Original Research Article

Factors Affecting Attitude and Behaviour towards Organ Donation among Medical Students in Melaka-Manipal Medical College: A Cross-Sectional Study

ABSTRACT

Aims: To assess the relationship between personality traits and different sociodemographic parameters towards attitude concerning organ donation.
Study design: Analytical cross sectional study
Place and Duration of Study: Melaka-Manipal Medical College (Muar Campus), Malaysia between November and December 2016.
Methodology: A total 350 of students from Batch 33 and 34 were given the questionnaire. The response rate was 228 students and 216 were included in this analysis. Non-probability sampling was used. The questionnaires encompassed demographic profiles, The Big Five personality test and a modified standardised structured questionnaire on Knowledge, Attitude and Practice toward organ donation. All answered questionnaires were collected and subjected to data analysis using Epi-info software version 7.1. The data was interpreted using Chi-square test.
Results: The response rate to our questionnaire is 65.1%. The risk factors with significant positive associations are race, religion, and birth order. For race, the Malay group was chosen to be the reference group. High scores correspond to higher willingness to donate meanwhile low scores corresponds to lower willingness towards organ donation. The Others group has 4.29 times more likely to have higher scores (*P* =.02). This is followed by the Chinese group which is 3.25 times more likely to have higher scores (*P* = .001); the Indians are 2.77 more feasible towards organ donation (*P* =.02).In the religion category, Islam was chosen as the reference group. Other religions have 6.33 times a higher chance to have higher scores and the *P* value was significant (*P* =.03). This is followed by Christianity which is 3.69 times more probable to have higher scores (*P* =.003). Buddhism has an OR of 2.7 with a significant *P* value of 0.01.Lastly, Hindus are 2.41 times more prospective towards organ donation when compared to Muslims (*P* =.03). First-borns have 2.19 higher tendencies towards organ donation when compared to last-borns (*P* =.04). As for personality, the study shows dominant openness trait to have positive and significant association to organ donation (*P* =.03).
Conclusion: It is apparent that multiple factors may contribute to the Knowledge, Attitude and Practice towards organ donation of a medical student. The results suggest that there is an association between race, religion, birth order and personality to the likelihood of an individual donating organ.

Keywords: Organ donation, Personality traits, Sociodemographic parameters

1. INTRODUCTION

Shortage of organs for transplantation is a global burden. Malaysia records as one of the lowest rates for organ donation among Asian countries and in the world [1]. In 2009, there were only 39 actual donors per 28.3 million in Malaysia [2]. Organ donation is defined as the gift of an individual's body parts after their demise for transplantation [3]. In Malaysia, an expressed consent is needed for organ donation. Malaysia introduced the Human Tissue Act in 1974, followed by a National Transplantation Program in 1975 to facilitate and promote organ donation. The first living kidney transplant was performed in Malaysia in 1975 and the first deceased donation follow suit two years later [4].

Organ for transplantation can be obtained from living or deceased donors with the decision to donate specific organs or tissue [5]. In the year 2012, 114690 organs were successfully transplanted worldwide. In spite of a 1.8% increase from the previous year, this number constitutes less than 10% of the global demand for organs. According to the World Health Organization (WHO)'s Global Observatory on Donation and Transplantation (GODT) 2012, Malaysia has one of the lowest rates for organ donations in the world at 1.3 organ donor per million populations when compared to Australia,

United States of America and Spain at 11, 26 and 35.1 per million populations respectively [6]. In February 2015, around 10 000 people in Malaysia are in need of a transplant and around 7000 people are on the transplant waiting list [7].Until August 2016, a total of 17 458 people had signed up as donors which is about 1% of the total Malaysia population [8].

The chronic shortage is attributed to lack of awareness and knowledge among public especially medical students [1] and also passivity among health professionals in approaching families of potential donors [9]. It is important to assess the factors affecting the knowledge and attitude towards organ donation in the public especially in future medical personnel. A study done among relatives of patients awaiting treatment in UM Medical Centre, Malaysia has shown a host of reasons behind negative attitude towards organ donation such as fears of organs being used for research, religio-cultural factors, and fear of less active treatment if patient is known to be a donor [10]. Another study has shown low education level, low household income and age group are also important aspects associated with not pledging as an organ donor [11].

This study aims to assess the relationship between personality trait and different sociodemographic parameters towards attitude concerning organ donation.

2. METHODOLOGY

The objective of this cross sectional study is to assess various risk factors affecting the attitude and behaviour towards organ donation among medical students of MMMC. Cross-sectional study (also known as a cross-sectional analysis, transversal study, or a prevalence study) is a type of observational study that analyses data collected from a population, or a subgroup of the population, at a particular point in time.

It was conducted at Melaka-Manipal Medical College (MMMC), Muar Campus, Johor, Malaysia. MMMC was established in 1997 through the vision of Dr.RamdasPai, Chancellor of Manipal University, and the instrumental efforts of the late Datuk K Pathmanaban, former Malaysian Deputy Minister of Health. There was a shortage of doctors in the country at that point in time. They recognised that the problem could be effectively addressed if more Malaysians had the opportunity to achieve their aspirations of becoming doctors and healthcare professionals. The national aspiration was for Malaysia to be a leading education hub in Southeast Asia. This was aligned to MMMC's vision of imparting quality medical education at an affordable price. This led to the signing of an agreement in New Delhi in 1993, between Manipal Academy of Higher Education (MAHE) and the college. The signing was witnessed by both the Prime Ministers of Malaysia and India. The college was the first Indo-Malaysian alliance in education and was among the spearheads to offer private medical education in the country.

The study was conducted for 6 weeks starting mid November 2016 to the end of December 2016. MBBS students from Batch 33 and Batch 34 of Melaka-Manipal Medical College were included in the study. Based on a previous study done [12], the sample size was calculated.

Sample size formula for cross sectional study:

$$n = Z^2_{1-\alpha/2} P(1-P)/d^2, \textit{ where,}$$

n = sample size

$Z^2_{1-\alpha/2}$ = confidence interval

P = estimated proportion

d = desired precision

Where,
P= prevalence rate, 88.3%
Z= 95% confidence level

A sample size of 162 participants was the minimum number required in order to obtain valid results.350 students from Batch 33 and 34 were given the questionnaire. The response rate was 228

students and 216 were included in this analysis. Students were briefed about the objectives of the study and a written consent form was attached with the questionnaire for willing respondents to sign. Non-probability sampling was used. The inclusion criteria included those who had given consent willingly. Despite of distributing all the questionnaires, there were some students who refused to take part in the study. Those who were absent on the particular day were excluded from the study. Demographic profiles were obtained from the students and these includes their roll number, age, gender, race, religion, address, birth order, blood groups, handedness, family's literacy and family income.

