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KNOWLEDGE, ATTITUDES, AND PERCEPTIONS OF TERTIARY LEVEL STUDENTS IN A UNIVERSITY IN MANILA REGARDING ORGAN DONATION AND TRANSPLANTATION

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Abstract: Organ transplantation had been considered as the only available cure for the end-stage failure of major organs. With the evidently huge gap between the number of suitable donors and recipients, the organ shortage crisis is a universal health emergency to be resolved. This study aims to assess the level of knowledge, attitudes, and perceptions of tertiary level students in a selected college in a university in Manila and to determine if these have a significant relationship with the sociodemographic profile. It also determines whether the three main variables have significant relationships with each other and whether a significant difference would arise based on their degree programs. This quantitative descriptive comparative study used descriptive and inferential statistics, with data gathered from an online questionnaire that was administered to a total of 464 respondents who were 18 to 23 years old, and were enrolled as first- to fourth-year tertiary level students in the selected college in a university in Manila, Philippines. Data were analyzed using frequency and percentage, weighted mean, one-way ANOVA, Phi and Cramer's V, Pearson correlation coefficient, and Pearson's Chi-square tests via the SPSS software. Overall, the respondents possessed a high level of knowledge and somewhat positive attitudes and perceptions towards organ donation and transplantation. The degree programs to which they belonged was moderately associated with their levels of knowledge ($p = 0.017$; $\varphi c = 0.132$) and attitudes ($p = 0.022$; $\varphi c = 0.139$); although religion posed a stronger effect ($p < 0.001$; $\varphi c = 0.217$) on attitudes. However, none of the sociodemographic parameters used were significantly related to the perceptions. These three main variables showed a positive linear correlation, albeit weak. Meanwhile, the sample of students from each degree program only had a significant difference in terms of their level of knowledge ($p = 0.002$). Further research using variables aside from those employed in this study, as well as a larger and more diverse sample size, are recommended.

Keywords: *Attitudes; Knowledge; Organ donation; Organ transplantation; Perceptions; Tertiary level students*

I. INTRODUCTION

Organ donation is the act of giving a person's consent to take a part of their body while they are alive or after death, while organ transplantation is the surgical procedure involving the removal of an organ from the donor to the receiver, who requires an organ since theirs does not work correctly due to a disease. There are three types of donations up to date, namely donation after brain stem death, after circulatory death, and living organ donations (Moscalu et al., 2015). Organ donation has been the only cure for the failure of major organs, namely the kidneys, heart, lungs, liver, small bowel, and pancreas, which puts thousands of patients each year on the transplants list (Moscalu et al., 2015). One living donor may donate one kidney, a lung, or a portion of the liver, pancreas, or intestine, while one deceased organ donor may donate two kidneys, liver, two lungs, their heart, pancreas, intestines, hands, and faces (Health Resources & Services Administration, 2020).

Globally, there are approximately 75,000 people on the active waiting list for organs per day, however, there are only approximately 8,000 deceased organ donors annually (Centers for Disease Control and Prevention, 2019). Thousands of these patients die due to long waiting times and prolonged treatment periods (Moorlock & Draper, 2018). Hence, the scarcity of suitable organs is considered a health crisis. According to the World Health Organization (WHO), organ donation is important for people who require a new organ due to no other available treatment. This provides the patient with a long-term and better quality of life.

In the Philippines, the opt-in system, which requires a potential donor to provide clear and explicitly expressed consent, was still implemented at the time of writing this study. According to the National Kidney Transplant Institute (NKTI), the most common organ transplanted is the kidney, giving patients with end-stage renal disease (ESRD) only two options, dialysis, or transplantation. ESRD is already the seventh leading cause of death among Filipinos wherein one Filipino develops chronic renal failure every 60 minutes and about 120 Filipinos per million population per year (Arcellana et al., 2014). However, as reported by the NKTI Executive Director in 2018, the number of patients receiving transplants from deceased donors remains "dismally low" in the country (Novartis, 2018). The dismal rate of organ donation in the Philippines matches the paradox of the public believing in organ transplantation as one of the effective approaches for recovery, yet no exhibition of willingness is put forward regarding donating organs (Uriarte et al., 2010). Factual information regarding donating organs in the Philippines is not given enough effort to become public knowledge. Despite a global positive attitude towards this, there is not enough public education towards organ donation (Danguilan et al., 2012).

In related literature, the level of knowledge in terms of organ donation and transplantation, educational attainment, sex, occupation, bodily concerns, sociodemographic characteristics, communities' and relatives' opinions and values, and religions are some of the factors that are considered to affect people's decisions to donate organs (Tontus, 2020). Knowledge is a major aspect that needs to be evaluated as it influences the decision of the people about organ donation and transplantation. Insufficient knowledge and failure to determine the qualifications to be a donor is a component that contributes to the scarcity of supply for organ donation (Bharambe et al., 2016). According to Huern et al. (2016), the probable cause of the shortage of organ supply is the lack of knowledge and misinformation about organ donation among the public and health care providers. Insufficient knowledge and exposure to this topic produced low results in registering as an organ donor from the respondents in previous studies (Zanuddin et al., 2017). Tontus (2020) stated that since knowledge and attitude are significant in the rates of organ donation, it has shown that having higher educational status increases the chance of the people willing to participate in organ donation. Results from a related study by Huern et al. (2016) revealed that knowledge was associated with the willingness of the participant to donate their organ. It is encouraging that within the family, inquiring

information and invalidating myths provide positive outcomes (Huern et al., 2016). If given reliable information through appropriate platforms, many would be encouraged to consider being a donor. Raising awareness among the public by communicating to them through the media, including its topics in the school curriculum and community programs, will help promote organ donation (Anderson, 2018).

