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Optometry Unit, Department of Clinical Surgical Sciences, Faculty of Medical Sciences, St. Augustine, the University of the West Indies

Perception and Attitude towards Eye Donation and Corneal Transplant among Trinidadian Population

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DEDICATION

We want to dedicate this study to our beloved parents, who have been our source of inspiration for this study. They have continuously provided their moral, emotional, financial support and guidance for us throughout the process of this study.

To our siblings, relatives, supervisor, lecturers, friends, and classmates who provided their words of encouragement and advice throughout this study.

Also, we would like to dedicate this study to our community in Trinidad and Tobago in hopes that in the future people's sight can be restored with corneal tissue from a local Eye Bank.

Finally, we dedicate this study to the Almighty God, who gave us the guidance, strength, power of mind and protection to complete this study. All of these, we offer to you.

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Abbreviations

US - United States

PK - penetrating keratoplasty

SALK- superficial anterior lamellar keratoplasty

ALTK - automated lamellar therapeutic keratoplasty

DALK - deep anterior lamellar keratoplasty

DAESK - Descemet stripping automated endothelial keratoplasty

DMEK - Descemet membrane endothelial keratoplasty

UWI - University of the West Indies

SPSS - Statistical Package for the Social Sciences

CXC/CSEC/O-Levels – Caribbean Examination Council/ Caribbean Secondary Examination Council exams / Ordinary Level exams

A Level - Advanced level exams

WHO – World Health Organization

ABSTRACT

Background: Corneal dystrophies and degenerations are one of the prevalent causes of corneal disease in the Caribbean which if left untreated can lead to blindness. Restoration of sight can be obtained from corneal transplant surgery. Corneal Tissues are imported from the US and can be costly and time-consuming, eye donation can alleviate this problem. With an Eye bank in place, these eye donations can be readily available for use as well as for scientific research.

Aim: To investigate the perception, level of awareness and attitudes towards corneal donations, transplants as well as optimal strategies to encourage eye donations in Trinidad

Methods: A quantitative observational cross-sectional study was conducted among the 398 participants in Trinidad, using questionnaires that consisted of questions that assessed variables such as demographics, awareness, attitude, perception, and willingness.

Results: Approximately half the participants (398) were aware of eye donation and among those aware, their main sources of knowledge were from online (15.8%) and TV (15.3%), radio. In terms of perception, a series of questions were used to gauge what people knew about eye donations. Majority of responses were inaccurate with regards to the time of retrieval and what part of the eye removed. Most participants expressed that they would not be willing to donate. The most popular reason for unwillingness was ‘I need more information’. It was difficult to gauge the participants’ attitudes since all responses were positive. So, there was no relation to age, sex, ethnicity, education, or region found.

Conclusion: The level of awareness was fair, with the main source being online media, however more means are required to help increase the awareness and education of citizens. Willingness was very poor, and the main reason was due to lack of informatio

CHAPTER ONE

1.0 INTRODUCTION

The cornea is located on the front surface of the eyes. It consists of 5 layers which refract the light rays towards the lens and eventually to the back of the eye. To have optimal vision the cornea must remain healthy, clear, and smooth, without this swelling, scarring or damage can compromise the quality of vision and if it is left untreated for long it can cause blindness. If the possibility of the cornea not being able to repair is lost, then an ophthalmologist would recommend a corneal transplant. To do so a donor is required, this is usually a healthy cornea from another human being, taken directly from a person or an eye bank. What a corneal transplant does is replace the defected cornea with a smooth, transparent, pathology free cornea held in place by stitches and after recommended weeks of healing, with no complications, vision should be restored better than before. [49]