The Big Five Personality Test is a model based on common language descriptors of personality.In a table, for each standardized questions, a score was given,1 is for disagree, 2 is for slightly disagree, 3 is for neutral, 4is for slightly agree and 5 is agree. The scores should be between zero and forty. Five descriptive types are identified which are Extroversion (E), Agreeableness (A), Conscientiousness (C), Neuroticism (N) and Openness to Experience (O). Extroversion (E) is the behavior of striving contentment from sources outside the self or in community. High scorers tend to be very outgoing while low scorers prefer to work alone. Agreeableness (A) reflects individuals who adjust their conduct to suit others. High scorers are typically polite and gregarious. Low scorers have a tendency to speak their mind. Conscientiousness (C) is the personality trait of being honest and hardworking. High scorers tend to abide by rules and favor organized home environment. Low scorers may be messy and may tend to deceive others. Neuroticism (N) individuals are emotional and sensitive beings. Openness to Experience (O) is the personality trait of seeking new capabilities and scholarly pursuits. High scorers tend to daydream and fantasize. Low scorers are most likely people who are subservient and unassertive.

A Knowledge, Attitude and Practices (KAP) study is a quantitative scheme (predefined questions structured in standardized questionnaires) that provides access to quantitative and qualitative information.
For example:

Knowledge: Organs for transplant can be legally bought and sold in Malaysia
Attitude: Are you willing to accept organs from other people?
Practices: Have you registered as an organ donor in the national registry?

A modified structured questionnaire (refer to appendix for questionnaire) was administered to the students and the collection of questionnaires was done. The completed questionnaire was analysed individually. Scores 20 and above was considered as high score and those with 19 and below were considered low scores. Data obtained in the report was analyzed using the data analysis software program Epi Info version 7.2 and Microsoft Excel 1997-2003. Descriptive statistics included mean and standard deviation for personality as well as frequency and percentage for gender, race and religion, place of stay, birth order, blood group and handedness. For inferential statistics, we used chi-square for nominal data to test the hypothesis. We used odds ratio and 95% confidence interval as the measure of association. The level of significance was set at *P* value of .05. *P* value less than .05 was regarded significant.
Partaking was voluntary and written informed consent was taken. Before the students completed the questionnaires, they were briefed about the objective of the study. Participants were reassured that their particulars will not be revealed to any third parties. Anonymity was also maintained.

3. RESULTS AND DISCUSSION

350 students from Batch 33 and 34 were given the questionnaire. The response rate to our questionnaire is 65.1% in which, 228 of the questionnaires were returned answered. About 12 questionnaires were excluded due to incomplete or invalid answers; the resultant valid questionnaires were 216.

Table 1 shows demographic data and results of the Big Five Personality test done on our respondents. Our study sample size consisted of 129 females making up 59.72% of the population while males were 87 in number with a percentage of 40.28%. Among the four races, Malay is the highest in number encompassing 41.67% of the population, Chinese and Indian made up the same percentage with 26.85% of the total population followed by the least, 4.63% which is the Others category. The majority of the population were Muslims at 43.52%, followed by Hindus at 20.37%, Buddhism at 19.91%, Christianity at 13.89% and others which made up the minority of the population

with 2.31%. 82.87% of our sample population were urbanites meanwhile 17.13% comes from the rural areas of Malaysia. Our study also took birth order as one of our independent variable. First-borns made up most of our sample size with a percentage of 40.74%, followed by middle children at 35.65 %, and last-borns at 23.61%. Blood group was also taken as one of our parameters, in which blood group O was the highest among all four groups at 42.59%. We also requested that the participants fill out their handedness. Right-handers made up 86.11% of our subjects, 11.57% were left-handers and 2.31% were ambidextrous. Based on the Big Five Personality Test, that was subjected to our sample size; some of the study sample had more than one dominant personality trait. It is due to this that only the dominance of each personality could be tabulated and not the total scores. 10.19% of our study sample was dominant for extroversion, 44.44% was dominant for Agreeableness, 25.00% was dominant for Conscientiousness, 15.28% was dominant for Neuroticism and 20.37% was dominant for openness.

Table 1: Descriptive Statistics of Basic Variables

Variables	Number (n)	Percentage (%)
Total Participant	216	
Gender		
Female	129	59.72%
Male	87	40.28%
Race		
Chinese	58	26.85%
Indian	58	26.85%
Malay	90	41.67%
Others	10	4.63%
Religion		
Buddhism	43	19.91%
Christianity	30	13.89%
Hindu	44	20.37%
Islam	94	43.52%
Others	5	2.31%
Place		
Rural	37	17.13%
Urban	179	82.87%
Birth Order		
First	88	40.74%

Last	51	23.61%
Middle	77	35.65%
Blood Group		
A	55	25.46%
AB	12	5.56%
B	57	26.39%
O	92	42.59%
Handedness		
Both	5	2.31%
Left	25	11.57%
Right	186	86.11%
Personality Traits		
Dominant Extroversion Trait		
No	194	89.81%
Yes	22	10.19%
Dominant Agreeableness Trait		
No	120	55.56%
Yes	96	44.44%
Dominant Conscientiousness Trait		
No	162	75.00%
Yes	54	25.00%
Dominant Neuroticism Trait		
No	183	84.72%
Yes	33	15.28%
Dominant Openness Trait		
No	172	79.63%
Yes	44	20.37%

Table 2 shows inferential statistics by comparing different parameters with high and low scores. High scores correspond to higher willingness to donate meanwhile low scores corresponds to lower willingness towards organ donation. In order to interpret the data, we used odds ratio which includes 95% Confidence Interval, Chi-square and two tailed *P* -value. For interpretation of Odds Ratio, OR is equal to 1 if there is no association between the independent and dependent variable; if OR is more than 1, this result can be interpreted as the independent variable having positive association against the dependent variable; if OR is less than 1; the independent variable has negative associations against the dependent variable. For Chi-square, if the value obtained is more than 3.841, the data is considered to be significant. *P* value is significant if the value is less than .05.