Another factor is one's attitude which is an individual's or group's behavior towards organ donation and transplantation. This serves as a factor that contributes to a deeper and wider understanding of a focus group. It is a determinant that can be influenced by many factors such as gender, sociodemographic status, income level, educational level, occupation, culture, and religion (Paneru et al., 2019). Pouraghaei et al. (2015) stated that inappropriate beliefs and attitudes of individuals regarding organ donation are also a reason for its decreased rates. The attitude of an individual is a stronger predictor of organ donation compared with personal values. Undeniably, this parameter is an essential factor in nurturing an environment that favors an increased organ donation rate (Balwani et al., 2015). This aspect places importance on the progression and improvement of educational activities and campaigns to encourage organ donation in certain populations. In the study conducted by Balwani et al. (2015), it was found that an individual's attitude with regards to organ donation and transplantation could be correlated with one's awareness on the topic. In addition, research done by Pouraghaei et al. (2015) indicated that organ donation and transplantation are affected by religion, culture, and family influence. In consonance, Paneru et al. (2019) found that the attitude of an individual regarding organ donation and transplantation can be influenced by one's family and with one's awareness about it.

Perception towards organ donation and transplantation which distinguishes an individual or a group's viewpoint, including their stance on the matter, is also a factor to be considered. According to Paneru et al. (2019), this may be affected by factors that influence the willingness of a person to donate his or her organs. Overall, perceptions are an innate belief that changes the course of a person's decision, especially in matters like organ donation. A study by Truijens and van Exel (2019) garnered viewpoints such as (1) "not donating my organs would be a waste," (2) "it does not go with my religion," (3) "my family should decide," and (4) "it is a good deed, but I am doubtful." All responses, despite the distribution into four viewpoints, reflected an appreciation for organ donation, especially viewpoint number one. This study, even with the uniformity in literature and no trouble in coming up with the statements to be ranked, still had issues in categorizing the said statements. Meanwhile, a study by Janahi et al. (2018) found that despite a majority of the respondents believing that organ donation is a gift of life and saves patients in need, and expressed their acceptance of donated organs if needed, there were still those who reflected unwillingness for donation due to undesirable organ allocation and black-market organ trade.

With the challenges of the persisting organ shortage crisis facing the healthcare field, it is crucial to address and overcome its drawbacks. This quantitative descriptive and comparative study reports knowledge, attitudes, and perceptions of tertiary level students enrolled in a selected college in a university in Manila, Philippines towards organ donation and transplantation. This takes into account various factors and potential barriers.

Research Problem

The study mainly aims to determine the knowledge, attitudes, and perceptions of tertiary level students enrolled in a selected college in a university in Manila, Philippines towards organ donation and transplantation.

It specifically aims to answer the following questions:

1. What is the sociodemographic profile of respondents enrolled in a selected college in a university in Manila?
2. What is the level of knowledge, attitudes, and perceptions of tertiary level students enrolled in a selected college in a university in Manila regarding organ donation and transplantation?
3. Is there a significant relationship between the sociodemographic profile and the level of knowledge, attitudes, and perceptions of tertiary level students enrolled in a selected college in a university in Manila towards organ donation and transplantation?
4. Is there a significant relationship between the three variables, namely the knowledge, attitudes, and perceptions of tertiary level students enrolled in a selected college in a university in Manila regarding organ donation and transplantation?
5. Is there a significant difference between the level of knowledge, attitudes, and perceptions of tertiary level students in a selected college in a university in Manila when they are grouped according to their degree programs?

II. METHODOLOGY

Research Design

The study utilized a quantitative, descriptive comparative design to assess and evaluate the level of knowledge, attitudes, and perceptions of the respondents towards organ donation and transplantation by evaluating objective theories through determination of existing relationships between variables (Creswell & Creswell, 2018). Additionally, the comparative approach allows the investigation of existing correlations between variables and differences between involved groups.

Subjects and Study Site

Individuals aging from 18 to 23 years old and were enrolled in the academic year 2020-2021 as first- to fourth-year tertiary level students within the three medical-related degree programs of the selected college were the only ones who were eligible and participated in the whole research process The study site, a selected university in Manila, Philippines, was chosen due to its feasibility; the major influential factors in its selection included the limitations of online and remote research, as well as constraints brought about by the COVID-19 pandemic. In case of withdrawal, any of the participants were free to do so for any reason, without penalty.

Slovin's formula was utilized to compute for the appropriate sample size that is representative for the selected college. It restricts the coefficient of confidence to 95% (Tejada & Punzalan, 2012), which is also applied in this study. The parameters were set with a margin of error of 5%. In coordination with the office of the dean of the chosen college, data on the total student population were procured. With a total of 3511 students, a minimum of 360 respondents were required to complete the study. The sampling technique utilized was purposive sampling, particularly maximum variation sampling or heterogeneous sampling.

Data Measure/Instrumentation

The questionnaire tool consisted of a total of 51 items with four sections, namely: sociodemographic profile, knowledge section, attitudes section, and perceptions section, all revolving around organ donation and transplantation. The socio-demographic section was adapted from Balwani et. al's (2015), study on the attitude and awareness towards organ donation in India. Additional questions were included to fit the local

setting and the study objectives. This is followed by the knowledge section with questions adapted from Balwani et. al's (2015) study, as well as Coad et al.'s (2013) study on the attitudes of young adults from the UK towards organ donation and transplantation, and Tontus' (2020) study on the importance of education and re-education on organ donation as well as the importance of establishing an organ donation-centered attitude in society. Meanwhile, the attitudes section involved questions adapted from the questionnaire tool in studies conducted by Coad et al. (2013), Tontus (2020), and Balwani et al. (2015). Lastly, the perceptions section consisted of questions adapted from the studies conducted by Balwani et al. (2015) and by Bedi et al. (2015), wherein the latter had focused on the knowledge, perception, and attitude of medical students at the University of Leeds toward organ donation and transplantation. Reliability testing revealed a Cronbach's alpha value of 0.805 corresponding to good internal consistency.

