

Organ Donation by Sociodemographic Characteristics in Malaysia

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Abstract

Willingness to pledge as an organ donor after death in Malaysia increased from 26 donors to 39 donors in 2009 compared with the previous year. However, this is still a relatively low number, translating to a donation rate of 1.38 per one million people. The aim of this study was to determine the proportion of receiving information about organ donation, willingness to donate, refusal factors for organ donation and reasons for refusal. We used data from organ donation module from the National Health and Morbidity Survey (NHMS) 2006, a nationwide cross-sectional study by the Institute for Public Health. Data were analyzed using SPSS ver. 19 and Stata Ver. 11 for descriptive and inferential statistics. They were 34,208 respondents in this study. About 69.6% (95%CI: 68.65-70.15) respondents who ever received information on organ donation and the proportion of those who pledged as organ donors was 1.5% (95%CI: 1.40-1.70). Pledge for organ donor was less likely among Malays (aOR=3.45, $p<0.001$), those with no formal education (aOR=3.93, $p=0.001$) and those with monthly incomes less than RM1000 (aOR=1.87, $p=0.001$). Main reasons for not pledging were fear (39.4%), against their religion (10.5%) and uncertainty because of religion (10.9%). Study revealed receiving information alone won't encourage organ donation. Therefore, awareness and in-depth knowledge is necessity to create positive perception on pledging for organ donation.

Keywords: National Health Morbidity Survey, organ donation, pledge, Malaysia

1. Introduction

Donating body organs or tissues is a process that enables transplantation in others in whom organs or tissues have failed. After receiving an organ transplant, a person can proceed to live with a better quality of life. It is a noble practice that can change the lives of many people with organ and tissue failure, save lives and give patients and their families hope for a better life. This is a method of treatment that has been widely accepted around the world. The number of patients who need organ transplants is increasing from year to year, but the number of potential donors who wish to donate after death is still low.

The highest organ donation rate in the world is in Spain, with 31.5 donors per one million people; other European countries have a mean of 15 donors per one million people (LP, 2010). Higher education, younger age and factors associated with political affiliation determined respondents' willingness to donate organs, and consent was given to donors' relatives (Saleem et al., 2009).

In China, 1 to 1.5 million patients requires organ transplantation, but only 13,000 transplants are conducted annually. A study in China reported that 49.8% of Chinese respondents were willing to donate their organs, and among them, 62% nominated relatives to be their most likely recipients, which was similar to the results of a study in Qatar (Zhang et al., 2007; Khan et al., 2011).

Several studies in Western countries as well as among Asian communities found that one factor that influenced the willingness to donate one's own or a family member's organ was racial disparities. It has been shown that Asians are more reluctant to donate their organs (Manninen & Evans, 1985). Cultural differences, religion, and understanding of organ donation procedures are among the main reasons for the low prevalence of organ donations (Yeung et al., 2000).

A qualitative study conducted in the Philippines identified major factors related to organ donation, including

awareness, personal experience with organ donation, family and religious beliefs, attitudes, health profession and cultural issues (Albright et al., 2005).

In Malaysia, the number of actual donors in 2009 was 39, which translated to a conversion rate of 27% and a donation rate of 1.38 per one million people. In terms of pledging, only 0.57% of Malaysians have pledged to donate their organs and tissues, whereas the number of Malaysians undergoing haemodialysis as a result of renal failure increased threefold, from 7,837 in 2001 to 22,932 in 2010 (Registry, 2009). Studies have shown that by an ethnic distribution, Malays were less willing to donate their organs compared with the other three major ethnic groups (S. Maliga); another study revealed that fear was the most common reason for not pledging (Morgan et al., 2008).

Therefore, using previous National Health Morbidity Survey (NHMS) data from 2006, this study determined the proportion of those who had received information about organ donations, the proportion of those who were willing to donate after death, the factors associated with not wanting to donate and the main reasons for refusal.

