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Knowledge, Attitude and Practice of Students Towards Organ Transplantation and Donation: A Cross- Sectional Study

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Knowledge, Attitude and Practice of Students Towards Organ Transplantation and Donation: A Cross- Sectional Study

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Abstract

Background: Organ donation and transplantation have become the ideal treatment for different types of end-stage organ failure. A significant problem, though, is the scarcity of available organs for transplantation. Public knowledge, attitude, and practice towards organ donation and transplantation are crucial determinants that should be addressed for the success of the donation process.

Aim: This study aims to assess Al-Baha University students' knowledge, attitudes, and practices regarding organ transplantation and donation.

Methods: This cross-sectional study enrolled 1065 students from Al-Baha University. An electronic questionnaire was distributed via their university emails. The questionnaire includes two sections: one for collecting sociodemographic information and the other for evaluating students' knowledge, attitudes, and practices about organ donation and transplantation.

Results: Participants have a poor level of positive practice and attitude (<50%), yet their knowledge level is average (50–75%). As compared with females, males reported better knowledge scores, while higher positive practice scores (0.3261 ± 0.73305) were reported among females (0.4952 ± 0.86979). College and knowledge level are significantly correlated ($P = 0.005$), students at medical colleges scored higher on knowledge assessments. There is no statistically significant difference in attitude based on sex, age, and college. A highly significant correlation between knowledge and attitude ($P = 0.000$), together with attitude and positive practice was detected ($P = 0.000$).

Conclusion: Students have an average level of knowledge and a poor level of positive practice and attitude. As attitude and positive practice are significantly correlated with knowledge, effective education initiatives are crucial to enhancing students' awareness, as students are considered the changing agents in their communities.

Keywords: Donation, KSA, Organ, Students, University, Transplantation

1. Introduction

Organ donation is a worldwide initiative that facilitates the transplantation of organs, tissues, and cells, which is seen to be the most effective plan for managing end-stage organ illnesses.¹ Organ transplantation of vital organs such as the heart, kidney, liver, lung, and pancreas gives the recipient another chance for life.² Although living or

deceased donors can provide transplantable organs and tissues,³ the lack of donors is a global problem, and as a result, many patients with organ failure pass away each year while waiting for transplants.^{4,5}

The first successful living and deceased kidney transplantation was done in Boston in 1954 and 1962, respectively, and then a large number of organ transplants occurred in the 1960s and 1970s worldwide. Noticeable medical improvement against

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organ rejection has been made in the 1980s due to the appropriate use of immunosuppressive drug.⁶ In 1979, Saudi Arabia started kidney transplantation from living donors then, transplantation from deceased donors started in 1985 when the Saudi Center for Organ Transplantation (SCOT), which supervises all national transplant acts, started up.⁷ The necessity for organ donation has increased worldwide as a result of an ongoing rise in the incidence of organ failure cases and the subsequent need for organ transplants.^{8,9} The number of prospective donors is still not rising enough to keep up with the need.¹⁰ Due to the shortage of organs, patients who are regarded as candidates for transplantation often and often die while waiting impatiently for a donor organ.¹¹

Although there have been advancements in medical, pharmacological sciences and technology, and despite the fact that organ malfunction and failure do not always and inevitably lead to mortality, organ donation and transplantation are still disputed topics. Public awareness and its contentiousness are sometimes intricately merged.¹² Public perception regarding organ donation and transplantation is affected by multiple factors, including educational level, culture, ethnicity, religion, legality, sociability, and ethics.¹³ There are differences between regions in organ donation. This is thought to be influenced by several variables, including the socioeconomic status of a nation, population awareness and knowledge, and the accessibility of the technology needed to carry out organ transplant procedures.^{10,14}

