

ORIGINAL ARTICLE

Knowledge, Attitude and Its Associated Factors Towards Organ Donation Among General Public in Kelantan: A Cross-sectional Study

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ABSTRACT

Introduction: Organ transplantation is crucial for end-stage organ failure treatment, but there's a growing discrepancy in donor supply, necessitating an understanding of public knowledge and attitudes to increase willingness. The study aimed to assess the knowledge, attitude and associated factors towards organ donation among the general public in Kelantan, Malaysia. **Materials and methods:** We conducted a cross-sectional study among 162 public in Kubang Kerian, a new economic hub in Kelantan, Malaysia, selected through convenience sampling. Participants' knowledge and attitudes towards organ donation were assessed using a self-administered question, with seven items measuring knowledge and eleven measuring attitudes. Descriptive statistics, an independent t-test or one-way analysis of variance test and a Spearman correlation test were used. **Results:** 56.8% have low knowledge of organ donation. However, their attitude towards organ donation was positive. Good knowledge was significantly associated with age and education ($p \leq 0.05$). Ethnicity, marital status, employment status and monthly household income were significantly associated with attitudes ($p \leq 0.05$). The aggregate score value of the items about knowledge and attitude showed a fair correlation ($r = 0.336$, $p < 0.001$). **Conclusion:** This study concluded that while participants had limited knowledge about organ donation, their attitudes towards it were positively influenced by factors such as age, education, ethnicity, marital status, employment status, and monthly household income. Community-based education campaigns, policymakers' and religious leaders' involvement are crucial in promoting public awareness about organ donation in life-saving treatments.

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INTRODUCTION

Organ transplantation plays an important role in life-saving treatment for patients with end-stage organ failure. The concept of extending life and well-being through organ transplantation has captured the attention of medical health professionals, scientists, and students worldwide. Organ transplantation began in 1954 and has made significant advancements and is now a prevalent aspect of medical practice in both developed and developing nations (1, 2). However, the shortage of donor organs represents the most challenging global problem. Organ transplantation entails dealing with the recipient's medical needs while also dealing with a matched donor in the case of a live donor or his family in the case of a deceased donor. The ethics surrounding

organ transplantation, whether involving a deceased or a living donor, are complex and frequently muddled by ethical and religious nuances (1).

Globally, more patients are on waiting lists for organ transplants than organ donors. As a result, the gap between organ supply and demand has widened over the years (3). In Malaysia, organ transplantations have begun since the 1970s. However, the annual number remains less than 500. Malaysia registered a 0.2 per million population, one of the world's lowest cadaver organ donation rates (4). Despite an increase in organ donors to 401,242, this only accounts for 1.3% of Malaysia's total population (5). Malaysia's organ donation rate remains low (6), with Kelantan's pledge rate at 0.4%, largely due to fear and unwillingness among the population to donate organs (7). According to the National Transplant Resource Center of Malaysia, as of November 2022, there are 10054 potential transplant patients on the waiting list (8). Despite advancements in transplantation, limited public awareness and cultural

opposition are some challenges (1,9).

Knowledge towards organ donation plays an integral role in determining the public's attitudes and readiness for organ donation. Organ donation and transplantation are the best and most cost-effective clinical treatments for end-stage organ failure (1). Therefore, the public's knowledge and attitudes toward organ donation are important as this could affect the decision and willingness of an organ donor. In this study, we aimed to determine public knowledge and its associated factors of organ donation. Few current papers from Malaysia were included in the review, suggesting a need for more local research to determine the Malaysian public's organ donation knowledge and attitudes. Thus, the present study was conducted to contribute to the body of knowledge on organ donation. To increase awareness of organ donation and inform policy and legislation targeted at increasing the number of organ donations, an investigation of the knowledge and attitudes towards organ donation among the general Malaysian public is necessary. Therefore, this study aimed to assess the knowledge, attitude and associated factors towards organ donation among the general public in Kelantan, Malaysia.

MATERIALS AND METHODS

Study design and setting

A cross-sectional study was conducted from January to March 2019 in the Kubang Kerian area, a new economic hub for Kelantan. The study design is beneficial to generate preliminary evidence for future research planning (10). The research site in Kelantan, a densely populated royal town with 15,652 populations (11), is chosen due to its low pledge organ donation rate (7).

Study population and sample size

All participants were from the communities within the Kubang Kerian area and were recruited via a convenient sampling technique. Inclusion criteria were public aged 18 years and older, literate in Malay or English, while those who had pledged as organ donors were excluded. The sample size was determined using a two-proportion method with an absolute precision of 0.40 and 0.24 of excellent information about organ donation (12) and 80% power, assuming a type I error probability (alpha) of 0.05. The calculated sample size was 162 after accounting for the 20% non-response rate.

