

Supplementary Table 1. Summary of relevant articles from Malaysia

Study	Study design	Study group	Results/discussion	Concept	Context
Syed Ismail (1996) [28]	Document analysis	-	<ul style="list-style-type: none"> Controversial: the need to increase the supply of organs to save lives or the efforts to do so should remain within ethical boundaries The Human Tissues Act 1974 needs to be amended 	<ul style="list-style-type: none"> Sale and purchase of human organs Altruism/moral duty 	Legal Ethics
Lim et al. (1998) [29]	Questionnaire survey	Parents	<ul style="list-style-type: none"> 632/900 Questionnaires 22% agreed with kidney donation Organ procurement system in this country is still ineffective 	<ul style="list-style-type: none"> Presumed consent/opt-out law Incentives Traditional approach: campaign 	Legal Social: attitudes, religion, beliefs
Yusof and Hassan (1998) [30]	Questionnaire survey	General public	<ul style="list-style-type: none"> 233 Questionnaires 44.6% have heard about tissue banking in Malaysia 11.6% were aware of the existence of two tissue banks, i.e., Malaysian Institute for Nuclear Technology Research, Bangi, Selangor and Hospital Universiti Sains Malaysia (HUSM), Kubang Kerian, Kelantan Respondents were aware of donation for both organs (56.2%) and tissue (51.1%) 	<ul style="list-style-type: none"> More aggressive publicity for tissue banking is needed Only half of the respondents were willing to donate after death, but most of them were willing to be recipients of tissue grafts for clinical treatment and organ transplantation Overall, the respondents were happy with the success of the two tissue banks toward developing an interesting new expertise 	Tissue bank Social: knowledge
Rozaidi et al. (2000) [31]	Questionnaire survey	HCPs	<ul style="list-style-type: none"> 426/460 Questionnaires Poor response to organ donation is due to a lack of positive attitudes and knowledge Failure of campaigns resulted in public lack of confidence and distrust in such healthcare professionals 	<ul style="list-style-type: none"> Own belief and religious/cultural belief on insufficient scientific and medical evidence to support the concept of brain death 	Social: knowledge of HCPs
Chen et al. (2000) [32]	Retrospective	Patients with severe brain injury (Kuala Lumpur)	<ul style="list-style-type: none"> 19 Potential cadaveric donors Demographic data and clinical data included (18 mo duration) Majority (79%) was referred from Neurosurgical Unit; only 1 referral (5%) from the ICU 	<ul style="list-style-type: none"> Problems identified: lack of awareness among medical personnel; lack of facilities to support brain-injured patients; cultural beliefs and misinterpretation of religious teachings; lack of public awareness and understanding of the concept of brain death 	Knowledge of HCPs
Kassim (2005) [33]	Legal opinion	-	<ul style="list-style-type: none"> Inadequacies in current legislation: scope of the definition for "tissue"; "the person lawfully in possession of the body"; hierarchy of relatives who are deemed the next-of-kin; provision of living donor 	<ul style="list-style-type: none"> Lack of cadaveric donors Organ shortage Organ purchase abroad Protect the living donor Opt-out law 	Legislation: Human Tissue Act 1974
Loch et al. (2010) [4]	Questionnaire survey	Relatives of patients awaiting treatment at the emergency department (Kuala Lumpur)	<ul style="list-style-type: none"> 904/1,000 Questionnaires Knowledge: 88.3% aware of organ transplantation Attitude: 43.6% would donate; Malays were less willing to donate their organs but were equally willing to become organ recipients 	<ul style="list-style-type: none"> Low awareness of cadaveric organ donation Differences in acceptability among 3 major ethnics 	Sociocultural Religious values
Abd-Wahab et al. (2010) [34]	Descriptive analysis	-	<ul style="list-style-type: none"> Potential and actual donors increased Improved donor management, procurement coordination, staff training, awareness, promotion, and data collection 	<ul style="list-style-type: none"> Consent: the main reason for the refusal to donate is differing opinions between relatives Establishment of structured procurement units for organ and tissue donation 	Government intervention