2. Instrument

The questions regarding organ donation were asked of all eligible respondents (18 years and above). The organ donation module contained four questions that covered receiving information regarding organ donation, pledging as an organ donor, available influences on pledging as an organ donor after death and reasons for not pledging. For the receiving of information, respondents were asked if they had ever received any information regarding organ donation and had to choose one of the following answer options: (1)=Yes, (2)=No, (3)=Do not know and (4)=Refuse to answer. For pledging as an organ donor, the answer choices were (1)=Yes, (2)=No and (3)=Refuse to answer. Respondents were also asked about the available information that had influenced whether they would pledge as organ donors after death, with the answer choices of (1)=Yes, (2)=No, (3)=Do not know and (4)=Refuse to answer. The last question asked about the reasons for not pledging, but respondents could choose multiple answers from among the following: (1)=uncertainty because of religion, (2)=against their religious practice, (3)=fear, (4)=objections from family, (5)=belief that the corpse would suffer, (6)=not receiving support from health staff, (7)=not knowing where to register, and (8)=others. Field data collection was conducted for four months in 2006. A bilingual (Malay and English) pre-coded questionnaire was designed, pretested and piloted prior to the administration of the survey. Trained research assistants conducted face-to-face interviews with all household members.

2.1 Variables Definition

Of the classifications of the three major ethnic groups in Malaysia were Malays, Chinese and Indians, followed by 'other Bumiputeras' and 'Others'. Other Bumiputeras comprises indigenous groups and local Sabahans and Sarawakians. 'Others' were mostly foreigners, immigrants both legal and illegal, who were residing in Malaysia.

Education level referred to the highest level of schooling a person had completed in a public or private educational institution that provides formal education. Those who had never attended school in any of the educational institutions that provide formal education were considered as having no formal education. Primary school refers to standard 1 to 6 or the equivalent. Those whose highest level of education was from form 1 to 5 or the equivalent were considered as having secondary education and tertiary referred to those who possessed a diploma or higher qualifications.

Household income was classified into four income groups: "less than RM1000", "RM1000-RM2999", "RM3000-RM4999" and "RM5000 and above". One USD equals approximately 3 Malaysia ringgit (MYR).

3. Methodology

3.1 Sample and Design

The data were extracted from the NHMS 2006. The survey questionnaire was designed to collect pertinent information on the personal characteristics of the survey population and detailed information on their health characteristics. Organ donation was one of the topics covered in the survey. A total of 34208 eligible respondents aged 18 years and above participated in the study. It was a population-based survey and used a sampling frame from the Malaysian Department of Statistics. The country is divided into contiguous geographical areas called Enumeration Blocks (EBs). These EBs constituted the sampling frame for the NHMS 2006. A two-stage stratified sample design was used. The first-stage sampling unit was the EB and the second-stage sampling unit was Living Quarters (LQ). All households and persons within a selected LQ were included in the survey. The EBs was selected using a probability that was proportional to a size-linear systematic selection scheme based on the latest updated size measurements. The selection of EBs was performed independently within each state (as a primary stratum) and within urban or rural areas (as a secondary stratum) in accordance with the selection rate

determined for each stratum. This ensured that the sample size was representative of the national population levels.

4. Analysis

Survey data were analysed using SPSS version 19.0 and Stata version 11.0 using the complex sample design. The descriptive statistics were used to calculate the overall prevalence of receiving information regarding organ donation by socio-demographic characteristics; the prevalence of pledging as an organ donor by socio-demographic characteristics; the prevalence of the availability of information to influence pledging to donate after death; and reasons for not donating organs. During the analysis, refusal to answer was coded as missing and was excluded from the denominator.

Bivariate analyses were conducted to estimate the proportion of Malaysians who had pledged as organ donors using the responses of either “Pledged” (0=Yes) or “Have not pledged” (1=No).

Multiple logistic regression modelling was used to measure the association between not pledging as an organ donor and the socio-demographic characteristics of sex, ethnicity, age, education level and household income. A final model was created that included all predictors which were significantly associated at a level of p-value <0.05%.

5. Results

5.1 Socio-Demographic Characteristics of the Respondents

Out of 34539 eligible respondents, 34208 respondents successfully answered, giving a response rate of 99.0%. More than half of the respondents (55.4%) were females and 44.6% were males. By ethnic distribution, more than half of the respondents (54.3%) were Malay, followed by Chinese (21.8%), Indians (8.8%), other Bumiputeras (10.2%) and others (4.9%). By age group, 27% were aged 18-29 years old, 20.9% were aged 30-39 years old, 21.6% were aged 40-49 years old, 16.3% were aged 50-59 years old, 9% were aged 60-69 years old and only 5.2% were aged 70 years old and above. Distribution by education level showed that the recorded majority of the respondents had received a secondary education (46.5%), followed by a primary education (31.9%), a tertiary education (10.4%) and no formal education (10.2%). The household income breakdown comprised 43.7% earning RM1000-RM2999 per month, followed by less than RM1000 per month (34.1%), 12.6% earned RM3000-RM4999 per month, and 9.6% earned RM5000 and above per month.