Study instruments

We adopted a structured self-administered questionnaire in English based on previous research (13). Our survey questionnaire consisted of 3 sections. Section I socio-demographic factors, such as age, gender, ethnicity, marital status, education level, employment status, monthly household income and sources of information

regarding organ donation are included. Section II, participant's knowledge of organ donation consists of 7 items. Each knowledge-related question about organ donation was given a "Yes" or "No" response choice with a maximum score of seven. For each correct answer, one score was added, and the incorrect answer was zero. Hence, the sum of the participants' responses represents the total knowledge score towards organ donation. The total points obtained were converted into a percentage from the score using the formula $(\text{score} \times 100)/7$, which were classified into two categories: low ($<50\%$) and high ($\geq 50\%$) from previous studies (12,14). Section III examined participants' attitudes towards organ donation consisting of 11 items, using a 5-point Likert scale, with a total score of Strongly Disagree, No Sure, Agree, or Strongly Agree, ranging from 11 to 55. Participants who scored above the mean value in attitude-related questions were considered positive, while those below were considered negative. The questionnaire was translated into Malay, translated back to English, and checked by three independent reviewers (one physician, one nursing lecturer, and one language expert) fluent in both languages to verify the questionnaire's consistency and content validity. Discussion on ambiguous questions in the questionnaire and clarity was made. Face validity was tested on 30 public in another state before data collection. No modification of the questionnaire was required. Thirty respondents were chosen because a general rule of thumb is to take 30 or more as an estimation parameter (15). A Cronbach's α of 0.83 was obtained, indicating a good level of item reliability (16).

Data collection

Participants were selected by the site researcher and provided with written information about the study after being briefed on its purpose. Before recruitment, both written and verbal consent were obtained from participants. All completed questionnaires were reviewed for completeness. No personal information was collected through the questionnaire to maintain anonymity. Consent forms containing personal information were stored separately in a locked cabinet.

Data Analysis

The study utilized SPSS version 26.0 for data analysis, including descriptive statistics, independent t-tests, one-way analysis of variance test and correlation tests, with significance set at $P \leq 0.05$.

Ethical Approval

Universiti Sains Malaysia, Human Research Ethics Committee (Reference Number: USM/JEPeM/20120646) approved the study. Anonymity and confidentiality were observed in this study. The study was voluntary, participants were informed about their rights, and data was presented in a way that prevented the identification

of any specific participant. Completed consent forms and responses were stored separately, and coded numbers were used during data collection. All participants gave informed consent.

RESULTS

Participants’ socio-demographic characteristics and association between knowledge and attitude towards organ donation

A total of 162 public participated in the study. The mean age was 33 ± 12.10 years, and most were females (59.9%) compared to males (40.1%). For ethnicity, Malay comprised 64.8%. Among the participants, 69.1% had a higher education, 55.6% were unmarried, 54.9% unemployed, and 51.2% had a monthly income of less than MYR4850. Of the study participants, 43.8% obtained the source of information concerning organ

donation from the Internet.

Findings show knowledge was significantly associated with age (p=0.001) and participant education (p=0.001). The study found that while gender, ethnicity, marital status, employment status, monthly household income, and sources of information about organ donation did not significantly impact knowledge scores, ethnicity (p< 0.001), marital status (p=0.044), employment status (p=0.005), and monthly household income (p=0.025), significantly influenced attitudes towards organ donation. However, age (p=0.687), gender (p=0.082) and education level (p=0.894) were not significantly associated with attitudes. Table I presents the participants’ socio-demographic characteristics and association between knowledge and attitude towards organ donation.

Table I: Socio-demographic characteristics and association between knowledge and attitudes towards organ donation (n=162)