Supplementary Table 1. Continued 1

Study	Study design	Study group	Results/discussion	Concept	Context
Wong (2010) [35]	Focus group discussion	General public aged 18–60 yr (Kuala Lumpur and Selangor)	<ul style="list-style-type: none"> • 17 Focus group discussions with 105 participants • Malay: handling of bodies aligns with Islamic faith • Chinese and Indian: concern with the mistreatment of bodies during procurement 	<ul style="list-style-type: none"> • Culturally sensitive public education • Role of the community and RLs 	Sociocultural barriers
Wong (2010) [36]	Focus group discussion	General public aged 18–60 yr (Kuala Lumpur and Selangor)	<ul style="list-style-type: none"> • General: positive attitudes toward deceased organ donation and transplantation • Religious prohibition, cultural misperceptions, fear of disfigurement, fear of surgery, distrust of the medical system, and family disapproval 	<ul style="list-style-type: none"> • Myths and misinformation: less-educated and rural groups had more misconceptions • Culture-specific information about organ donation—involvement of RLs 	Culture Religious beliefs
Muda Ismail (2011) [37]	Legal opinion	-	<ul style="list-style-type: none"> • Since 1980, the organ donation rate has been stagnant, but there is an increasing demand for organs (organ shortage) • Increased registered organ donors but few actual organ donors 	<ul style="list-style-type: none"> • Potential donors wasted due to family rejection • Amend the Human Tissues Act 1974 Section 2(b) • Promoting education: role of media 	Legal
Bhandary et al. (2011) [38]	Questionnaire survey	Attendants of patients: relatives/friends (Melaka)	<ul style="list-style-type: none"> • 370/400 Questionnaires • 69% awareness of eye donation, but only 34.42% from this group willing to donate their eyes • Rate of eye donation is low 	<ul style="list-style-type: none"> • Factors affecting the willingness to donate eye: gender, age, education level, and occupation 	Sociodemographics Religion
Wong (2011) [39]	Cross-sectional study, computer-assisted telephone interview	Public	<ul style="list-style-type: none"> • 5.5% of the total participants (n=1,174) had registered to be organ donors • Malays have the lowest willingness to donate organ • Factors affecting the willingness to donate: knowledge, education, attitudes, and ethnicity 	<ul style="list-style-type: none"> • Culture-specific information about organ donation—reaching out to targeted diverse sociodemographic and ethnic communities through organ donation and transplantation organizations 	Religion Social: knowledge, attitudes, behavior
Noordin et al. (2012) [40]	Case study, questionnaire	Malaysian Muslim (Sg Petani City Council, Kedah)	<ul style="list-style-type: none"> • 74/100 Questionnaires • Identify factors contributing to the lack of donors in the Malay community: religion and perceptions • Awareness was not a factor causing a shortage of organ donors among the Malays 	<ul style="list-style-type: none"> • Islam never forbids Muslims to donate organs • Majority of them believe that Islam does not allow them to donate organs • Urgent need to change public perception of organ donation from an Islamic perspective 	Religion Myth (perceptions/tradition)
Badrolhisam and Zakaria (2012) [41]	Structured questionnaire	Public (several hospitals in Kuala Lumpur and Selangor, and internet distribution)	<ul style="list-style-type: none"> • 213 Questionnaires • Respondents consisted of patients who are on the waiting list for organ transplants (16%) and nonpatients (84%) • Most were positive about receiving organs donated by death row inmates 	<ul style="list-style-type: none"> • Efforts to reduce the gap between the demand and supply of organs • Society to have an open mind in accepting organs from capital inmates • Reform the legislation 	Society stigma Legislation Ethics Social: knowledge, attitudes, behavior
Ibrahim Shukri et al. (2013) [42]	Comparative and content analysis: Malaysia, Spain, Australia In-depth interview	4 Respondents	<ul style="list-style-type: none"> • Inadequacies in current legislation: scope of the definition for "tissue"; "the person lawfully in possession of the body"; hierarchy of relatives who are deemed the next-of-kin; provision of living donor • Organ donation and transplantation: complex and morally controversial medical dilemmas besides abortion and euthanasia • Lack of expertise and facilities for organ transplantation 	<ul style="list-style-type: none"> • Amend the Human Tissues Act 1974 Section 2(b): Confusing and vague terminologies (Never been reviewed or amended since 1974—outdated) • Opt-out or presumed consent law as a solution to low rate of organ donation • Concept: transplant tourism; transplant tourism country; organ-importing countries • Determination of priority of recipient: the maxim of 'first come, first serve' applies 	Legislation: Human Tissue Act 1974

Supplementary Table 1. Continued 2

Study	Study design	Study group	Results/discussion	Concept	Context
Kamar (2013) [43]	Questionnaire	Living kidney donors (Kuala Lumpur)	<ul style="list-style-type: none"> • 80 Questionnaires out of 170 phone calls • QOL improved after organ donations and living capabilities of the living kidney donors did not decrease; living donation should be encouraged and promoted in Malaysia • Factors that deteriorate QOL: nonlife-threatening physical health (pain interfering with work); limited activities/low energy; minor to major psychological impact; psychosocial health 	<ul style="list-style-type: none"> • Missing living donor registry • Organ donation policy–protection to the living donor: QOL (excellent healthcare system, follow-ups, indiscriminating medical benefit insurance policy) • Organ donation models: conscription (organ donation is an “obligation” toward prisoners like the military conscription model); presumed consent; commodification; required response; compensation/reimbursement/incentives 	Living donor Government policy
Tumin et al. (2013) [44]	Questionnaire	Malaysian Muslim (Kuala Lumpur)	<ul style="list-style-type: none"> • 779/900 Questionnaires • 65.2% disagreed with organ donation (although 34.8% agreed but had not pledged to be organ donors) • Religious and cultural factors are not significant determinants of Malaysian Muslims’ decision to donate their organs 	<ul style="list-style-type: none"> • Malaysia’s inability to improve its organ donation is due more to structural rather than religious or cultural considerations • Malaysia has a lot more room to maneuver its policy and adopt a segmented policy engagement when dealing with its largest population (Muslims) 	Religion
Tumin et al. (2013) [13]	Questionnaire	Malaysian with tertiary level of education (Kuala Lumpur and Selangor)	<ul style="list-style-type: none"> • 1,311/1,420 Questionnaires • 52.5% willing to be organ donor out of 688 respondents with tertiary education • Low donation rate in Malaysia is due to public’s lack of trust in the state’s ability to carry out proper organ procurement and medical procedures 	<ul style="list-style-type: none"> • Lack of medical information on organ donation • Lack of knowledge on deceased organ donation • Setting up an independent organ procurement organization • To narrow the gap between organ demand and supply, target the better-educated group 	Public confidence
Tumin et al. (2013) [45]	Questionnaire	Malaysian with postsecondary education (tertiary) (Kuala Lumpur and Selangor)	<ul style="list-style-type: none"> • 1,310/1,420 Questionnaires • Identify underlying deterrents among better-educated Malaysians to be living kidney donors (n=688 respondents with tertiary education) • 198/688 Respondents were willing to be kidney donors • Incentives may not be the sole determinant of the decision to be an organ donor 	<ul style="list-style-type: none"> • Lack of medical knowledge in organ transplantation • Targeted awareness program in encouraging living organ donation–increase the number of non-related kidney donors • Measure to relieve would-be donors’ fear–independent donor advocacy service; donors’ ready access to medical treatment 	Living donor Government policy
Tumin et al. (2013) [46]	Questionnaire	Malaysian (Kuala Lumpur and Selangor)	<ul style="list-style-type: none"> • 730/1,311 Questionnaires • 29.6% agreed to be organ donor upon their death, if the government introduced policies that reward their families (incentives) in exchange for their good deeds 	<ul style="list-style-type: none"> • Provide attractive policy options; medical and nonmedical benefits to surviving family; reimbursement of legitimate expenses • Declaration of Istanbul on Organ Trafficking and Transplant Tourism 	Government policy