The first idea of corneal transplants came bout during the French Revolution, where a French surgeon suggested that a transparent material can be used to replace a cornea to improve vision. It was then the grandfather of Charles Darwin, Erasmus Darwin who suggested using a trephine, the size if a small crow quill that would heal with no scarring. Then on, only until the 19th century, experiments began. Initially, animal corneas were used to replace opaque animal corneas, then experiments were made using animal corneas on human eyes. Unfortunately, this idea failed after man other scientist attempted it. Then in 1837 an Irish surgeon, Samuel Bigger performed the first successful same species corneal transplant on a gazelle. In 1905, Eduard Zirm performed the very first successful human allograft using the cornea of a blind 11-year-old boy. [34]

Corneal transplant surgery is a similar process to any organ transplant surgery whereby a donor must be found and matched with the recipient's blood and cells. The process from donor to recipient consists of harvesting the eyes within twenty-four hours of death and placing the tissue into a storage media. The tissues can be stored for a maximum of fourteen days if needed. The tissue then undergoes a procurement process, as well as steps are taken to ensure the tissues are viable and safe for surgery, ruling out contraindications from the donor's medical history. The tissues are then prepared and ready for transplantation to the recipient. [32]

In this case, Eye donations would help with corneal transplants since there would be an ease of accessibility to them and less waiting time to get the corneal transplant surgery done. This would be a cause for an Eye bank to be implemented so there may be fewer importations of the tissues. Hence, the outcome of the surgical procedures would improve and decrease the rate of blindness from these diseases.

1.1 Background of the study

According to WHO blindness is defined as presenting visual acuity worse than 3/60. Some of the major causes of blindness are uncorrected refractive errors, cataract, glaucoma, corneal opacities, etc. Diseases specific to the cornea such as keratoconus, Fuchs' Dystrophy, Ocular Herpes, and many others can be resolved with laser surgery, keratoplasty and corneal transplants. Some of the prevalent corneal diseases that can cause visual impairment and blindness in the Caribbean and Trinidad are corneal dystrophies and degenerations such as keratoconus. Common causes of blindness in the Caribbean were diabetic retinopathy and glaucoma. In Latin America, the causes for blindness were similar but the only corneal related cause of blindness known were Trachoma and Trauma from chemical burns. [16] In the United States of America, the leading causes of blindness are cataract, glaucoma, diabetic

retinopathy, and most commonly, age related macular degeneration. [10] Though none of these are directly related to the cornea and require a corneal transplant, the USA performs numerous transplants on an annual basis. According to the Eye Banking Statistical Report for 2019 US 85,601 long term preserved tissues were used in corneal transplants both locally and internationally for the year 2019.

An important step before retrieving the corneal tissue would be to determine the type of surgery that needs to be done, this is pertinent to the type of graft required. As stated before there are five layers of the cornea and at every layer something can go wrong, therefore before ordering the tissue specimen the surgery type needs to be determined and there are many types of corneal surgeries; penetrating keratoplasty for full thickness opacities with no cataract, PK triple procedure for the same full thickness opacity but with cataract. For anterior stromal opacities, according to the depth, superficial anterior lamellar keratoplasty SALK or automated lamellar therapeutic keratoplasty ALTK would be performed and for a posterior stroma opacity a deep anterior lamellar keratoplasty DALK is done. For a corneal decompensation with a poor endothelium with stromal scarring a Descemet stripping automated endothelial keratoplasty DAESK or Descemet membrane endothelial keratoplasty DMEK is performed. [45]

Globally, 184 576 corneal transplants are performed spanning over 116 countries and corneal procurement occurs in 82 countries with the US and India being involved in 5% of all procurements. India is known to have the most eye banks in the world with 238, the USA has 84 and China has 84, in total there were 742 eye banks in the world. The US and New Zealand were the largest exporters of corneal tissues due to their advancement of surgical technology. [18]

The creation of an eye bank requires an organization to oversee the technicalities like education, accreditation, finances, research technicians, quality assurance, legislation, etc. In the USA this is known as the Eye Bank Association of America. Once this organization is formed the eye bank can now be physically created. The structure is dependent on the amount of processing that will be done, and a good idea would be to attach an eye bank to a hospital or university. Once a physical Eye Bank is established staff is required and there are many roles to be filled. In the figure below [31], lists the required occupations needed to run an eye bank as well as the process of action flow an eye bank should follow.