| Variables | Knowledge | | t-stat (df) | P value* | Attitudes | | t-stat (df) | P value* |
|---------------------------------|-----------|------------|-------------|----------|------------|--------------|-------------|----------|
| | n (%) | Mean (SD) | | | n (%) | Mean (SD) | | |
| Age | | | 3.39(160) | 0.001 | | | 0.40 (160) | 0.687 |
| ≤ 33 years old | 104(64.2) | 3.83(1.93) | | | 104 (64.2) | 45.39 (5.72) | | |
| > 33 years old | 58(35.8) | 2.78(1.82) | | | 58 (35.8) | 45.03 (4.87) | | |
| Gender | | | 0.88(160) | 0.381 | | | 1.75 (160) | 0.082 |
| Male | 65(40.1) | 3.62(2.04) | | | 65 (40.1) | 46.17 (5.61) | | |
| Female | 97(59.8) | 3.34(1.90) | | | 97 (59.8) | 44.66 (5.23) | | |
| Ethnicity | | | -1.21(160) | 0.229 | | | -4.93 (160) | <0.001 |
| Malay | 105(64.8) | 3.31(1.93) | | | 105 (64.8) | 43.81 (5.02) | | |
| Non-Malay | 57(35.2) | 3.70(1.99) | | | 57 (35.2) | 47.93 (5.14) | | |
| Marital status | | | 1.75(160) | 0.083 | | | -2.03 (160) | 0.044 |
| Married | 72(44.4) | 3.15(1.96) | | | 72 (44.4) | 46.2 (5.39) | | |
| Unmarried | 90(55.6) | 3.69(1.92) | | | 90 (55.6) | 44.5 (5.35) | | |
| Education Level | | | -3.47(160) | 0.001 | | | -0.13 (160) | 0.894 |
| Low | 50(30.9) | 2.68(1.53) | | | 50 (30.9) | 45.18 (4.96) | | |
| High | 112(69.1) | 3.79(2.03) | | | 112 (69.1) | 45.30 (5.63) | | |
| Employment Status | | | 0.64(160) | 0.525 | | | -2.82 (160) | 0.005 |
| Unemployed | 89(54.9) | 3.54(1.88) | | | 89 (54.9) | 44.2 (5.38) | | |
| Employed | 73(45.1) | 3.34(2.05) | | | 73 (45.1) | 46.2 (5.21) | | |
| Monthly Household Income | | | -0.99(160) | 0.320 | | | -2.26 (160) | 0.025 |
| ≤ MYR4850 | 83(51.2) | 3.30(1.85) | | | 83 (51.2) | 44.34 (5.76) | | |
| > MYR4850 | 79(48.8) | 3.61(2.06) | | | 79 (48.8) | 46.24 (4.88) | | |

*Independent t-test
 Low education is secondary education in Malaysia.
 High education includes certificates, diplomas, and undergraduate and postgraduate studies.

Knowledge of participants towards organ donation

Of the 162 public responses, less than half reported knowing (35.8%) about organ donation. More than three-quarters (77.2%) did not know about the laws of organ donation and the steps involved in organ donation

(79.6%). However, 75.9% of them thought that organ donation was a treatment option, while 92.0% thought that the age of the organ donor and the receiver were important. Table II presents the knowledge of participants towards organ donation.

Table II: Participants’ knowledge towards organ donation (n=162)

| Question | Yes n (%) | No n (%) |
|--|--------------|-------------|
| Do you know enough knowledge about organ donation? | 58 (35.8) | 104 (64.2) |
| Do you know about the laws of organ donation? | 37 (22.8) | 125 (77.2) |
| Do you think an organ donation is a treatment option? | 123 (75.9) | 39 (24.1) |
| Do you have any information about brain-dead? | 65 (40.1) | 97 (59.9) |
| Do you think that brain-dead is a certain method to determine death? | 94 (58.0) | 68 (42.0) |
| Do you know the steps of organ donation? | 33 (20.4) | 129 (79.6) |
| Do you think the age of the organ donor and receiver is important? | 149 (92.0) | 13 (8.0) |

Knowledge and attitude level of participants towards organ donation

Findings reveal that the level of knowledge towards organ donation was low among most participants (56.8%). However, 100% show a positive attitude towards organ donation. Table III shows the knowledge and attitude level of participants towards organ donation.

Table III: Participants’ knowledge and attitude level towards organ donation (n=162)

| Knowledge level | n (%) |
|-----------------|------------|
| Low | 104 (64.2) |
| High | 58 (35.8) |
| Attitude level | |
| Negative | 65 (40.1) |
| Positive | 97 (59.9) |

Correlation between knowledge and attitude level towards organ donation

The study reveals a significant correlation between public knowledge and attitudes towards organ donation and a fair correlation (r= 0.336). In this analysis, the correlation result shows the p-value < 0.001, thus rejecting the null hypothesis (Table IV).

Table IV: Correlation between participants’ knowledge and attitudes towards organ donation (n=162)

| Knowledge Level | Attitudes Level | |
|-----------------|-----------------|-----------|
| | r | P values* |
| | 0.336 | <0.001 |

*Pearson correlation

DISCUSSION

The present study assessed the level of knowledge and attitudes towards organ donation among the general public in Kelantan, northeastern Peninsular Malaysia. Our findings demonstrated that more than half of the participants’ knowledge was low. Nevertheless, 100% have a positive attitude towards organ donation. Age and education were associated with knowledge of organ donation. In addition, factors such as ethnicity, marital status, employment status and monthly household income were associated with attitudes. Findings highlight a significant correlation between knowledge and attitudes towards organ donation among the Malaysian

public. Most participants were female, young adults, and had high education, revealing that the Internet was a source of information about organ donation.

