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Knowledge and Attitude towards Organ Donation among Driver's License Applicants in Metro Manila, Philippines

Bernadette E Ordoña[1*], Benita S Padilla[2], Ma Elizabeth J Macapagal[3], Genevieve J Lukban[4]

[1]Department of Adult Nephrology, National Kidney and Transplant Institute, Quezon City, Philippines

[2]Consultant, Department of Adult Nephrology, National Kidney and Transplant Institute, Quezon City, Philippines

[3]Associate Professor, Department of Psychology, Ateneo de Manila University, Quezon City, Philippines

[4]Transplant Coordinator, National Kidney and Transplant Institute, Quezon City, Philippines/ Human Organ Preservation Effort (HOPE)

[*]**Corresponding author:** Ordoña B E, Department of Adult Nephrology, National kidney and Transplant Institute, Quezon City, Philippines, Tel No: +639778375501 ; E-mail: bernadette.ecunar@gmail.com

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INTRODUCTION

The reasons for disparities on the success of deceased organ donation programs across the globe are complex and multifactorial [1]. Many surveys from various countries have shown that people look at organ donation favorably, yet this does not translate to a high organ donation rate [2]. The same is true in the Philippines where a population survey in in 2005 showed that 53% of respondents were willing to become a deceased organ donor [3], but actual deceased donation was below 1 per million population. Uriarte et al, stated an increase in transplantation from deceased donors from an average of 10 per year from 1999 to 2001 to 31 per year from 2006 to 2008 [4].

A rising incidence and prevalence of end-stage renal disease treated with dialysis [3], high health care costs associated with renal replacement therapy, and challenges in living donation brought about by threats of transplant commercialism and human trafficking for the purpose of removal of organs [5] are important forces that compel a critical analysis of how the deceased donation program in our country can be infused with new life.

Many countries have attempted to use the application for a driver's license to prompt a consideration and to provide an opportunity for an individual to document their desire to be an organ donor. In England, a question on organ donation had existed in the driver's license application prior to 2011 but it was optional and often missed or ignored [6]. In 2011, it became an obligation to tick about joining the organ donor register as a condition of completing the application. In some places, the driver's license donation question has been linked to an educational intervention to increase success rate. "Kelly's Law", which requires driver's education courses offered in the state to provide at least 30 minutes of instruction relating to organ and tissue donation, was passed in Wisconsin, USA in 2000 [7]. Kelly's Law was named after Kelly Nachreiner, a woman killed in a car crash weeks after signing the back of her driver's license to become a donor. According to LifeSource, a regional organ procurement organization (OPO), the state of Minnesota had a 26 percent increase in donor intent on driver's licenses when it passed a law in 2002 mandating organ donation topic to be part of driver's education. [7].

Currently, an inquiry to being an organ donor exists in the driver's license application form of the Land Transportation Office of the Philippines. There is no accompanying information on organ donation being provided to the applicant. There has been no documentation of the number that agrees to donate.

Sociodemographic factors are deemed as factors that may possibly influence willingness to donate organs. The effect of age, education, income, gender, marital status, and religion have been studied [8, 9,10] with rather different findings on the effects of age, education, income, and religion. A special topic of the Eurobarometer survey in 2010 covered organ donation. People educated to age 20 or later were more likely to support organ donation. Those in managerial jobs were more likely to show willingness to donate one of their own organs than those looking after the home or unemployed [11]. In the Philippines, a survey in 2001 showed that single civil status, higher educational attainment, and higher monthly income had positive correlation to consent for donation [4] .

Zhanga [9] found that donation knowledge, understanding brain death concept, and having donors among friends or relatives were shown to affect willingness to donate. Reasons to hinder organ donation included imperfect laws and regulations, distrust on organ allocation, and insufficient promotion by relevant organizations.

Consent to deceased organ donation has been linked to an individual's knowledge and attitude toward it. Several studies have shown that knowledge is required, but not sufficient, for an individual to consent to organ donation [12].