Data Gathering Procedure

Prior to data gathering, a certificate of ethical approval was first obtained from the Faculty of Pharmacy Research Ethics Committee of the University of Santo Tomas; subsequently, a letter seeking permission to conduct data gathering was presented to and approved by dean of the selected college. The manner of recruitment of respondents was through purposive sampling and only those who met the inclusion criteria were allowed to participate. The link of the online questionnaire in Google Forms was distributed via social media sites from March 15, 2021, until March 29, 2021. Moreover, the aid of the class officers under the selected college were sought. It consisted of 51 items and was answerable within 5-10 minutes. In front was an informed consent form containing pertinent details regarding the research study; willing respondents must answer the form to proceed with the questionnaire. A total of 464 respondents completely answered the survey. All the data collected were stored in a reliable and secured cloud file storage system that is only accessible by authorized research team members. The confidentiality and anonymity of the respondents were assured throughout the study and no sensitive information were breached. The degree programs involved were also coded (A, B, and C) to guarantee this.

Data Analysis

Descriptive and inferential statistics were employed in this study using the SPSS (Statistical Package for the Social Sciences) software. Descriptive statistical tools used were frequency and percentage and weighted mean; inferential statistical tools included chi-square tests, Phi and Cramer's V, Pearson correlation coefficient, and the one-way analysis of variance (ANOVA). Frequency and percentage were utilized to quantify the answers for each item.

In addition, the test for the level of knowledge used frequency and percentage distribution in grouping the scores of the respondents. The researchers adapted a general scale based on Bloom's cut-off point, scores ranging from 80.0% to100.0% of the possible maximum score were interpreted as "good" knowledge, those between 60.0% to 79.0% were "moderate," whereas scores of ≤59.0% were considered as "poor" knowledge (Abdullahi et.al., 2016). Deriving from the percentages, the interval scores for good knowledge ranged from 18-23 points, moderate knowledge ranged from 14-17 points, and scores from 0-13 are poor. These were then interpreted into its equivalent level of knowledge, corresponding to a high, adequate, and low level of knowledge, respectively.

For attitudes and perceptions, responses via a 5-point Likert scale were analyzed through the weighted mean. The responses ranged from 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, and 5=strongly agree. These were interpreted into equivalent levels, where 1=negative, 2=somewhat negative, 3=neutral, 4=somewhat positive, and 5=positive. As consulted with a professional statistician,

interpretations were applied using a quantitative scale with ranges based on class width: 1 = 1.00 to 1.79, 2 =1.80 to 2.59, 3 = 2.60 to 3.39, 4 = 3.40 to 4.19, and 5 = 4.20 to 5.00.

In determining whether there is a significant relationship between the sociodemographic profile of the respondents and their level of knowledge, attitudes, and perceptions towards organ donation and transplantation, a chi-square test of independence was used. Each sociodemographic parameter was compared with the overall knowledge score and weighted means for the attitudes and perceptions. Consequently, a chi-based measure of association tool, Phi and Cramer's V, was employed as a post-test to measure the strength of the existing relationship. The level of association was interpreted as "no or very weak" (> 0.00), "weak" (> 0.05), "moderate" (> 0.10), "strong" (> 0.15), and "very strong" (> 0.25).

On the other hand, to assess whether a significant relationship exists between the three variables (knowledge, attitudes, and perceptions) of the participants, a chi-square test was also used, followed by the Pearson R correlation coefficient to determine whether a linear relationship exists between variables. This involved all possible comparisons between the knowledge scores and the weighted mean for attitudes and perceptions. The computed coefficient indicates the strength of correlation which was interpreted as: "no correlation" ($0.0 = r$), "very weak correlation" ($0.0 < r < 0.2$), "weak correlation" ($0.2 \leq r < 0.4$), "moderately strong correlation" ($0.4 \leq r < 0.6$), "strong correlation" ($0.6 \leq r \leq 0.8$), "very strong correlation" ($0.8 \leq r < 1.0$), and "perfect correlation" ($1.0 = r$).

Lastly, a one-way analysis of variance (ANOVA) was used to determine if there is a significant difference between the level of knowledge, attitudes, and perceptions of the respondents when grouped according to their degree programs. The usage of all aforementioned statistical analysis tools was supplemented upon consultation with a professional statistician.

III. RESULTS AND DISCUSSION

Sociodemographic Profile of the Respondents

Most of the respondents (75.86%) were females and a majority (55.82%) were aged 20 to 21 years old. In terms of the degree program within the selected college, a majority (54.31%) were from degree program B, less were from degree program C, and very few (6.47%) were from degree program A. Moreover, more respondents (34.27%) were third-year students. In terms of religion, most of the respondents were Roman Catholics (87.07%) while the rest belonged to other religions and very few were atheists or agnostic. Almost all of the respondents were not registered donors (97.41%) and have never donated (98.71%) nor received any organ transplant (99.57%).

Level of Knowledge, Attitudes, and Perceptions

The level of knowledge of the respondents was evaluated through a graded assessment in which items on organ donation facts, including conceptual questions and those applicable to the local setting, were utilized. Questions included were about the definitions of basic terms, eligibility of organs for donation, existence of potential risks, sources of consent or decision-making for organ donation, local organ donation systems, and local sites for organ donor applications.

Table 1. Scores and Level of Knowledge of the Respondents

Bloom's Cut-off Point	Level of Knowledge	*n*	*%*
Good (18 to 23)	High Level of Knowledge	380	81.90

Moderate (14 to 17)	Adequate Level of Knowledge	76	16.38
Poor (0 to 13)	Low Level of Knowledge	8	1.72
	Total	**464**	**100.00**

The resulting scores of the respondents were grouped according to interval values incorporated into a scale with corresponding interpretations on the level of knowledge (Table 1). The majority of the respondents (81.90%) attained scores ranging from 18 to 23 points which were interpreted as "good," corresponding to a high level of knowledge. Scores between 14 to 17 points were garnered by 16.38% of the respondents, which was "moderate," denoting an adequate level of knowledge. Meanwhile, only a minute percentage of the respondents (1.72%) exhibited a low level of knowledge with scores ranging from 0 to 13 points which were interpreted as "poor." Overall, the respondents from the three-degree programs of the selected college mostly possessed a high level of knowledge towards organ donation and transplantation. Knowledge had been considered as one of the strongest predictors of organ donation based on Horton and Horton's model of factors (Balwani et.al. 2015).

