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A Research Article

## KNOWLEDGE, ATTITUDE, AND PRACTICE TOWARDS ORGAN DONATION AMONG COMMUNITY IN DAMMAM AND KHOBAR, SAUDI ARABIA 2019-2020

<sup>1</sup>Hanan Saleh AL-Ruwaili, <sup>2</sup>Yara Mazen Simbawa, <sup>3</sup>Nada A AlBunaian, <sup>4</sup>Muna Ahmed  
Abdullah AL-Yusuf

<sup>1</sup>Family Medicine Resident, Alkhobar, Ministry of Health, KSA, hsa-e@outlook.com  
+966507222853

<sup>2</sup>Family Medicine Resident, Alkhobar, Ministry of Health, KSA, Yarasimbawa@gmail.com  
+966502966134

<sup>3</sup>Family Medicine Consultant, Nada.bunaian@gmail.com, +966504816260

<sup>4</sup>Family Medicine Consultant, Ministry of Health, Eastern province, KSA,  
[DrMnMn@gmail.com](mailto:DrMnMn@gmail.com), +966505658914

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**Abstract:**

**Background:** Organ donation is described as giving one or more organs, without compensation, for transplantation to another person. It is defined as a life-saving treatment of choice for multiple end-stage organ diseases. Our study's objective is to assess the knowledge, attitude, and practice of organ donation among AL-Dammam and AL-Khobar communities. **Method:** This was an analytical community-based cross-sectional study, conducted in two Eastern Province cities in Saudi Arabia. A convenient sample was approached by using a web-based questionnaire to collect data from the population. We included all who completely filled responses, reaching a total of 1179 participants. Data were compiled and analyzed using a statistical package for the social sciences (SPSS, version 16). **Results:** The study found that only 48.1% of cases agreed that organ transplants successfully prolong and improve a recipient's life quality. Almost half of the patients (49.9%) agreed that organ donation is vital to help those who need the organs. The majority of participants (73.3%) know that it is allowed to give or receive organs from a KSA living person. Social media was the most common source of knowledge about organ donation. **Conclusion:** Our study found reported good levels of awareness about organ donation among the participants, and most of them had a positive attitude towards organ donation.

**Keywords:** Organ donation; Organ transplantation; Brain death; Deceased donor; Saudi Arabia.

**Corresponding author:**

Hanan Saleh AL-Ruwaili,  
Family Medicine Resident,  
Alkhobar, Ministry of Health, KSA,  
hsa-e@outlook.com  
+966507222853

QR code



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## 1. INTRODUCTION:

Organ donation is defined as giving one or more organs, without compensation, for transplantation to another person. The liver, kidney, pancreas, heart, and lungs are all organs that can be donated. There is a worldwide scarcity of organ donors that can be resolved by raising the population's willingness and ability to donate organs. (1, 2)

There is an adversarial relationship between the number of people undergoing transplantation and the number of organs donated. In 2003, a collaborative breakthrough in organ donation by the US Department of Health and Human Services was launched to expand access to transplantable organs. (3) In Turkey in 1987, the Middle East Society for Organ Transplantation (MESOT) was established to encourage, promote, and educate the medical centers and the public about organ donation. It is estimated that two hundred patients per million need renal transplantation, with a mortality rate of 10%–15% per year in people on dialysis. Moreover, 15–20 patients per million population need hearts, and 40–50 per million population need livers; most patients in MESOT countries die while waiting for these organs. (4)

The deceased organ donation program initiative was introduced in Saudi Arabia due to the growing demand for organ donation. Saudi Arabia has an active deceased donation and transplantation program under the Saudi center's supervision for organ transplantation (SCOT), headquartered in Riyadh, and is responsible for coordinating medical faculties caring for end-stage organ disease and supporting public health education, among other responsibilities. (5)

Considering organ donation as a regular procedure in almost all hospitals equipped with intensive care units and the substantial rise in transplant centers and the number of organ transplants in Saudi Arabia has been a significant achievement of the Saudi Centre for Organ Transplantation (SCOT) in the last 18 years. (4) An estimated 28 organs and tissues were preserved and transplanted inside the kingdom in 2016. (5) There has been a lot of improvement in the organ donation system, but nearly 120,000 people still need life-saving organ transplantation in the United States. At the same time, an average of 22 patients dies every day to wait for a transplant. (6) There is daily one patient who dies on the organ waiting list in the United Kingdom. (7) The number of patients added to the transplant list increases day by day, which is associated with the high cost of caring for patients with end-stage organ disease in every health system. Several studies reported that the success of organ

transplantation largely depends on social attitude and awareness. (6, 7, 8)