Our study revealed that the general public knew little about organ donation, concurring with Puraghaei et al. and Agrawal et al.’s studies, which found knowledge about organ donation was lacking (12,14). However, contrary to studies conducted in Saudi Arabia (2,17) and China (18) showed that most participants have high knowledge about organ donation. These disparities could be attributable to knowledge measurement and cultural and country-specific elements and policies such as traditional values, religious perspectives, campaign efforts, and institutional health credibility (19). Our findings suggest a need to educate the public on organ donation through a public education campaign and various mass media.

Our findings demonstrated that slightly more than half of the participants’ knowledge was low; nevertheless, 100% of participants have a positive attitude towards organ donation. Previous studies demonstrate that knowledge affects attitudes towards organ donation. According to Ismail, Lim, and Mahadevan (20), knowledge may affect a person’s desire to make decisions about organ donation. On the other hand, knowing about organ donations affects one’s willingness to give an organ (18). Together with better knowledge and information, hence, it may result in the act of organ donation. The common reason for organ donation refusal is often attributed to a lack of knowledge (19). Another plausible explanation could be that religion-cultural was the main obstacle to organ donation in Malaysia (21, 22). These results are surprising in that they reveal that many of those opposed on some level to organ donation do not recognize the good that donation can do. Socio-demographic factors like ethnicity, marital status, employment status, and monthly household income were found to be less likely to support organ donation, indicating less altruistic behaviour.

In addition, our findings show that most did not know about the legal aspects and steps involved in organ donation. Consent in medical practice is a complicated process that involves organ donation and transplantation. Organ transplantation presents significantly more

difficulties than most other medical or surgical operations (23). The present data shows that participants perceived organ donation as a treatment option, while most thought that the age of the organ donor and the receiver were important. Therefore, a better understanding of the laws and regulations governing organ donation and transplantation is required. This impact may result in a more positive public reaction to organ donation. Furthermore, the ethical principles of organ donation serve as an acid test for the public in evolving and resolving many of the future moral challenges they are expected to face. Finally, the ethics of organ donation have significant societal implications since it would serve as the foundation for resolving many conflicts in emerging regenerative sciences (23).

Our findings showed that age was significant, with knowledge of organ donation being comparable with research done among individuals in Jazan, Saudi Arabia, who were young adults (2). In addition, research shows that most young adults in Malaysia prefer to source health information from websites and are more technologically savvy to adopt it (24). The results of this study also concur with those of a previous study conducted in Malaysia that showed young individuals were receptive to using technology to seek health-related information, including on medical conditions, symptoms and treatment options (25, 26).

Education was also significant with knowledge of organ donation. The present finding concurs with a study performed in Jeddah (17) and contrary to a South Korean study (27), which showed a higher level of organ donation knowledge is associated with a higher educational level. A Pew Research Center survey shows highly educated people have better scientific understanding (28). The plausible explanation could be higher education levels may lead to better technological savvy and increased awareness, while those with higher education levels are more willing to donate organs (29).

Our findings demonstrate that males and females in our study did not substantially vary in their knowledge regarding organ donation, comparable with Woodman et al.'s study among medical students in the Eastern Province of Saudi Arabia (30). However, a study in South India found women performed worse than men in terms of their knowledge of organ donation (31). Therefore, educational programs for both genders should be a good strategy to promote knowledge about organ donation in the Malaysian population. Unfortunately, little research has examined the differences between genders in their knowledge of organ donation. As a result, gender comparisons are not possible. Therefore, additional research is warranted into the gender gap in public knowledge.

The present study demonstrates that most participants were unemployed and had a monthly household

income of less than MYR 4,850 (USD 1,043.68 as of 16 January 2024). In Malaysia, three income groups—the top 20% (T20), middle 40% (M40), and bottom 40% are used to classify Malaysians (B40). B40 is in the Bottom 40% of Malaysian household income, earning less than MYR 4,850 per month (32). It could be inferred from the above fact that B40 category Malaysian are from underprivileged strata with limited spending power. Challenges accessing the Internet were faced by the B40-income families in Malaysia (33). Hence, this explains why B40 and the unemployed benefit the least from the internet divide. Access to the Internet has been identified as vital for engagement towards health information portals. Thus, the effects of low knowledge of organ donation may also be largely explained by internet access among disadvantaged populations. Thus, much remains to be studied about the Internet access gaps between underserved populations and knowledge of organ donation.