In a study by Akhter et al. (2021) involving medical and nursing students, the participants were described to have a high level of knowledge, accompanied by favorable attitudes and perceptions towards organ donation and transplantation. Students under programs that are health- and life-science-oriented were usually reported to display a satisfactory level of knowledge on the topic. In consonance, Dibaba et al. (2020) presented similar findings in terms of the knowledge of medical students in a university in Jimma, Ethiopia.

Meanwhile, the level of attitude was analyzed through the weighted mean responses from the 5-point Likert scale which was applied against an interpretative scale for its verbal interpretations and corresponding levels.

Table 2. Level of Attitude of the Respondents

Statements	*M*	Verbal Interpretation	Level of Attitudes
1. I have a positive attitude towards donating an organ for transplantation.	4.40	Strongly Agree	Positive
2. I have a positive attitude towards receiving an organ for transplantation.	4.30	Strongly Agree	Positive
3. My religion allows organ donation or transplantation.	4.43	Strongly Agree	Positive
4. I have no cultural belief that my body should be kept intact after death.	4.17	Agree	Somewhat Positive
5. I have no fear of my body being disfigured if I donate my organs.	3.69	Agree	Somewhat Positive
6. I have no fear of surgical procedures.	3.31	Neutral	Neutral
7. My family agrees with organ donation.	3.19	Neutral	Neutral
Average	**3.93**	**Agree**	**Somewhat Positive**

Note. Legend of the Verbal Interpretation of the Weighted Mean

1.00 to 1.79	Strongly Disagree
1.80 to 2.59	Disagree
2.60 to 3.39	Neutral
3.40 to 4.19	Agree
4.20 to 5.00	Strongly Agree

Table 2 shows that the respondents strongly agreed (M=4.40) that they have a positive attitude towards donating an organ for transplantation. This was higher than the findings from a study by Coad et al. (2013), which also involved young adults. However, the aforementioned related study involved participants who had a wider age group range, particularly ages 18 up to 30, which may imply differing avenues of information exposure, thus, affecting their attitude on the matter. Moreover, their respondents belonged to a general demographic, unlike in this study in which the respondents were from degree programs encompassing the science field. Along with knowledge, attitudes serve as the strongest predictors of organ donation based on Horton and Horton's model of factors (Balwani et al., 2015).

The respondents also generally strongly agreed (M=4.30) that they have a positive attitude towards receiving an organ for transplantation. This was slightly higher than the results from the study by Coad et al. (2013), in which the difference may be attributed to variations in the inclusion criteria as previously stated.

Results also showed that respondents strongly agreed that their religion allows organ donation or transplantation (M=4.43). Religion, along with knowledge and education, has been reported as influential factors generally affecting attitudes on organ donation globally (Chakradhar et al., 2016). As reported in a study by Ramadurg and Gupta (2014), only a few of the medical students (4.3%) stated that they belonged to religions that permit organ donation; however, this response decreased upon being told that organ donation is considered as a pious act by every religion. This highlights the effect of religious beliefs on an individual as well as the challenges of deviating from blind beliefs. Interestingly, a study by Sindhu et al. (2017) also revealed that 47.9% of the respondents who were medical students believed that an inhibiting factor to organ donation includes religious beliefs. Despite this is the existence of religions that support the ideals underlying organ donation, such as Catholicism which preaches teachings of love and compassion, hence, supports the humanitarian act of organ donation. Many religions practice gnostic attitudes, influenced by the Cartesian philosophy, that perpetuates the concept of the separation of body and soul or the "self" after death, thus, deviating from the idea that the body is required to stay "complete" (Randhawa & Sharp, 2016).

Moreover, the respondents generally agreed (M=4.17) that they have no cultural belief that their body should be kept intact after death. Cultural beliefs encompass traditions, cultural perspectives, and customs (Albright et al., 2005). In consonance, a study by Randhawa and Sharp (2016) that explored cultural attitudes towards death practices, the body after death, and life after death in deceased organ donation showed that it is more common to have a belief that others could benefit from organs donated from a deceased person as the body would not be needed after death. However, the findings deviate from the results of an early study by Albright et al. (2005), which revealed that Filipinos more commonly hold cultural and/or religious beliefs that value the preservation of the integrity of one's body after death, making them fear the removal of their organs postmortem. Some respondents believed that it is quite difficult to change the frame of mind of individuals from the "old school" or those who have been deeply accustomed to old traditions, although they also believed that this mindset could be changed over time. Such behavior demonstrates the significant role of both healthcare professionals and social scientists in promoting public consciousness and acceptance of organ donation in society (Sindhu et al., 2017).

It was also shown that the respondents agreed (3.69) that they have no fear of body disfigurement upon organ donation. This was less than that of the findings in a study by Ibrahim and Randhawa (2017) on Nigerian students wherein most of the respondents believed that body mutilation and disfigurement would not occur. Such fear may be attributed to the natural tendency of worrying, misconceptions, or it may be tied with an individual's religion and/or cultural beliefs requiring the body to be kept intact (Albright et al., 2005). A study by Srinivasula et al. (2018), which assessed the influence of health education on knowledge,

attitude, and practices toward organ donation among dental house surgeon students of Panineeya Institute of Dental Sciences and Research Centre, Hyderabad, India, observed that a large proportion of students had a fear of body disfigurement after organ donation before and even after an educational intervention. Meanwhile, a study by Suprai (2016), which was conducted on an Asian Indian population in the United States, revealed that a concern of many ethnic groups is body disfigurement and how their body would not look pleasant during funeral viewing after the procurement of organs. Additionally, a study by Coad et al. (2013), which assessed the attitudes of young adults in the United Kingdom towards organ donation and transplantation, revealed that individuals who had a fear of body disfigurement after organ donation also agreed that it makes them less likely to donate.