Based on table 2, males are 1.04 times more likely to have higher scores but the value is not significant based on 95% CI, chi-square and *P* value (*P* =.91). For race, the Malay group was chosen to be the reference group. The others group has 4.29 times more likely to have higher scores and the value is significant (*P* =.02). This is followed by the Chinese group which is 3.25 times more likely to have higher scores, (*P* =.001); the Indians are 2.77 more feasible towards organ donation, (*P* =.02). In the religion category, Islam was chosen as the reference group. Other religions have 6.33 times a higher chance to have higher scores and the *P* value was significant (*P* =.03). This is followed by Christianity which is 3.69 times more probable to have higher scores (*P* =.003). Buddhism has an OR of 2.7 with a significant *P* value of .01. Lastly, Hindus are 2.41 times more prospective towards organ donation when compared to Muslims (*P* =.03). Between urbanites and those who come from rural regions, urbanites have 1.1 times higher chances to have higher scores but this value have no significance. First-borns have 2.19 higher tendencies towards organ donation when compared to last-borns, this value is significant (*P* =.04). As for blood group, group A was set as the reference. Blood group AB has the highest likelihood for better scores followed by groups B and O; however the values are not significant. Lastly, left handers are 1.21 more likely to have higher KAP scores compared to right handers, but the value is not significant.

Table 2: Comparison of Characteristics against Scores (Willing to donate) via Qualitative Analysis

Parameter	Scores		Odds Ratio (95% CI)	Chi-Square	*P* value
	High	Low			
Gender					
Male	19 (42.22%)	42 (41.18%)	1.04 (0.51 - 2.13)	0.01	0.91
Female	26 (57.78%)	60 (58.82%)			
Race					
Malay	17 (25.00%)	73 (49.32%)	1.00 (reference)		
Chinese	25 (36.76%)	33 (22.30%)	3.25 (1.55 - 6.82)	10.17	0.001***
Indian	21 (30.88%)	37 (25.00%)	2.77 (1.15 - 5.17)	5.54	0.02***
Others	5 (7.35%)	5 (3.38%)	4.29 (1.12 - 16.52)	5.08	0.02***
Religion					
Islam	18 (26.47%)	76 (51.35%)	1.00 (reference)		

Christianity	14 (20.59%)	16 (10.81%)	3.69 (1.53 - 8.93)	8.99	0.003***
Hindu	16 (23.53%)	28 (18.92%)	2.41 (1.08 - 5.37)	4.78	0.03***
Buddhism	17 (25.00%)	26 (17.57%)	2.76 (1.24 - 6.14)	6.45	0.01***
Others	3 (4.41 %)	2 (1.35%)	6.33 (0.98 - 40.75)	4.74	0.03***
Place					
Urban	57 (83.82%)	122 (82.43%)	1.10 (0.51 - 2.39)	0.06	0.80
Rural	11 (16.18%)	26 (17.57%)			
Birth Order					
First	20 (50.00%)	68 (68.69%)	2.19 (1.03 - 4.65)	4.28	0.04***
Last	20 (50.00%)	31 (31.31%)			
Blood Group					
A	13 (19.12%)	42 (28.38%)	1.00 (reference)		
AB	5 (7.35%)	7 (4.73%)	2.31 (0.63 - 8.51)	1.63	0.20
B	18 (26.47%)	39 (26.35%)	1.49 (0.65 - 3.44)	0.88	0.35
O	32 (47.06%)	60 (40.54%)	1.72 (0.81 - 3.67)	2.01	0.16
Handedness					
Left	9 (13.24 %)	16 (11.19%)	1.21 (0.51 - 2.90)	0.18	0.67
Right	59 (86.76%)	127 (88.81%)			