5.2 Ever Receiving Any Information Regarding Organ Donation

Table 1. Prevalence of receiving information on organ donation by socio-demographic characteristics

| Socio-demographic Characteristics | Yes | | | | No | | | | Don't know | | | |
|-----------------------------------|-------|------|--------|-------|------|------|--------|-------|------------|------|--------|-------|
| | n | % | 95% CI | | n | % | 95% CI | | n | % | 95% CI | |
| | | | Lower | Upper | | | Lower | Upper | | | Lower | Upper |
| National | 23379 | 69.6 | 68.65 | 70.15 | 8981 | 25.8 | 24.96 | 26.67 | 1558 | 4.6 | 4.31 | 4.93 |
| Sex | | | | | | | | | | | | |
| Male | 10469 | 69.6 | 68.41 | 70.70 | 4082 | 26.2 | 25.18 | 27.26 | 639 | 4.2 | 3.81 | 4.68 |
| Female | 12910 | 69.6 | 68.61 | 70.59 | 4899 | 25.5 | 24.56 | 26.41 | 919 | 4.9 | 4.55 | 5.31 |
| Ethnic Group | | | | | | | | | | | | |
| Malay | 14274 | 77.1 | 76.05 | 78.10 | 3922 | 20.5 | 19.48 | 21.44 | 480 | 2.5 | 2.21 | 2.74 |
| Chinese | 4298 | 62.9 | 61.17 | 64.54 | 2009 | 28.8 | 27.31 | 30.35 | 568 | 8.3 | 7.50 | 9.21 |
| Indian | 2061 | 74.2 | 72.04 | 76.16 | 598 | 21.4 | 19.51 | 23.34 | 126 | 4.5 | 3.67 | 5.47 |
| Other Bumiputeras | 1997 | 51.7 | 49.29 | 54.01 | 1673 | 42.8 | 40.58 | 45.08 | 211 | 5.5 | 4.73 | 6.46 |
| Others | 749 | 45.0 | 41.66 | 48.40 | 779 | 44.6 | 41.53 | 47.62 | 173 | 10.4 | 8.44 | 12.85 |
| Age Group | | | | | | | | | | | | |
| 18-29 | 6644 | 73.0 | 71.70 | 74.31 | 2236 | 23.7 | 22.56 | 24.94 | 296 | 3.2 | 2.80 | 3.76 |
| 30-39 | 5092 | 72.0 | 70.58 | 73.42 | 1848 | 25.3 | 23.99 | 26.67 | 189 | 2.7 | 2.29 | 3.11 |
| 40-49 | 5348 | 73.8 | 72.52 | 75.08 | 1752 | 23.2 | 22.05 | 24.45 | 215 | 3.0 | 2.56 | 3.42 |
| 50-59 | 3795 | 69.3 | 67.80 | 70.82 | 1446 | 25.9 | 24.50 | 27.26 | 263 | 4.8 | 4.25 | 5.46 |
| 60-69 | 1810 | 60.1 | 58.03 | 62.11 | 983 | 31.1 | 29.30 | 32.97 | 269 | 8.8 | 7.74 | 10.02 |
| 70 and above | 690 | 40.5 | 38.01 | 43.09 | 716 | 40.5 | 38.10 | 42.89 | 326 | 19.0 | 17.09 | 21.08 |
| Education | | | | | | | | | | | | |