Meanwhile, the respondents were neutral (3.31) on having a fear of surgical procedures. This was less definite compared to a study conducted by Abdullahi et al. (2018) involving basic nursing and midwifery students of a selected college in Northern Nigeria wherein the mean response of the participants revealed that they generally had no fear of surgical procedures. As previously mentioned, this fear may be brought about by the natural tendency of worrying (Albright et al., 2005). Additionally, the respondents from the study of Abdullahi et al. (2018) may have had more exposure or a better grasp on the implications of undergoing surgery. Moreover, another study by Milaniak et al. (2020), which tackled the factors influencing decision-making about living donation among medical students, identified the fear of surgical treatments as a significant reason for their refusal to undergo living donation.

The respondents were also neutral (M=3.19) regarding whether their families agree with organ donation. The family plays a pivotal role in decision-making, especially in situations that may cause a major impact, including organ donation; hence, the potential donor is not the lone decision-making authority, especially in cases of organ donation upon deceasement. A study by Akhter et al. (2021) conducted on medical and nursing students in Lahore revealed that a majority of the participants deemed permission from the nearest family member as essential before organ retrieval. The family is generally regarded as a primary social institution, a basic unit of society, or a social agency, thereby designating the final decision on organ donation upon the family members (Srinivasula et al., 2018).

Overall, table 2 presents the summary of the mean responses of the respondents for each of the aforementioned statements in the assessment for the level of attitude. The resulting mean was 3.93 which falls under the range of “agree” and shows that the respondents generally have a somewhat positive attitude towards organ donation and transplantation.

Determining attitudes towards organ donation aids in the identification of contributory factors and in the formulation of appropriate and cost-effect measures to address them (Ríos et al., 2017). As described in various studies worldwide, key drivers in people’s attitude on organ donation are knowledge, education, and religion (Akhter et al., 2021).

The assessment for attitudes towards organ donation and transplantation also included supporting information which showed that the most common reason as to why the respondents were currently not registered as organ donors was not knowing where and how to register as one (36.64%), followed by respondents who believe that they are still young to make such decisions (18.75%). In terms of willingness, a majority were more inclined to donate to a family member (58.84%) but were willing to donate regardless of the recipient’s smoking status (64.44%), drinking practices (69.83%), age (78.66%), mental condition (92.24%), physical condition (91.38%), and religion (96.12%).

On the other hand, the level of perceptions was also assessed with questions that used a 5-point Likert scale in which the weighted mean was applied with the verbal interpretation and the corresponding level of perceptions.

Table 3. Level of Perception of the Respondents

Statements	*M*	Verbal Interpretation	Level of Perceptions
1. I believe that there is a risk that donated organs could be misused, abused, or misappropriated.	4.24	Strongly Agree	Positive
2. I feel that every individual should automatically be registered as an organ donor.	2.60	Neutral	Neutral
3. I am happy with my knowledge of organ donation and transplantation.	3.54	Agree	Somewhat Positive
4. I believe that organ donation and transplantation should be part of the undergraduate medical curriculum.	4.18	Agree	Somewhat Positive
5. I think that those who are brain-stem dead are truly dead.	3.38	Neutral	Neutral
Average	**3.59**	**Agree**	**Somewhat Positive**

Note. Legend of the Verbal Interpretation of the Weighted Mean

1.00 to 1.79	Strongly Disagree
1.80 to 2.59	Disagree
2.60 to 3.39	Neutral
3.40 to 4.19	Agree
4.20 to 5.00	Strongly Agree

Table 3 presents the mean responses of the respondents in which they generally strongly agreed (M=4.24) that they believe there exists the risk of donated organs being misused, abused, or misappropriated. Similarly, in a study by Balwani et al. (2015), from which the questionnaire was originally formulated, a majority of the participants perceived a potential danger that organs could be misused, abused, or misappropriated. This may be due to the delivery of news across media regarding illegal handling of organ transplants wherein the public can be exposed to regardless of the field one belongs to.

Meanwhile, there was a generally neutral (M=2.60) stance on whether the respondents feel that every individual should automatically be registered as an organ donor. The perception of those who expressed any degree of disagreement aligns with the opt-in scheme of organ donation that applies an explicit consent system requiring prospective donors to actively register their intent, thereby having higher perceived autonomy (Steenaart et al., 2020). Advocating for this system had also been related to mainly having a pragmatic perception of one's body after death wherein there is a minimal psychological or sentimental attachment to one's organs and considers its donation as a form of life-saving "recycling" (Miller et al., 2019). On the other hand, the perception of those who expressed a degree of agreement aligns with the opt-out system of organ donation, which automatically regards an individual as an organ donor upon death and requires the registration of objection if one refuses. Studies have shown that the rationale behind those who advocate for this scheme is that freedom of choice remains even in the application of defaults (Steenaart et al., 2020). Additionally, a large survey by Miller et al. (2019), which was conducted on participants from Scotland, England, and Northern Ireland, revealed that a key theme among those who prefer this system is that it was perceived as a "simple, effortless choice."

In relation to knowledge, the respondents mostly agreed (M=3.54) that they are happy with their knowledge on organ donation and transplantation. With the large number of respondents expressing contentment on their knowledge on the topic, this may reflect upon the previously shown results on their level of knowledge in which most of the respondents possessed a high level of knowledge (Table 1).

The respondents, who were all students, agreed (M=4.18) that organ donation and transplantation should be part of the undergraduate medical curriculum. As future professionals, especially those engaging in the healthcare field, it is important for students to promote organ donation and transplantation. With this, it is necessary to equip students with sufficient knowledge and opportunities to assess themselves through educational intervention (Ramadurg & Gupta, 2014).

