ETHICAL KNOWLEDGE AND PERCEPTION REGARDING ORGAN TRANSPLANTATION AMONG EGYPTIAN DOCTORS

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ABSTRACT

Introduction: Organ transplantation started in 1954. Improvements in organ transplantation have made progress to save many people suffering from end-stage organ failure because organ transplantation is the treatment of choice for most end-stage organ failure diseases. **Objectives:** Although physicians can affect attitudes toward organ donation in society, few studies about the attitudes of these Egyptian physicians toward organ donation have been conducted in Egypt. Therefore, the objective of our study was to assess the ethical knowledge and perceptions of doctors regarding organ donation methods. In our research, we used the online Google form, which was distributed throughout Facebook and Whats' app (the two most popular social media platforms), to ensure a high rate of response. The researchers shared the link of the survey along with the explanation of its purpose to encourage the participants. Calculations of correct responses were coded as 1, and correct and unknown responses were coded as 0. (18 questions, maximum score 18, minimum score 0). The percent score was calculated as: individual response/maximum score 18 *100. **Results**: A total of 247 physicians participated in the survey, and the mean age of the participants was 36 years (standard deviation ±4. A total of 89.9% of the respondents had clinical specialties, and 44.5% had master's degrees. The majority of the participants (n=149, 81.9%) had not read about the law regulating organ transplantation. A total of 74 (40.7%) of them knew about the law from media, 53 (29.1%) knew about the law from practice, 43 (23.6%) knew about the law from study, and 12 (6.6%) of participants knew about the law from other resources. A total of 137 responders had poor knowledge, 110 had good knowledge about OD, and more knowledge was among surgeons. Among the 247 participants, 44.5% had an average knowledge score and suboptimal practice score, with a mean knowledge score of 8 ± 3 and a median of 8 (6,10). **Conclusion**: Most of the participants had poor knowledge. Poor knowledge increased in urban areas in comparison to good knowledge about OD. There was greater knowledge among surgeons. The majority of participants had their knowledge of practice.

INTRODUCTION

Organ transplantation started in 1954. Improvements in organ transplantation have progressed to save many people suffering from end-stage organ failure because it is the most appropriate treatment for most organ failure diseases **(Vincent et al, 2019).**

According to Egyptian law number 5 for the year 2010, which organizes the human organ donation process, OD is prohibited from dead to live persons except in life-threatening conditions, and the process must be performed under free will and must be written in accordance with the executive regulations of this law. Genital organ or tissue donation is prohibited in Egypt to avoid mixing of lineages. An OD between Egyptians and foreigners is prohibited except between spouses, on the condition that this marriage lasts for 3 years or more. OD from children and incompetent persons is prohibited even after the consent of their caregivers. Donation for nonrelatives is prohibited except in life-threatening conditions after the agreement of a specific committee formed by a health minister according to this law. Organ donation operations must be performed in licensed hospitals under responsible medical teamwork with technical

and administrative experience throughout the process of donation Hence, it is important to assess the knowledge and awareness of this law among Egyptian doctors through our online questionnaire about OD **(Egyptian parliament, 2010)**.

A few studies have been performed in South Asian countries to assess practices, knowledge and attitudes toward medical ethics, and the findings support the need to improve doctors' knowledge of ethics. A study performed in India showed that 59.7% of doctors had read ethics, most doctors (98.7%) had heard of the code of ethics, and only one-third of doctors had adequate knowledge of the code of ethics **(Ranasinghe et al., 2020).**

There is a defect in public awareness about organ donation. This reluctance to donate organs is due to many barriers, such as religious and cultural myths and misconceptions concerning organ donation. This is the time to encourage our self-donation to save one's life and improve medical science **(Singh et al,2021)**.

A total of 326 healthcare professionals were recruited from Jimma town, Ethiopia, to assess the knowledge and attitudes of care providers toward organ donation. The knowledge and attitudes of the healthcare providers regarding organ donation were good. The results might motivate medical personnel to offer better guidance to increase organ donation **(Wolide et al., 2020).**

OBJECTIVES

Although physicians can affect attitudes toward organ donation in society, few studies have been conducted in Egypt on the attitudes of these Egyptian physicians toward organ donation. Therefore, the objective of our study was to assess the ethical knowledge and perceptions of doctors regarding organ donation.