Health practitioners also play a vital role in raising awareness, inspiring, and subsequently increasing organ donation rates. The Saudi Center for Organ Transplantation underlines the need for ongoing efforts to raise awareness among both the medical community as well as the public in Saudi Arabia of the value of organ donation and transplantation and increase organ transplants. (5) There are primary factors that affect organ donation worldwide: awareness, attitudes, and behavior. Community and religious history still have a role to play. (8)

International studies were conducted from 2004 to 2018 in Germany (9), India (10), China (11), Iran (12), and Pakistan (13), and all reported relatively good knowledge with less positive attitudes towards organ donation.

Many studies concerning organ donation were conducted in Arab countries. In the United Arab Emirates, and implemented a cross-sectional study in 2016, aimed to assess the public awareness on knowledge and attitude for organ donation and transplantation. It showed that 68% of the respondents were willing to donate their organs if they become brain dead, and 88% of the respondents correctly knew the definition of brain death. (7). While the cross-section study conducted in Egypt in 2014 aimed at assessing knowledge and attitudes about organ donation among medical students at the University of Al-Mansoura showed 37% of the overall positive attitude. Adequate awareness of organ donation was around 36%. (14) In a cross-sectional study in Qatar aimed to assess health care practitioners' knowledge and attitudes towards organ donation and transplantation in 2007-2008, the study found 46.8% of physicians compared with 18.2% of nurses believed in brain death. Most of the health care professionals felt that there is no organ shortage. The study supports the need to develop an educational program and address organ donation among Health care professionals. (15)

In Saudi Arabia, a study was performed in Jeddah in 2014 among medical students at King Abdul-Aziz University, assessing the awareness and attitudes towards organ donation. The result showed that 50.9% of the participants were willing to donate their organs only to their family members; on the other hand, 41.2% were willing to donate to any patient needing transplantation. Ninety percent of the participants supported organ donation. Furthermore, 31.8% of participants agreed to donate an organ(s). In

comparison, 68.2% had several reasons not to donate an organ(s). Several participants had never thought about organ donation; 15% said that their families would not allow them, 9% preferred to keep all their organs intact. (16) In Riyadh city (2010), a cross-sectional study was performed among residents evaluating their awareness and attitude towards organ donation. The study found that 76% of the participants had some knowledge about organ donation; however, 41% refused to donate their organs, with only 30.1% of the sample having prior knowledge about the Islamic view about organ donation. (17)

There is a significant lack of organs available for transplantation throughout the world. This shortage may be attributed to a lack of awareness and misconception about organ donation among the population. The number of patients being added to the transplant list is regularly increasing, which is associated with the high costs of caring for patients suffering from end-stage organ failure in every health care system. In the literature review, there are many factors opposing organ donation, for instance, lack of knowledge, the misunderstanding of brainstem death Culture, and religious aspects. More studies are required to encourage the general population for organ donation.

This study investigates the knowledge, attitude, and practice towards organ donation among the population in Dammam and Khobar cities and determining the associations between the attitude and the demographic characteristic of the population.

## **1.2 Research question:**

What are the levels of knowledge, attitude, and perception of the community's practice towards organ donation in Eastern province Saudi Arabia?

## **1.3 Aim:**

To evaluate the knowledge, attitude, and practice of organ donation among the community in AL-Dammam and AL-Khobar cities.

## **1.4 Objective:**

- 1- To assess the knowledge regarding organ donation among the community in AL-Dammam and AL-Khobar cities, KSA.
- 2- To determine the attitude toward organ donation among the community in AL-Dammam and AL-Khobar cities, KSA.
- 3- To assess the perception of practice among the community in AL-Dammam and AL-Khobar cities, KSA.

- 4- To measure the relationship between the attitude and the demographic characteristic of the community in AL-Dammam and AL-Khobar cities, KSA.

## **2. Methods & Participants**

### **2.1 Study design:**

Analytical Cross-sectional study.

### **2.2 Study setting:**

This study was conducted over the community in two cities of Eastern Province in Saudi Arabia AL-Dammam and AL-Khobar during 2019-2020. These two cities are the major cities in the Eastern province, with a population of 2 million. There is one organ transplant center in the Eastern province.