The main barrier to organ donation currently may be the general public's lack of knowledge about transplantation and organ donation.¹⁵ Individuals' attitude and knowledge about organ donation and transplantation have an impact on how they behave or plan to behave towards organ donation.¹⁶ Individual behavior is significantly influenced by their views regarding organ donation in general, and positive attitudes increase one's desire to sign organ donation cards or donate organs.¹⁷ Organ donation willingness is impacted by one's knowledge and positive attitudes toward organ donation.¹⁸ The lack of knowledge about organ donation is said to be the cause, according to studies using samples from various demographics.^{19,20} Most people gain knowledge of organ donation from social media platforms including television, newspapers, and magazines. The existing social media platforms, for education and exposure, however, have not been successful in influencing negative public perceptions. As a result, increasing communications and education activities are crucial to fostering positive

attitudes regarding organ donation.²¹ Therefore, it is obvious that it is crucial that the public should receive truthful data regarding organ donation to promote more involvement in organ donation initiatives and, as a result, address the organ donor shortage. To raise public awareness of organ donation as to impact policy and legislation focused on expanding the number of organ donations, a survey of knowledge and attitudes in relation to organ donation is crucial. So, our study's objective is to evaluate the level of knowledge, practice and attitude among students to determine the suitable educational programs needed to raise their willingness and practice for organ donation and transplantation.

2. Participants and methods

2.1. Study design and setting

This population survey study was conducted from August 2023 to October 2023 at Al-Baha University, Saudi Arabia. The University is located in the Al-Baha region, in the southwest of Saudi Arabia's kingdom. The institutional Review Board at Al-Baha University gave their approval to the study. All undergraduate male and female students at Al-Baha University, from all branches and sections, at all levels, and from medical and nonmedical colleges, were eligible to share in the study. The goal of the study and the ability to revoke permission at any time were explained to the participants, and they were assured about the privacy and confidentiality of their responses. For the calculation of the sample size, EpiInfo ver 7 was employed using the 20 000 current Al-Baha students, a 50% expected frequency, a 95% confidence level, and a design effect of two. The maximum required sample size was 754 students, and in order to achieve it, a multi-stage stratified cluster selection method was employed to select colleges from inside the institution and research participants, at each college.

2.2. Research instruments

Three parts of a pre-designed, self-administering questionnaire were employed in the study. Students received the electronic questionnaire via their university email addresses. The first part of the questionnaire collects demographic information from participants, such as age, sex, and college. The second section includes questions that assess their knowledge of Saudi Arabia's organ donation and transplantation status, such as their knowledge about Saudi centers for organ donation, the

donation process, and their source of information about organ donation; and the third section employs a reliable questionnaire utilized in previous studies to assess their knowledge, attitude, and practice about donation and transplantation.^{4,13,22,23} This part of the questionnaire consists of 27 questions, where (Q1–13) assesses level of knowledge, (Q14–24) for positive attitude and (Q25–27) is regarding practice habits about organ donation and transplantation. Each response was recorded on a binary scale (Yes/No). A '1' was given for each 'Yes' response and a '0' for each 'No' response. For questions (Q6, 9, 10, 23) where the right answers were 'No,' reverse scoring was applied. The entire points gained were summed together. According to Chakradhar *et al.*,⁴ the level of knowledge, attitude and practice were categorized into three groups for better interpretation, where (>50%), (50%–75%) and ($\geq 75\%$) indicate low, average, and high level, respectively. Higher scores indicate a good knowledge, a more positive attitude, and better practice habits about organ donation.

2.3. Statistical analysis

The statistical package for the social sciences (SPSS) program was employed for analyzing the data. To provide summary statistics, the following values were calculated: number (n), percentage (%), mean (standard deviation), and minimum and maximum values. The one-way ANOVA and student's *t* test were employed to compare the means of continuous variables that were regularly distributed. Pearson's correlation coefficient was used to determine the association between the knowledge, attitude, and practice scores. *P* values less than 0.05 are recognized as statistically significant.

3. Results

3.1. The participants' socio-demographic characteristics

The questionnaire was distributed to 1500 students, and from them, 1065 students who satisfied the inclusion criteria and accurately filled out the questionnaire were enrolled in the research, with a completion rate of 71%. The majority of participants are in the 18–20 age range (74.1%), with a mean \pm SD age of 21 ± 2.1 years. Sixty-four (40.5%) of the participants were female. Approximately 54.9% of students were from nonmedical colleges (Engineering, Art and Humanities, Computer and Information Technology, Business and Administration, while 45.1% were from medical colleges

(Medicine, Applied medical Sciences, Pharmacy and Dentistry colleges).