METHODS

Our study was cross-sectional descriptive research. All Egyptian physicians who agreed to participate were contacted. We used the online Google form used in our researchh, which was distributed over Facebook and WhatsApp (two of the most popular social media platforms), to ensure a high rate of response. This online survey is based on a previous study performed to assess the knowledge and attitudes of heath care professionals toward organ donation **(Radunz et al., 2010)**.

The researchers shared the survey link and explained its purpose to encourage the participants. The knowledge score was calculated (correct answers were coded as 1, and correct and unknown answers were coded as 0). (18 questions, maximum score 18, minimum score 0). The percent score was calculated as follows: individual response/maximum score 18 *100. Good and bad knowledge were categorized according to the median percent score (> median percent score 44% was categorized as good knowledge, ≤ median percent score was categorized as bad knowledge). For the knowledge question scales, we used Cronbach's alpha reliability test. The scales were internally consistent, with a Cronbach's alpha of 0.781. The local Ethics Committee of Cairo University's Faculty of Medicine's forensic medicine and clinical toxicology department approved the study (IRB No: N-323-2023). The online consent form was included in the questionnaire.

STATISTICAL ANALYSIS

To ensure completeness and logical consistency, all the gathered data were reviewed. The data extracted from Google Forms were imported into Microsoft Office Excel 2019. After that, the data were transferred and examined using the Statistical Package of Social Science Software, version 26 (SPSS), for statistical analysis. The mean, standard deviation (SD), median and interquartile range (IQR) were calculated for age and knowledge score, and participants were subsequently categorized into 2 groups according to the median score for knowledge **(Chan YH, 2003a).** Chi-square tests and Mann–Whitney U tests were used to compare the participants' sociodemographic characteristics and categories, with a significant p value set at $p < 0.05$.

RESULTS

Table (1): The Demographic characteristics of the participants.

Variable		Value
age mean ± sd, median (IQR)		36 ± 4 35 (33, 38)
Gender n (%)	Male	32 (13.0%)
	Female	215 (87.0%)
Residence n (%)	Urban	214 (86.6%)
	Rural	33 (13.4%)
Academic degree n (%)	MBBCH	45 (18.2%)
	MSC	110 (44.5%)
	MD	92 (37.2%)
Specialty n (%)	Academic	25 (10.1%)
	Clinical	222 (89.9%)

Table (1) shows that 247 physicians participated in the survey, the mean age of the participants was 36 years (standard deviation ±4), and the majority of participants (87%) were women. 214 (86.6%) participants were urban residents, while 33 (13.4%) were rural residents. A total of 89.9% of the respondents had a clinical degree, and 44.5% had a master's degree.

As shown in **Table (2)**, the majority of the participants (n=149, 81.9%) did not read about the law regulating organ transplantation. Regarding knowledge about OD, 26.3% (n=65, 26.3%) of the participants had not heard about OD, while 73.7% (n=182, 73.7%) knew about the law. Concerning knowledge resources, 74 (40.7%) of them know about the law from media, 53 (29.1%) know about the law from practice, 43 (23.6%) know about the law from study and 12 (6.6%) of participants know about the law from other resource.

Table (2): Represents the evaluation of knowledge of the participants related to transplantation

Variable		**Value**
Have you ever heard about Egyptian laws that organizing OD process? N=247	Yes	182 (73.7%)
	No	65 (26.3%)
Have you read these laws before? N=182	Yes	33 (18.1%)
	No	149 (81.9%)
What is your point of view towards these laws? N= 182	With	162 (89.0%)
	Against	20 (11.0%)
What are your knowledge sources	Media	74 (40.7%)
	Radio, TV,	

