

ORIGINAL ARTICLE

Exploring Knowledge and Attitudes on Organ and Tissue Donation among Malaysian Undergraduate Students

Siti Hawa Rusli¹, Aina Amanina Abdul Jalil¹, Nur Sabiha Md Hussin²

¹ Faculty of Pharmacy and Health Sciences, Royal College of Medicine Perak, Universiti Kuala Lumpur (RCMP UniKL), 30450 Ipoh, Perak, Malaysia

² Department of Clinical Pharmacy, Faculty of Pharmacy, Universiti Teknologi MARA, Puncak Alam, Selangor, Malaysia.

ABSTRACT

Introduction: Organ transplantation is the sole treatment option for patients suffering from end-stage organ diseases. The organ donation rate in Malaysia is still far from reaching a satisfying level as many of the citizens are still reluctant to pledge as organ donors. This study aimed to identify the level of knowledge and attitude regarding organ and tissue donation among undergraduate university students in Malaysia as well as to investigate the relationship between sociodemographic profiles with the level of knowledge and attitude regarding organ and tissue donation.

Materials and methods: A cross-sectional study was conducted using a 29-item online structured questionnaire distributed via Google Forms. This study used a non-probability convenience sampling method and a sum of 400 respondents from public and private universities around Malaysia participated in answering the questionnaire. Descriptive analysis was used to assess the level of knowledge and attitude regarding organ and tissue donation. The chi-square test was used to identify the association between the sociodemographic profiles with the level of knowledge and attitude regarding organ and tissue donation. **Results:** The findings revealed a high level of knowledge (47.5%) but a neutral attitude (61%) among respondents regarding organ and tissue donation. Significant associations were identified between respondents' ethnicity, university, program of study, year of study, and family monthly income with knowledge levels. However, no significant associations were observed between sociodemographic factors and attitudes toward donation. **Conclusion:** The results of this study demonstrate that undergraduate university students in Malaysia have a high knowledge and neutral attitude about organ and tissue donation.

Malaysian Journal of Medicine and Health Sciences (2025) 21(5): 4-12. doi:10.47836/mjms.21.5.2

Keywords: Knowledge, Attitude, Organ donation, Transplantation, Undergraduate students

Corresponding Author:

Aina Amanina Abdul Jalil, MCLin Pharm

Email: aina.amanina@unikl.edu.my

Tel : +605-2432635 (ext 846)

INTRODUCTION

Organ donation has become one of the most effective interventions to save and enhance the quality of life for individuals suffering from end-stage diseases. Patients in need of donated organs often face significant limitations in their daily lives and rely on costly, ongoing medical treatments. Organ transplantation offers the potential for these patients to regain a sense of normalcy without dependence on expensive therapies. According to the Transplantation Unit Ministry of Health (MoH) Malaysia, organ donation is the voluntary act of giving one's organs or tissues for transplantation to another person who has organ failure or dysfunction. It is a selfless act that can save or improve the lives of individuals in need of organ transplantation (1). Commonly donated organs include the kidneys, liver, lungs, and heart. The most transplanted tissues are cornea, skin, bone, and heart

valve (2).

Globally, organ donation rates vary significantly. Spain, for instance, leads the world with an organ donation rate of 31.5 donations per million population (3). In contrast, countries like China and South Korea report much lower donation rates, with only 3.7 and 10.6 donations per million population, respectively, reflecting a greater reluctance towards organ donation (4). Similar to many other nations, Malaysia faces an increasing demand for organ and tissue transplants but suffers from a shortage of pledgers. This shortage has resulted in an insufficient supply of organs and tissues from both deceased and living donors, impeding transplant activities (5). Although organ donation was introduced in Malaysia in the early 1970s, the number of deceased organ donors remains critically low, with fewer than 500 registered to date (6).

The public's willingness to donate their organs during their lifetime or after passing has a direct impact on the success of organ transplantation. A study by Mohamed et al. in 2022 highlighted a few elements that may

influence the decision-making process concerning organ donations by family members involved. For instance, the death of a loved one may leave the family members in a state of grief, shock, and sensitivity. As a result, the approach taken by medical professionals in requesting consent from the family members to retrieve the deceased's organs assumes significant importance. Other than that, the level of satisfaction of family members toward the quality of medical care received by the deceased, as well as the behaviour of representatives from the transplant team toward their current state of emotions may influence the outcomes of their decision-making process. The knowledge and attitude of medical personnel in regard to organ donation, and the clarity of information provided to close relatives may also impact the result of their decision-making process (7).