Supplementary Table 1. Continued 3

Study	Study design	Study group	Results/discussion	Concept	Context
Zainal Abidin et al. (2013) [47]	Questionnaire	Health professionals (Kuala Lumpur)	<ul style="list-style-type: none"> • 462 Questionnaires • 93.3% of health professionals acknowledged a need for organ transplantation in Malaysia, but only 47.8% were willing to donate their organs • Factors influencing organ shortage: the brainstem death concept among health professionals 	<ul style="list-style-type: none"> • Passivity in approaching families of potential donors and activating transplant teams by health professionals • Continuous medical education and emphasizing the role of the organ transplant coordinator 	HCPs
Al-Naggar and Al-Jashamy (2013) [48]	Questionnaire	Management and Science University students (Selangor)	<ul style="list-style-type: none"> • 181 Questionnaires • 6.6% of the study participants had registered as organ donors • 50.3% of the participants would like to donate their organs after death 	<ul style="list-style-type: none"> • Lack of knowledge among participants • Sufficient emphasis in the medical curriculum—donor recruitment; supply and demand of cadaveric organs 	Sociocultural barriers
Morad and Ismail (2013) [49]	Expert opinion	-	<ul style="list-style-type: none"> • Organ transplantation is a lifesaving treatment that requires extensive ethical, legal, and religious considerations unlike other medical interventions • Inadequacies in the current legislation: definition of death and close relatives; live-related donation; and prohibition of organ trading 	<ul style="list-style-type: none"> • In late 2011, Ministry of Health Malaysia formed a technical working group to develop a new law: • opt-in system is suitable • best approach is through education rather than opt-out law • logistical challenges (reaching the rural areas) • level of functional literacy 	Legislation: Human Tissue Act 1974
Rasiah et al. (2014) [50]	Questionnaire	Malaysian (Kuala Lumpur)	<ul style="list-style-type: none"> • 10,350 Questionnaires • The following groups are more inclined toward donating organs after death: female, Chinese, Buddhist, primary education holders, and low-income earners 	<ul style="list-style-type: none"> • The likelihood for Malaysians to donate their organs upon death depends on sex, education, ethnicity, religion, and income • Targeted awareness program for these groups 	Socioeconomic
Tumin et al. (2014) [51]	Questionnaire	Family members of dialysis patients (Kuala Lumpur)	<ul style="list-style-type: none"> • 350 Questionnaires • Aimed to explore the preferred channels of campaigns • Electronic media channels (TV and radio) were the most preferred to deliver organ donation messages • Printed media was the least preferred medium 	<ul style="list-style-type: none"> • Campaigns targeting different ethnic groups according to their preferences • Health professionals (experienced doctors) are the most preferred campaigners compared to religious/community leaders 	Campaign
Riyanti et al. (2014) [52]	Questionnaire survey	General public aged 18 yr and above	<ul style="list-style-type: none"> • 34,208 Questionnaires • 69.6% received information regarding organ donation • 52.2% disagreed that currently available information had influenced them to pledge to donate their organs after death 	<ul style="list-style-type: none"> • Fear was the dominant reason for the reluctance of all ethnic groups to pledge to donate organs after death • Malays were 3–5 times less likely to pledge as organ donor 	Sociodemographic
Khotib et al. (2014) [53]	Questionnaire	Doctors working in anesthesiology, medicine, surgery, and emergency medicine (Kuala Lumpur)	<ul style="list-style-type: none"> • 79/80 Questionnaires • 63.3% needed more information regarding brain death • 45.6% did not know whether Malaysia accepts the concept of brain death as death 	<ul style="list-style-type: none"> • Acceptance of brain death as true death • Misconception of the concept of brain death • Lack of knowledge about brain death • Lack of responsibility/initiative in carrying out professional duties 	Knowledge of HCPs