In regard to student awareness of the situation regarding organ donation and transplantation in Saudi Arabia, 86.2% of the students were aware of the institutions concerned with organ donation and transplantation, and 58.5% were aware of the donation procedures in Saudi Arabia. The Saudi Organ Donation Center was known by the majority of participants (48.5%), followed by the Saudi Organ Donation Society (29.6%), then King Fahad Specialist Hospital in Riyadh (12.5%) and King Fahad Specialist Hospital (9.4%) in Dammam. The majority of students (60.2%) gain their information about organ donation from internet websites and social media, (25%) television and only (14.7%) take it from hospitals and medical centers.

3.2. Assessment of the knowledge, attitude, and practice levels towards organ donation and transplantation

The analysis concerned the correct responses to the questions regarding the students' knowledge, practice, and attitude towards organ donation and transplantation, was stratified according to sex, age and college as shown in (Table 1). There is a statistically significant relationship between level of knowledge and sex ($P = 0.008$) but a significant difference was noted only for questions (9, 10, 11) ($P < 0.05$). Yet, the significant difference ($P < 0.05$) between sex and attitude is notable in many questions (Q17, Q18, Q20, Q22, and Q23). For the association between positive practice and sex, three questions out of four have significant association ($P < 0.05$). When the age is considered, there is no significant difference between age and level of knowledge, practice, and attitude for the majority of questions. Furthermore, for questions 2, 7, 8, 9, and 12, medical colleges' students had significantly higher knowledge ($P < 0.05$).

3.3. The mean level of knowledge, attitude and practice in accordance with sex, age, and college

As demonstrated in (Table 2), there is a significant difference between the mean level of knowledge and sex ($P = 0.00$) where males have higher knowledge than females. There is a statistically highly significance ($P = 0.004$) difference between the knowledge and the college with medical college students having higher knowledge than nonmedical colleges students. Regarding the practice, females had significantly ($P = 0.001$) higher positive practice than males. The mean attitude scores did not show

Table 1. Distribution of frequency of knowledge, attitude and practice according to sex, age and type of college.

Questions	P value		
	Sex	Age	College
1 Are you familiar with the concept of 'organ donation'?	0.122	0.903	0.312
2 Are you familiar with the concept of 'organ transplantation'?	0.017 ^a	0.322	0.175
3 Are you know 'transplantation of human organs process'?	0.407	0.229	0.070
4 Do you know where to obtain organ donation card?	0.637	0.518	0.360
5 Can a brain dead patient organ be donated?	0.161	0.190	0.593
6 Will the confirmed brain dead registered organ donor's breathing apparatus be cut off right away?	0.728	0.020 ^a	0.570
7 Can parents or guardians make decisions about donation on behalf of people with mental disabilities?	0.055 ^a	0.085	0.664
8 Donor and recipients blood group have to be matched?	0.033 ^a	0.845	0.090
9 For every organ donation, the donor's human leukocyte antigen and the recipient's antigen must match exactly?	0.142	0.295	0.013 ^a
10 Can donors of all solid organs, with the exception of liver organs, be infected with hepatitis B and C?	0.005 ^a	0.188	0.000 ^b
11 Malignancy usually is contraindicated to cadaver organ donation?	0.184	0.743	0.047 ^a
12 Increased danger of opportunistic infection is a popular complication to all transplantation?	0.009 ^b	0.440	0.067
13 Are those who have received organ transplants more likely to get cancer following the procedure?	0.273	0.260	0.090
14 Do you support organ donation?	0.216	0.384	0.553
15 Do you feel comfortable talking about or considering organ donation?	0.072	0.053 ^a	0.252
16 Do you accept to donate organs after dying?	0.792	0.156	0.395
17 Do you accept organ donations from members of your family?	0.060	0.000 ^b	0.016 ^b
18 Is organ donation accepted in your family?	0.490	0.033	0.000 ^b
19 Do you believe that giving up one's organs gives life more purpose?	0.018 ^b	0.648	0.128
20 Do your religion accept organ transplantation or donation?	0.866	0.932	0.055 ^a
21 Do you believe that once you die, your body has to be intact?	0.657	0.703	0.840
22 Do you have fright that your body will be disfigured, if you donate organs?	0.292	0.802	0.002 ^b
23 Do you believe that registered organ donors' medical care will finish too soon?	0.273	0.351	0.002 ^b
24 Do you believe that in order to address the shortage, living organ donation is preferable than cadaveric organ donation?	0.607	0.262	0.762
25 Have you signed for organ donation?	0.402	0.001 ^b	0.001 ^b
26 Have you already given an organ?	0.245	0.016	0.026 ^a
27 Have you ever received an organ for a transplant?	0.066	0.608	0.018 ^b

^a Denotes a significant correlation at the 0.05 level of analysis.