As shown in **Table (3)**, 52.2% of participants knew that organ donation is allowed only among relatives, and 62.8% did not know that donation is permitted for the 4th-degree relative. More than half of the participants (69.6%) did not know that transplantation from children was not allowed, and only 6.5% had acquired knowledge. Most of the participants (69.2%) did not know that transplantation from incompetent individuals is not allowed, and only 4.9% had a lack of knowledge that transplantation is allowed. The majority of participants (73.7%) did not know that transplantation from children and incompetent persons was not allowed even with consent from guardians. A total of 19% had knowledge that donation was allowed only from children and was competent if guardians provided consent. Only 20.2% did not know that they could not complete transplantation if there was any breaking in legal aspects. Only 17% did not know that the donor could discontinue the donation procedure at any time. A total of 35% of the respondents had missing knowledge that organ donation is allowed from people who died from brainstems, and 40% did not know that it is not allowed. A total of 49.4% had acquired knowledge that organ donation recommendations after death are allowed, 40.1% did not know. Thirty-two% had acquired knowledge that organ donation is allowed from cadavers after providing written consent from relatives, and 46.2% did not have knowledge. Additionally, 53.8% did not know the suitable time for each organ to be transferred for transplantation. A total of 87.4% had knowledge that there is a corneal bank.

Table (3): presents the evaluation of information of the participants related to transplantation.

Variable		**Value N (%)**	from the donor?		
Have you ever known that OD is permissible only for relatives?	Yes	129 (52.2%)	Have you ever known that selling human organs is unlawful in Egypt?	Yes	227 (91.9%)
	No	118 (47.8%)		No	20 (8.1%)
	Don´t know	0 (0.0%)		Don´t know	0 (0.0%)
Have you ever known that OD is permissible to fourth degree of relatives?	Yes	92 (37.2%)	Have you ever known that OD isn't permissible for foreigners?	Yes	133 (53.8%)
	No	155 (62.8%)		No	114 (46.2%)
	Don´t know	0 (0.0%)		Don´t know	0 (0.0%)
Have you ever known when OD is available for non-relatives?	Yes	69 (27.9%)	Have you ever known when OD is being permissible from or to foreigners?	Yes	30 (12.1%)
	No	178 (72.1%)		No	217 (87.9%)
	Don´t know	0 (0.0%)		Don´t know	0 (0.0%)
Have you ever known that it is obligatory to take written consent	Yes	236 (95.5%)	Have you ever known how legal it is for	allowed	16 (6.5%)
	No	11 (4.5%)		Not	59 (23.9%)
	Don´t know	0 (0.0%)			

children to denote?	allowed	
	Don´t know	172 (69.6%)
Have you ever known how legal it is for children to denote after written consent from his parents?	allowed	18 (7.3%)
	Not allowed	47 (19.0%)
	Don´t know	182 (73.7%)
Have you ever known how legal it is for incompetent persons to denote?	allowed	12 (4.9%)
	Not allowed	64 (25.9%)
	Don´t know	171 (69.2%)
Have you ever known how legal it is for incompetent persons to denote after take written consent from his guardian?	allowed	17 (6.9%)
	Not allowed	48 (19.4%)
	Don´t know	182 (73.7%)
Have you ever known that it is forbidden to complete the donation process after breach of any legal aspects?	Yes	197 (79.8%)
	No	50 (20.2%)
	Don´t know	0 (0.0%)
Have you ever known it is permissible to discontinue donation process at any time?	Yes	205 (83.0%)
	No	42 (17.0%)
	Don´t know	0 (0.0%)
Have you ever known it is legal to denote organs after brain stem death?	allowed	88 (35.6%)
	Not allowed	60 (24.3%)
	Don´t know	99 (40.1%)
What do you know about the validity of recommending a donation?	allowed	122 (49.4%)
	Not allowed	37 (15.0%)
	Don´t know	88 (35.6%)
Have you ever known how it is legal to denote from cadaver after written consent from relatives?	allowed	79 (32.0%)
	Not allowed	54 (21.9%)
	Don´t know	114 (46.2%)
Have you ever known about corneal bank?	Yes	216 (87.4%)
	No	31 (12.6%)
	Don´t know	0 (0.0%)
Have you ever known time suitable for each organ to transfer?	Yes	114 (46.2%)
	No	133 (53.8%)
	Don´t know	0 (0.0%)

Table (4) shows all 247 participants. A total of 44.5% of the participants had an average knowledge score and suboptimal practice score, with a mean knowledge score of 8 ± 3 and a median of 8 (6,10).