Supplementary Table 1. Continued 4

Study	Study design	Study group	Results/discussion	Concept	Context
Tumin et al. (2015) [54]	Questionnaire	2 Groups: mosque committees and the Muslim Jama'ah (individuals who regularly come to the mosque for prayer)	<ul style="list-style-type: none"> • 653/700 Questionnaires • Main factors that hamper organ donation-related activities at mosques in Malaysia are the lack of experts and financial resources 	<ul style="list-style-type: none"> • Mosques are the main gateways into the Muslim community • Opportunity for mosque committees to impart knowledge of organ donation into content of religious talk and dialogues at the mosque 	Religion
Tumin et al. (2015) [7]	Questionnaire	Malaysian public	<ul style="list-style-type: none"> • 775/900 Questionnaires • Two-thirds of the Malaysian public would object to a presumed consent system • Implementation of a presumed consent system would face substantial public objections to organ donations primarily from groups of lower educational levels, age 31 to 50 yr, and middle incomes 	<ul style="list-style-type: none"> • Priority allocation scheme for organ transplantation would help alleviate the public's negative attitudes toward organ donation • Challenge to implementing presumed consent system: lack of public trust in medical systems and government institutions; insufficient infrastructure to host donation and transplant activities 	Socioeconomic Sociodemographic
Tumin et al. (2015) [9]	Questionnaire	Family members of dialysis patients (Kuala Lumpur)	<ul style="list-style-type: none"> • 350 Questionnaires • Chinese and respondents with higher education were more likely to be organ donors; if the respondent was a child in the family, he/she was more likely to be an organ donor compared with being a spouse or parent 	<ul style="list-style-type: none"> • Decision to become a living organ donor is influenced by education level, ethnicity, and role in the family • Willingness for deceased donation is driven by ethnicity, knowledge of donation, and age of donor 	Socioeconomic Sociodemographic
Emdadul Haque et al. (2015) [55]	Questionnaire	Medical, pharmacy and radiography students (Perak)	<ul style="list-style-type: none"> • 341/380 Questionnaires • 73% with good knowledge; 58% of them have a good attitude; less than 46% with poor commitment 	<ul style="list-style-type: none"> • Inconsistency in the knowledge, attitudes, and commitment of students toward organ donation—good knowledge and attitudes toward organ donation, but poor commitment 	Social: knowledge, attitudes
Tumin et al. (2015) [56]	Questionnaire	3 Groups: RLS/Muslim scholars (Kuala Lumpur and Selangor), HCPs (Kuala Lumpur, Kelantan, Pahang), academicians (Kuala Lumpur and Selangor)	<ul style="list-style-type: none"> • 350 Questionnaires: RLS (n=173), HCPs (n=53), academicians (n=124) • RLS' knowledge of organ donation and transplantation is the lowest • Wide gap between HCPs and RLS: brain death criteria comply with Islamic teachings on death: HCPs (60.4%), RLS (35.7%), academicians (25%) 	<ul style="list-style-type: none"> • Lack of knowledge among RLS as they are expected to be more exposed to contemporary Islamic fatwas in the country • The new definition of death introduced in 1968 by Harvard medical experts and approved in 1992 by Muslim officials has not been promoted properly into the community • Educational efforts on brain death for RLS 	Knowledge of HCPs and RLS
Saidin et al. (2015) [3]	Questionnaire	Public (shopping malls Alor Setar, Kedah)	<ul style="list-style-type: none"> • 116/120 Questionnaires • 11.2% and 18.9% willing to donate organs irrespective of circumstances and under special circumstances, respectively 	<ul style="list-style-type: none"> • Public perceptions of organ donation • Risk to health status • Possibility of misuse of donated organs (black market sale) 	Public perceptions
Hoe and Shan (2016) [57]	Comparative analysis: Malaysia, Australia, Singapore	-	<ul style="list-style-type: none"> • As of Sep 30, 2014, only 1.7% pledged as donors • Low organ donation rate in Malaysia: misinformation; perception and beliefs; religious aspects 	<ul style="list-style-type: none"> • Implement a presumed consent system in replacement of the current opt-in system as a solution to curb the low donation rate in Malaysia 	Legislation Public perceptions

Supplementary Table 1. Continued 5

Study	Study design	Study group	Results/discussion	Concept	Context
Ibrahim et al. (2016) [58]	Comparative analysis	-	<ul style="list-style-type: none"> • Juristic views: Muslim scholar-imposed conditions that a medical surgeon must be a Muslim if the operation involves a Muslim donor and recipient 	<ul style="list-style-type: none"> • Practice in Malaysia • Follows the guiding principles by World Health Organization • Fatwa Committee of the National Council for Islamic Religious Affairs Malaysia allows organ transplant • Religion of the surgeon is immaterial: safety of the patient's life is the priority 	Ethics Religion
Tumin et al. (2016) [59]	Questionnaire	Medical and nursing students (Kuala Lumpur)	<ul style="list-style-type: none"> • 500 Questionnaires (n=264) medical and (n=236) nursing • 55.6% willing to donate organs; 8.8% had donor cards • Willingness to donate organs: minorities ethnic group than Malay; medical students than nursing students; respondents who have a family member with a donor card 	<ul style="list-style-type: none"> • Respondents had low commitment toward deceased organ donation • Strategies to improve: target Malay and nursing students, consider the influence of family attitudes, and penetrate religious permissibility 	Social
Tumin et al. (2016) [60]	Questionnaire	Malaysian Muslims (Kuala Lumpur)	<ul style="list-style-type: none"> • 829 Questionnaires • 42.8% people of the Muslim community were unwilling to donate; 17% of them were willing to sign objection form if the presumed consent system were to be implemented 	<ul style="list-style-type: none"> • Implement a priority scheme for organ allocation in the organ donation legislation • Considering the majority of Muslims are willing donors, this would overcome the organ shortage problem in the country through the presumed consent system 	Legislation Religion
Tumin et al. (2016) [61]	Questionnaire	Malaysian Muslims (Kuala Lumpur)	<ul style="list-style-type: none"> • 829/900 Questionnaires • 55.1% believed that organ donation is permissible in Islam; 48.3% agreed that donor and his/her family are entitled to receive a reward for donating organs or for giving consent to donate their dead relative's organs • Immediate remedy to organ shortage: persuade its Muslim population to donate organs 	<ul style="list-style-type: none"> • Organ donation should be encouraged as a form of communal responsibility • Financial reward for organ donation: position of Islam to prohibit rewards • Malaysian Muslims are the largest population; they are not against organ donation but encouraging it needs effective policy tools 	Religion Government policy
Rasiah et al. (2016) [62]	Questionnaire and structural equation modeling	Malaysian public	<ul style="list-style-type: none"> • 10,412 Questionnaires • Factor influencing willingness to donate: (1) cognitive: perception, socioeconomic status, financial incentives; (2) noncognitive: fear, demography • Donation perception variables: trust in the transplantation system, knowledge about brain death, altruistic value, socioeconomic status, education, income 	<ul style="list-style-type: none"> • Organ donation as a mandatory topic under health education in schools • Strengthen the HCP in organ donation process to improve public trust • Designated hospital for transplantation to be equipped with counselors • Role of media • Targeting the cognitive factors could help reduce the negative influence of noncognitive factors 	Government policy
Hamid et al. (2016) [63]	Questionnaire	University staff (Selangor)	<ul style="list-style-type: none"> • 103 Questionnaires: 32 (30.8%) academic, 11 (10.6%) administrative, and 60 (57.7%) support staff • Knowledge and attitudes toward organ donation were good among the staff 	<ul style="list-style-type: none"> • Aggressive educational campaigns with Islamic input highlighting the concept of daruriyyah and maqasid syariah are needed to promote and create awareness regarding organ donation in Malaysia 	Religion Social: knowledge, attitudes, behavior