Meanwhile, the respondents expressed neutrality (M=3.38) in their stance on whether those who are brain-stem dead are truly dead. The Harvard criteria for diagnosis of brain stem death include unreceptive and unresponsiveness, no movements, apnea, absence of elicitable reflexes, and isoelectric electroencephalogram, which must be separately declared by two independent teams with a 6-hour interval (Saran & Padubidri, 2019). In line with this, the accepted medical definition to definitively diagnose death currently follows the brain stem death criteria. However, confusion remains prevalent among both laymen and medical professionals alike. Studies have observed that this has always been a controversial psychological and emotional challenge affecting the decision-making process, especially among family members who have a separate definition of their concept of death and have difficulties accepting that their loved one is truly dead. They perceive the patient as still “alive” due to the presence of their physical body with the sustenance of medical care. Moreover, the term “brain-stem dead” even misleads them to believe that recovery is still possible (Maguire, 2019).

Overall, Table 3 depicts the summary of the mean responses of the respondents for each of the aforementioned statements for the assessment of the level of perception. Overall, the mean response was 3.59 which lies within the range of “agree” and indicates that the respondents overall had a somewhat positive perception towards organ donation and transplantation.

A study by Akhter et al. (2021), involving participants composed of medical and nursing students, found that there was a more positive perception among this group towards compared to the common adult population in other studies. This similar finding may be attributed to the relatively intensive exposure to topics related to organ donation and transplantation, such as its purpose as a treatment, among the students from medical-related courses. Public perception may be shaped by widespread myths and misconceptions circulating in society (Vincent et al., 2019).

The assessment for perceptions was also accompanied by supplementary data which showed that most of the respondents believed in the importance of being well-aware of the degree of organ supply scarcity (99.35%), as well as the importance of promoting organ donation (98.49%) and the need for effective laws to govern the organ donation process (97.63%). In terms of legislation, majority (77.37%) of the respondents preferred the opt-in donation system after being provided with the definitions of both the opt-in and opt-out organ donation schemes. Opt-in is the general system currently being implemented in the country at the time of writing this study.

Relationship between the Sociodemographic Profile and the Level of Knowledge, Attitudes, and Perceptions

Table 4. Relationship between the Level of Knowledge of the Respondents on Organ Donation and Transplantation and their Sociodemographic Profile

Variables Tested		Pearson Chi-Square	*p*-value	Decision Rule
Knowledge	Sex	0.235	0.628	Reject H_0 if p-value is less than alpha (0.05)
	Age (In Years)	0.835	0.659	
	Degree Program	8.131*	0.017[a]	
	Year Level	2.165	0.539	
	Religion	8.304	0.307	
	Registered organ donor	0.001	0.978	
	Donated an organ	0.000	0.985	
	Received an organ for transplant	0.393	0.530	

* $p < .05$

[a] Post-test revealed a Cramer's V value of 0.132

Note. Legend of the estimated values of Phi and Cramer's V and the Interpretations of Association

> 0.25 Very Strong
> 0.15 Strong
> 0.10 Moderate
> 0.05 Weak
> 0.00 No or Very Weak

Table 4 shows the relationship between the knowledge of the respondents and their corresponding sociodemographic profile using Phi and Cramer's V and Pearson Chi-Square analyses. The relationship between the variables is significant at the 0.05 level. Out of all the sociodemographic parameters analyzed, it was determined that only the degree program of the respondents had a significant relationship with the respondents' level of knowledge ($p = 0.017$). Since the p-value of the variables was <0.05 upon Pearson's chi-square analysis, the null hypothesis that there is no existing relationship between the level of knowledge of the respondents and their corresponding degree program was rejected. Hence, it can be concluded that there is a significant relationship between the aforementioned variables. Consequently, this relationship had a moderate strength of association with a Phi and Cramer's V value of 0.132, further proving the relationship between the two variables. The rest of the sociodemographic parameters showed failure to reject the null hypothesis ($p > 0.05$).

In a study conducted by Soylar and Ulaş Kadioğlu (2018), the knowledge of undergraduate students, specifically of nursing and theology tertiary students, varied. The knowledge of the mentioned undergraduate students varied depending on the type of organ donation knowledge question. It was found that theology students garnered a higher knowledge score in the first dimension in relation to questions tackling donor characteristics, whilst nursing students garnered a higher knowledge score in the second dimension in relation to questions tackling the legal, medical, and ethical issues of organ donation. This may suggest that the tertiary education degree program may be a contributory factor in the level of knowledge that an individual has with regards to organ donation and transplantation. In another study conducted in a university in Western China, it was shown that the undergraduate students belonging to different degree programs, namely, arts and literature, science, engineering, law, education, and medicine, showed a considerably high knowledge score (Lei et al., 2018). However, it was mentioned in this study that out of the total 1589 respondents, only 17.74% were equipped with knowledge on organ donation and

transplantation. Moreover, a lesser number of participants were able to correctly answer all knowledge questions with regards to organ donation. This further suggests that the knowledge exposure of undergraduate students with regards organ donation and transplantation plays an important factor in their overall knowledge. Since the study's respondents belonged to different degree programs, their knowledge levels would differ as well. Hence, it is expected that the degree program of the participants would contribute to their knowledge assessment. Although the degree programs surveyed are pre-medical programs, one degree program has an advantage when it comes to being trained and equipped with courses tackling the facets of organ donation and transplantation; specifically, its legal, ethical, and medical aspects. Hence, the differences in the curriculum implemented in each of the degree programs may have affected the knowledge assessment of the participants.

On the contrary, other findings do not correlate with other studies, such as that of the sex of the participants. It was reported in Chakradhar et al. (2016) study that there is a significant relationship between the knowledge of Indian dental students and their genders. It was shown that female participants had higher mean knowledge scores than males. The same was true when the levels of correct knowledge are assessed with respect to gender. This may be due to the different study settings and educational systems being employed in other countries, the different laws governing organ donation and transplantation, their sociodemographic profile, and the overall exposure of individuals to organ donation and transplantation.