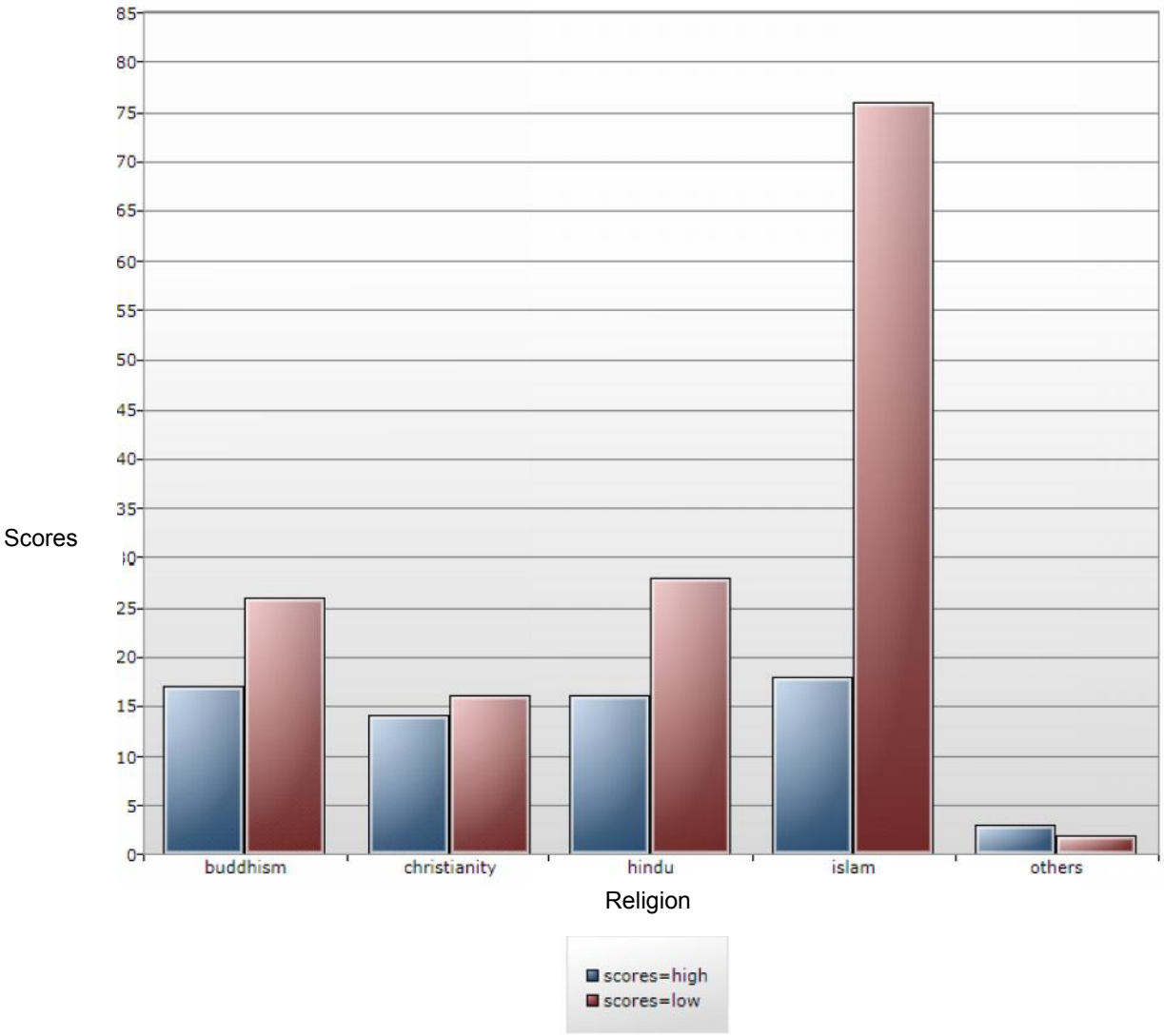

Figure 1: Bar chart shows scores (willingness to donate) obtained plotted against different religions

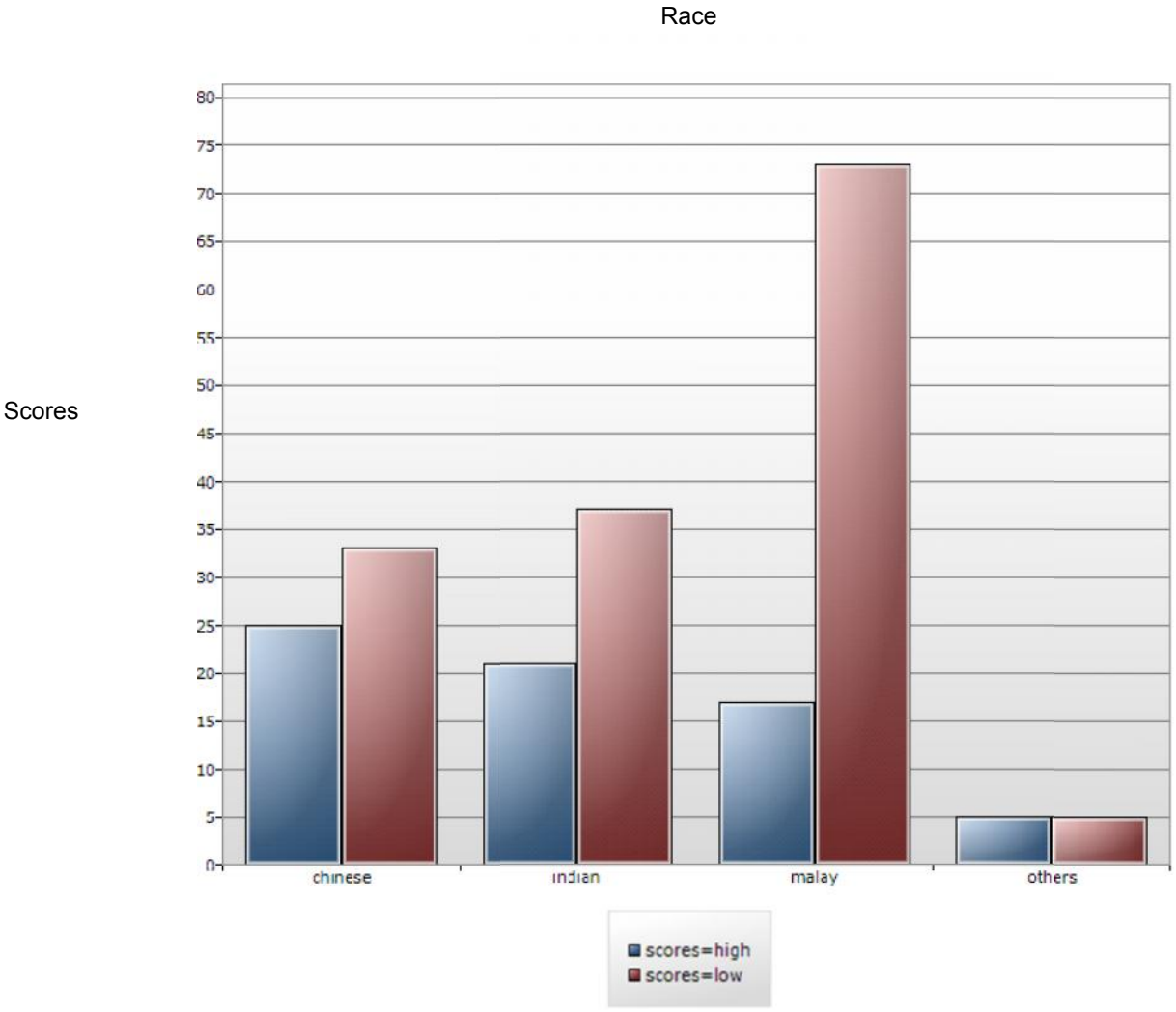

Figure 2: Bar chart shows scores (willingness to donate) obtained against different races