In Malaysia, a lack of awareness surrounding organ donation remains a significant barrier (5). Misconceptions and fears regarding the transplantation process, along with a lack of trust in how donated organs will be used, contribute to this issue. Religious beliefs also play a key role in shaping individuals' perceptions of organ donation. As a multicultural nation, Malaysia's population is composed of three major ethnic groups—Malay, Chinese, and Indian—each with its own distinct beliefs. However, across these groups, there is a common apprehension about the potential mistreatment of the deceased's body during the organ retrieval process (8). Many fear that the body may be disfigured or handled improperly during the procedure. Among Muslims, concerns also exist about whether organ donation is permissible under Islamic law, as the process involves the removal of organs, which is traditionally seen as a violation of the body's integrity. Additionally, questions arise over the permissibility of donating organs to non-Muslim recipients (3).

Research has shown correlations between demographic factors such as age group, ethnicity, household income, as well as the level of education with the inclination to become an organ donor. Younger individuals, particularly those with less conservative religious views, are more inclined to pledge as organ donors, which may be attributed to their greater trust in medical professionals and a higher level of understanding about the donation process. Ethnically, Malays have demonstrated the lowest willingness to donate organs compared to Bumiputera, Chinese, and Indian populations, likely due to a lack of exposure and knowledge about organ donation within these communities. Those with low household incomes were reported to be more reluctant to pledge as organ donors in comparison with those of higher household incomes. The study also reported that people with tertiary education levels are more likely to pledge as organ donors due to the immense amount of information that they receive regarding organ donation compared to less educated people (9).

While several studies have explored public awareness of organ donation, few have focused specifically on undergraduate students in Malaysia. This population was chosen for the present study due to their unique positioning as young, educated individuals who are at a formative stage in life, often developing values and beliefs that will influence their future actions. University students, in particular, represent a critical demographic as they are more likely to be informed about healthcare issues, including organ donation, and have greater access to relevant information through academic resources. Their exposure to knowledge and their role as future professionals also give them the potential to be advocates for organ donation within their communities. By understanding the knowledge, attitudes, and perceptions of this group, we can assess how prepared they are to serve as agents of change in promoting organ donation awareness and increasing donor rates. Organ donation is a noble practice crucial for saving lives and improving quality of life, and university students' understanding and advocacy may play a pivotal role in raising awareness and fostering a positive culture of donation at the societal level.

MATERIALS AND METHODS

Study Design

A descriptive, cross-sectional study was conducted by using voluntary anonymous self-administered online structured questionnaires. The questionnaires in Google Forms were distributed among undergraduate healthcare students throughout Malaysia. The data collection was conducted over a period of three months, from March to May 2023. The study design ensures representation of students across Malaysia by including participants from both Public Higher Learning Institutions (IPTA) and Private Higher Learning Institutions (IPTS). There are 136 students from IPTA and 264 students from IPTS, reflecting a diverse sample that spans different educational settings and states across the country.

Study Population

The target population of this study was undergraduate healthcare students from private and public universities across Malaysia.

Inclusion Criteria

- Undergraduate university students from public and private universities in Malaysia enrolled in the Diploma and Degree programmes.
- Students who are willing to participate in this study.
- Students must be enrolled in full-time or active mode.

Exclusion Criteria

- All postgraduate, foundation, and certificate-level students.
- Students who had difficulty understanding the English language.

- Students who had difficulties in completing the survey.

Data Collection

The data for this study was collected using a voluntary anonymous self-administered online structured questionnaire that was distributed via a link to Google Forms. The questionnaire was distributed to undergraduate students in Malaysia via various online communication channels (WhatsApp, Facebook, Instagram, and Twitter).

Research Instrument and Scoring Method

The questionnaire used in this study consisted of a total of 29 questions. Nine of these questions were focused on collecting sociodemographic information, while the remaining 20 questions were designed to assess participants' knowledge and attitudes on the subject of the study. The questions were divided into 4 different sections. Section A includes the informed consent part in which permission was asked from participants for their data to be used strictly only for this study. Section B of the questionnaire focuses on gathering sociodemographic information from the participants. It includes questions related to their age, gender, ethnicity, religion, family income, and education profiles. Section C consists of questions that were adapted with minor modifications from the questionnaire of a previous study by Janahi et al. (2018) (14) that assessed the knowledge of the respondents regarding organ and tissue donation. Section D was adapted from a study by Akbulut et al. (2022) (15) to evaluate the respondents' attitudes toward the donation of organs and tissue.