In a metasynthesis of qualitative studies on public's view on posthumous organ donation, eight themes were identified to influence decision to donate: religion, death, altruism, personal relevance, the body, the family, medical professionals, and transplant recipients. An altruistic motivation was the most

commonly identified motivator. The most commonly identified barriers were the need to maintain bodily integrity and concerns on possible unethical recovery of organs. [13].

A focus groups discussion performed among Filipinos in Hawaii concluded that Filipinos were generally knowledgeable about organ donation although some were unfamiliar with eligibility requirements of a donor [14]. With regards to attitude on organ donation, it revealed that Filipinos have a strong altruistic attitude but it is common for them to hold a belief to preserve the body's integrity following death. The study found few references to mistrust of medical professionals [14]. Concerns for how family feels about organ donation is extremely important [14]. Some adolescents had chosen to become organ donors on their driver's license without telling their parents revealing that some Filipino families have not discussed organ donation among them. [14].

According to a local survey by Tan et al, the usual indicators of willingness to donate used in the Western literature are not applicable in the Philippines because of the low awareness of the organ donor card or the low proportion of the adult population who possess a driver's license [15]. While the small percentage of those who had heard of organ donor card (12.4%) has improved over the 6.6% awareness reported in a 2002 survey (REDCOP 2001), the improvement is minimal in the context of the entire population [15].

METHODOLOGY

Objectives

The objectives were: 1.To describe driver's license applicants in terms of sociodemographic profile, knowledge and attitude towards organ donation., 2. To determine the correlation of sociodemographic characteristics to willingness to donate, 3. To determine the correlation of knowledge to willingness to donate, 4. To determine the correlation of attitude to willingness to donate, and 5. To determine the correlation of the knowledge to attitude.

Sample Size Estimation

Sample size was computed using the formula n= t2 x p(1-p)m2 where

n= required sample size

t= confidence level at 95% (standard value of 1.96)

p= % of population giving a certain response

m=margin of error at 5% (standard value of 0.0.5)

Based on the assumption that only 3% of subjects will say yes to the option of consenting for organ donation, the computed sample was 384 respondents. The assumption of 3% was nased on an informal survey on 20 drivers entering East Avenue Medical Center, a public hospital in Quezon City, in July 2017.

The Sample

The target participants were applicants for a driver's license card at LTO. Inclusion criteria were 1) ≥Aged 18 years, 2) Applicant for a new or renewal of driver's license at the LTO Main Office, and 3) can read and write Tagalog or English language. Enrolment lasted from the first to fourth week of February, 2018.

Purposive sampling was done. The research assistants offered the questionnaire to all driver's license applicants in the queue. Subjects who consented were informed that they are free anytime to discontinue answering the questionnaire if they are uncomfortable with the questions and/or unwilling to complete answering it.

Questionnaire Construction

This study used a researcher-generated, validated questionnaire. A comprehensive literature review was performed to determine the sociodemographic factors that affect willingness to donate. The knowledge section of the questionnaire was also based on the review of literature. The attitude section was created based on a key informant interview conducted by Human Organ Preservation Effort (HOPE) transplant coordinators and review of literature.

The questionnaire underwent pre-testing (n=30) among non-hospital staff drivers in the National Kidney Transplant Institute parking lot.

Difficulty and discrimination indices were calculated for each knowledge item. Based on the reliability analysis on pretesting, the computed Cronbach's alpha was acceptable at 0.779. Item discrimination for the items should be at least 0.2.

The construct validity of the attitude questions was evaluated using factor analysis. The scree plot indicated that a four factor solution would suffice. Principal components extraction was used to get the four factor solution and direct oblimin was used as the rotation method. Loadings less than .4 were excluded. (Figure 1 at separate file).

Nine out of the sixteen attitude items were classified into four merging themes based on item-total correlations (Table 1).

Theme Number and Corresponding Theme	Items Included in each Theme
1: Perceptions on organ retrieval and distribution	(1) I think that if I intend to be a donor, doctors will be less likely to try save my life. (2) I am concerned that if I agree to organ donation, my organs might go to undeserving people. (3) If a person will donate an organ after death, it will add to his/her suffering.
2: Physical Appearance	(1) It is important for a person's body to have all of its parts when it is buried. (2) Someone who has donated organs can still look good in his/her coffin.

