon request.

Disclosure

The author declares that they have no conflicts of interest.

References

1. Agrawal S, Binsaleem S, Al-Homrani M, Al-Juhayim A, Al-Harbi A. Knowledge and attitude towards organ donation among adult population in Al-Kharj, Saudi Arabia. *Saudi J Kidney Dis Transpl.* 2018;28(1):81–89.
2. Alnasyan AY, Aldihan KA, Albassam AA, Alhusain FA, Al Tamimi AR. How informed are the Saudi public about the value of organ donation: a community-based cross-sectional study. *Saudi J Kidney Dis Transpl.* 2019;30(6):1236–1244. doi:10.4103/1319-2442.275467
3. Global observatory on donation and transplantation [homepage on the Internet]. Available from: <http://www.transplant-observatory.org>. Accessed April 9, 2020.
4. Saudi centre for organ transplantation [homepage on the Internet]. Available from: <http://www.transplant-observatory.org/summary/KSA>. Accessed April 9, 2020.
5. Alam AA. Public opinion on organ donation in Saudi Arabia. *Saudi J Kidney Dis Transpl.* 2007;18:54–59.
6. Al-Ghanim SA. The willingness toward deceased organ donation among university students. Implications for health education in Saudi Arabia. *Saudi.* 2009;30:1340–1345.
7. AlShareef SA, Smith RM. Saudi medical students knowledge, attitudes, and beliefs with regard to organ donation and transplantation. *Saudi J Kidney Dis Transpl.* 2018;29(5):1115–1127.
8. Majeed F. Saudi nursing and medical student's knowledge and attitude toward organ donation—a comparative cross-sectional study. *Int J Health Sci.* 2016;10(2):1–9.
9. Chakradhar K, Doshi D, Reddy BS, Kulkarni S, Reddy MP, Reddy SS. Knowledge, attitude and practice regarding organ donation among Indian dental students. *Int J Organ Transplant Med.* 2016;7:28–35.
10. Chung CKY, Ng CWK, Li JYC, et al. Attitudes, knowledge, and actions with regard to organ donation among Hong Kong medical students. *Hong Kong Med J.* 2008;14:278–285.
11. Sam N, Ganesh R, Indrapriyadarshini V, Jeyamarthan S, Nandhini CK. Awareness, knowledge, and attitude regarding organ donation among final year students of medical, dental, engineering and arts and science colleges in Thiruvallur and Chennai city, India. *Indian J Transplant.* 2018;12:25. doi:10.4103/ijot.ijot_60_17
12. Bharambe VK, Rathod H, Angadi K. Knowledge and attitude regarding organ donation among medical students. *BANTAO Journal.* 2016;14(1):34–40. doi:10.1515/bj-2016-0008

13. Sharma P, Sharma R, Chadha C, Kataria J, Fahim T. Knowledge, attitudes and beliefs about organ donation among physiotherapy students. *Int J Creative Res Thought*. 2018;6(2):1325–1334.
14. Naçar M, Çetinkaya F, Baykan Z, Elmalı F. Knowledge attitudes and behaviors about organ donation among first- and sixth-class medical students: a study from Turkey. *Transplant Proc*. 2015;47(6):1553–1559. doi:10.1016/j.transproceed.2015.02.029
15. Marqués-Lespier JM, Ortiz-Vega NM, Sánchez MC, Sánchez MC, Soto-Avilés OE, Torres EA. Knowledge of and attitudes toward organ donation: a survey of medical students in Puerto Rico. *P R Health Sci J*. 2013;32(4):187–193.
16. Alghanim SA. Knowledge and attitudes toward organ donation: a community-based study comparing rural and urban populations. *Saudi J Kidney Dis Transpl*. 2010;21(1):23–30.
17. Jabri G, Sandokji A, Alzughabi N, et al. Awareness, beliefs and barriers of organ donation among Saudis in Madinah City, Saudi Arabia. *J Health Educ Res Dev*. 2016;4:187. doi:10.4172/2380-5439.1000187
18. Golmakani MM, Niknam MH, Hedayat KM. Transplantation ethics from the Islamic point of view. *Med Sci Monit*. 2005;11:RA105–109.
19. Alqurashi KA, Aljabri KS, Bokhari SA. Prevalence of diabetes mellitus in a Saudi community. *Ann Saudi Med*. 2011;31:19–23. doi:10.4103/0256-4947.75773
20. Sayedalamin Z, Imran M, Almutairi O, Lamfon M, Alnawwar M, Baig M. Awareness and attitudes towards organ donation among medical students at King Abdulaziz University, Jeddah, Saudi Arabia. *J Pak Med Assoc*. 2017;67(4):534–537.

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