Bloom's cut-off point was used to categorise the score of the respondents' total knowledge and attitude. For the knowledge section (Section C), responses were 'Yes' or 'No/Unsure'. 1 mark was given for each question with a correct answer and 0 mark was given for incorrect or unsure answers according to the answer scheme. The total knowledge score ranges from 0 - 10. The total score for knowledge was categorised into three levels based on the specified ranges. A score between 80% and 100% was classified as a high level of knowledge. A score between 60% and 79% fell into the moderate level category, while a score below 60% was considered a low level of knowledge (16).

For the attitude section (Section D), the Likert scale was used, and the responses were 'Strongly agree' (5 points), 'Agree' (4 points), 'No opinion' (3 points), 'Disagree' (2 points), and 'Strongly disagree' (1 point). Participants were required to select the option that best represented their attitude towards each statement provided in the questionnaire. For negative statement questions, the individual point for each response was reversed into 'Strongly agree' (1 point), 'Agree' (2 points), 'No opinion' (3 points), 'Disagree' (4 points), and 'Strongly disagree' (5 points). The total score for attitude was classified into three levels using Bloom's cut-off point. These levels

included a positive attitude (80% - 100%), indicating a favourable perspective; a neutral attitude (60% - 79%), representing a lack of strong inclination; and a negative attitude (<60%), suggesting a disagreement or unfavourable view (17).

Statistical Analysis

Statistical Package for the Social Sciences (SPSS) for Windows (Version 21) was used to analyse and present all of the data from questionnaires, which was then presented as mean \pm SD. Descriptive analysis was employed to evaluate the level of knowledge and attitude of organ and tissue donation among undergraduate Malaysian university students. Pearson's chi-square test was employed to explore the relationship between sociodemographic profiles and the level of knowledge and attitude regarding organ and tissue donation among undergraduate Malaysian university students. A significance level of $P \leq 0.05$ was used as the threshold for statistical significance. Quantitative variables were presented as mean and standard deviation. On the other hand, qualitative variables were presented as numbers as well as percentages.

Ethical Clearance

This study was approved by the Universiti Kuala Lumpur Royal College of Medicine (UniKL RCMP) Research Ethics Committee (UniKLRCMP/MREC/2022-2023/BACH.PHARM/FYP-006).

RESULTS

Sociodemographic Data

A total of 400 respondents completed the questionnaire within the three-month period from March to May 2023, with no missing data, meeting all inclusion criteria. The sociodemographic profile, as summarised in Table 1, indicates a majority of female respondents (n=259, 64.8%), and (n=141, 35.3% were male. The age distribution reveals that 50.8% (n=203) of respondents were in the 21 to 23 years old category, with 23.0% (n=92) each for the 18 to 20 years old and 24 to 26 years old categories. Only 3.3% (n=13) were aged 27 and above. Ethnically, 90.8% (n=363) were Malay, 3.8% (n=15) Chinese, 3.5% (n=14) Indian and 2.0% (n=8) belonged to other ethnicities. The religious composition was predominantly Muslim (n=370, 92.5%), followed by 3.8% (n=15) Christians, 2.8% (n=11) Hindus, 0.8% (n=3) Buddhists and 0.3% (n=1) from other religions. Institutionally, 66.0% (n=264) were from Private Higher Learning Institutions (IPTs) and 34.0% (n=136) were from Public Higher Learning Institutions (IPTA). Regarding academic levels, 78.8% (n=315) were pursuing a degree, while 21.3% (n=85) were in diploma programs. The distribution across programs included 29.0% (n=116) in Pharmacy, 26.0% (n=104) in Science, Technology, Engineering, Mathematics (STEM), 17.8% (n=71) in other fields, 16.3% (n=65) in Health Sciences and 11.0% (n=44) in Accountancy, Business, and

Management. Year-wise, 14.0% (n=56), 29.5% (n=118), 35.3% (141), 16.0% (n=64) and 5.3% (n=21) were in their first to fifth years of study, respectively. In terms of family monthly income, 46.5% (n=186) reported RM1500 to RM3000, 44.5% (n=178) over RM3000 and 9.0% (n=36) less than RM1000.