3: Psychologically-derived Benefit and Altruism	(1) Organ donation allows something positive to come out of a person's death. (2) Organ donation helps save the lives of sick people receiving the organ.
4: Beliefs about Brain Death	(1) I can accept the idea that a patient can be declared dead based on brain death even if the heart is still beating. (2) Even if the brain is permanently damaged, I still believe that a patient can recover as long as their heart is beating.

Table 1: Attitude themes based on Item total correlation in the pretesting questionnaire.

The questions not part of the themes were decided to undergo descriptive statistics. A 3-part questionnaire was prepared composed of the knowledge, attitude, and sociodemographic characteristics with an inquiry on the status of consent for organ donation through the driver's license card.

Each correct answer on knowledge was assigned 1 point. Low knowledge corresponded to scores of 0-5, average knowledge corresponded to scores of 6-11, and high knowledge corresponded to scores of 7-16.

For the Attitude items, a Liker scale was used. Strongly agree is a score of 5, Agree is a score of 4, Neutral is a score of 3, Disagree is a score of 2, and Strongly disagree is a score of 1. A median score of 0-2.5 was labeled negative, a score of 2.6-3.5 was labeled neutral, and a score of 3.6-5 was labeled positive attitude.

Statistical Analysis

Descriptive statistics were generated to present the sociodemographic profile and to determine the level of knowledge and attitude of the respondents. Frequency counts and percentages were calculated from the sociodemographic variables.

The median of the knowledge scores, attitude scores, and attitude themes scores of the respondents were calculated and presented based on willingness to donate. Dichotomous classification of granting consent was utilized, consistent with the consent variable that will be utilized for logistic regression analysis.

A logistic regression model was fitted to the data to determine whether an association exists between the dichotomous consent classification and the sociodemographic variables, the knowledge score/level and the attitude score/level. The demographic variables utilized were age (in years), sex, educational attainment (binary – college vs non-college), work status, religion (binary – Roman Catholic vs Non Roman Catholic) and marital status (binary – single vs non-single). The variable monthly salary was not used due to many missing values.

For the knowledge and attitude scores, separate models were used utilizing the total attitude level, and the attitude level per theme as classified in Table 1, thus generating two models of logistic regression. Wald test with α=0.05 significance level was used to determine the variables that are significantly associated with granting of consent and can be used as predictors of the odds of granting consent. The two models were compared based on their predictive accuracy and the set of variables found to be significantly associated with granting of consent.

Spearman rank order correlation coefficient was computed to explore the association between the knowledge and attitude scores. A 0.05 level of significance was utilized in testing for the significance of association.

FINDINGS

Sample Characteristics

Sociodemographic Factor		Frequency (Percentage)
Gender	Male	256 (66%)
	Female	129 (34%)
Marital Status	Single	224 (58%)
	Married	126 (33%)
	Live-in Partner	24 (6%)
	Separated	8 (2%)
	Widowed	3 (<1%)
Religion	Roman Catholic	281 (73%)
	Other Religion	104 (27%)
Educational Attainment	Post-Graduate	24 (6%)
	College	174 (45%)
	College Undergraduate	72 (19%)
	Vocational Course	35 (9)%
	High School	63 (16%)
	High School Undergraduate	12 (3%)
	Elementary	4 (1%)
	Elementary Undergraduate	1 (<1%)
Work Status	Employed	242 (63%)
	Unemployed	143 (37%)
Monthly Salary among employed (in Philippine pesos)	500-4999	20 (8%)
	5000-15000	72 (30%)
	15001-25000	66 (27%)
	25001-35000	29 (12%)
	35001-45000	21 (9%)
	45001-99999	27 (11%)
	>100000	7 (3%)

Table 2: Sociodemographic Characteristics of the 385 Respondents

A total of 385 subjects participated. Majority were male (~66%). The mean age was 30.09 years (SD = 9.70), with range of 18 to 71 years. Majority of the respondents were single (~58%) and Roman Catholics (~73%). Most were college graduates (45%). Most respondents with jobs earn P5000-15000/month (~30%) (Table 2).