Malaysia is recognized for being ethnically diverse with a multicultural population. Nevertheless, in Kelantan, Malays form 95% of the population, making them the largest ethnic group (11). Therefore, this explains the ethnic discrepancies and that Malay, who are Muslim, represent the predominant ethnic group in this study. Organ donation has become an issue in Malaysia due to the lack of individuals coming forward as donors. Malays were the least involved with organ donation among the three main races compared to other communities, such as the Indians and Chinese. Their religious aspect of organ donation is the main facet of disagreements with organ donation. Organ donation appears to be a highly controversial issue among Muslims, as it contradicts several fundamental Islamic teachings regarding the sacred and forbidden nature of the human body. As a result, Malays and Muslims are less willing to be donors or accept organ donations (34,35). Therefore, community-based education campaigns are needed to raise awareness about the significance of organ donation (deceased donor and living donation) in aiding individuals with severe organ needs (36). The Islamic view on organ donation conveyed to the public by religious leaders is necessary to raise awareness about organ donation in Malaysia (37).

Additionally, some Malays are unaware that Islam permits organ transplants to be performed to save other people's lives. Furthermore, there was a lack of awareness of this problem, making it impossible to find a suitable remedy or attempt to promote organ donation. Besides, it was difficult to discuss organ donation without bringing up the Malay community's problems and traditions. Their inability to make decisions and ingrained ways of doing things paint a clear picture of the Malay community's lack of enthusiasm for organ donation (22). However, because there were insufficient representatives for each ethnicity, the association between ethnicity and knowledge of organ donation could not be examined.

Therefore, this study provides valuable insights for increasing diversity (Chinese, Indian, Sikh and other ethnic groups) and inclusion in future research.

Our findings concur with studies conducted in India and Saudi Arabia, where participants obtained online information on organ donation (2, 38). Corresponding to Blank and Lutz's finding, the Internet is the crucial technology of the information age and plays an important part in every aspect of our modern lives (29). The implication suggests that the Internet could play a key role in raising knowledge of organ donation.

Attitude is one of the imperative aspects of organ donation, as stated by previous studies (39,40). Even though most of our study population is Muslim, this survey shows that 100% of the public has a positive attitude towards organ donation was similar to a representative poll among the Swiss's attitude towards organ donation (39). Although the attitude is positive, organs donated for transplantation remain scarce in Malaysia. Thus, suggesting the importance of raising awareness about the importance of communicating the willingness, both in written form and to communities. Hence, more work is needed to capitalize on the strong support for organ donation.

Contrary to our findings, other studies conducted in Turkey and China showed negative attitudes towards organ donation (19,40). These discrepancies might be related to cultural and country-specific factors such as traditional values, religious beliefs, compensation mechanisms, and ideals (19) and are considered an underlying organ donation decision (41). Our findings show attitudes towards organ donation in Malaysia and other countries differ. Malays are less likely to be donors and accept organ donation as compared to Chinese and Indian (42). Hence, the relationship between knowledge and attitudes toward organ donation needs more research.

In our study, marital status was significantly associated with attitude. However, a comparison on this issue is impossible due to the lack of literature displaying the relationship between attitude levels of organ donation and marital status. Thus, the findings can be recommended in prompting further intervention strategies to link knowledge and attitudes towards organ donation and its associated factors among the public in a more adaptable way. In addition, these data are essential to optimize the utilization of healthcare professionals, constituting an important part of raising awareness of organ donation knowledge and process, which may enhance the public's decisions about organ donation. Nevertheless, this study serves as a crucial starting point for further studies.

Study limitations

There are some limitations noted in this study. First,

the study was conducted in a rural Malaysian state. Therefore, the findings may not represent the public across Malaysia. Furthermore, the implications for other populations in other states or areas remain unknown. Second, the study was conducted in a state that has a 95% majority of Malay (11). Thus limiting the results' generalizability to the Chinese and Indian communities in Malaysia. Therefore, to generalize the results, future studies should involve participants from different ethnic groups in Malaysia. Third, the findings cannot be concluded as a cause or an effect from a cross-sectional study. Finally, the authors suggest that future research recruit a larger sample of a diverse population with similar demographic factors.

CONCLUSION

This study concluded that while participants had limited knowledge about organ donation, their attitudes towards it were positively influenced by factors such as age, education, ethnicity, marital status, employment status, and monthly household income. Community-based education campaigns, policymakers' and religious leaders' involvement are crucial in promoting public awareness about organ donation in life-saving treatments.

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