| Socio-demographic Characteristics | Yes | | | | No | | | | Don't know | | | |
|-----------------------------------|-------|------|--------|-------|------|------|--------|-------|------------|------|--------|-------|
| | n | % | 95% CI | | n | % | 95% CI | | n | % | 95% CI | |
| | | | Lower | Upper | | | Lower | Upper | | | Lower | Upper |
| attainment | | | | | | | | | | | | |
| No formal education | 1295 | 36.5 | 34.66 | 38.36 | 1753 | 47.7 | 45.80 | 49.61 | 553 | 15.8 | 14.52 | 17.23 |
| Primary | 6835 | 62.6 | 61.28 | 63.83 | 3508 | 31.3 | 30.10 | 32.48 | 660 | 6.1 | 5.61 | 6.72 |
| Secondary | 12211 | 78.0 | 76.97 | 78.94 | 3208 | 20.1 | 19.20 | 21.08 | 292 | 1.9 | 1.67 | 2.19 |
| Tertiary | 2901 | 86.6 | 85.06 | 88.05 | 422 | 12.7 | 11.30 | 14.27 | 21 | 0.6 | 0.41 | 1.01 |
| Household Income | | | | | | | | | | | | |
| Less than RM1000 | 7106 | 61.6 | 60.06 | 63.06 | 3941 | 32.8 | 31.40 | 34.20 | 655 | 5.7 | 5.16 | 6.23 |
| RM1000-RM2999 | 10276 | 73.6 | 72.47 | 74.66 | 3201 | 22.5 | 21.50 | 23.50 | 541 | 3.9 | 3.54 | 4.33 |
| RM3000-RM4999 | 2916 | 74.9 | 73.04 | 74.69 | 832 | 21.2 | 19.60 | 22.80 | 153 | 3.9 | 3.23 | 4.76 |
| RM5000 and above | 2248 | 76.6 | 74.10 | 78.86 | 582 | 20.1 | 18.10 | 22.20 | 100 | 3.3 | 2.45 | 4.56 |

As shown in Table 1, 23379 (69.6%) of the respondents received any information regarding organ donation, 25.8% reported not ever receiving any information, and 4.6% were unsure if they had ever received information regarding organ donation. Among those who had received information, there was no significant difference by sex. By ethnicity, more than half of the respondents who had ever received information regarding organ donation were Malay [77.1% (95%CI: 76.1-78.1)]. A high proportion of Indians [74.2% (95%CI: 72.0-76.2)] had received information, followed by the Chinese [62.9% (95%CI: 61.2-64.5)], other Bumiputeras [51.7% (95%CI: 49.3-54.0)] and others [45% (95%CI: 41.7-48.4)]. Those aged 40-49 years old [73.8% (95%CI: 72.5-75.1)] reported the highest prevalence, and the lowest prevalence was recorded by those 70 years and above [40.5% (95%CI: 38.0-43.1)]. Respondents with a tertiary education, 86.6% (95%CI: 85.1-88.1), had a significantly higher prevalence of having received information regarding organ donation, followed by those with a secondary education, 78.0% (95%CI: 77.0-78.9%); a primary education, 62.6% (95%CI: 61.3-63.8%); and no formal education, 36.5% (95%CI: 34.7-38.3%). By household income, the highest prevalence was reported among those who earned more than RM5000 per month [76.6% (95%CI: 74.1-78.9)], with the lowest prevalence being reported among those who earned less than RM1000 per month [61.6% (95%CI: 60.1-63.1%)].

5.3 Pledging as an Organ Donor

Table 2. Factors associated with not pledging as an organ donor using a univariate analysis (crude odd ratio) and multiple regressions (adjusted odd ratio)

| Socio-demographic Characteristics | cOR | 95% CI | p-value | aOR | 95% CI | p-value |
|-----------------------------------|------|-----------|---------|------|-----------|---------|
| Sex | | | | | | |
| Male | 1.00 | - | - | - | - | - |
| Female | 1.14 | 0.96-1.36 | 0.148 | - | - | - |
| Ethnicity | | | | | | |
| Malay | 3.80 | 2.92-4.94 | <0.001 | 3.45 | 2.64-4.52 | <0.001 |
| Chinese | 1.96 | 1.48-2.60 | <0.001 | 1.93 | 1.45-2.56 | <0.001 |
| Indian | 1.00 | - | - | - | - | - |
| Other Bumiputeras | 3.72 | 2.57-5.39 | <0.001 | 2.48 | 1.70-3.62 | <0.001 |
| Others | 3.35 | 1.99-5.65 | <0.001 | 2.63 | 1.49-4.64 | 0.001 |
| Age group | | | | | | |
| 18-29 | 1.06 | 0.83-1.36 | 0.643 | 1.10 | 0.86-1.42 | 0.450 |
| 30-39 | 1.00 | - | - | - | - | - |
| 40-49 | 1.10 | 0.85-1.41 | 0.471 | 1.04 | 0.80-1.34 | 0.775 |
| 50-59 | 1.51 | 1.11-2.05 | 0.009 | 1.23 | 0.89-1.70 | 0.209 |
| 60-69 | 2.63 | 1.59-4.37 | <0.001 | 1.69 | 0.95-3.03 | 0.076 |
| 70 and above | 3.74 | 1.83-7.67 | <0.001 | 1.58 | 0.72-3.48 | 0.255 |
| Education attainment | | | | | | |
| No Formal Education | 4.58 | 2.23-9.40 | <0.001 | 3.93 | 1.81-8.53 | 0.001 |