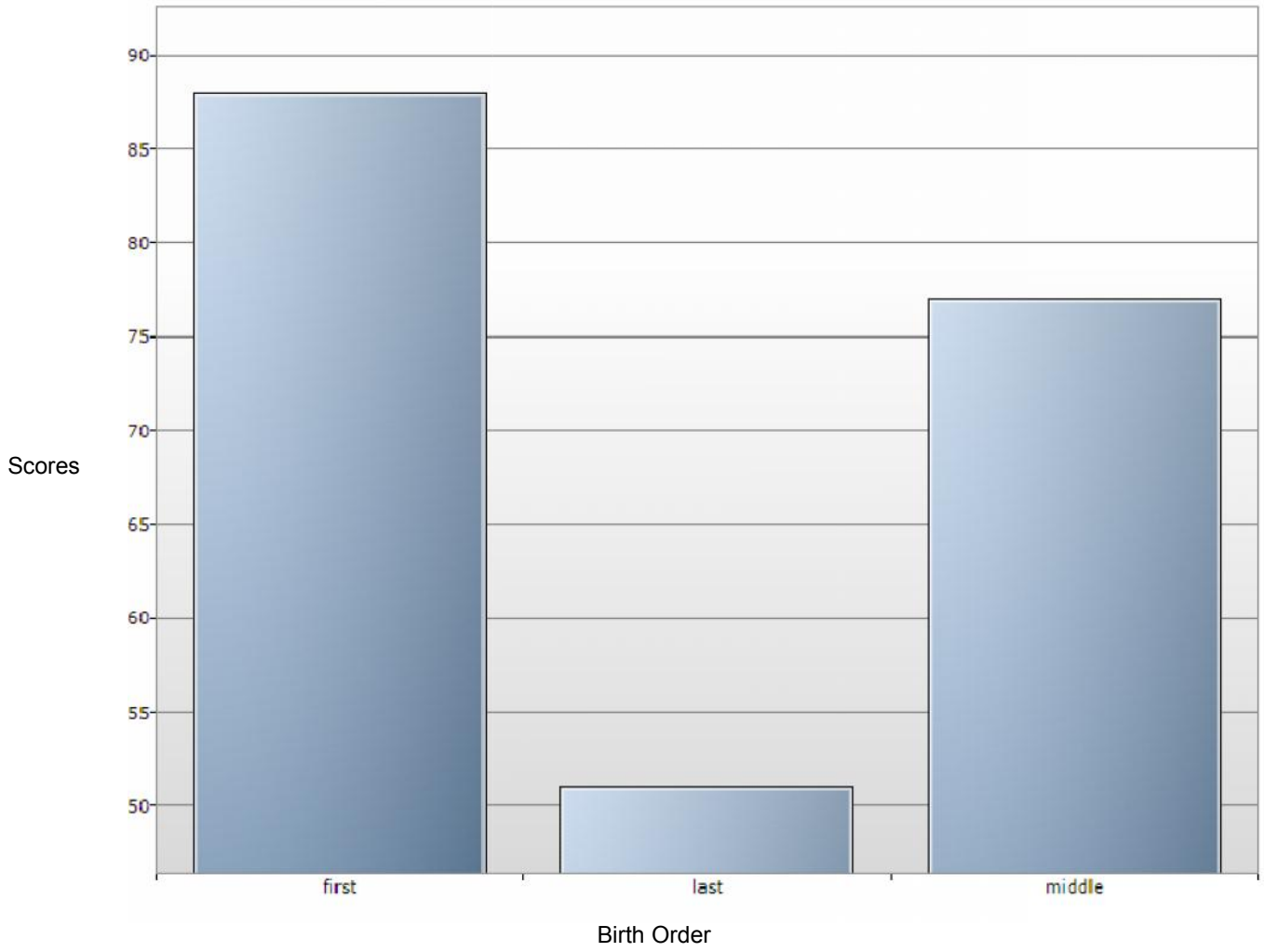

Figure 3: Bar chart shows scores (willingness to donate) obtained plotted against birth order of the subjects

Table 3 shows that Dominant Agreeableness, Conscientiousness, Extroversion, Neuroticism, and Openness are more prone for organ donation but only Dominant Openness has significant *P* value (*P* =.03).

Table 3: Comparison of Dominant Personality against Scores via Qualitative Analysis

Dominant Personality	Scores		Odds Ratio (95% CI)	Chi-Square	*P* value
	High	Low			
Dominant Agreeableness					
Yes	24 (35.29%)	72 (48.65%)	0.58 (0.32 - 1.04)	3.37	0.07
No	44 (64.71%)	76 (51.35%)			
Dominant Conscientiousness					
Yes	16 (23.53%)	38 (25.68%)	0.89 (0.46 - 1.74)	0.11	0.38
No	52 (76.47%)	110 (74.32%)			
Dominant Extroversion					
Yes	7 (10.29%)	15 (10.14%)	1.02 (0.40 - 2.62)	0.00	0.97
No	61 (89.71%)	133 (89.86%)			
Dominant Neuroticism					
Yes	11 (16.18%)	22 (14.86%)	1.11(0.50 - 2.43)	0.06	0.80
No	57 (83.8%)	126 (85.14%)			
Dominant Openness					
Yes	20 (29.41%)	24 (16.22%)	2.15 (1.09 - 2.45)	5.00	0.03
No	48 (70.59%)	124 (83.78%)			