Most respondents heard about organ donation in the past year, mostly from television (~51%), followed by Facebook (~31%) and through healthcare workers (~23%). Majority of respondents were not aware of their family's opinion on organ donation (~54%). More than half reported that their family members are unaware if they are in favor or not to donate their organs (~52%).

Knowledge and Attitude of the Subjects

Of the 385 subjects, 165 (43%) scored a high knowledge, 217 (56%) scored average, and only 3 (less than 1%) got a low score category. Most knew that the liver, heart, cornea, gallbladder, and kidneys can be transplanted, but most were unaware that the lungs can be transplanted (61%).

Most of them knew about the principle of living (~95%) and deceased donation (~85%), and that deceased organ donation is legal in the country. Only a little more than half of the respondents were aware of the concept of brain death (53%).

Most of the respondents knew that being a hypertensive or diabetic can disqualify them from being living organ donors (~70%). Less than half were aware that people who smoke or drink alcohol can still be qualified to donate (~47%). Most respondents did not know their religion's stand on organ donation (~52%) .

Most respondents had favorable attitude on psychologic benefit and altruism through organ donation. Most were just neutral on the effect of organ donation on physical appearance of the deceased donor.

The scores were also neutral on perceptions on organ retrieval and distribution and on brain death. The summary of the attitude and knowledge scores of the respondents, and their distribution based on consent is presented in (Table 3).

	Consent not granted/Blank answer	Consent granted	Total
Knowledge	11.00	11.00	11.00
Attitude	3.33	3.44	3.44
Theme 1	3.33	3.67	3.33
Theme 2	3.00	3.50	3.50
Theme 3	4.00	4.50	4.00
Theme 4	2.50	3.00	3.00

Table 3: Knowledge and Attitude Median Scores of the Respondents.

Most respondents agreed that they want their relatives to follow their decision to donate or not to donate organs at the time of death, and most agreed to donate only if their families support that decision. Majority believed on equal chance for the rich and the poor to receive a deceased organ. Most were neutral with regards to the following: conforming to religion's stand on organ donation, morbid idea of death, and openness to the discussion of organ donation in the family to religion's stand on organ donation, morbid idea of death, and openness to the discussion of organ donation in the family.

Predicting Factors to Willingness to Donate

Of the total respondents, two hundred twelve people (55%) answered "Yes" to donation of organ. Seventy-five respondents (20%) answered "No". Ninety-eight (25%) left the question blank.

The first logistic regression model correlated socio demographic variables, knowledge levels, and the total attitude levels to granting consent through the driver's license card (Table 4).

Based on the Wald Test, age (in years) and the attitude level are significant predictors of the odds of granting consent at 0.05 level of significance. A one-year increase in the age of a subject increases the odds of granting consent by 4.0%. On the other hand, a one-level increase in the attitude level increases the odds of granting consent by 106.7% or roughly a doubling of the odds of granting consent. This interpretation is applicable while holding the other variables constant. Hosmer and Lemeshow Test: , signifying an acceptable fit of the model to the data. The percent correct prediction for those who granted consent is 68.9%,. The percent correct prediction for those who did not grant consent/no answer: 51.7%. The overall percent correct prediction is 61.2%.

	Coefficient	S.E.	Wald	df	p-value
Age	0.039	0.014	7.673	1	0.006
Sex (Male)	0.25	0.241	1.08	1	0.299
Educational Attainment (Non-College Graduate)	0.118	0.23	0.264	1	0.607
Work Status (Yes)	-0.314	0.229	1.868	1	0.172
Marital Status (Single)	0.14	0.26	0.29	1	0.59
Religion (Roman Catholic)	-0.087	0.242	0.13	1	0.719

Knowledge Level	0.109	0.219	0.249	1	0.618
Attitude Level	0.726	0.211	11.816	1	0.001
Intercept	-3.005	0.938	10.267	1	0.001

Table 4: Correlating socio demographic variables, knowledge levels, and total attitude levels to granting consent.