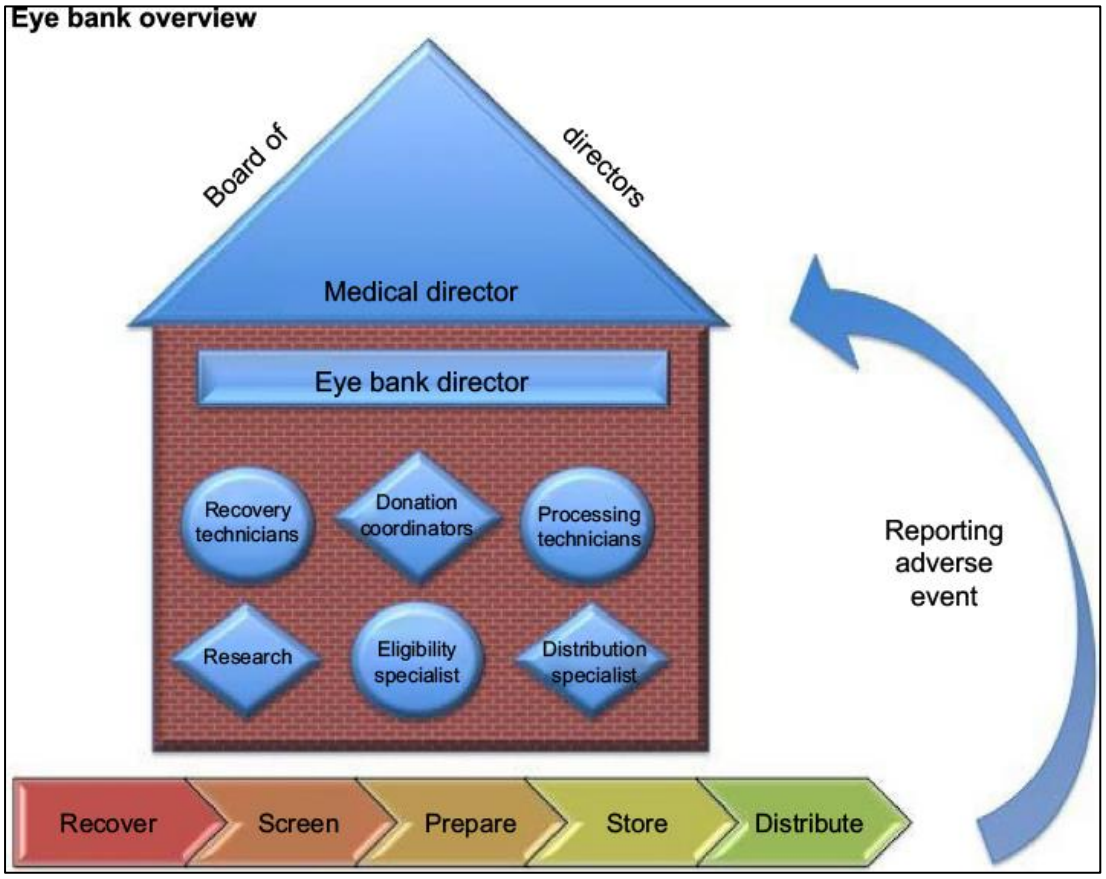

Figure 1 Flow of Action need for the functioning of an Eye Bank

In 2020 the COVID-19 Pandemic is predicted to dent the number of donors in years to come as the virus can be spread through tears and mucus membranes, therefore it is considered a threat for those undergoing ocular procedures. Even though there is no supporting evidence that the virus can be spread through blood transfusion and tissue transplants, precautions need

to be taken to eradicate further spread at least until more information is available [17]. Procedures have been limited during this time, so the number of donations would have halted but in addition to this, donors will now be wary of the possibilities and risks.