Table (4): The score of knowledge

Variable	**Value mean ± sd, median (IQR)**	
Knowledge score	8 ± 3	8 (6,10)
Knowledge score percentage	45 ± 19	44 (33, 56)

Table (5): Stratifying the responders according to their knowledge

Variable		**Poor knowledge (≤median knowledge percent score) n=137**	**Good knowledge (>median knowledge percent score) n=110**	**p value**
age mean ± sd, median (IQR)		36 ± 4 35 (34, 38)	36 ± 5 35 (33, 38)	0.97
Gender n(%)	Male	15 (46.9%)	17 (53.1%)	0.29
	Female	122 (56.7%)	93 (43.3%)	
Residence n(%)	Urban	115 (53.7%)	99 (46.3%)	0.16
	Rural	22 (66.7%)	11 (33.3%)	
Academic degree n(%)	MBBCH	25 (55.6%)	20 (44.4%)	0.37
	MSC	56 (50.9%)	54 (49.1%)	
	MD	56 (60.9%)	36 (39.1%)	
Specialty n(%)	Academic	14 (56.0%)	11 (44.0%)	0.95
	Clinical	123 (55.4%)	99 (44.6%)	

Table (5) shows that 137 respondents had limited knowledge, while 110 responders had high knowledge about OD. Moreover, the percentage of limited knowledge increased in urban areas (n=115) in comparison to those with high knowledge (n=99) concerning OD, with no significant p value.

Table (6): Stratifying the responders according to specialty

		Knowledge score percentage more than 44_median				P value
		poor knowledge		good knowledge		
		Count	N %	Count	N %	
speciality1	Academic	17	12.4%	13	11.8%	0.268
	Medicine	107	78.1%	79	71.8%	
	Surgery	13	9.5%	18	16.4%	
	Total	137	100%	110	100%	

Among those with an academic degree, 55.6% with MBBCH, 50.9% with MSC and 60.9% with MD had poor knowledge. Fourteen (56.0%) students with academic specialties and 123 (55.4%) with clinical specialties had poor knowledge, but the difference was not significant.

As shown in **Table (6)**, 137 (55%) of the responders had poor knowledge and 107 (78.1% of those with poor knowledge physicians) of medicinal specialties, and those with high knowledge were also among 79 (71.8% of those with high knowledge responders) with no significant P value. This may be because the responders were mainly medicinal. Greater knowledge among surgeons had no significant P value. Poor knowledge is also found among academics with no significant P value.

DISCUSSION

The purpose of this study was to investigate and evaluate the different factors that influence Egyptian doctors' knowledge of ethics related to OD. In our study, the majority of participants (87%) were women, which was similar to the results of **Hu & Huang (2015)** in 6 hospitals in China obtained through a questionnaire to medical health personnel, which showed that 288 (77.2%) were women.

In our study, 74 (40.7%) of the physicians knew about the law from the media, 53 (29.1%) knew about the law from practice, 43 (23.6%) knew about the law from the study, and 12 (6.6%) of the participants knew about the law from other resources that were not available for a study among all family physicians working in Family Health Centers in Turkey through an online questionnaire, which showed that most of the physicians (62.28%, n=1050) knew about organ donation from university, (35.82%, n=604) knew about service training, (34.22%, n=577) knew about the law through the internet and media (32.44%, n=547) **(Dagcioglu et al., 2021);** this may be because our study had a wide sector of specialty, but a study in Turkey had family medicine physicians.

In our study, 52.2% of participants knew that organ donation was allowed only among relatives, and 62.8% did not know that donation was permitted to the 4th degree relative; this finding is not consistent with a study that included physicians from different institutes in Mexico, which showed that most participants knew that organ transplantation was allowed between nonrelatives **(Marván., et al 2022).**

In our study, 49.4% of the participants had acquired knowledge that organ donation after death was allowed, 40.1% did not know. Thirty-two% had acquired knowledge that organ donation was allowed from cadavers after providing written consent from relatives, and 46.2% did not have knowledge that was not provided by a study performed by **Gerbi et al., 2020** among healthcare professionals at tertiary care teaching institutes in Jimma town, Ethiopia, which showed that a total of 760 (73%) participants knew correctly that the brain dead person is an ideal organ donor, which may be due to different laws among countries.