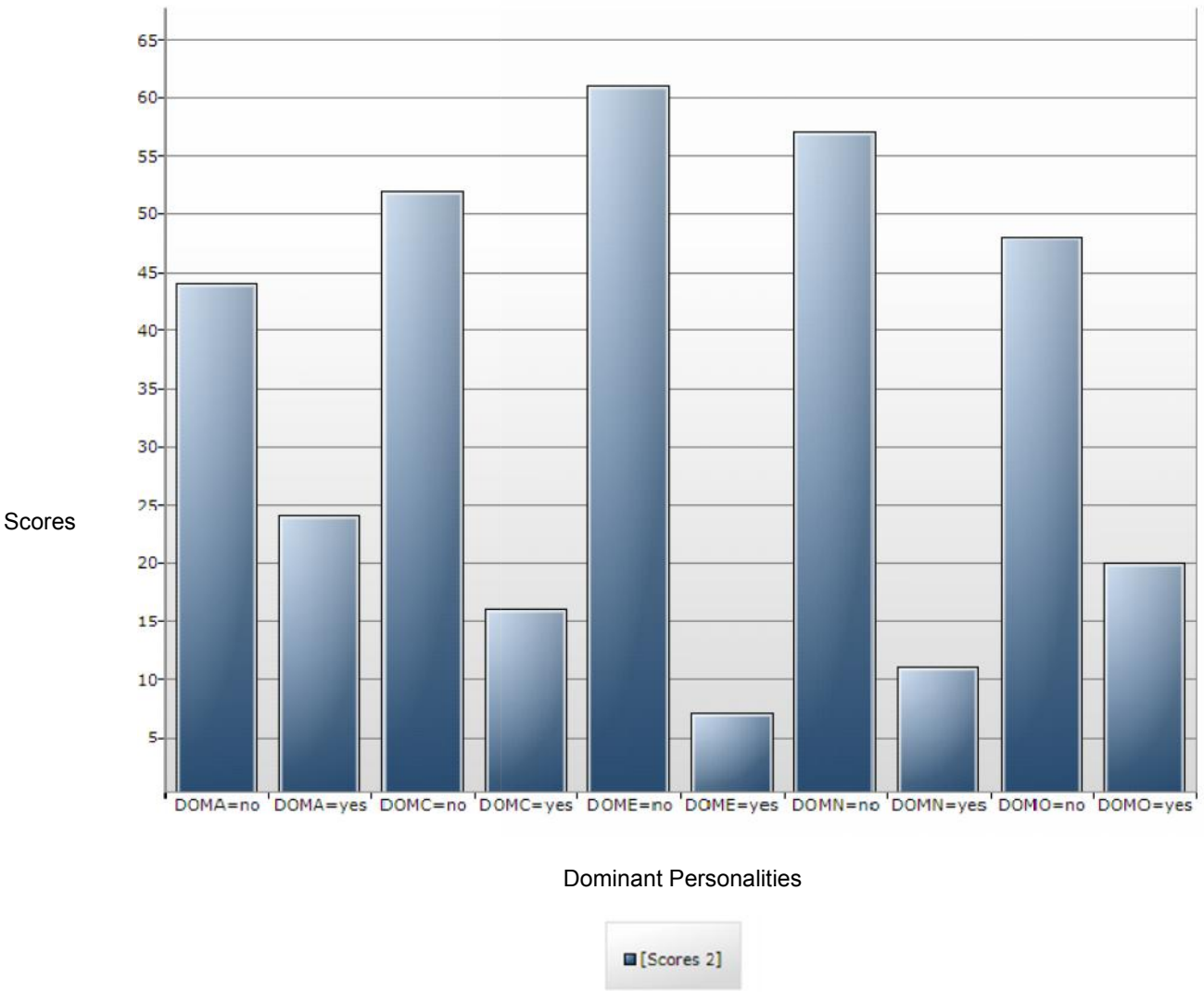

Figure 4: Bar chart shows scores (willingness to donate) obtained plotted against dominant personalities;

DOMA: dominant agreeableness; DOMC: dominant conscientiousness; DOME: dominant extroversion; DOMN: dominant neuroticism; DOMO: dominant openness.

The attitude and behaviour is undeniable in affecting a person's perception towards organ donation. Donation decisions are examined as a function of attitude toward donation and the religious, cultural, noble, normative, and knowledge-based beliefs that comprise the attitude [16]. In view of this, this study was conducted to determine the factors affecting attitude and behaviour towards organ donation. Among the 5 types of personalities, openness was found to be most willing to be an organ donor.

In Table 2, we found that the sociodemographic data of religion have a significant association with attitude on organ donations. We established that others are 6.33 times (*P* value=.03) and Christianity, 3.69 times more likely to have positive attitude on organ donations (*P* value=.003) when compared to Muslims.). Buddhism has 2.7 times with a significant *P* value of .01. Lastly, Hindus are 2.41 times more prospective towards organ donation when compared to Muslims (*P* =.03) In another similar study[17], religion wise, almost two-thirds (66%) of the donors were Buddhists, with Hindus at 24%, Islam at 3%, Christians at 3% and others at 5%. This can be justified by the fact that Muslims face the dilemma of being unsure whether their religion allows them to make organ donations [18, 19, 20]. The culture-specific issues among some Muslims arguing against donation including a sense of the

sacredness of the body, belief that it is important to have an intact body after passing away and fear of illegal trade in organs and the poor would suffer [21]. From the Islamic perspective, a fatwa (decree) on organ donation had been declared in Malaysia in the year 1969 stating that organ donation was not haram (forbidden) and was in fact permitted not only for the benefit of other fellow Muslims, but for non-Muslims as well [22]. This decree is in line with similar fatwas in other Muslim countries. However, it appears that there are still widely held belief that it is forbidden in Islam [23]. There is even a very recent review article in the medical setting erroneously stating that organ donation was forbidden in Islam as the human body is considered sacred after death [24]. Conversely, there is no commandment that prohibits the Hindus to donate their organs. Donating organs is a good deed that may positively affect their karma and reincarnation and rebirth process [25]. In Christianity, donating organs is generally accepted and Pope Benedict XVI has shown his support by becoming a donor himself. His predecessor John Paul II had once stated that donating organs is an act of Christian's love and duty [26].

When comparing likelihood among different ethnicity to register for organ donation, the Others group are most willing to register for organ donations with 4.29 with (*P* value=.02), followed by Chinese with 3.25 times more likely with (*P* value=.001). Lastly, Indians with odds ratio of 2.77 with *P* value of .02. This is in line with the national transplant registry where it noted an increasing trend in the number of donors among the Chinese ethnic group for the past five years while Malays made up only 5% of total donors in the recent years [27]. The Malays in Malaysia is the largest ethnic group, but unfortunately, the statistics show that the Malays are the least to sign up for organ donation as seen in a similar study [28]. Similarly, the willingness to donate one's own organ was significantly and positively associated with a higher knowledge and attitude score as seen in a similar study [29].

In table 3, our studies show that students with dominant openness trait has 2.15 times higher tendency to donate organ with (*P* value=.03). Openness is negatively correlated with harm avoidance and positively correlated with novelty seeking (De Fruyt, Van De Wiele, & Van Heeringen, 2000)[30]. Participants who score are dominant for openness have the tendency to be generous toward strangers in the absence of any guarantee of reciprocity. Openness covers intellect that is not constrained by experience or culture. Individuals with a high degree of openness are creative, imaginative, curious, broad-minded, and intelligent [31, 32, 33]. Openness to experience is the personality trait of seeking new experience and intellectual pursuits and probably due to this they are more likely to be a prospect organ donor.

From the result, males has 1.04 times higher probability to donate organ as compared to female, however our value is not significant. A study among Indian dental students also concluded that gender had no association with practice of organ donation [34]. There was another study done among nursing students in Hong Kong which showed no significant association between age, gender and willingness towards organ donation [35].

There are a few limitations that needed to be overcome in our study. First of all, the population of the study is only based on MMMC students in Muar campus, it is not only limited in a specific institution, but the study is also limited to only 2 batches of students, the sample size although is not small, but can be increased for better reliability. Thus, it is required for the research to be extended to other medical institutions in Malaysia like International Medical University (IMU), Penang Medical College (PMC) and medical faculties in public universities to compare and contrast on the results obtained. As this study is cross-sectional, the findings are not to be compared on causality effect.