### **2.3 Study population:**

Adult aged above 18 years old, male and female, Saudis, and Non-Saudi residents in Dammam and Khobar city.

### **2.4 Sampling type and Sample size:**

A convenient sample was used to approach the community by using a web-based questionnaire directed to Dammam and Khobar cities, KSA. We calculated the minimum sample size using a Roasoft calculator for a two million population, CI 95%, an error of 5%, and response distribution 50% to calculate the sample size to be 379. We multiply by three to overcome the statistical errors that can be possible due to the sampling method's effect. However, we included all who completely filled responses, reaching a total of 1179 participants.

### **2.5 Study variables:**

Dependent variables:

- Knowledge, attitude, and practice towards organ donation among the community in AL-Dammam and AL-Khobar cities, KSA.

Independent variables:

- Age
- Current career
- Gender
- Marital status
- Level of education
- Have heard about Organ donation
- Have a family member have an organ donation card
- Have a family member needed an organ donation

### **2.9 Study tools:**

A web-based questionnaire consists of five parts. The second, third, and fourth parts were taken from a

questionnaire done by Janahi FK (18), a study done in Emirates (Public awareness on knowledge, belief, and attitude for organ donation and organ transplantation), after obtaining the approval to use the English version by the original authors. While the researchers constructed the first and fifth parts.

As a part of questionnaire validity, the questionnaire was translated into Arabic and back-translated back into English; both English versions were compared to ensure the similarity of context. Another validity phase after translation is to review the questionnaire by two specialists in organ transplantation, with mild modification as suggested by the specialists.

Pretesting of the questionnaire was prepared by 30 individuals to ensure language suitability and clarity. All the pilot records were excluded from the study sample.

The questionnaire part is as the following sections:

-The First section captured sociodemographic information of the participant, such as age, gender, and education.

The Second section was on their knowledge about organ donation.

The third section was on their attitude towards organ donation.

The fourth section asked about their perception of practice regarding organ donation.

The fifth section asked about the reasons behind refusing organ donation.

#### **4. Data management and statistical analysis:**

All data were entered and checked by SPSS program Version 16. Data was presented in descriptive tables. Statistical analysis was conducted using t-test, one-way ANOVA, chi-square test, and linear regression analysis. A P-value of less than 0.05 was considered significant. Fisher's exact P was considered if more than 20% of the cross-tabulation cells had an expected frequency of less than 5.

#### **5. Ethical consideration:**

Approval was obtained from the IRB in the ministry of health, written permission was obtained from the concerned, individual consent from participants (noted on the front page of the questionnaire) was collected, and all information was kept confidential.

#### **6. RESULTS:**

**Table (1)** shows the sociodemographic characteristics of 1179 participants. The mean age  $\pm$ SD is  $30.3 \pm 12.5$ , and the majority were males (72.5%), Saudi (94.6%), and hold a university degree (68.1%). Over a half

(60.1%) are single, and 51.6% are unemployed. Of all, 13.1% reported suffering from end-organ failure among themselves or one of the relatives. Of which, 37.4% had kidney failure, 14.2% in the liver, 29.0% in the pancreas, and 19.4% in the heart.

**Table (2)** shows the awareness of participants towards organ donation. The majority (81.8%) believes that even if the heart is beating artificially, brain death can occur when the brain functions stop. While 60.1% agree that people who have experienced irreversible brain death but maintained on a life-support system can be considered as potential organ donors. Moreover, 52.4% agree that clinical brain death must occur before one's organs can be donated, and 55.2% know that organ donation does not interfere with funeral arrangements. About three-fourths (73.3%) believe that it is allowed in KSA for living individuals to donate organs, while 39.9% do not know whether it is allowed to receive organs from a brain-dead individual, and 72.9% believe that coma does not mean brain death.

**Table (3)** shows the attitude of participants towards organ donation. Almost half the participants (48.1%) agree that organ transplants can prolong and improve the recipient's life quality. In comparison, 41.1% agree that it is a positive act for a family for a deceased member to agree to donate the organs, 42.5% agree that organ donation is allowed in religion. Over a third of all participants (33.9%) are ready to donate their organs upon brain death, while 49.9% agree that organ donation is helpful to the recipients, 49.6% agree that organ donation is an acceptable medical treatment, 38.5% agree that donating their organs or tissues upon death is suitable for the recipients, 43.9% agree that organ or tissue donation means that a part of the donor will live on, and 66.1% would accept organ donation to preserve their lives.