A second model correlating Sociodemographic variables, knowledge levels, and the attitude themes levels to granting consent through the driver's license card (Table 5) was also generated.

Age and Theme 2 attitude level were significant predictors of the odds of granting consent based on the Wald test. A one-year increase in the age increases the odds of granting consent by 4.1%. A one-level increase in attitude level increases the odds of granting consent by 78.8%. This interpretation is applicable while holding the other variables constant. Homer and Lemeshow Test: . The percentage of correct prediction of giving consent was 74.2%, and the percentage of correct prediction of not granting or no answer is: 48.3%. The overall correct prediction is 62.5%.

	Coefficient	S.E.	Wald	df	p-value
Age	0.04	0.014	7.828	1	0.005
Sex (Male)	0.23	0.245	0.888	1	0.346
Educational Attainment (Non-College Graduate)	0.11	0.233	0.224	1	0.636
Work Status (Yes)	-0.335	0.233	2.057	1	0.151
Marital Status (Single)	0.102	0.264	0.149	1	0.699
Religion (Roman Catholic)	-0.079	0.246	0.102	1	0.749
Knowledge	0.051	0.225	0.052	1	0.82
Theme 1	0.03	0.158	0.035	1	0.852
Theme 2	0.581	0.163	12.744	1	<0.001
Theme 3	0.292	0.227	1.646	1	0.2
Theme 4	0.123	0.142	0.749	1	0.387
Intercept	-3.403	1.068	10.161	1	0.001

Table 5: Correlating socio demographic variables, Knowledge levels, and attitude themes levels to granting consent

The results arising from the models show that older age increases the odds of granting consent. The knowledge scores were not related to granting consent. Theme 2 was found to be the only significant predictor of the odds of granting consent for organ donation.

Correlation of Knowledge and Attitude

	Spearman's rank correlation coefficient (	p-value
Total Attitude Score	0.369	<0.001
Theme 1	0.264	<0.001
Theme 2	0.247	<0.001
Theme 3	0.272	<0.001
Theme 4	0.153	0.003

Table 6: Non-parametric correlation of the knowledge and attitude scores of the respondents.

Based on the data, the total knowledge score is moderately associated with the total attitude score. There is weak to moderate positive association between the theme scores and the total knowledge scores.

Discussion

Sociodemographic Factors and Willingness to Donate

This study found that as a person gets older, the odds of granting consent increases. Our finding on the positive effect of older age was in discordance with previous studies [8,19]where younger people approve of living and deceased donation. This may be related to lack of knowledge due to lack of exposure to source of information on organ donation in our young generation.

Sex, marital status, educational attainment, religion, work status, and religion did not correlate with intention to donate in the driver's license card. This was not in accordance with a survey done on 2001 in 15 regions in the Philippines where the consent for donation positively correlated with being single, higher educational attainment (high school, college, and vocational course graduate), and higher monthly income (>USD $212/month)[4]. Our finding that education is not related to willingness to donate is also not consistent with a study done in Malaysia, which had found that willingness to donate is positively associated with higher levels of education [10].

Knowledge and Willingness to Donate

This study found that most respondents have average knowledge on organ donation and only a very few have low knowledge on organ donation. Most respondents were knowledgeable on organ donation except on the issue of brain death and some qualifications of a possible organ donor. Based on the data, having high knowledge is associated with a more

appropriate attitude score. (Table 6) , but it is not correlated with granting of consent in the driver's license card. This implies that knowledge is not sufficient to lead to intention to donate, but is a possible mediating factor.

Attitude and Willingness to Donate

The perceptions on organ retrieval and distribution was not related to granting consent. Mistrust on physicians and the organ distribution system, and fear of inflicting pain to the dead is not an issue among Filipinos. Similar to the FGD done in Hawaii, our respondents has no mistrust on medical professionals with respect to organ donation (procurement of organs prior to brain death, or withholding life-saving medical care of a designated donor).