| Socio-demographic Characteristics | cOR | 95% CI | p-value | aOR | 95% CI | p-value |
|--|------------|---------------|----------------|------------|---------------|----------------|
| Primary | 1.00 | - | - | - | - | - |
| Secondary | 0.64 | 0.51-0.81 | <0.001 | 0.74 | 0.57-0.97 | 0.030 |
| Tertiary | 0.23 | 0.18-0.30 | <0.001 | 0.33 | 0.24-0.45 | <0.001 |
| Household income | | | | | | |
| Less than RM1,000 | 4.04 | 2.92-5.58 | <0.001 | 1.87 | 1.32-2.67 | 0.001 |
| RM1,000-RM2,999 | 2.12 | 1.60-2.80 | <0.001 | 1.36 | 1.01-1.82 | 0.043 |
| RM3,000-RM4,999 | 1.10 | 0.83-1.48 | 0.501 | 0.90 | 0.67-1.21 | 0.487 |
| RM5,000 and above | 1.00 | - | - | - | - | - |

Even though more than half of the respondents reported ever receiving information regarding organ donation, the majority of the respondents [98.5% (95%CI: 98.3-98.6)] had no intention of donating their organs after death. Only 1.5% (95%CI: 1.4-1.7) planned to donate their organ after death. In a univariate analysis, ethnicity, age group, education level and household income were the factors associated with not pledging as an organ donor. However, in a multiple logistic regression, Malays were 3.5 times less likely to pledge as organ donors, followed by other Bumiputeras (aOR 2.5) and Chinese (aOR 1.9) compared with Indians. Those with no formal education were 3.9 times less likely to pledge as organ donors. The aOR among those with monthly incomes of less than RM1000 and RM1000-RM2999 were 1.9 and 1.4, respectively, compared with the aOR those who earned RM5000 and above per month. Sex and age group demonstrated no significant differences in this study (Table 2).

5.4 Availability of Information to Influence Individuals to Be Organ Donors

Table 3. Prevalence of the influence of the available information on organ donation

| Socio-demographic Characteristics | Yes | | | | No | | | | Don't know | | | |
|--|------|------|--------|-------|-------|------|--------|-------|------------|------|--------|-------|
| | n | % | 95% CI | | n | % | 95% CI | | n | % | 95% CI | |
| | | | Lower | Upper | | | Lower | Upper | | | Lower | Upper |
| National | 6821 | 20.6 | 20.01 | 21.24 | 17312 | 52.2 | 51.40 | 53.09 | 8975 | 27.1 | 26.37 | 27.93 |
| Sex | | | | | | | | | | | | |
| Male | 3320 | 22.3 | 21.53 | 23.15 | 7556 | 50.9 | 49.79 | 51.93 | 3942 | 26.8 | 25.82 | 27.81 |
| Female | 3501 | 19.2 | 18.53 | 19.96 | 9756 | 53.4 | 52.39 | 54.32 | 5033 | 27.4 | 26.52 | 28.31 |
| Ethnic Group | | | | | | | | | | | | |
| Malay | 3525 | 19.1 | 18.46 | 19.85 | 10346 | 56.5 | 55.48 | 57.46 | 4473 | 24.4 | 23.49 | 25.30 |
| Chinese | 1216 | 18.3 | 17.02 | 19.59 | 3265 | 49.1 | 47.32 | 50.83 | 2177 | 32.7 | 30.97 | 34.39 |
| Indian | 1047 | 39.4 | 37.03 | 41.81 | 975 | 36.7 | 21.69 | 26.17 | 625 | 23.9 | 34.48 | 39.08 |
| Other Bumiputeras | 718 | 18.8 | 17.13 | 20.48 | 1931 | 51.3 | 48.79 | 53.79 | 1144 | 30.0 | 27.82 | 32.18 |
| Others | 315 | 18.6 | 16.46 | 20.93 | 795 | 47.8 | 44.99 | 50.62 | 556 | 33.6 | 30.78 | 36.56 |
| Age Group | | | | | | | | | | | | |
| 18-29 | 2521 | 28.3 | 27.14 | 29.39 | 4201 | 47.1 | 45.78 | 48.38 | 2210 | 24.7 | 23.60 | 25.79 |
| 30-39 | 1549 | 22.3 | 21.26 | 23.48 | 3572 | 51.3 | 49.92 | 52.62 | 1825 | 26.4 | 25.18 | 27.62 |
| 40-49 | 1321 | 18.6 | 17.63 | 19.67 | 3796 | 53.0 | 51.62 | 54.37 | 2018 | 28.4 | 27.12 | 29.66 |
| 50-59 | 865 | 15.9 | 14.81 | 16.99 | 3041 | 56.5 | 55.01 | 58.02 | 1484 | 27.6 | 26.26 | 28.99 |
| 60-69 | 415 | 13.8 | 12.42 | 15.20 | 1736 | 57.8 | 55.80 | 59.80 | 853 | 28.4 | 26.64 | 30.30 |
| 70 and above | 150 | 8.7 | 7.45 | 10.20 | 966 | 56.9 | 54.35 | 59.45 | 585 | 34.4 | 31.96 | 36.83 |
| Education attainment | | | | | | | | | | | | |
| No formal education | 360 | 10.0 | 8.92 | 11.11 | 1979 | 55.8 | 53.98 | 57.69 | 1205 | 34.2 | 32.38 | 36.07 |
| Primary | 1911 | 17.6 | 16.75 | 18.46 | 5744 | 53.1 | 51.98 | 54.30 | 3143 | 29.3 | 28.17 | 30.38 |
| Secondary | 3656 | 23.8 | 22.92 | 24.60 | 7828 | 51.1 | 49.98 | 52.12 | 3859 | 25.2 | 24.26 | 26.16 |
| Tertiary | 841 | 26.4 | 24.79 | 28.15 | 1625 | 51.2 | 49.16 | 53.30 | 700 | 22.3 | 20.74 | 24.01 |
| Household Income | | | | | | | | | | | | |