In India, some challenges Eye banks face are the lack of financial support, non-supportive legislature, and shortage of trained personnel. Most importantly the biggest downsides are the awareness and lack of motivation of persons to donate has created a large gap between supply and demand. When their level of awareness and willingness were assessed it was found that the more rural areas that lack education are more reluctant in donating. Also, many have refused due to the legal problems, religion, and ignorance to learn [35] . Similar problems are being faced in China where more interventions are required to raise the level of awareness as it is low and affecting the number of donations [49].

1.2 Statement of the Problem/ Rationale of study

Our motivation to do this study was the idea that one day people would have the benefit of a local eye bank to have their much-needed corneal transplant done quicker and cheaper with hopes of saving their eyesight. Sight for many is the most important sense and without our world would be literal darkness. However, we are very far from seeing this dream became a reality, but it only takes one step in the right direction to get the dream started. Hence the reason we have dedicated our time and effort into finding out the level of awareness, perceptions and attitudes persons have towards Eye donation and Corneal Transplants. It was our desire to be of some service to society by creating awareness about Eye donation and encourage people to consider the idea of donating their eyes when and if an Eye bank is established. In Trinidad and Tobago persons can pledge to donate their eyes however, there seems to be a lack of awareness about eye donations as the idea is not pushed sufficiently to encourage people to engage and assist. There seems to be a high demand for ocular tissues

which are not available locally. There is also an inadequate amount of quality research on evidence-based data regarding ocular donation. If awareness about eye donations is increased, it is believed that more persons would pledge to donate such tissues after they have passed. With an influx of people willing to donate, we can encourage our leader to efficiently create a means to store the donated tissue, thus leading the way for the creation of an Eye Bank locally. This would then improve the outcome of surgical procedures and decrease the rate of blindness associated with corneal diseases in the country.

This study aims to create awareness by investigating the knowledge and attitudes the Trinidadian people have about eye donation. There may be factors hampering the rate of donations such as religion, age, or health conditions but the majority of unwillingness may be due to a lack of education about donation. Not many people are wary that the possibility exists, the many benefits donation brings to others and its contribution to scientific research. Through education and creating awareness about eye donations, it can increase the number of donations per year reducing the need for importations and would then bring the system closer to the ideal concept. There can be strategies put into place to improve the situation and clarify the notions persons may believe. This can be done through education; brochures can be printed and handed out at the optometrists' office, ophthalmologists can do seminars open to the public to educate people on the basics of donation and corneal transplants, as well as, answer questions people may have on the issue. Thus, making them conscious of it, individuals may attempt to contribute in whatever manner they can.

1.3 Aim/ Purpose of the study

The purpose of this study is to investigate the basic understanding, perception and attitudes towards corneal donations and transplants in Trinidad, as well as determining the level of awareness about the various benefits of an Eye Bank within the Caribbean region. In addition

to that, the study aims at researching optimal strategies to encourage eye donations and the best possible system to create a fully functional Eye Bank.

1.4 Specific objectives of the study

- To determine the level of awareness among the population
- To determine their attitude towards eye donation and transplant
- To assess the perception of the population towards eye donation.
- To determine factors that influences their willingness to donate

1.5 Research questions

- What is the level of awareness among the Trinidadian population?
- What is the population's perception of eye donation and corneal transplants?
- Are there any kind of factors that influence the population's willingness to donate?
- Does the population have any kind of attitude towards eye donation and transplants?

1.6 Significance of the study

This study would help determine the level of awareness, willingness, attitudes, and perceptions the public may have on the topic of eye donations and corneal transplants. It would help us to address the issues which hinder eye donations and to understand what general ideas exist within the population, so that we can rectify them and encourage people to donate. If there are many misconceptions surrounding eye donations, then we would be able to clarify it and organize a means to create more awareness. There are many benefits that this study would bring for the public. The importation of these corneal tissues would be expensive and delay the time for a corneal transplant surgery to occur especially for those cases that are emergencies. This delay in the surgery may cause people to avoid or delay doing the surgery

which can put their sight at great risk. Therefore, with eye donations and an Eye Bank available locally or regionally the access to these corneal tissues would be quick, the cost would be greatly reduced, and these surgeries would be able to happen as quickly as within a few hours.