Table I: Socio-demographic profiles of the respondents (n = 400)

Character-istics	Demographic Characteristics	Frequency (n)	Percentage (%)
Gender	Male	141	35.3
	Female	259	64.8
Age	18 – 20 years old	92	23.0
	21 – 23 years old	203	50.8
	24 – 26 years old	92	23.0
	27 years old and above	13	3.3
Ethnicity	Malay	363	90.8
	Chinese	15	3.8
	Indian	14	3.5
	Others	8	2.0
Religion	Muslim	370	92.5
	Hindu	11	2.8
	Christian	15	3.8
	Buddhist	3	0.8
	Others	1	0.3
University	Public Higher Learning Institutions (IPTA)	136	34.0
	Private Higher Learning Institutions (IPTS)	264	66.0
Level of Study	Diploma	85	21.3
	Degree	315	78.8
Programmes	Pharmacy	116	29.0
	Health Sciences	65	16.3
	Accountancy, Business & Management	44	11.0
	Science, Technology, Engineering, Mathematics	104	26.0
	Others	71	17.8
Year of Study	1	56	14.0
	2	118	29.5
	3	141	35.3
	4	64	16.0
	5	21	5.3
Family monthly Income	Less than RM1000	36	9.0
	RM1500 – RM3000	186	46.5
	More than RM3000	178	44.5

Respondents’ Knowledge of Organ and Tissue Donation

The knowledge of 400 respondents on organ and tissue donation was assessed based on a scoring system where correct answers received 1 mark, and incorrect or uncertain responses were given 0 marks. The findings, presented in Table II, indicate that 80%

(n=320) correctly identified brain death, 63.9% (n=256) recognised the potential for organ donation in cases of irreversible brain death and 75.9% (n=304) understood the necessity of clinical brain death for organ eligibility. However, misconceptions existed, with 44.3% (n=177) uncertain about the permissible age range for organ donors and 32.0% (n=128) incorrectly believing that the family of a deceased donor bears the surgery cost. Furthermore, 20.5% (n=82) incorrectly thought organ donation might disrupt funeral arrangements. While 84.0% (n=336) knew it is permissible to donate or receive organs from a living person, 74.3% (n=297) correctly acknowledged the permissibility of receiving organs from a person pronounced brain dead. Most respondents (n=354, 88.5%) recognised the potential for organ transplants to enhance recipients' quality of life. Of the respondents, 47.5% (n=190) exhibited good knowledge, 30.3% (n=121) moderate knowledge and 22.3% (n=89) poor knowledge regarding organ and tissue donation, as summarised in Table III.

Table II: Respondents’ knowledge of organ and tissue donation (n=400)

Knowledge of Organ and Tissue Donation	Yes N (%)	No N (%)	Unsure N (%)	Mean (SD)
Brain death occurs when the brain stops functioning, even if the heart is kept beating by artificial means.	320 (80.0)	7 (1.7)	73 (18.3)	1.38 (0.776)
A person who has experienced irreversible brain death but is maintained on a life-support system can be considered a potential organ donor.	256 (63.9)	21 (5.3)	123 (30.8)	1.67 (0.916)
A person must be pronounced clinically brain dead in order to have that person’s organs donated.	304 (75.9)	23 (5.8)	73 (18.3)	1.42 (0.781)
The age of organ donors may range from newborn to 70 years old.	180 (45.0)	43 (10.7)	177 (44.3)	1.99 (0.946)
When an organ is removed, the family of the deceased donor pays for the surgery to remove the organ.	37 (9.3)	235 (58.7)	128 (32.0)	2.23 (0.601)
Organ donation prevents or interferes with the arrangements of a funeral.	82 (20.5)	170 (42.5)	148 (37.0)	2.17 (0.741)
In Malaysia, it is allowed to donate or receive organs from a living person.	336 (84.0)	18 (4.5)	46 (11.5)	1.28 (0.656)
In Malaysia, it is allowed to receive organs from a person declared brain dead.	297 (74.3)	7 (1.7)	96 (24.0)	1.50 (0.855)
In Malaysia, there is a legal regulation regarding organ donation.	334 (83.5)	2 (0.5)	64 (16.0)	1.33 (0.735)
Organ transplants can be successful in prolonging and improving the recipient’s quality of life.	354 (88.5)	8 (2.0)	38 (9.5)	1.21 (0.597)

Table III: Distribution of knowledge level regarding organ and tissue donation (n=400)