Table 5. Relationship between the Level of Attitudes of the Respondents towards Organ Donation and Transplantation and Their Sociodemographic Profile

Variables Tested		Pearson Chi-Square	*p*-value	Decision Rule
Attitude	Sex	1.432	0.839	Reject H_0 if p-value is less than alpha (0.05)
	Age (In Years)	7.764	0.457	
	Degree Program	17.939*	0.022[a]	
	Year Level	13.484	0.335	
	Religion	87.143*	<0.001[b]	
	Registered organ donor	1.757	0.780	
	Donated an organ	5.536	0.237	
	Received an organ for transplant	9.087	0.059	

* $p < .05$

[a] Post-test revealed a Cramer's value of 0.139. [b] Post-test revealed a Cramer's value of 0.217.

Note. Legend of the estimated values of Phi and Cramer's V and the Interpretations of Association

> 0.25 Very Strong
> 0.15 Strong
> 0.10 Moderate
> 0.05 Weak
> 0.00 No or Very Weak

Table 5 shows the relationship between the attitude of the respondents and their corresponding sociodemographic profile using Phi and Cramer's V and Pearson Chi-Square analyses. The relationship between the variables is significant at the 0.05 level. It was seen that both the degree program and religion of the respondents had a significant relationship with their attitude ($p = 0.022$ and $p < 0.001$, respectively). Hence, the null hypotheses on the relationship between the respondents' level of attitude and their corresponding degree program and religion were rejected. The relationship between the degree program and religion had a moderate and strong strength of association accordingly as analyzed with Phi and Cramer's

V, having a value of 0.139 and 0.217, respectively. The rest of the sociodemographic profile were considered insignificant as these exceeded the p-value ($p > 0.05$).

According to Paneru et al. (2019), attitude is a determinant that can be influenced by many factors such as religion. In a cross-sectional study by Pouraghaei et al. (2015), it was found that organ donation and transplantation may be affected by religion, culture, and family influence. This was congruent with the findings of this study. Although the majority of the respondents are Roman Catholics there are a few respondents belonging to other denominations and religions that prohibit individuals to partake in such humanitarian acts. Furthermore, some religions would as well have the ideology of preserving the body after death. Thus, it could be deduced that religion could affect the attitude of the respondents with regards organ donation and transplantation.

According to a cross-sectional research by Sah et al. (2019), the results showed that the awareness of organ donation among undergraduate medical students was high. Moreover, the attitude of an individual with regards to organ donation and transplantation can be correlated with one's awareness about it (Balwani et al., 2015). This was also in line with the findings of this study, as the degree program of the respondents had affected their level of attitude. Although all degree programs are medically related, the differences with the implemented curriculum may have contributed to the varying levels of knowledge and awareness of the respondents with regards to organ donation and transplantation. In this sense, one program may be more exposed than the other programs; and it could be deduced that their attitude towards organ donation may as well vary. Hence, respondents with a high level of knowledge may have a positive attitude towards organ donation, while respondents with a low level of knowledge may have a negative attitude towards organ donation.

Table 6. Relationship between the Level of Perceptions of the Respondents towards Organ Donation and Transplantation and their Sociodemographic Profile

Variables Tested		Pearson Chi-Square	*p*-value	Decision Rule
Perception	Sex	2.372	0.499	Reject H_0 if p-value is less than alpha (0.05)
	Age (In Years)	2.010	0.919	
	Degree Program	2.412	0.878	
	Year Level	8.683	0.467	
	Religion	24.004	0.293	
	Registered organ donor	0.440	0.932	
	Donated an organ	4.312	0.230	
	Received an organ for transplant	2.451	0.484	

Table 6 shows the relationship between the perception of the respondents and their corresponding sociodemographic profile using Phi and Cramer's V and Pearson Chi-Square analyses. The relationship between the variables is significant at the 0.05 level. There was no significant relationship between the sociodemographic parameters and the respondents' perception. All sociodemographic variables had exhibited an insignificant relationship with the perception parameter as all exceeded the p-value ($p > 0.05$). Hence, the null hypotheses for all variables were not rejected.

Due to the lack of relevant literature on the relationship of these variables, comparison cannot be established. However, according to Bedi et al. (2015), perceptions were regarded as personal views and experiences. This may be similar to the results of the study as the perception of the respondents with regards organ donation and transplantation was not heavily influenced by their sociodemographic profile. Hence,

it could be postulated that the perception of an individual may depend on their viewpoint on organ donation regardless of their sociodemographic parameters.

Relationship between the Three Variables (Knowledge, Attitudes, and Perceptions)

Table 7. Relationship between the Three Variables (Knowledge, Attitudes, and Perceptions) Assessed Among Respondents Regarding Organ Donation and Transplantation

Variables Tested		Pearson *r* Correlation Coefficient	*p*-value	Interpretation
Knowledge	Attitude	0.176**	<0.001	Very weak correlation
Knowledge	Perception	0.157**	0.001	Very weak correlation
Attitude	Perception	0.327**	<0.001	Weak correlation

** $p < .01$

Table 7 shows the relationship between the knowledge, attitudes, and perceptions assessed among the participating tertiary level students regarding organ donation and transplantation using the Pearson r correlation coefficient. The correlation between variables was significant at the 0.01 level. The knowledge of the respondents regarding organ donation and transplantation showed significant, positive, but very weak correlations with their attitudes ($r = 0.176$; $p < 0.001$) and perceptions ($r = 0.157$; $p = 0.001$). Moreover, the attitudes of the respondents towards organ donation and transplantation showed a significant, positive, but weak correlation with their perceptions ($r = 0.327$; $p < 0.001$). The correlations led to the rejection of the null hypothesis stating that there is no significant relationship between the three variables, namely the knowledge, attitudes, and perceptions of young adults enrolled in a selected college in a university in Manila regarding organ donation and transplantation.