| Socio-demographic Characteristics | Yes | | | | No | | | | Don't know | | | |
|-----------------------------------|------|------|--------|-------|------|------|--------|-------|------------|------|--------|-------|
| | n | % | 95% CI | | n | % | 95% CI | | n | % | 95% CI | |
| | | | Lower | Upper | | | Lower | Upper | | | Lower | Upper |
| Less than RM1000 | 2121 | 18.4 | 17.48 | 19.36 | 6277 | 54.6 | 53.44 | 55.74 | 3112 | 27.0 | 25.91 | 28.13 |
| RM1000-RM2999 | 2934 | 21.3 | 20.51 | 22.21 | 7124 | 52.0 | 50.85 | 53.15 | 3640 | 26.6 | 25.62 | 27.70 |
| RM3000-RM4999 | 824 | 21.9 | 20.32 | 23.49 | 1898 | 50.5 | 48.59 | 52.51 | 1035 | 27.6 | 25.81 | 29.44 |
| RM5000 and above | 718 | 25.4 | 23.44 | 27.50 | 1369 | 48.8 | 46.43 | 51.16 | 725 | 25.8 | 23.65 | 28.07 |

Almost half of the respondents, 52.2% (95%CI: 51.4-53.1), did not agree that the currently available information had influenced them to pledge to donate their organs after death, although 20.6% (95%CI: 20.0-21.2) did agree. Among those who agreed, significantly more were male (22.3%; CI: 21.5-23.2) than were female (19.2%; 95%CI: 18.5-20.0). At 39.4% (95%CI: 37.0-41.8), Indians had a significantly higher prevalence of agreeing with the statement, followed by Malays at 19.1% (95%CI: 18.5-19.9), the Chinese at 18.3% (95%CI: 17.0-19.6), other Bumiputeras at 18.8% (95%CI: 17.1-20.5) and others at 18.6% (95%CI: 16.5-20.9). By age group, those aged 18 to 29 years had the highest prevalence, 28.3% (95%CI: 27.1-29.4), of agreeing with the statement; the lowest prevalence was among those aged 70 years and above. By education level, those with a tertiary education, 26.4% (95%CI: 24.8-28.2), were significantly higher in the prevalence of agreeing with the statement, followed by those with a secondary education at 23.8% (95%CI: 22.9-24.6). By household income, those with less than RM1000 were significantly lower in prevalence, 18.4% (95%CI: 17.5-19.4), compared with the other income groups (Table 3).