**Table (4)** presents the history of organ donation and their willingness to donate their organs, and the reason behind refusing organ donation. The majority (97.0%) have never donated an organ before. On the other hand, 1.4%, 1.5%, and 0.1% reported kidney and liver and stem cell donation, respectively. Among participants, 10% reported that they have a relative in need of a kidney, while 2.5% have a relative who needs liver transplantation. Almost 29.9% of respondents would donate an organ to a family member, 20.4% would donate an organ to a stranger, 1- 9.6% to a friend, and 30.1% prefer not to donate at all. Among reasons the respondents would not donate their organs is the fear of postoperative pain (9.8%), family refusal (13.7%), a desire to keep the body intact

(16.9%), religious and medical reasons (4.2%, and 3.1%, respectively).

**Table (5)** illustrates the relationship between the participants' agreement to donate his/her organs (attitude variable) and sociodemographic characteristics. About half (50.7%) of the participants aged 21-35 years and 25.4% of the group aged 20 years or less agreed to donate their organs then the percentage decreased with increasing age. Most

(70.1%) of male participants, 95.2% of Saudi, 62.7% of singles, 61.5% university or more educated, and 62.4% of the not working participants agreed to donate their organs. However, there was a significant association between age group, educational level, working status, and organ donation attitude ( $P<0.05$ ). At the same time, there was an insignificant relation between sex, nationality, marital status, and attitude from organ donation ( $P>0.05$ ).

**Table (1): Sociodemographic characteristics of the participants, KSA, 2020 (n=1179).**

Variables	Frequency (N=1179)	Percent
<b>Sex</b>		
• Male	855	72.5%
• Female	324	27.5%
<b>Age groups (Mean±SD)</b>	30.3±12.5	
• 20 years or less	266	22.6%
• 21 – 35 years	603	51.1%
• 36 – 50 years	198	16.8%
• More than 50 years	112	9.5%
<b>Nationality</b>		
• Saudi	1115	94.6%
• Non-Saudi	64	5.4%
<b>Educational level</b>		
• Illiterate	12	1.0%
• Primary	5	0.4%
• Preparatory	29	2.5%
• Secondary	330	28.0%
• University degree	803	68.1%
<b>Marital status</b>		
• Single	709	60.1%
• Married	404	34.3%
• Divorced	48	4.1%
• Widowed	18	1.5%
<b>Employment</b>		
• Employed	571	48.4%
• Unemployed	608	51.6%
<b>Are you or one of your relatives in end-stage organ failure?</b>		
• Yes	155	13.1%
• No	1024	86.9%
<b>If yes, which organ?</b>		
• Pancreas	45	29.0%
• Heart	30	19.4%
• Liver	22	14.2%
• Kidney	58	37.4%
<b>Source of knowledge of organ donation</b>		
• TV/Radio	177	15.0%
• Social media	524	44.4%
• Advertisements	77	6.5%
• Relatives and friends	236	20.0%
• No prior knowledge	165	14.0%

**Table (2): knowledge of the participants towards organ donation, KSA, 2020 (n=1179).**

Item.	True	False	I do not know
Brain death occurs when the brain stops functioning, even if the heart is kept beating by artificial means.	81.8%	4.2%	13.9%
Persons who have experienced irreversible brain death but are maintained on a life-support system can be considered as potential organ donors.	60.1%	14.5%	25.4%
A person must be pronounced clinically brain dead to have that person's organs donated.	52.4%	10.1%	37.5%
Organ donors may range in age from new-born to 70 years.	42.1%	19.0%	38.9%
Organ donation does not prevent or interfere with funeral arrangements.	55.2%	11.0%	33.8%
In the KSA, it is allowed to donate or receive organs from a living person.	73.3%	7.0%	19.7%
In the KSA, it is allowed to take organs from a brain-dead person.	46.8%	13.3%	39.9%
After the announcement of clinical death, the deceased cannot return.	42.4%	14.2%	43.3%
Coma does not mean brain death.	72.9%	9.1%	18.1%