Supplementary Table 1. Continued 6

Study	Study design	Study group	Results/discussion	Concept	Context
Rady and Verheijde (2016) [64]	Expert opinion	-	<ul style="list-style-type: none"> • Selective disclosure of promotional information about organ donation in mosques directly conflicts with at least two principles in the Islamic moral code • Knowledge insufficiencies, i.e., controversies around the definition of death in end-of-life organ donation are likely to negatively impact the moral legitimacy of organ donation 	<ul style="list-style-type: none"> • Marketing campaigns emphasize the benefit of organ transplantation to recipients but are universally silent about the potential harm to donors • Recommendations: a list of minimal standards of prerequisite information to be disclosed in organ donation campaigns at mosques and among the Muslim communities 	Religion Social Ethics
Zanuddin et al. (2017) [65]	Questionnaire	University undergraduate students (Kuala Lumpur)	<ul style="list-style-type: none"> • 376 Questionnaires • Adopts the Theory of Reasoned Action • 6.2% pledged to donate their organs; 45.4% ready to donate their organs after death • 80% mentioned that decision about organ donation should be made after consulting their family members 	<ul style="list-style-type: none"> • Health communication is essentially an indispensable component of an integrated public health response plan through dissemination of information and public engagement • Networked media and social media to target the youth through open discussions 	Perceptions Religion Social
Mohd et al. (2017) [66]	Questionnaire	Orthopedic community involved in tissue transplantation	<ul style="list-style-type: none"> • 80/100 Questionnaires: 60% orthopedic surgeons and 40% paramedics • 74.2% were aware of the existence of tissue banks in Malaysia namely HUSM Tissue Bank (27.3%), Hospital Kuala Lumpur Bone Bank (13.6%), and University Malaya Medical Centre Bone Bank (9.1%) 	<ul style="list-style-type: none"> • Professional training seemed to be an effective way to create awareness and attitudes of doctors and nurses to tissue donation and banking, to promote bone transplantation 	Tissue bank Knowledge of HCPs
Syed Annuar et al. (2018) [67]	Questionnaire	University undergraduate students (Penang, Kuala Lumpur, Johor Bahru, Sarawak, and Sabah)	<ul style="list-style-type: none"> • 138 Questionnaires on 5 attributes of celebrities • Celebrity expertise, trustworthiness, and attractiveness were not significant in creating positive attitudes toward organ donation • Celebrity authenticity and charisma were important in shaping attitudes toward organ donation 	<ul style="list-style-type: none"> • Celebrities act as vicarious role models • Celebrities are claimed to be advantageous toward creating attention toward commercial marketing and proven to be useful in nonprofit marketing, particularly in the context of organ donation communication campaign 	Social
Segaran et al. (2018) [68]	Questionnaire	University student nurses (Sabah)	<ul style="list-style-type: none"> • 169 Questionnaires: 5.9% registered as organ donors • Perceived barriers: fear of medical side effects or disability (85.7%), religious taboo and beliefs (71.5%), family reluctance (65.6%), distrust of the organ procurement process (51%) 	<ul style="list-style-type: none"> • Future healthcare providers exhibit a lack of commitment toward organ donation • Nurses could be a role model and become registered organ donors 	Perceptions
Kiat (2018) [69]	Questionnaire	Final year university undergraduate medical students (Kuala Lumpur)	<ul style="list-style-type: none"> • 116/120 Questionnaires • 13.8% registered as organ pledgers with majority from Buddhism • 63.8% willing to be a donor • 100% aware of organ donation 	<ul style="list-style-type: none"> • Most respondents had average to good knowledge as lectures pertaining to organ donation were given during 4th year of study • Updated knowledge to be included in the curriculum 	Sociodemographics Knowledge, attitudes, behavior
Yunus et al. (2018) [70]	Questionnaire	General public aged 18 yr and above	<ul style="list-style-type: none"> • 149/200 Questionnaires • Attitude, altruism, and spiritual belief accounted for a significant 50.8% of the variance in the intention to register as organ donors • There was a significant relationship between altruism and organ donation intention 	<ul style="list-style-type: none"> • Reevaluation and enhancement of the current national program and policies on organ donation are crucial to enhance public awareness and acceptance toward organ donation to address the problem of organ shortage in Malaysia 	Social