^b Denotes a significant correlation at the 0.01 level of analysis.

any significant differences for sex, age, and college. Table 3 shows that there is an average to high level of knowledge among students with no difference regarding age and sex but there is a significant

difference between level of knowledge and the college ($P = 0.005$). The majority of the participants had a low level of attitude with no difference noted in sex and college. Most students reported low levels

Table 2. Comparing the knowledge, attitude, and practice mean standard deviation scores according to age, gender, and college.

Variables (n)	Knowledge	Attitude	Practice
Sex			
Male (644)	0.3261 ± 0.73305	6.0714 ± 2.22131	9.0373 ± 1.53401
Female (420)	0.4952 ± 0.86979	6.2643 ± 2.50901	8.7810 ± 1.53701
P value	0.001 ^a	0.189	0.008 ^a
Age			
18–20 (501)	0.3154 ± 0.74856	6.0419 ± 2.23791	8.8822 ± 1.53496
21–23 (421)	0.4561 ± 0.81713	6.1971 ± 2.41653	9.0404 ± 1.54482
24–26 (142)	0.4789 ± 0.85650	6.3732 ± 2.45414	8.8169 ± 1.53272
P value	0.010 ^a	0.282	0.183
College			
Medical (480)	0.3979 ± 0.77943	6.2083 ± 2.33837	9.0875 ± 1.56042
Non-medical (584)	0.3887 ± 0.80603	6.0976 ± 2.34189	8.8116 ± 1.51226
P value	0.851	0.443	0.004 ^a

n: number of cases.

^a Denotes a significant correlation at the 0.05 level of analysis.

Table 3. Knowledge, attitude, and practice levels are compared according to age, gender, and college.

Sex (n)	Knowledge				Attitude				Practice			
	Low	Average	High	P value	Low	Average	High	P value	Low	Average	High	P value
Male (644)	29	351	264	0.223	259	192	193	0.015 ^a	590	30	24	0.018 ^a
Female (420)	22	241	157		151	107	162		366	28	26	
Age (n)												
18–20 (501)	21	300	180	0.223	199	154	148	0.025 ^a	459	20	22	0.182
21–23 (421)	24	212	185		160	116	145		371	31	19	
24–26 (142)	6	80	56		51	29	62		126	7	9	
College (n)												
Medical (480)	21	245	214	0.005 ^a	178	132	170	0.221	436	22	2	0.489
Nonmedical (584)	30	347	207		232	167	185		520	36	28	

n: number of cases.

Low level (>50%); average level (50%–75%); and high level (≥75%).

^a Denotes a significant correlation at the 0.05 level of analysis.

of positive organ donation practice, which did not show any significant difference based on age and college but there is a significant difference based on sex ($P = 0.018$).

3.4. Correlation between participants' level of knowledge, attitude and positive practice

In correlating the level of knowledge, attitude and positive practice scores. It was shown that there is a highly significant relationship between participants' knowledge and positive attitude. There is also a highly significant correlation between participants' positive attitude and positive practice (Table 4).

4. Discussion

The ideal treatment for organ failure and end-stage disease is organ transplantation. It provides a higher standard of living along with improved survival advantages. It is therefore crucial to consider how many organs are recovered. The awareness and attitude of the population play a major role in its success. Students as a sector of youth in the community, plays a critical role in disseminating positive knowledge regarding organ donation among the population. So, the purpose of the current study was to evaluate and analyze the knowledge, attitude, and practice about organ donation and transplantation among students.

Table 4. Correlation between participants' level of knowledge, attitude and practice.

	Age	Sex	College	Do you support organ donation?	Practice	Knowledge	Attitude
Age							
Pearson Correlation	1						
Sig. (2-tailed)							
Gender							
Pearson Correlation	0.211 ^b	1					
Significance (2-tailed)	0.000						
College							
Pearson Correlation	0.038	-0.060 ^a	1				
Significance (2-tailed)	0.217	0.050					
Do you support organ donation?							
Pearson Correlation	-0.027	0.018	-0.038	1			
Significance (2-tailed)	0.384	0.553	0.216				
Practice							
Pearson Correlation	0.086 ^b	0.104 ^b	-0.006	0.084 ^b	1		
Significance (2-tailed)	0.005	0.001	0.851	0.006			
Knowledge							
Pearson Correlation	0.009	-0.081 ^b	-0.089 ^b	0.187 ^b	0.045	1	
Significance (2-tailed)	0.775	0.008	0.004	0.000	0.141		
Attitude							
Pearson Correlation	0.049	0.040	-0.024	0.629 ^b	0.242 ^b	0.193 ^b	1
Significance (2-tailed)	0.112	0.189	0.443	0.000	0.000	0.000	

^a Denotes a significant correlation at the 0.05 level of analysis.