**Table (3): Attitude of the participants towards organ donation, KSA, 2020 (n=1179).**

Item	Strongly agree	Agree	No opinion	Disagree	Strongly disagreed
Organ transplants are successful in prolonging and improving the quality of a recipient's life.	17.4%	48.1%	22.5%	6.9%	5.2%
Organ donation is a positive option for the family at the time of the death of a family member.	14.2%	41.1%	29.6%	6.5%	8.6%
Organ donation is allowed in religion.	15.7%	42.5%	31.0%	5.3%	5.4%
I am ready to donate my organs if I have brain death.	14.8%	33.9%	22.8%	15.4%	13.0%
Organ donation is vital to help those who need organs.	24.1%	49.9%	14.4%	6.6%	5.0%
Organ transplantation is an acceptable form of medical treatment.	16.4%	49.6%	22.1%	4.2%	7.7%
If I donate my organs or tissues at the time of death, I could be doing something good for someone else.	14.0%	38.5%	29.1%	8.4%	10.0%
If I donate my organs or tissues at the time of death, it could be that a part of me will live on.	13.4%	43.9%	24.1%	9.3%	9.2%
If necessary, I would accept an organ transplant to preserve my life.	21.1%	45.0%	18.3%	8.7%	6.8%

**Table (4): History and willingness of the participants to donate their organs the reasons behind refusing organ donation, KSA, 2020 (n=1179).**

Variables	Frequency (n=1179)	Percent
<b>Have you ever donated an organ before (which)?</b>		
• No	1144	97.0%
• Stem cells	1	0.1%
• Liver	18	1.5%
• Kidney	16	1.4%
<b>Do you have a relative who needs an organ donated (which)?</b>		
• No	1025	86.9%
• Blood components	1	0.1%
• Cornea	1	0.1%
• Liver	30	2.5%
• Kidney	118	10.0%
• Pancreas	4	0.3%
<b>To whom would you donate an organ?</b>		
• Family member	353	29.9%
• Stranger	240	20.4%
• Friend	231	19.6%
• I prefer not to	355	30.1%
<b>Reasons I would not donate my organs:</b>		
• Fear of postoperative pain	115	9.8%
• The desire to keep my body intact	199	16.9%
• Family refusal	162	13.7%
• I do not mind	617	52.3%
• Religious beliefs	49	4.2%
• Medical reasons	37	3.1%



Table (5): The relationship between the participants' agreement to donate his/ her organs and sociodemographic characteristics

Sociodemographic variable		Agreement to donate his/her organs		Total (N=1179)	P-value
		Agree (N=335)	Refuse or neutral (N=844)		
Age group	20 years or less	85	181	266	0.039
		25.4%	21.4%	22.6%	
	21-35 years	170	433	603	
		50.7%	51.3%	51.1%	
	36-50 years	42	156	198	
		12.5%	18.5%	16.8%	
	More than 50 years	38	74	112	
		11.3%	8.8%	9.5%	
Sex	Male	235	620	855	0.141
		70.1%	73.5%	72.5%	
	Female	100	224	324	
		29.9%	26.5%	27.5%	
Nationality	Saudi	319	796	1115	0.321
		95.2%	94.3%	94.6%	
	Non Saudi	16	48	64	
		4.8%	5.7%	5.4%	
Marital status	Single	210	499	709	0.339
		62.7%	59.1%	60.1%	
	Married	103	301	404	
		30.7%	35.7%	34.3%	
	Divorced	15	33	48	
		4.5%	3.9%	4.1%	
	Widow	7	11	18	
		2.1%	1.3%	1.5%	
Educational level	Illiterate	7	5	12	0.008
		2.1%	.6%	1.0%	
	Primary	1	4	5	
		.3%	.5%	.4%	
	Intermediate	11	18	29	
		3.3%	2.1%	2.5%	
	Secondary	110	220	330	
		32.8%	26.1%	28.0%	
Working status	Working	126	445	571	0.001
		37.6%	52.7%	48.4%	
	Not working	209	399	608	
		62.4%	47.3%	51.6%	

## 7. DISCUSSION:

Recruiting a sufficient number of organ donors in Saudi Arabia has been an emerging challenge since the establishment of SCOT [19]. Consequently, more people would appreciate to donate organs if they are

propped by religious communities and enhance the public and medical communities' awareness and attitudes towards organ donation [4].

The current study is a cross-sectional study that was conducted among 1179 Saudi residents. The study aimed to assess the knowledge, attitude, and practice of organ donation among the population in AL-Dammam and AL-Khobar cities in the Eastern province of Saudi Arabia.