5.5 Reasons Not Pledge

Among those who did not agree that the available information had influenced them to pledge, *fear* was the main reason given for not pledging as organ donors (39.4%, CI: 38.3-40.5), followed by *uncertainty because of religion* (10.9%, 95%CI: 10.3-11.6) and *against religious practice* (10.5%, 95%CI: 9.8-11.2). Approximately 6.3% (95%CI: 5.9-6.8) thought that the *corpse would suffer*, 2.9% (95%CI: 2.6-3.2) cited *objections from family*, 2.6% (95%CI: 2.3-2.9) reported that *they did not know where to register*, and 1.2% (95%CI: 1.0-1.3) had received no support from health staff; other reasons were cited by 26.3% (95%CI: 25.3-27.3) of respondents. Cross-tabulation by ethnicity, revealed that fear was the dominant reason for the reluctance of all ethnic groups to pledge to donate after death. Among all ethnic groups, the Chinese cited the fear of pledging the most often [48.4% (95%CI: 5.9-5.0)], followed by Indians [44.7% (95%CI: 41.0-48.4)]; Malays cited fear the least often [33.2% (95%CI: 32.0-34.4)].

6. Discussion

Receiving sufficient information is an important key to creating awareness of and willingness to pledge as an organ donor. The findings from this study showed that more than half of the respondents had received information regarding organ donation, which was comparable with the findings from another study (S. Maliga). Despite the high prevalence of receiving information, the willingness to pledge to organ donation is still very low (Yeung et al., 2000). The reason is likely an inadequate public information campaign that was ineffective at encouraging the public to pledge as organ donors (Khan et al., 2011; Morgan & Miller, 2002).

Several efforts have been made regionally and internationally to promote organ donation by increasing the rates of pledges. The National Minority Organ, Tissue, Transplant Education Program (MOTTEP) in Washington, DC has conducted an intervention programme that has demonstrated that proper messaging and information regarding organ donation are making a difference in changing knowledge, attitudes, behaviours and the belief in pledging. There is a strong relationship between information and knowledge and feeling encouraged to donate organs (Morgan et al., 2008; Callender & Miles, 2011). Information regarding the transplantation procedure, as well as from peers and family members, may have a positive influence on organ donation (Rumsey et al., 2003). In contrast to Rumsey, other studies have reported that low donor rates might not be attributed solely to a lack of knowledge or of good knowledge but may be connected to self-awareness about helping others (Edwards et al., 2007; Pat McIntyre, 1987). Few studies have been conducted to examine the socio-demographic characteristics that might give a deeper understanding of people's reasons for not pledging, as well as their knowledge, attitudes and practices regarding organ donation (Yeung et al., 2000; Loch et al., 2010; Callender & Miles, 2011; S. Maliga).

Our findings revealed that sex did not demonstrate any significant difference in terms of who had received information or in terms of influencing respondents to pledge to donate their organs. Other studies have also reported that sex differences have no correlation with attitudes and beliefs about donating organs (Bapat et al.,

2010). In contrast, a study in the US showed a higher prevalence of awareness of organ donation that correlated with a higher prevalence of willingness to donate among both sexes (Minniefield et al., 2001). Being female was significantly associated with the awareness of eye donation (Bhandary et al., 2011), but a study in Libya showed that males were significantly more willing to donate organs after death (Alashek et al., 2009). Another study among university students in China found that females were 2.24 times more inclined than were males to be organ donors; however, there was no significant difference between the sexes in terms of attitude (Chen et al., 2006).

There are few studies that have assessed racial differences in receiving information on organ donation or in the willingness to donate organs (Edwards et al., 2007; Bapat et al., 2010; Li, 2011; M.Kaur, 1998; Loch et al., 2010). Most studies discuss religious aspects and cultural beliefs as major factors in whether to donate organs (Khan et al., 2011; Kaur, 1998; Oliver et al., 2011). In this study, ethnicity played a significant role in respondents not pledging. Despite receiving information regarding organ donation, respondents still refused to pledge. Malays indicated the least willingness to pledge compared with the Chinese and Indians. This finding was in line with those of other studies. Lack of exposure and knowledge were the main factors contributing to this perception (Li, 2011; Noordin et al., 2012). Stigmas and cultural beliefs, such as the importance of being buried with organs intact, and uncertainty towards donating organs to others of different religions, are among the barriers to organ donation (Edwards et al., 2007; Kaur, 1998; Noordin et al., 2012). There are a few characteristics that are linked to the willingness to donate organs, including blood donation and discussing the donation decision with family members, that may increase the willingness to pledge (Edwards et al., 2007). Higher levels of trust in doctors and the medical system were reported among whites than among blacks, which contributes to the willingness to donate organs (Minniefield et al., 2001).