In our study, 87.4% of participants were aware that there is a corneal bank, which is not consistent with studies in India, and 89.7% of participants were aware of corneal donation after brain death **(Zirpe et al.,2024)**. This difference may be because corneal donation after brain death may not mean that there was a corneal bank or may be due to different sources of knowledge.

In our study, only 17% did not know that the donor could discontinue the procedure of donation at any time, which is not in line with a study by **Ketenet al., 2017,** among physicians in Kahramanmaras, a city in the Mediterranean region of Turkey, who reported that 215 (80.5%) participants knew the right of donor to withdraw the permission of transplantation, possibly due to different sources of knowledge and poor knowledge about Egyptian law.

In our study, 137 (55%) responders had

limited knowledge, while 110 (45%) responders had high knowledge about OD, which is in line with a study in Pakistan in which only 82 (33.7%) participants (physicians and nurses) were aware that deceased-donor transplantation is legal **(Siddiqui et al.,2012)**. Additionally, our study is in line with a study by **Fernandes Vasconcelos et al.,2022** among physicians in Brazil, which showed that the participants had poor knowledge scores below 5 about the diagnosis of brain death and organ donation protocols.

A total of 53.8% did not know the suitable time for each organ to be transferred for transplantation due to a lack of medical and ethical curricula explaining issues of organ transplantation for either undergraduate or postgraduate candidates in different medical specialties. Greater knowledge was among surgeons, and poor knowledge was among medicinal and academics, which may be due to the close relationship between surgeons and transplantation.

CONCLUSION

Most participants had poor knowledge. Poor knowledge increased in urban areas in comparison to good knowledge concerning organ donation ethics. A high percentage of medical physicians and academics had poor knowledge, and surgeons had more knowledge.

The majority of participants had practical knowledge, and good knowledge was not correlated with advanced medical licenses; there is a great need to increase medical doctors' knowledge about ethics and laws related to organ donation.

RECOMMENDATION

We recommend increasing awareness and knowledge of organ transplantation ethics among medicinal doctors and academics through lectures and workshops. Specify certain postgraduate and undergraduate curricula about ethics and laws about organ donation.

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الملخص العربي

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مدرس الطب شرعي والسموم الاكينيكيه كلية الطب قصر العيني , مدرس الطب شرعي والسموم الاكينيكيه كلية الطب قصر العيني ,مدرس طب المجتمع و الصحه العامة , مدرس الطب شرعي والسموم الاكينيكيه كلية الطب قصر العيني.

بدأت زراعة الأعضاء في عام ١٩٥٤. وقد أدى التحسن في زراعة الأعضاء إلى تقدم لإنقاذ العديد من الأشخاص الذين يعانون من فشل الأعضاء في المرحلة النهائية، لأنه العلاج المفضل لمعظم أمراض فشل الأعضاء في المرحلة النهائية.

الأهداف: على الرغم من قدرة الأطباء على التأثيرعلى المواقف تجاه التبرع بالأعضـــاء في المجتمع، فقد تم تطوير القليل من الدراسات في مصر حول موقف هؤلاء الأطباء المصريين تجاه التبرع بالأعضاء. وقد جاء في القانون المصري ما يلي:

مادة (1): لا يجوز إجراء عمليات زرع الأعضـاء أوأجزائها أو الأنسجة بنقل أي عضو أو جزء من عضو أو نسيج من جسم إنسان حي أو من جسد إنسان ميت بقصد زرعه في جسم إنسان آخر إلا طبقاً لأحكام القانون ولائحته التنفيذية.

مادة (2): لا يجوز نقل أي عضـو أو جزء من عضـو أو نسـيج من جسـم إنسـان حي بقصـد زرعه في جسـم إنسـان آخر إلا لضـرورة تقتضـيها المحافظة علي حياة المتلقي أو علاجه من مرض جسيم، وبشـرط أن يكون النقل هو الوسـيلة الوحيدة لمواجهة هذه الضرورة وألا يكون من شأن النقل تعريض المتبرع لخطر جسيم علي حياته أو صـحته.ويحظر زرع الأعضـاء أو أجزائها أو الأنسجة أو الخلايا التناسلية بما يؤدي إلي إختلاط الأنساب.