Regarding awareness of the participants towards organ donation, our study found that the majority of respondents (81.8%) think that brain death occurs when the brain stops functioning, even if the heart is kept beating by artificial means. A percentage of 60.1% believe that persons who have experienced irreversible brain death but are maintained on a life-support system can be considered as potential organ donors. More than half of cases, 52.4%, think that a person must be pronounced brain clinically dead in order to have that person's organs donated, 42.1% agreed that Organ donors might range in age from new-born to 70 years, and 55.2% said that Organ donation does not prevent or interfere with funeral arrangements. The majority of participants, 73.3% know that it is allowed to donate or receive organs from a living person in the KSA also, 46.8% said that it is allowed to take organs from a brain-dead person. 42.4% of cases reported that after the announcement of clinical death, the deceased could not return, and the majority (72.9%) think that coma does not mean brain death.

In addition to long-term survival benefits, organ donation also improves the quality of life in certain circumstances (for instance, in the case of cornea, skin, or bone transplantation) [20, 21]. It is currently recognized to be the treatment of choice for multiple end-stage organ diseases [22]. In particular, recognition among young adults in general and medical students and physicians has been proposed as a factor in achieving the necessary continued rise in organ donation. [23, 24].

In Riyadh, a cross-sectional questionnaire-based study was conducted on 2596 Saudi residents and reported a relatively good awareness about organ donation, which is consistent with our findings. As 76.3% of

participants had heard about organ donation, the level of organ donation awareness was 74%. Only 30% had prior knowledge about organ donation, which is lower than previous knowledge levels in our study [25]. A possible interpretation of this good level of knowledge could be the ranking number of educational campaigns as a critical factor in increasing awareness about organ donation [26].

In contrast, in Al-Kharj, Saudi Arabia, *AlShareef SM et al.(2018)* [27], a hospital-based cross-sectional study that included 403 respondents, reported negative beliefs among the population. Half of the respondents (50.25%) knew that both the living and the dead are eligible to donate organs, whereas (35.6%) did not know that organ donation is legal in Saudi Arabia. This is consistent with our findings as nearly half of the respondents (52.4%) thought that one must be announced brain-dead before having their organs donated.

In India, higher knowledge levels were found as a community-based cross-sectional study was conducted among 257 randomly selected participants. Nearly (89.1%) have heard about organ donation in their lifetime. Still, only half of them had sufficient knowledge regarding the qualifying status for organ donation and place of enrolment for organ donation, 115 (44.8%) and 152 (59.1%), respectively [28]. Several international studies have been published on organ donation. In a cross-sectional survey conducted in Pakistan, nearly 60% of participants had adequate organ donation knowledge, but only (23%) knew that organs could come from both living and cadaver bodies [29].

In Morocco, another study found that (66.4%) of people interviewed knew about the feasibility and the practice of organ transplantation in Morocco; nearly two-thirds of all participants (62.3%) had a low to mid-level of knowledge about the enactment regulating organ donation [30]. These contrast findings in international studies can be attributed to the differences in the populations' cultural and socio-economic status.

Regarding the attitudes towards organ donation, we found that 48.1% of cases agreed that Organ transplants are effective in prolonging and improving the quality of a recipient's life. Besides, 41.1% agreed that an organ donation is a positive option for the family at the time of death of a family member, 42.5% agreed that Organ donation is allowed in religion. Furthermore, 33.9% of participants said they are ready to donate their organs if they have brain death. Half of

the cases (49.9%) agreed that organ donation is essential to help those who need the organs, 49.6% agreed that organ transplantation is an acceptable form of medical treatment.

Another study found that the degree of perceived importance of organ donation was important or very important in 79.8% of cases. More than half (56%) agreed to organ donation of a relative if they had brain death, which was higher than our findings [25]. A similar study found that nearly 78% supported the promotion of organ donation, but less than 25% were willing for organ donation at any stage [27]. The relatively positive attitudes towards organ donation in our study and other Saudi study is probably due to the ranking increase of morbidity rates of end-organ dysfunction and the spreading awareness about organ donation as a life-saving treatment [25].

In India, a study reported; over half of the study participants (59%) have considered organ donation at any time in the past within their lifetime. While 66% were willing to donate an organ in the future, among those who were willing for organ donation, more than three-fourths 77.5% of them were willing to donate an organ to an unknown member [28]. The study also reported; overall, 60% of participants had a positive attitude toward organ donation if they were willing to donate organs in the future and willing to donate organs either to unknown members or to a medical college [29]. Another study found that 51.2% of respondents agreed to donate their organs; this percentage increased to 91.3% when it was about donating organs to relatives [30].