^b Denotes a significant correlation at the 0.01 level of analysis.

In this study, we went a step further by analyzing the questionnaire responses to participants' characteristics such as sex, age, and college. When knowledge scores were compared by sex, males had a higher mean score than females. These findings are consistent with a study conducted by Margues–Lespier *et al.*²⁴ on medical students at the University of Puerto Rico School of Medicine in India, found that compared with 41.9% of female participants, over half (49.6%) of male participants demonstrated adequate knowledge (>50%). Our findings, on the other hand, contradict the findings of Chakradhare *et al.*,⁴ who found that females had higher mean score than males in their study among Indian dental students. We couldn't compare our findings to other Saudi studies as, to our best knowledge, no study compared the mean level of knowledge with sex. We noted that medical college students had a higher knowledge than non-medical students and this is in accordance with Sun *et al.*²⁵ study which conducted in China among university students. This is because medical students gain more comprehensive knowledge regarding organ transplantation through the curriculum included in the education program.

Our findings showed that the average level of knowledge among students is high. This is consistent with a survey carried out by Al Bshabshe *et al.*²⁶ among students at the King Khalid University in Abha, Saudi Arabia, where respondents possess adequate knowledge (93%) about organ donation. However, a research conducted in Central Region, Saudi Arabia revealed that students studying medicine and health sciences knew very little about organ donation.²⁷ Furthermore, a different research conducted by Almohsen *et al.*²⁸ in Qassim University, Saudi Arabia shows that students have inadequate awareness of organ donation (61.5%).

Although our participants had an average level of knowledge about organ transplantation, their mean level of attitude and positive practice is low. This result has been reported in other Saudi Arabian research, such as Sayedalamini *et al.*,¹¹ who found that 41.2% of medical students at King Abdulaziz University in Jeddah, Saudi Arabia, were eager to donate in their cross-sectional survey. Almohsen *et al.*²⁸ study at Qassim University, the students' willingness to donate was (37.4%) and only (44%) of the allied health students at Dhahran at the Prince Sultan Military College of Health Sciences had a willingness to donate their organs.²⁹ This may be due to religious and cultural factors that need more focus in educational programs.

From the study findings, attitude had a significant positive correlation between both knowledge and

positive practice, which corresponds with the findings of Chakradhar *et al.*⁴ in India and Al Moweshy *et al.*³⁰ in Saudi Arabia. This point should be in focus as if the authorities are able to raise population awareness and knowledge about organ donation, the population attitude will be positive towards organ donation. This needs collaborative work between the ministry of health, the Saudi Centre for Organ Transplantation and the ministry of education. Research suggests that these factors are seen as obstacles to organ donation willingness; hence, it is critical to emphasize knowledge initiatives regarding the safety of organ donation. It is crucial to educate people about religion and organ donation.

4.1. Conclusion

Our findings highlight inadequate education and organ donation advertisements. Therefore, a strategy to increase public awareness and education can be extremely valuable in encouraging the population to address the current organ shortage. These findings emphasize the need for more education and communication. In order to change the public's negative attitudes against organ donation and increase the pool of organ donors, publicity and education campaigns are effective strategies. More advertising and education will significantly raise public awareness of organ donation, moral conscience, and social responsibility. In order to address the present organ scarcity challenges, the population can greatly benefit from the strategy to improve awareness and education.

Authors' contributions

N.E. has shared in the study design, implementation, and writing. M.A. and S.B. have shared in the implementation and the writing of the manuscript. A.A. has shared in data collection. H.A., E.A., M.A., and G.A. have shared in the study design, data collection, and writing the manuscript. R.A. made the data analysis and shared in writing the manuscript. All authors read and approved the final manuscript.

Conflicts of interest

There is no conflict of interest.

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