Supplementary Table 1. Continued 7

Study	Study design	Study group	Results/discussion	Concept	Context
Foong et al. (2019) [71]	Questionnaire	Health professionals in critical care (Kuala Lumpur and Selangor)	<ul style="list-style-type: none"> • 412/565 Questionnaires: 163 (39.6%) doctors and 249 (60.4%) nurses • Respondents from neurosurgical ICUs had higher knowledge score on brain death than others 	<ul style="list-style-type: none"> • 376 Questionnaires • Profession was significantly correlated with having a positive attitude toward brain death, deceased organ donation and organ transplantation 	<ul style="list-style-type: none"> Field of expertise Knowledge of HCPs
Tumin et al. (2019) [72]	Questionnaire	Health professionals (Kuala Lumpur)	<ul style="list-style-type: none"> • 382 Questionnaires • 45.8% would officially object to the presumed consent system • HCPs from the Malay ethnic group and respondents with low income of less than 3,000 MYR were more likely to object 	<ul style="list-style-type: none"> • Health care professionals in Malaysia had a relatively negative attitude toward the presumed consent system 	<ul style="list-style-type: none"> Socioeconomic Sociodemographic
Gan Kim Soon et al. (2019) [73]	Semi-structured interview	8 Key informants in renal transplantation	<ul style="list-style-type: none"> • In-depth one-to-one interviews • Socioecological model framework in barrier and solutions to renal transplantation 	<ul style="list-style-type: none"> • Donor's consent should be final and must not be overruled by their family members • Supportive system to the living donor • Improvement to the healthcare system • Opt-out system 	<ul style="list-style-type: none"> Legal Social Government policy
Guad et al. (2019) [74]	Retrospective	Kidney transplant patients (Kuala Lumpur)	<ul style="list-style-type: none"> • 146 Patients who received their first renal allograft: Mar 1996 and Apr 2014 (5 excluded-lack of data) • 32 Spousal donors, 109 living-related donor transplants • 75% were men as transplant recipients in spousal grafts rather than living-related grafts 	<ul style="list-style-type: none"> • Living-related kidney donors were more common than spousal kidney donors in Malaysia • Spousal donors are a safe option and can address the shortage of kidney donors in Malaysia 	<ul style="list-style-type: none"> Social
Yusof et al. (2019) [75]	Questionnaire	University health sciences students (Selangor)	<ul style="list-style-type: none"> • 312 Questionnaires • 46.5% poor knowledge and 54.2% negative attitude toward organ donation • 51.9% undecided to pledge as an organ donor in Malaysia 	<ul style="list-style-type: none"> • Having good knowledge does not imply respondents have a positive attitude and favorable behavior toward organ donation • Suggest implementing compulsory subject on organ donation and transplantation 	<ul style="list-style-type: none"> Social: knowledge, attitudes, behavior
Abdul Majid (2019) [76]	Textual analysis (Primary data) and Content analysis (Secondary data)	-	<ul style="list-style-type: none"> • Interpreting interpretation of provisions of legal documents: Human Tissues Act 1974 (covering domestic organ donation); Anti-Trafficking in Persons and Anti-Smuggling of Migrants Act 2007 (addressing organ trafficking in the country) 	<ul style="list-style-type: none"> • Draft of Organ and Tissue Transplantation Bill aims to ban organ trading and advertising, and to address living organ donations since 2018 have not been tabled in Parliament 	<ul style="list-style-type: none"> Legal Social
Islahudin and Hong (2020) [77]	Questionnaire	Malaysian adults (Kuala Lumpur)	<ul style="list-style-type: none"> • 391 Questionnaires • 94.4% were willing to donate their kidneys • An increase in 1 unit of the knowledge and belief score increased the likelihood of kidney donation by 1.29 and 1.23 times, respectively 	<ul style="list-style-type: none"> • Malaysia has a huge population of potential kidney donors • Public education on donor registration is also vital to optimize the number of potential donors 	<ul style="list-style-type: none"> Social: belief
Tumpanga et al. (2020) [78]	Questionnaire	Malaysian public (Selangor)	<ul style="list-style-type: none"> • There were associations of attitudes, family influence, religious belief, and mass media toward perceptions of organ donation; religious belief had the strongest association in shaping an individual view on donating his/her organ 	<ul style="list-style-type: none"> • The family members are considered as final decision makers, and they think they have a legal right to change the consent of the deceased donor has been made while they were alive 	<ul style="list-style-type: none"> Sociodemographics Attitudes Religion Belief Perceptions