Future studies should involve more institutions, and more respondents ranging from the 1st year to the last year. In our study, it was found that dominant openness personality is most likely to become organ donor. Certain strategies to increase knowledge of organ donation among medical students should be imparted as this would provide different attitudes and behaviours towards organ donation. Hence, more information regarding organ donation should be disclosed to medical students as to improve their knowledge regarding this field.

4. CONCLUSION

CONSENT

A written, informed consent was taken from the participants of the study before they proceeded to answer the questionnaire. Anonymity of the participants was maintained.

ETHICAL APPROVAL

The research was approved by the Faculty of Medicine, Melaka-Manipal Medical College, Prof. Dr Soumendra Sahoo, Prof. Dr Adinegara Lutfi Abas and Prof Dr Htoo Htoo Kyaw Soe. A written, informed consent was taken from each participant, privacy and anonymity of each participant was maintained throughout the course of the study.

REFERENCES

1. Seo YH, Katarina CSY, Janusha SR, Mathias PP, Muhammad IS. Knowledge, awareness and attitudes on organ donation among undergraduate medical students in Malaysia: an analytical cross sectional study. British Journal of Medicine and Medical Research 2016,16(3):1-14.
2. National Transplant Registry. 6th Report of National Transplant Registry. Malaysia: MOH, 2009.
3. Transplantation Unit, Medical Development Division, Ministry Of Health Malaysia. Living Organ Donation What You Need To Know. Malaysia: MOH, 2011.
4. Makmor T, Abdillah N, Raja Noriza RA, Nurulhuda MS, Sook-Lu Y, Lim SK, Ng KP. Low organ donation rate in Malaysia: A survey. Journal of Health and Translational Medicine. 2014;17(1):14-17.
5. National Kidney Foundation of Malaysia. Organ Donation & Kidney Transplantation. Malaysia: NKF, 2012.
6. World Health Organization. Global Observatory on Donation and Transplantation. Spain: WHO, 2012.
7. National Transplant Resource Centre. Organ Donation: What You Need to Know. Malaysia: NHS, 2015.
8. Anonymous. Malaysia's organ donation rate among the lowest in the world. The Star 2016. Accessed 20 December 2016. Available: https://www.thestar.com.my/news/nation/2016/10/04/malaysia-organ-donation-rate-among-lowest-in-the-world/
9. Satyapal KS. Ethics, transplantation, and the changing role of anatomists. Clinical Anat. 2005;18(2):150-3. Accessed 20 December 2016. Available: https://onlinelibrary.wiley.com/doi/abs/10.1002/ca.20066
10. Abidin ZL, Ming WT, Loch A, Hilmi I, Hautmann O. Are health professionals responsible for the shortage of organs from deceased donors in Malaysia? Transplant Int. 2013;26(2):187-94.
11. Riyanti S, Hatta M, Norhafizah S, Balkish MN, Siti ZM, Hamizatul AH, et al. Organ donation by sociodemographic characteristics in Malaysia. Asian Social Science. 2014; 10(4):132-40.
12. Hilmi I, Mazam Z, Yegan P, D Choon. Differences in attitude towards cadaveric organ donation: observations in a multiracial malaysian society. Hong Kong Journal of Emergency Medicine. 2010;17(3):236-243.
13. Rumsey S, Hurtford DP, Cole AK. Influence of knowledge and religiousness on attitudes toward organ donation. Transplant Proc. 2003;35(8):2845-50.
14. Morgan S, Miller J. Communicating about gifts of life: the effect of knowledge, attitudes, and altruism on behavior and behavioural intentions regarding organ donation. Journal of Applied Communication Research. 2002;30(2):163-78.
15. Goldberg LR. The structure of phenotypic personality traits. American Psychologist. 1993;48(1):26-34.
16. Radecki CM, Jaccard J. Psychological aspects of organ donation: a critical review and synthesis of individual and next-of-kin donation decisions. Health Psychology. 1997;16(2):183-95.
17. Wong LP. Factors limiting deceased organ donation: focus groups' perspective from culturally diverse community. Transplant Proc. 2010;42(5):1439-44.
18. Noordin N, Zakaria Z, Aminuddin A, Sawal MZHM, Daud MS, Yusof ASM et al. Organ donation among Malaysian: The malay dilemma toward social development. Asian Social Science. 2012;8(10).

19. Tokalak I, Kut A, Moray G, Emiroglu R, Erdal R, Karakavali H et al. Knowledge and attitudes of high school students related to organ donation and transplantation: a cross-sectional survey in Turkey. Saudi Journal of Kidney Diseases and Transplantation. 2006;17(4):491-6.
20. Rashid A. Muslim families: Donating organs and asking for post mortems. Archives of Disease in Childhood. 2001;85:79.
21. Bhandary S, Khanna R, Rao KA, Rao LG, Lingam KD, Binu V. Eye donation - awareness and willingness among attendants of patients at various clinics in Melaka, Malaysia. Indian Journal of Ophthalmology. 2011;59(1):41-5.
22. Albar M. Islamic ethics of organ transplantation and brain death. Saudi Journal of Kidney Diseases and Transplantation. 1996;7(2):109-14.
23. Shaheen FA, Al-Jondeby M, Kurpad R, Al-Khader AA. Social and cultural issues in organ transplantation in Islamic countries. Ann Transplant. 2004;9(2):11-3.
24. Puchalski CM, O'Donnell E. Religious and spiritual beliefs in end of life care: how major religions view death and dying. Tech RegAnesth Pain Manag. 2005;9(3):114-21.
25. Anonymous. Hinduism and organ donation. British Broadcasting Corporation 2003. Accessed 29th November 2016.
Available: http://www.bbc.co.uk/religion/religions/hinduism/hinduethics/organdonation.
26. Badrolhisam NI, Zakaria Z. Knowledge, religious beliefs and perception towards organ donation from death row prisoners from the perspective of patients and nonpatients in Malaysia: A Preliminary Study. 2012; 2(24):197-206.
27. Hooi LS, Lela YM. Seventh report of the national transplant registry Malaysia 2010. National Transplant Registry Kuala Lumpur; 2013.
28. Nazni N, Zaherawati Z, Adnan A, Mahazril' AY, MohdZool HMS, MohdShamsul D, et al. Organ Donation among Malaysian: The Malay Dilemma toward Social Development. 2012;8(10):8-15.
29. Anonymous. Organ Donation- What Can Be Donated 2014.
Available: http://www.nhs.uk/Conditions/Organ-donation/Pages/Definition.aspx
30. De Fruyt F, Van De Wiele L, and Van Heeringen C. Cloninger's psychobiological model of temperament and character and the five-factor model of personality. Personality and Individual Differences. 2000;29(3):441–452.
31. Barrick MR, Mount MK. The Big Five personality dimensions and job performance: a meta-analysis. PersPsychol. 1991;44(1):1–26.
32. Goldberg, Lewis R. The structure of phenotypic personality traits. American Psychologist. 1993;48(1):26-34.
33. McCrae RR, John OP. An introduction to the Five-Factor Model and its applications. J Pers. 1992;60(2):175–215.
34. Chakradhar K, Doshi D, Srikanth RB, Kulkarni S, Padma RM, Sruthi RS. Knowledge, Attitude and Practice Regarding Organ Donation among Indian Dental Students. Int J Organ Transplant Med. 2016;7(1):28–35.
35. Tam WW, Suen LK, Chan HY. Knowledge, Attitudes and Commitment towards Organ Donation among Nursing Students in Hong Kong. Transplantation Proceedings. 2012;44(5):1196–1200.