No.	Level	n (%)
1	Good	190 (47.5)
2	Moderate	121 (30.3)
3	Poor	89 (22.3)

Respondents' Attitude Toward Organ and Tissue Donation

Table IV outlines the ten questions used to assess the attitudes of 400 respondents toward organ and tissue donation, with responses ranging from 'Strongly agree' to 'Strongly disagree.' Notably, 27.3% (n=109) of participants expressed comfort in requesting an organ from a family member, while 46.5% (n=186) agreed

that organ donation is a favourable choice for the family of a critically ill patient. Additionally, 41.5% (n=166) were willing to donate their organs if declared brain-dead and 54.0% (n=216) would allow their loved ones to do the same. Furthermore, 49.5% (n=198) believed they could do something good by donating organs after death, contrasting with 7.0% who desired bodily integrity for resurrection purposes. Concerns about doctors' inappropriate actions were expressed by 27.8% (n=111) of respondents. The overall attitude mean score was 36.84, with 31.5% (n=126) displaying a positive attitude, 61.0% (n=244) a neutral attitude, and 7.5% (n=30) a negative attitude toward organ and tissue donation, as detailed in Table V.

Table IV: Respondents' attitude on organ and tissue donation (n=400)

Attitude on organ and tissue donation	Strongly Agree N (%)	Agree N (%)	No Opinion N (%)	Disagree N (%)	Strongly Disagree N (%)	Mean (SD)
I would feel comfortable about requesting an organ (kidney, liver, heart, lung, or pancreas) from my family member.	80 (20.0)	109 (27.3)	72 (18.0)	99 (24.8)	40 (10.0)	3.23 (1.294)
Organ donation is a positive option for the family of a patient who is critically ill.	172 (43.0)	186 (46.5)	28 (7.0)	5 (1.3)	9 (2.3)	4.27 (0.826)
I am willing to donate my organs in case I become brain-dead.	115 (28.8)	166 (41.5)	89 (22.3)	21 (5.3)	9 (2.3)	3.89 (0.956)
I am ready to allow my loved ones to donate their organs in case they become brain-dead.	93 (23.3)	154 (38.5)	99 (24.8)	40 (10.0)	14 (3.5)	3.68 (1.047)
I would accept an organ transplant in order to preserve my life.	129 (32.3)	216 (54.0)	33 (8.3)	10 (2.5)	12 (3.0)	4.10 (0.876)
If I donate my organs or tissues at the time of death, it could be that a part of me will live on.	123 (30.8)	176 (44.0)	75 (18.8)	19 (4.8)	7 (1.8)	3.97 (0.919)
If I donate my organs or tissues at the time of death, I could be doing something good for someone else.	198 (49.5)	169 (42.3)	23 (5.8)	2 (0.5)	8 (2.0)	4.37 (0.787)
I want my body intact for the resurrection or for the afterlife.	28 (7.0)	67 (16.8)	200 (50.0)	84 (21.0)	21 (5.3)	2.99 (0.933)
The request for organ or tissue donation would place an additional burden on my family at a time of grief.	23 (5.8)	71 (17.8)	140 (35.0)	142 (35.5)	24 (6.0)	2.82 (0.986)
I am sure the doctors or nurses might do something inappropriate to me before I am dead if I agree to donate my organs.	111 (27.8)	103 (25.8)	99 (24.8)	59 (14.8)	28 (7.0)	3.53 (1.234)

Table V: Respondents' attitude toward organ and tissue donation (n=400)

No.	Level	n (%)
1	Positive	126 (31.5)
2	Neutral	244 (61.0)
3	Negative	30 (7.5)

Associations Between Sociodemographic Profiles and Knowledge Levels

The analysis revealed significant associations between

knowledge of organ and tissue donation and several sociodemographic factors (Table VI). Ethnicity (p = 0.004), type of university (p = 0.016), academic program (p = 0.000), year of study (p = 0.002), and family monthly income (p = 0.040) were all significantly linked to knowledge levels. Respondents who were Malay, from private universities, enrolled in health-related programs, in later years of study, or from higher-income families demonstrated higher knowledge. However, no significant associations were found with gender, age, religion, or level of study.