Supplementary Table 1. Continued 8

Study	Study design	Study group	Results/discussion	Concept	Context
Lim et al. (2020) [79]	Questionnaire	Patients 18 yr and above in outpatient clinic (Sabah)	<ul style="list-style-type: none"> • 400 Questionnaires • 56% had good knowledge of organ donation • 33% lacked knowledge of brain death • The higher the education level and income, the more positive attitude toward organ donation 	<ul style="list-style-type: none"> • The greater the knowledge of organ donation and brain death, the more positive impression of or attitude toward organ donation • Organ donation promotion efforts have widely introduced knowledge of organ donation but do not mention much about brain death: suggest improving the organ donation program/promotion 	Socioeconomic Sociodemographic
Naghavi et al. (2020) [80]	Questionnaire	Expert	<ul style="list-style-type: none"> • 35 Questionnaires • Dimension affecting the willingness to donate: donation perception (0.36) has the highest priority, followed by socioeconomic status (0.32), demographic factors (0.23), and financial incentives (0.09) 	<ul style="list-style-type: none"> • A need to identify the most suitable organ donation system for Malaysia that accounts for education, awareness, attitudes, and trust taking into consideration the most influential factor, i.e., donation perception • Promote altruism 	Legal Sociocultural Socioeconomic Perceptions
Ismail et al. (2020) [81]	Questionnaire	Patients and relatives in hospital (Negeri Sembilan)	<ul style="list-style-type: none"> • 385 Questionnaires • 35% willing to donate their organs upon death; 19% registered donors • Objection from family: major decision to donate organ 	<ul style="list-style-type: none"> • Correct understanding of brain death was associated with a willingness to be an organ donor 	Social: knowledge, attitude
Rasihah et al. (2020) [82]	Questionnaire survey and structural equation modeling	Malaysia public	<ul style="list-style-type: none"> • 10,412 Questionnaires • Factors influencing willingness to donate: altruism, financial incentives, donation perception, and socioeconomic status 	<ul style="list-style-type: none"> • Financial incentives cannot complement altruism to raise organ donation rates • Altruism amplifies the impact of socioeconomic status and donation perception on willingness to donate 	Social Perceptions Government policy
Oo et al. (2020) [83]	Questionnaire survey	HCPs in a critical transplant hospital	<ul style="list-style-type: none"> • 412/420 questionnaires; majority (60.4%) were nurses • 68% were willing to donate their organs; 37.3% were carrying a donor card; 63.1% had informed their family of their intention to donate 	<ul style="list-style-type: none"> • Willingness to donate was higher in critical care in general care among HCPs • Knowledge gaps, beliefs and perceptions of brain death were still barriers to willingness to donate organs 	Sociodemographics Knowledge of HCPs
Venorich et al. (2020) [84]	Questionnaire	Rural and urban public 18 yr and above (Sarawak)	<ul style="list-style-type: none"> • 327 Questionnaires • Urban vs. rural: respondents in urban areas had higher knowledge and awareness • Both respondent groups were willing to donate organs to their loved ones 	<ul style="list-style-type: none"> • Rural area: limited sources of information; internet connections; education level, social media • To improve targeted rural health education 	Knowledge Sociodemographic
Kasim and Shohor (2021) [85]	Questionnaire	Intensive Care Nurses (Selangor)	<ul style="list-style-type: none"> • 63/71 Questionnaires • Pre- and posttest were conducted to evaluate the knowledge of organ donations with a 1-hour lecture given • Pretest showed that the majority of nurses had average to poor knowledge 	<ul style="list-style-type: none"> • There was a statistically significant difference in increasing respondents' knowledge from pretest to posttest • Proven effectiveness of organ donation education intervention on knowledge 	Knowledge of HCPs
Hamdan and Hoque (2021) [86]	Questionnaire	4th year Islamic study university students (Selangor)	<ul style="list-style-type: none"> • 52 Questionnaires using Google Form • Level of understanding: average; 50% students accept organ donation and transplantation • 94.2% had not pledged as organ donors 	<ul style="list-style-type: none"> • Understanding and acceptance of organ donations among respondents do not mean they will donate their organs upon death 	Religion

Supplementary Table 1. Continued 9

Study	Study design	Study group	Results/discussion	Concept	Context
Attamimi et al. (2021) [87]	Retrospective	Data collected from NTRC (Kuala Lumpur)	<ul style="list-style-type: none"> • 292/772 records from Jan to Apr 2021 • Inclusion criteria include records with reported: suspected brain death, fulfilling brain death criteria, admission diagnosis, complete demographic data • Confirmed brain death 122/772 (15.8%): 27 successful donation requests 	<ul style="list-style-type: none"> • Clinical barriers: prerequisites for brain death diagnosis, use of correct clinical, and cardiac death preceding test parameters • Nonclinical barriers: family's acceptance of death and organ donation, staff awareness and attitude, and role of the transplant coordinator 	Knowledge of HCPs
Abd Jalil et al. (2022) [88]	Content analysis	-	<ul style="list-style-type: none"> • Autopsies generally prolong period of nonperfusion to vital organs, exposing them to biochemical processes of decaying and dying itself, cutting open organs for a complete forensic examination • Considerations where organ pledger is involved in a medicolegal situation 	<ul style="list-style-type: none"> • Forensic investigation involves ascertaining the actual cause of death in criminal or suspected criminal cases • There is a need to weigh the significance of forensic outcomes in the judiciary system or success rate of lifesaving and life-changing cadaveric organ donations 	Judicial Forensic medicine services Postmortem/autopsy
Islahudin et al. (2022) [89]	Questionnaire	Adult Malaysian 18 yr and above (Kuala Lumpur and Pahang)	<ul style="list-style-type: none"> • 1,001 Questionnaires • No significant findings were demonstrated between willingness to donate kidneys with spirituality score and knowledge of kidney donation • Chinese were 15.6 times more willing to donate their kidneys than Malays 	<ul style="list-style-type: none"> • Ethnicity and attitudes on kidney donation scores were predictors of willingness to donate kidneys • Malays refused to donate kidneys due to the lack of transparent disclosure or discussion on this kidney donation 	Sociodemographics Attitudes Religion Belief Spirituality
Keya et al. (2021) [90]	Questionnaire	Private medical 4th year university students (Kedah)	<ul style="list-style-type: none"> • 122/223 Questionnaires • 44.3% of respondents had adequate knowledge about organ donation • 48.4% were willing to donate organs in the future • Overall, lack of knowledge on brain death and negative attitudes toward organ donation 	<ul style="list-style-type: none"> • No statistically significant relationship between knowledge on organ donation and attitudes in willingness to donate • Large gap between organ donors and the recipients can be bridged by increasing knowledge of ethical fundamentals among young generation, i.e., future doctors 	Knowledge Attitudes Sociodemographic
Wan Muhd Shukeri et al. (2022) [91]	Questionnaire	Healthcare workers in hospitals (Kuala Lumpur, Selangor, Kelantan, and Pahang)	<ul style="list-style-type: none"> • 345/458 Questionnaires • Pre and posttest conducted online (website-based educational materials) to evaluate the knowledge of organ donations • Pretest showed majority of the healthcare workers, the majority nurses, exhibited positive attitudes toward organ donation 	<ul style="list-style-type: none"> • There was statically significant difference in increasing respondents' attitudes from pretest to posttest, i.e., willingness to facilitate organ donation in ICUs; follow the same standard care for potential brain death patients • Proven effectiveness of organ donation education intervention to improve the attitudes of healthcare workers toward organ donation 	Knowledge of healthcare workers
Ong et al. (2022) [92]	Questionnaire survey	HCPs (Kuala Lumpur)	<ul style="list-style-type: none"> • 412/565 Questionnaires • 75.9% showed a willingness to donate an organ • 74.0% of HCPs believed that their religion permitted organ donation • Doctors had higher knowledge of organ donation and transplantation, and brain death compared to nurses 	<ul style="list-style-type: none"> • Doctors were found to be more likely to offer the option of organ donation • HCPs believed that the families had the right to refuse organ donation even if their loved ones had pledged to donate their organs • Lack of adequate family counselling: cause of low-rate deceased organ donation 	Knowledge of HCPs