In early studies, similar results were found in a study conducted by Schaeffner et al. (2004) stating that their respondents' knowledge and attitudes towards organ donation were poorly correlated with each other. This was also demonstrated in a study conducted by Youngner (1989) stating that an increase in knowledge alone will not necessarily result in other cognitive changes in health professionals. On the other hand, a study conducted by Agrawal et al. (2017) revealed that the higher level of knowledge observed among medical students compared to nurses in Saudi Arabia was positively correlated with their willingness to donate. In this study, a similar trend was observed wherein there is a positive but very weak correlation between the knowledge and attitudes of respondents towards organ donation and transplantation. According to Symvoulakis et al. (2012), higher medical education is related to a positive attitude towards organ donation and an increased willingness to donate organs. This could explain the results of the study conducted by Hu and Huang (2015), where they had doctors as their study population who garnered higher knowledge resulting in having a higher positive attitude and willingness to donate organs than that of nurses and non-clinical staff members.

On the contrary, there were no similar studies on the other correlations. However, it can be deduced from this study that a higher level of knowledge may very weakly influence the perception of an individual while the attitude of the individual may weakly influence their perception.

Difference between the Level of Knowledge, Attitudes, and Perceptions of the Respondents When Grouped According to their Degree Programs

Table 8. Difference between the Level of Knowledge, Attitudes, and Perceptions of Respondents When Grouped According to their Degree Programs

Variables Tested	Degree Program	*M*	*p*-value	*df*	Decision Rule
Knowledge	Degree Program A	18.50	0.002	463	Reject H_0 if p-value is less than alpha (0.05)
	Degree Program B	19.43			
	Degree Program C	18.84			
Attitude	Degree Program A	3.81	0.057		
	Degree Program B	3.99			
	Degree Program C	3.86			
Perception	Degree Program A	3.53	0.518		
	Degree Program B	3.61			
	Degree Program C	3.56			

Table 8 shows the relationship between the knowledge, attitudes, and perceptions of the respondents and their corresponding degree program using one-way ANOVA. Only the knowledge between the three degree programs had a significant difference (p = 0.002), rejecting the null hypothesis that there is no significant difference between the knowledge of each degree program. The mean score knowledge of degree program B ($\bar{x}$ = 19.43) was higher than that of degree program C ($\bar{x}$ = 18.84) and degree program A ($\bar{x}$ = 18.50) regarding facts on organ donation and transplantation. The attitude (p = 0.057) and perception (p = 0.518) of the respondents showed no significant difference.

A study conducted by Ju et al. (2018) stated that health allied students advocated for health education regarding brain-death organ donation and intend to donate organs as not all respondents have received education on organ donation. Relevant education could be the reason for the differences in the mean knowledge scores across degree programs because organ donation is a part of degree program B curriculum, while the curriculums of degree programs A and C had no direct education related to the topic.

IV. CONCLUSION AND RECOMMENDATIONS

This study was one of the few kinds of research concerning the field of organ donation and transplantation in the Philippines. Moreover, it was one of the first, if not the only one so far, in terms of the quantitative assessment of socio-behavioral aspects, specifically the knowledge, attitudes, and perceptions, of young Filipino adults who were undergraduate university students pursuing Bachelor of Science degree programs.

Statistical analysis revealed that the respondents had a high level of knowledge and a somewhat positive attitude and perception towards organ donation and transplantation. Unfortunately, there was a discrepancy with their actions as students who actually committed to registering as organ donors were underwhelmingly few.

Most respondents had satisfactory results; nonetheless, the presence of gaps cannot be ignored. This may simply be brought upon by the lack of information exposure that may be coupled with gaps in information dissemination by responsible institutions. On the other hand, a neutral standpoint was observed

among the respondents when considering familial ideology on the topic. This then sheds light on the importance of communication as familial influence may be considered a factor in decision-making, reflecting the functional role of a family unit.

Aspects of an individual's sociodemographic profile may serve as a factor that shapes one's characteristics. An influencing factor on knowledge, among the sociodemographic parameters used, was the degree program under which the respondents were studying. This may be due to the existing differences in the curriculum of each degree program wherein students may have variable to its facets. Degree program affiliation was also a contributory factor to one's attitudes towards the matter, although religion posed a greater effect. This may be attributed to religious teachings of altruism, hence, supports the humanitarian act of organ donation, and may also be due to the practice of gnostic attitudes based on spiritual philosophies on life after death. Meanwhile, none of the given sociodemographic parameters affected one's perceptions. Knowledge, attitudes, and perceptions the respondents exhibited a directly proportional relationship with each other, although to a weak extent. This denotes that as one expands their knowledge, there may also be an improvement in attitudes and the development of more profound perceptions.

With organ shortage being a universal problem, it is crucial to address gaps and issues to overcome the stark reality of supply and demand, thereby preventing further harm to public health.

This study limited its focus on the students at a selected college within a university in Manila, Philippines, mainly due to the COVID-19 pandemic constricting time and resources. In future studies, a larger, more diverse sample size should be accommodated to increase the reliability of the results, and to explore viewpoints of other demographic groups. It is also worth considering the type of participants, such as those coming from different programs instead of solely focusing on the medical-related programs. Moreover, further study on what factors can affect the three parameters, especially perception, other than the variables used can be delved on. In-depth research through focus group discussions could be done to further explore the intricacies of the topic, if resources would permit.

The role of the legislative sector, hospitals, health centers, and other related organizations or institutions must be further elaborated with regards to their strategies in information dissemination about organ donation and transplantation. New or modified policies and systems are instrumental in enhancing the current status of this field.

Social media is a cost-effective tool in educating the public about organ donation and transplantation, its importance, and its potential advantages and risks. It may serve as a platform for campaigns and educational forums, as well as a directory of guides on the actual process of organ donation and transplantation in the local setting.

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