Table VI: Associations Between Sociodemographic Profiles and Knowledge Levels (n=400)

Sociodemographic Profile	High Knowledge	Moderate Knowledge	Low Knowledge	X Statistics (df)	p-value
Gender				5.599 (2)	0.061
Male	68 (35.8%)	34 (28.1%)	39 (43.8%)		
Female	122 (64.2%)	87 (72.5%)	50 (56.2%)		
Age				12.363 (6)	0.054
18 – 20 years old	51 (26.8%)	23 (19.0%)	18 (20.2%)		
21 – 23 years old	82 (43.2%)	66 (54.5%)	55 (61.8%)		
24 – 26 years old	49 (25.8%)	27 (22.3%)	16 (17.9%)		
27 years old and above	8 (4.21%)	5 (4.13%)	0 (0.0%)		
Ethnicity				19.306 (6)	0.004
Malay	178 (93.7%)	110 (90.9%)	75 (84.3%)		
Chinese	6 (3.16%)	1 (0.83%)	8 (8.99%)		
Indian	5 (2.63%)	4 (3.31%)	5 (5.62%)		
Others	1 (0.53%)	6 (4.96%)	1 (1.12%)		
Religion				10.388 (8)	0.239
Muslim	178 (93.7%)	114 (94.2%)	78 (87.6%)		
Hindu	4 (2.11%)	4 (3.31%)	3 (3.37%)		
Christian	7 (3.68%)	2 (1.65%)	6 (6.74%)		
Buddhism	1 (0.53%)	0 (0.0%)	2 (2.25%)		
Others	0 (0.0%)	1 (0.83%)	0 (0.0%)		
University				8.219 (2)	0.016
Public (IPTA)	52 (27.4%)	52 (43.0%)	32 (36.0%)		
Private (IPTS)	138 (72.6%)	69 (57.0%)	57 (64.0%)		
Level of Study				1.921 (2)	0.383
Diploma	46 (24.2%)	22 (18.2%)	17 (19.1%)		
Degree	144 (75.8%)	99 (81.8%)	72 (80.9%)		
Programmes				50.508 (8)	0.000
Pharmacy	68 (35.8%)	37 (30.6%)	11 (12.4%)		
Health Sciences	37 (19.5%)	20 (16.5%)	8 (8.99%)		
Accountancy, Business & Management	16 (8.42%)	14 (11.6%)	14 (15.7%)		
Science, Technology, Engineering, Mathematics	26 (13.7%)	37 (30.6%)	41 (46.1%)		
Others	43 (22.6%)	13 (10.7%)	15 (16.9%)		
Year of Study				24.793 (8)	0.002
1	28 (14.7%)	16 (13.2%)	12 (13.5%)		
2	52 (27.4%)	32 (26.4%)	34 (38.2%)		
3	63 (33.2%)	46 (38.0%)	32 (36.0%)		
4	28 (14.7%)	27 (22.3%)	9 (10.1%)		
5	19 (10.0%)	0 (0.0%)	2 (2.25%)		
Family Monthly Income				10.012 (4)	0.040
Less than RM1000	16 (8.42%)	9 (7.44%)	11 (12.4%)		
RM1500 – RM3000	100 (52.6%)	45 (37.2%)	41 (46.1%)		
More than RM3000	74 (38.9%)	67 (55.4%)	37 (41.6%)		

DISCUSSION

The knowledge section of the questionnaire generally consists of the definition, awareness and impacts of organ and tissue donation. The responses provided by the respondents in this section helped to determine their level of knowledge regarding organ and tissue donation.

From the findings, the respondents' level of knowledge was categorised as high level (n=190, 47.5%). This rate of knowledge is 10.5% higher than the rate disclosed by a prior study done in Qatar (10). The study conducted in Qatar targeted the general public aged 17 years and above, whereas our research focused exclusively on undergraduate university students. This difference in

the target population may account for the variation in the levels of knowledge observed. University students, particularly those pursuing higher education, are likely to have better access to educational resources, academic discussions, and awareness campaigns, which may contribute to their higher knowledge levels. The findings showed that 80% of the respondents were knowledgeable about the definition of brain death, and 63.9% knew that organ donation is possible for individuals who have experienced irreversible brain death while on artificial life support. Additionally, 75.9% understood that brain death must be diagnosed before organs and tissues are eligible for donation, and 45% knew that organ donors could range from newborns to individuals aged up to 70 years old. Furthermore, more than half of the respondents (n=235, 58.7%) were aware that the family of a deceased organ donor does not bear the financial responsibility for the surgery involved in organ donation, a fact aligned with the Malaysian Society of Transplantation (11). However, around 82 (20.5%) respondents believed that organ donation could hinder funeral arrangements, while 170 (42.5%) correctly identified that it does not. The majority of the respondents (n=336, 84%) also knew that living donations are permissible in Malaysia, and many of the respondents (n=297, 74.3%) were aware that brain-dead individuals can donate organs.