مادة (3): مع مراعاة حكم المادة السـابقة يحظر الزرع من مصـريين إلي أجانب عدا الزوجين إذا كان أحدهما مصـريا والآخر أجنبياً، على أن يكون قد مضـــي على هذا الزواج ثلاث ســـنوات على الأقل وبعقد موثق علي النحو المقرر قانوناً كما يجوز الزرع فيما بين الأجانب من جنسية واحدة بناء على طلب الدولة التي ينتمي إليها المتبرع والمتلقي على النحو الذي تحدده اللائحة التنفيذية لهذا القانون.

مادة (4): مع مراعاة أحكام المادتين (2،3) من هذا القانون، لا يجوز نقل أي عضو أو جزء من عضو أو نسيج من جسم إنسان حي لزراعة في جسم إنسان آخر، إلا إذ كان ذلك علي سبيل التبرع فيما بين الأقارب من المصريين.

مادة (5): في جميع الأحوال يجب أن يكون التبرع صـادراً عن إرادة حرة خالية من عيوب الرضـاء، وثابتاً بالكتابة وذلك علي النحو الذي تحدده اللائحة التنفيذية لهذا القانون.ولايقبل التبرع من طفل، ولا يعتد بموافقة أبويه أو من له الولاية أو الوصى.

ولذلك، فإن الهدف من دراستنا هو تقييم المعرفة الأخلاقية وتصور الأطباء تجاه التبرع بالأعضاء.

الطرق: نسـتخدم نموذج *جوجل* عبر الإنترنت في بحثنا الذي تم توزيعه على؛ *Facebook* و*What's App* (وهما منصـتي التواصـل الاجتماعي الأكثر شـهرة) بمعدل اسـتجابة مرتفع. وقد شـارك الباحثون رابط الاسـتطلاع مع شـرح الغرض منه لتشـجيع المشاركين. حساب درجة المعرفة تم ترميز الإجابات الصحيحة بـــ ١، في الإجابات الصحيحة ولا أعرف تم ترميزها بـــ صفر. (١٨ سؤال، الدرجة القصوى ١٨، الحد الأدنى من الدرجات صفرا). تم حساب النسبة المئوية على النحو التالي: الاستجابة الفردية/الدرجة القصوى ١٨*١٠٠.

النتائج: شارك في الاستطلاع ٢٤٧ طبيبًا وكان متوسط عمر المشاركين ٣٦ عامًا (الانحراف المعياري ±٤. كان التخصص ٨٩.٩% سريريًا و٤٤.٥% بدرجة الماجستير. غالبية المشاركين (العدد = ١٤٩, ٨١.٩ %) لم يقرأوا عن قان زراعة الأعضاءو ٧٤ (٤٠.٧%) منهم يعرفون عن القانون من خلال وســائل الإعلام، ٥٣ (٢٩.١%) يعرفون عن القانون من خلال الممارســة، ٤٣ (٢٣.٦%) يعرفون عن القانون من خلال الدراسة. ١٢ (٦.٦٪) من المشاركين يعرفون عن القانون من مصادر أخرى .كان لدى ١٣٧ من المسـتجيبين معرفة سـيئة بينما كان لدى ١١٠ من المسـتجيبين ، معرفة جيدة حول التطوير التنظيمي . في جميع المشـاركين البالغ عددهم ٢٤٧ مشاركًا متوسط درجة المعرفة ودرجة الممارسة دون المستوى الأمثل، مع متوسط درجة المعرفة (٨ ± ٣) ومتوسط ٨ (٦،١٠).

الاسـتنتاج: كان لدى معظم المشـاركين معرفة ضـعيفة. زادت المعرفة الضـعيفة في المناطق الحضـريه مقارنة بالمعرفة الجيدة فيها. كان لدى غالبية المشاركين معرفه جيده بزراعة الأعضاء من الممارسة العملية.