As has been found in the focus group discussion among Filipinos, in the national survey in the Philippines in 2001, and other researches on the attitudes of Asian-Americans about organ donation, this study revealed that desire to preserve the body's integrity following death is correlated with the lack of granting of consent. This was also consistent with the findings of Newton et al who identified the "The Body" as one of the themes impacting willingness to donate [13]. They quoted one of the statements of a Filipino respondent in USA who said, "I can donate everything just as long I look OK in my coffin". A study done in Switzerland among kind of organ donor-eligible patients, found out that need to maintain body integrity had a negative impact on consenting to donate their kin's organs. Clearly, we cannot extrapolate at this point if issue on body integrity may also affect consenting to relative's organs among Filipinos, but it may be a possibility. [16].

Even if most of the respondents strongly agreed to the idea of altruism and psychologically-derived positivity of donating one's organs, the models disprove that it was related to granting consent. Altruism may not be effective alone as a motivator for donation. It may be important to always discuss it alongside the concept that organ donation does not disfigure the donor's body.

The concept of brain death which is often mentioned as a potential barrier to willingness to donate did not appear to correlate with actual willingness to donate among our subjects. We should be mindful that a little less than 50 percent of the respondents have poor knowledge on concept of brain death [17-20]. Knowing that knowledge correlated with attitude, we can hypothesize that this might be altered once the people are educated about the principle of brain death.

Attitude Items beyond the Four Attitude Themes

Some findings were similar to the FGD done among Filipinos in Hawaii namely: 1) Wanting their relatives to follow their decision to donate organs (or not) at the time of death and 2) Agreement to donate only if family support that decision. In contrast to the FGD, most of our respondents were only neutral on the idea of difficulty opening the discussion of organ donation in the family.

Improving Consent Rates

Several limitations were noted in the study. First, the researchers did not directly check the respondent's newly-released licenses to verify their willingness to donate. Instead, we used a direct question in the questionnaire to ask the respondent's choice of status in the application form and relied on that. We believe that this self-reported donor status is a better measure of willingness to donate rather than simply asking about willingness directly [12]. Another limitation is that the sampling was conducted in only one LTO office. Hence the conclusion cannot be generalized to the entire Philippine driver population. Knowledge and attitudes toward organ donation differ according to geographical location (urban versus rural) [17] thus this study has to be replicated in LTO offices outside the National Capital Region. The next limitation was that a quarter of respondents left the question on organ donation as blank.

Despite the limitations, we can present the data of this study to policy makers so that they can create policies in LTO agencies to 1) revise the application form template to make the question on organ donation more understandable/noticeable, 2) incorporate a short educational lecture on organ donation for the applicants during driver's license application as part of the procedures, and 3) give orientation to LTO clerks. A survey in USA participated upon by Department of Motor Vehicles (DMV) clerks was conducted to assess knowledge and attitudes toward organ donation before and after a 1-hour training intervention on the nature of the organ donor registry, information about organ donation, and communication strategies for interacting with public. It significantly increased DMV clerks' knowledge, attitude, beliefs, and behavioral intention toward donation [18]. Organ donor registration rates were 14% higher in counties where clerks were trained [18]. We can try to adapt it in our setting. Inside the LTO office, a prepared video presentation tackling organ donation may be presented to the applicants. Based on this study, focus could be geared on the issue of body integrity during lectures or information dissemination. It may be reassuring to explain that organ recovery is performed in a manner that does not destroy the appearance of the body. In contrast to previous studies, the influence of religion on decision-making appears to be less strong. Nevertheless, because not everyone is aware of their religion's position on organ donation, religion should still be discussed. We can extend dissemination campaigns outside LTO to involve the mass media and schools to be able to reach the young population.

Conclusion

The study uncovered that age and emphasis on issue on body integrity are factors that correlate with intention to donate. The large fraction of respondents who left the question on donation blank imply that there is a need to modify the way the question is asked during driver's license applications. The data can be presented to authorities to help develop nationwide programs on organ donation tailored from the results of this study.

Competing Interests

The authors declare no support from any organization for the submitted work.

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