Those who have signed organ donation cards are more likely to be young and have less-traditional religious views (Yeung et al., 2000; Danguilan et al., 2012; Siminoff et al., 2001). Our study also found that the younger age groups were among the most willing to pledge compared with the other age groups, whereas the elderly were the least willing to pledge. Those who did not have strong traditional beliefs and who had higher levels of understanding and had greater confidence in the professional conduct of doctors were among those who were willing to donate (Yeung et al., 2000).

Our findings revealed that those with higher education were more likely to have received information regarding organ donation compared with other groups. This finding is consistent with those of Wong et al. who found that those with a tertiary education had a significantly higher mean total knowledge compared with those with other education levels. Individuals with more formal education were more likely to donate than were those with less formal education (Li, 2011). A survey in a Turkish community showed that females, the less educated and older people showed less willingness to donate organs (Bilgel et al., 1991). The same finding was concluded by Barcellos et al. that higher education levels and a younger age were associated with a higher tendency to pledge (Barcellos et al., 2005).

Socioeconomic factors, such as income and education level may play significant roles in influencing the decision to pledge. Our finding was in line with those of other studies in that low income earners reported being less likely to pledge compared with those with high incomes (Li, 2011; Danguilan et al., 2012).

Multiple factors are associated with not donating. Studies have shown that wanting to be buried with organs intact and having personal issues with donation were among these factors (Edwards et al., 2007). In this study, fear was the major reason for not pledging, and this is also the reason most commonly mentioned in most studies (Minniefield et al., 2001; Alashek et al., 2009; Khan et al., 2011; Loch et al., 2010; S. Maliga). Fear relates to the perception of surgical organ retrieval procedures and body mutilation as well as to the concern that the corpse can feel pain. Fear arises because of the lack of in-depth information about and knowledge of organ donation procedures and processes. A public information campaign was still insufficient to change misconceptions about the organ donation process (Evans, 1998). Organ donation needs agreement not only from the individual him-or herself but also from close relatives, such as parents. Organ donation procedures after death will not be conducted without family consent. Therefore, in-depth information and knowledge about organ donation can lead to positive perceptions and attitudes as well as reduce reluctance towards organ donation.

The next most frequent reason concerned religious beliefs (Edwards et al., 2007; Alashek et al., 2009; Morgan et al., 2008), referring to organ donation's being against religious practices and to uncertainty about the consequences of organ donation. The national Fatwa Committee of 1970, assisted by a panel of medical experts, made the decision to allow organ transplantation based on acceptable juridical principles. Based on Confucian philosophy, those who are born with a complete body should end the same way when they pass away because it is considered disrespectful to parents and ancestors if any organ is missing (Chung et al., 2008; Cheng-tek, 2009).

A literature review indicated that the major religions of the world do not object to organ donations. The Roman Catholic and Jewish traditions consider giving up a body part for the benefit of another to be morally justifiable. However, there is still a severe shortage of organ transplantation because of limited knowledge of religious views as well as other logistical problems.

Concern about the suffering of the corpse was the third most-cited reason that respondents decided not to pledge. Taoism states that in the world after death, there is another type of life that has the same needs as before, including food, clothing and also money. This philosophy believes that life does not end after death and that it will be affected if there is any damage to the body (Kaur, 1998). For most people, concerns about complications after donation, religious beliefs, not receiving adequate healthcare after donation and lack of family support are among the factors that limit organ donation.

7. Limitation

The analysis presented was only able to provide a general picture regarding organ donation because of the limited related variables in the questionnaire. The research design of this study was cross-sectional, which does not allow for a cause-and-effect relationship to be measured.

8. Conclusion

This study showed that the prevalence of having received information regarding organ donation was high among the respondent population. More than half of the respondents had received information regarding organ donation, but the prevalence of pledging to be an organ donor was still low. In particular, being Malay, having no formal education and having a low income were found to be associated with not pledging. Fear was indicated as the main reason for not pledging. Therefore, the promotion of organ donation must not only be promoted by the National Transplant Registry Organisation but also by health care professionals and religious associations as well as by civil society to ensure that clear information is disseminated, especially for those groups mentioned above. This information is pertinent to changing the mind sets and misconceptions about organ donation procedures after death.

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