Respondents achieved an average score of 36.84 out of 50, with a standard deviation of 5.499. Despite this high level of knowledge, their attitude towards organ and tissue donation was still classified as neutral. While 47.3% of respondents said they would be comfortable asking their family members to donate organs, a larger population (89.5%) believed that organ donation is a favourable choice for the families of critically ill patients. 281 (70.3%) of the respondents expressed willingness to donate their organs if declared brain-dead and 247 (61.8%) were willing to allow loved ones to donate in the same situation. However, the positive attitude toward organ donation in this study (31.5%) was lower than that reported in India, where 53.5% of respondents had a positive attitude which may be attributed to several factors (Balwani et al., 2015). Cultural, religious, and societal beliefs play a significant role in shaping attitudes toward organ donation. India, with its diverse population, has seen significant government-led and non-governmental initiatives to promote organ donation awareness, which may have contributed to a higher percentage of positive attitudes. These initiatives, coupled with widespread campaigns and education efforts, could have fostered greater acceptance and willingness among the population. Nonetheless, 345 (86.3%) said they would accept organ transplants if needed to save their lives, while 30 (7.6%) were reluctant to donate organs if declared brain-dead. This reluctance was influenced by various factors, including the belief in maintaining bodily integrity for religious reasons or the afterlife, as well as mistrust in medical personnel. This mistrust may stem

from concerns about potential inappropriate actions by doctors or nurses before the individual's death or during the organ donation process. The latter finding is consistent with a study by Minniefield and Muti (2002), which showed that 32% of respondents in New York had concerns about the motivations of doctors during the organ donation process. The respondents also had a fear that they would be neglected by the doctors and other healthcare personnel if they agreed to donate their organs (12). Similarly, an Australian study revealed that 30% of the respondents feared the possibility of organs being traded on the black market or unfairly distributed (13).

Practical Implications

The findings from this study highlight the need for more targeted public health campaigns and educational interventions to address misconceptions and build trust in the organ donation process. Public health campaigns could focus on raising awareness about the legal and medical safeguards in place to ensure ethical and safe organ donation practices. Addressing mistrust in healthcare providers, particularly by engaging religious and community leaders, could be an effective way to increase acceptance of organ donation. Additionally, campaigns should provide clear information about the minimal disruption to funeral arrangements and emphasise the life-saving impact of organ donation. Educational interventions should also aim to improve understanding of brain death and living donations, underlining that these practices are both medically and legally sound.

Educational initiatives could be tailored for different demographic groups to improve both knowledge and attitudes. For instance, younger age groups who demonstrated lower levels of knowledge about brain death could be targeted through school or university programmes. Similarly, cultural and religious factors influencing attitudes towards organ donation can be addressed by involving community and religious leaders in public messaging. Such targeted interventions would help ensure that campaigns resonate more effectively with specific population segments, thereby improving overall acceptance of organ donation.

Limitations

This study had several limitations. Firstly, the sample was predominantly composed of students from specific academic programmes, which may not be representative of the general population in Malaysia. As a result, the findings cannot be generalised to all demographic groups. Future research would benefit from a more diverse sample, including participants from various educational backgrounds, professions, and regions. Secondly, this study relied on self-reported data, which may be influenced by social desirability bias, whereby participants might have provided responses they believed to be more socially acceptable rather than their

true beliefs and attitudes. Finally, the cross-sectional design of the study captures attitudes and knowledge at a single point in time, and it does not account for any changes over time or the effects of ongoing public health campaigns. Longitudinal studies could provide further insights into how knowledge and attitudes evolve and how effectively public health interventions improve these factors.

CONCLUSION

Undergraduate university students in Malaysia exhibit a high level of knowledge and a moderate attitude towards organ and tissue donation. Certain sociodemographic profiles are linked to varying levels of knowledge on this subject, while no significant associations have been found between sociodemographic profiles and attitudes. The findings of this study provide valuable insights for healthcare professionals and regulatory bodies in promoting awareness about the benefits of organ donation to enhance donation rates. Additionally, communication channels, including educational platforms and public campaigns, can be leveraged to improve students' understanding and attitudes towards organ and tissue donation. Enhancing these efforts through consistent and well-designed initiatives may inspire students to become advocates for organ donation, ultimately contributing to an increase in donation rates nationwide.