APPENDIX

Factors Affecting Attitude and Behavior towards Organ Donation among Medical Students in Melaka-Manipal Medical College: A Cross-Sectional Study.

(Investigators: Edmund Lee, Nurul Shazlyiana, Farah Nursyahirah, Fam Jia Cheng, Chua Jenna)

We kindly ask for your cooperation to take part in our research study as titled above. Your responses to this survey will be anonymous. Every effort will be made to preserve your confidentiality. Your participation in this study is voluntary.

Thank you.

Consent Form

I have read and I understand the provided information. My participation in this study is voluntary and I am free to withdraw at any time.

Participant's Signature: _____ Date: _____

Demographic Profile

Roll number: _____

Age: ____

Gender: Male / Female

Race: Malay / Chinese / Indian / Others: _____

Religion: Islam / Buddhism / Hindu / Christianity /Others: _____

Place: Urban / Rural

Birth Order: __out of __

Blood Group: ____ (E.g.: O+)

Handedness: Left / Right/ Both

Family background:

Parents' literacy:

- Mother: Primary / Secondary / Tertiary
- Father: Primary / Secondary / Tertiary

Total Income:

- < RM1000.00
- RM1000 – RM 5999
- RM6000 – RM 9999
- > RM 10000

Instructions

In the table below, for each statement 1-50 mark how much you agree with on the scale 1-5, where 1=disagree, 2=slightly disagree, 3=neutral, 4=slightly agree and 5=agree, in the box to the left of it.

Test

Rating	I....	Rating	I.....
	1. Am the life of the party.		26. Have little to say.
	2. Feel little concern for others.		27. Have a soft heart.
	3. Am always prepared.		28. Often forget to put things back in their proper place.
	4. Get stressed out easily.		29. Get upset easily.
	5. Have a rich vocabulary.		30. Do not have a good imagination.
	6. Don't talk a lot.		31. Talk to a lot of different people at parties.
	7. Am interested in people.		32. Am not really interested in others.
	8. Leave my belongings around.		33. Like order.
	9. Am relaxed most of the time.		34. Change my mood a lot.
	10. Have difficulty understanding abstract ideas.		35. Am quick to understand things.
	11. Feel comfortable around people.		36. Don't like to draw attention to myself.
	12. Insult people.		37. Take time out for others.
	13. Pay attention to details.		38. Shirk my duties.
	14. Worry about things.		39. Have frequent mood swings.
	15. Have a vivid imagination.		40. Use difficult words.
	16. Keep in the background.		41. Don't mind being the center of attention.
	17. Sympathize with others' feelings.		42. Feel others' emotions.
	18. Make a mess of things.		43. Follow a schedule.
	19. Seldom feel blue.		44. Get irritated easily.
	20. Am not interested in abstract ideas.		45. Spend time reflecting on things.
	21. Start conversations.		46. Am quiet around strangers.
	22. Am not interested in other people's problems.		47. Make people feel at ease.
	23. Get chores done right away.		48. Am exacting in my work.
	24. Am easily disturbed.		49. Often feel blue.
	25. Have excellent ideas.		50. Am full of ideas.

Kindly respond YES/NO to the following questions pertaining to our research project.

No:	Question	YES	NO
1.	In the past years, have you ever read, heard		

	or seen any information about organ donation and transplantation?		
2.	In general, do you support organ donation?		
3.	Have you registered as an organ donor in the national registry?		
4.	Have you discussed your wish to be an organ donor with a member of your family?		
5.	Recent medical breakthrough has resulted in successful hand and face transplants for people who have suffered the loss of limbs or facial disfigurement. Would you be upon your death to donate your face?		
6.	Recent medical breakthrough has resulted in successful hand and face transplants for people who have suffered the loss of limbs or facial disfigurement. Would you be upon your death to donate your hands?		
7.	Is it important for a person to have all of their parts when they are buried?		
8.	Are you willing to accept organs from other people?		
9.	Are you willing to accept organs from people of different racial backgrounds?		
10.	Are you willing to donate your organ?		
11.	Are you willing to donate organs to people of different racial backgrounds?		
12.	Are you willing to donate your kidney or part of your liver while you are alive?		
13.	Organ donation is against my religion.		
14.	It's impossible to have a regular funeral service following organ and tissue donation.		
15.	Given equal need, a poor person has as good a chance as a rich person of getting an organ transplant.		
16.	A deceased person's next of kin is able to override the deceased person's wish to donate his/her organs in Malaysia.		
17.	People over 50 years old can donate their organs.		
18.	Do you know the shortage of organ donors is still a fundamental public health problem in Malaysia?		

19.	A person must carry a signed organ donor card giving permission before they can become an organ donor.		
20.	A person next-of-kin must give their permission before they can become an organ donor.		
21.	Most people who need an organ transplant receive one.		
22.	Racial discrimination prevents minority patients from receiving the transplant the need.		
23.	It is possible for a brain dead person to recover from their injuries.		
24.	People who choose to donate a family member's organs end up paying extra medical bills for harvesting.		
25.	Organs for transplant can be legally bought and sold in Malaysia.		