However, in Malaysia, an overwhelming majority of the respondents (98.5%) are against donating their organs, despite receiving information on organ donation [31]. Regarding the participants' history and willingness to donate their organs, our study reported; the majority of participants, 97%, had not ever donated an organ before, and 86.9% don't have a relative who needs an organ donation.

Regarding sources of knowledge about organ donation, 44.4% reported social media followed by 20% relatives and friends, 15% TV/Radio, and only 6.5% reported advertisements as a source of knowledge of organ donation. This shows that the media plays a crucial role in raising awareness of organ donation. In contrast to our results, another study found that TV and the internet were the major sources of information for the people, reported by 70.7% and 42.6% respectively, other sources like friends 39.6%, newspaper 33.3% and health workers

20.7% [27]. Another study showed that in more than half of cases, 56.9% thought that they could get information about organ donation only through the media [28].

When asked about the reasons for not donating organs, we found that over half of participants (52.3%) don't mind to donate their organs, 16.9% refuse due to the desire to keep my body intact, 13.7% for family refuse, 9.8% fear of postoperative pain, 4.2% religious beliefs and 3.1% for medical reasons.

In Riyadh, another study reported; among those who declined donation, 27.7% reported the apprehension to be buried "incomplete," 17.7% believed the donor's body would be disfigured, 19.7% reported the disagreement of the family in this issue, 19.4% refused because they lacked the basic understanding of brainstem death. Finally, 15% rejected donation as they thought it was prohibited in Islam [24]. Another study reported that fear of body distortion (39%), health sequelae (35%), scarcity of information (20%), and religion (19%) were the most frequent reasons for the unwillingness for organ donation [27].

Regarding the relationship between the participants' attitude toward organ donation and their sociodemographic characteristics, about half (50.7%) of the participants aged 21-35 years agreed to donate their organs. The percentage decreased with increasing age. Most (70.1%) of male participants, 62.7% of singles, 61.5% university or more educated, and 62.4% of the not working participants agreed to donate their organs. However, there was a significant relationship between attitude from organ donation and age group, educational level, and working status ( $P < 0.05$ ). The tendency for organ donation in younger participants may be due to less death thought at a young age because it seems farther away than the older participants. At the same time, there was an insignificant relation between sex, marital status, and attitude from organ donation ( $P > 0.05$ ). Our findings supported the Turkish study's results [32]; there was a significant correlation between willingness to donate, age, sex, and educational level.

Regarding the educational level, there is an important difference related to the increase in the ability to donate organs with the academic level due to the correct concepts and information about organ donation and its importance to save others' lives in need.

The reason for the similar results between us and Turkey's study is that we hold the same religion, Islam, and the same customs and traditions.

The younger was better of organ donation than the elder (55.9% Vs. 52.5%,  $P=0.002$ ). Willingness to donate organs was higher among males (67.5% Vs. 53.7%) [31]. Our findings were also supported by another study in Al-Kharj, Saudi Arabia [33], which found that 74% of males and only 21.6% of females agreed to donate their organs ( $P>0.34$ ); they also found a significant relationship between age and working status with the attitude toward donation, while there was insignificant relation with the sex, level of education and other personal aspects with the attitude toward donation.

## 8. Study Strength and Limitations:

### 8.1 Study Strength:

To our knowledge, this is the first study in the eastern province of the kingdom of Saudi Arabia assessing the knowledge, attitude, and practice of organ donation among the community in AL-Dammam and AL-Khobar cities.

### 8.2 Study Limitation:

As this study was cross-sectional, it did not assess any temporality or establish a causative relation between the variables: time, fewer literature reviews about the topic.

## 9. CONCLUSION:

The study concluded that there was good awareness about organ donation, and the majority of participants reported a positive attitude.

## 10. Recommendations

As we assessed relatively negative attitudes towards organ donation, in addition to a shortage in the sources of knowledge, we recommend:

- Holding more physical campaigns in universities and other vital institutions to encourage people to donate organs.
- The Ministry of Health should hold health education and awareness sessions and campaigns to support the public's knowledge, attitudes, and beliefs towards organ donation.
- Need to establish organ donation centers in the city.
- Educating students in schools about the importance of organ donation.
- The universities encourage holding health education campaigns and organ donation days to increase awareness and improve the students' attitude about organ and blood donation.
- Conduction of large scale research including all Saudi population in different regions of the kingdom to assess the public awareness, attitude, and practice towards the blood and organ donation.

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