Supplementary Table 1. Continued 10

Study	Study design	Study group	Results/discussion	Concept	Context
Lim et al. (2022) [93]	Questionnaire survey	Malaysian born in Sarawak (Sarawak)	<ul style="list-style-type: none"> • 488 Questionnaires • 9% registered organ donors, while 52.9% willing to be organ donors • 13% unaware of organ donation and out of this group 49% were indigenous Sarawakians • Groups who were more willing to donate organs: female, Buddhist, Chinese ethnic, higher education level, younger generations and higher income 	<ul style="list-style-type: none"> • Indigenous Sarawakians are most likely to be unaware of organ donation and correspondingly, the least willing to donate • Demographic factors that correspond to the knowledge of brain death, such as younger age, higher education, and income • Family consent and perception toward organ donation affect the decision to be organ donor 	Socioeconomic Sociodemographics Attitudes Awareness Belief Perceptions
Ab Latiff et al. (2022) [94]	Semi-structured interview	Registered organ donors from the NTRC (Kuala Lumpur)	<ul style="list-style-type: none"> • 16/28 Registered donors completed interview (45 min) • Confidence in information received about organ donation from electronic resources (official, religious, blogs, viral online), traditional mass media, verification of the value from authority, assurances about the organ donation process 	<ul style="list-style-type: none"> • A need for both traditional (for traditionalists who prefer manual) and electronic means of organ donation registration • NTRC to link with other agencies for online registration platform, all hospital websites, passport or driving license renewal 	Psychological concepts Perceptions
Mohamad Ismail et al. (2022) [95]	In-depth interview and thematic analysis	8 Respondents (Pahang)	<ul style="list-style-type: none"> • 8 Residents of Kuantan • Theme: understanding organ donation, decision-making factors, awareness of Islamic guidelines related to organ donation and source of information 	<ul style="list-style-type: none"> • Willingness to register as a donor was still lacking due to misunderstanding and anxiety 	Religion Social: fear, perception, belief
Tengku Anuar et al. (2022) [96]	Questionnaire survey	General public (Terengganu)	<ul style="list-style-type: none"> • 129 Questionnaires • Attitude, moral values, and perceived risk and benefits (except knowledge) were positively correlated with organ donation intention 	<ul style="list-style-type: none"> • No significant relationship between knowledge and organ donation intention • Attitudes and intention to donate organs were found to be highly associated 	Knowledge Sociodemographics Attitudes Perceptions
Sh Abdullah et al. (2022) [97]	Questionnaire and randomized controlled trial	University students nurses (Selangor)	<ul style="list-style-type: none"> • Baseline survey: 146/150 questionnaires • Intervention: health education conducted online [group A: pamphlet-based health education; or group B: video-based health education and then respondents take posttest (Google link) to evaluate their knowledge of organ donations] • Group A: 72; group B: 74 	<ul style="list-style-type: none"> • The posttest comparison of knowledge levels revealed no statistically significant difference between the two groups, but mean attitude score increased from the baseline to the posttest scores following intervention • Proven effectiveness of organ donation education intervention on positive attitudes toward organ donation 	Knowledge Attitudes
Ismail et al. (2023) [98]	Retrospective	Possible donors not referred to transplant coordinator in 2 hospital ICUs (Johor and Sabah)	<ul style="list-style-type: none"> • 56/819 ICU admission records from Aug 2020–Jan 2021 (fulfilled the possible organ donor criteria) • No. of potential organ donors detected (clinically suspected to fulfill brain death criteria): 7 • Apparent medically suitable possible donors (none were declared brain dead): 31 • Possible organ donation rate: 6.83%; actual donation after brain death: 0 	<ul style="list-style-type: none"> • No referrals were made to the hospitals' organ donation coordinator during the study period • 23/56 Cases were found to be neither suspected nor identified as possible organ donors by the ICU team preventing any further investigation into their potential for becoming actual deceased organ donors • Lack of knowledge and education of ICU doctors 	Knowledge of HCPs Role of the transplant coordinator
Wan Abdul Halim et al. (2023) [99]	Questionnaire survey	Healthcare workers (Selangor)	<ul style="list-style-type: none"> • 255 Questionnaires: 85 respondents in each group—doctors, nurses, health assistants • Attitudes and practices toward organ donation were significantly higher among doctors, male, Indians ethnic, Hindus, higher education and income groups 	<ul style="list-style-type: none"> • Education levels play an important role in knowledge about organ donation • Factors affecting attitudes and practice are not associated with knowledge; despite good knowledge, willingness to donate was low when attitude was poor 	Knowledge Attitudes Practice Healthcare workers

HCP, healthcare professional; ICU, intensive care unit; RL, religious leader; QOL, quality of life; NTRC; National Transplant Resource Centre.