ACKNOWLEDGEMENT

The authors would like to thank the Faculty of Pharmacy and Health Sciences, Universiti Kuala Lumpur Royal College of Medicine (FPHS UniKL RCMP) and all stakeholders from the industry for providing the necessary facilities for the students to experience a very conducive learning environment during their teaching and learning process.

REFERENCES

- Jawoniyi O, Gormley K, McGleenan E, Noble HR. Organ donation and transplantation: Awareness and roles of healthcare professionals-A systematic literature review. *J Clin Nurs*. 2018;27(5-6):726-38. doi:10.1111/jocn.14154.
- MyHealth Ministry of Health Malaysia. Organ donation. Available from: <http://myhealth.moh.gov.my/en/organ-donation-2/>. Accessed 24 September 2023.
- Wong LP. Information needs, preferred educational messages and channel of delivery, and opinion on strategies to promote organ donation: a multicultural perspective. *Singapore Med J*. 2010;51(10):790-5.
- International Registry in Organ Donation and Transplantation. Deceased donor evolution. Available from: <http://www.irodat.org/?p=database&c=0#data>. Accessed 15 November 2023.
- Badrolhisam NI, Zakaria Z. Knowledge, religious beliefs and perception towards organ donation from death row prisoners from the perspective of patients and non-patients in Malaysia: A preliminary study. *Int J Humanit Soc Sci*. 2012;2(24):197-206.
- Transplantation Unit, Ministry of Health Malaysia. Did You Know? We Are Capable To Help Others. Available from: <https://www.moh.gov.my/moh/resources/auto%20download%20images/589d7a9b94f34.pdf>. Accessed 15 November 2023.
- Mohamed DE, Hossein YES, Eltomy EM. Students' Knowledge and Attitude Toward Organ Donation and Transplantation at Selected Faculties of Minia University. *Minia Sci Nurs J*. 2022;11(1):32-9. doi:10.21608/msnj.2022.121999.1019.
- Tumin M, Noh A, Raja Ariffin RNB, Mohd Satar N, Yong SL, Lim S, et al. Low organ donation rate in Malaysia: A survey. *J Health Transl Med*. 2014;17(1).
- Riyanti S, Hatta M, Norhafizah S, Balkish MN, Siti ZM, Akmal HA, et al. Organ donation by sociodemographic characteristics in Malaysia. *Asian Soc Sci*. 2014;10(4):264. doi:10.5539/ass.v10n4p264.
- El-Shoubaki H, Bener A. Public knowledge and attitudes toward organ donation and transplantation: a cross-cultural study. *Transplant Proc*. 2005;37(5):1993-7. doi:10.1016/j.transproceed.2005.03.014.
- Clinic debunks myths about organ donations and transplants. Available from: <http://www.mst.org.my/articles/mayoclinic.html>. Accessed 4 December 2023.
- Minniefield WJ, Muti P. Organ donation survey results of a Buffalo, New York, African-American community. *J Natl Med Assoc*. 2002;94(11):979-86.
- Hyde MK, Wihardjo KR, White KM. Do the myths still exist? Revisiting people's negative beliefs about organ donation upon death. *Psychol Health Med*. 2012;17(5):530-41. doi:10.1080/13548506.2011.647698.
- Janahi FK, Al Rais A, Al Rukhaimi M, Khamis AH, Hickey D. Public awareness of knowledge, belief, and attitude regarding organ donation and organ transplantation: a National Survey from the United Arab Emirates. *Transplant Proc*. 2018;50(10):2932-8. doi:10.1016/j.transproceed.2018.08.006.
- Akbulut S, Demyati K, Toman I, et al. Medical students' knowledge, attitudes and awareness toward organ donation. *Transpl Immunol*. 2022;73:101634. doi:10.1016/j.trim.2022.101634.
- Alzahrani MM, Alghamdi AA, Alghamdi SA, Alotaibi RK. Knowledge and Attitude of Dentists Towards Obstructive Sleep Apnea.

- Int Dent J. 2022;72(3):315-21. doi:10.1016/j.identj.2021.05.004.
17. Sözen E, Güven U. The Effect of Online Assessments on Students' Attitudes towards Undergraduate-Level Geography Courses. Int Educ Stud. 2019;12(10):1-8. doi:10.5539/ies.v12n10p1.