This study could also introduce the possibility of research, which people can donate their eyes and the tissues which are not used on a recipient can be used for scientific research purposes. This can lead to possibly finding cures and treatments for diseases and conditions that many people suffer from. Also, the data collected by the Eye Bank could contribute to global statistics for even further research on cornea tissues. This could lead to international recognition of medicine and research in Trinidad. Aside from benefitting Trinidad, this Eye Bank initiative can also benefit countries in the Caribbean region and possibly introduce Medical Tourism in Trinidad. If Trinidad becomes known for corneal transplants, this can encourage more people regionally and internationally to come to Trinidad and have their surgery done, which can introduce many economic benefits for the country and the population.

1.7 Delimitation of the study

This study was concentrated on the public population in Trinidad, who are over 18 years of age. It was only conducted in public areas around Trinidad. These public areas consisted of malls, shopping areas, various eateries and businesses.

1.8 Limitation of the study

Some of the challenges experienced in this study were that people in a few areas of the country rejected to filling out the questionnaire. Some people were cautious of our consent form in terms of giving out private health information. However, we explained there was no private health information being recorded. When we approached some people in the public

areas, they were unwilling to participate in the study despite explaining to them about it. Persons also would have made no conscious effort to fill out the questionnaire truthfully as they may have been in a rush.

Some limitations during the data analysis was that the multivariate analysis cannot be performed on the objective Attitudes, due to the limited questions based on attitudes and the variation of options to choose from were all positive. This created a positive bias for attitudes that do not properly represent the attitudes of the population.

Most persons interviewed were between the ages of 20-30, limiting the variation in ages to fully capture and represent the population. This can be considered an age bias that would also be linked to level of education.

1.9 Definition of terms

1. **Cornea** – it is an anterior transparent portion of the eye that protects the eyes acting like a barrier so foreign bodies will not be able to enter the eye. Its main function is to bend light entering the eye, which will allow us to see. [1]
2. **Corneal donation** – is a procedure where the cornea from a person's eye is surgically removed and given to someone who requires a cornea to restore their sight. These persons whose corneas are removed have died and their consent was given before death.
3. **Ophthalmologist** – is a person who has a medical degree and has chosen to specialize in the eyes and how it works. They can perform surgical procedures such as corneal transplant and are well educated on eye diseases and treatments.
4. **Visual Acuity** – how well a person can decipher letters, shaped, and small details on objects at a certain distance usually 20 feet.
5. **Eye Bank** – is a place where the corneas from persons who have donated their eyes are properly stored until it is ready to be used.

6. **Congenital** – refers to a disease or abnormality which started at birth.
7. **Keratoconus** – is the thinning of the cornea due to its bulging forward which results in visual abnormalities such as blurry vision.
8. **Corneal Dystrophies** – are abnormalities of the cornea which could be due to genetics or acquired at any age in life. The disorder is often progressive and may be asymptomatic but impairs a person's vision.
9. **Transplantation**- is a surgical process where a living tissue example the cornea or another organ is inserted into another person's body as a replacement.
10. **Willingness**- is the urge or readiness of a person who is prepared to perform a task.
11. **Awareness** – is the act of having knowledge or concern about a certain topic or fact.
12. **Perception** – is the ability to understand and explain something that became aware through the sense of sight and hearing.
13. **Procurement** – to acquire an object with care.
14. **Self-administered** - are a questionnaire that is used along with an interview to gather data on a specific topic.
15. **Continuous variable** – are infinite numbers between 1 to 2 values which can be taken in a specific limit.
16. **Cross-sectional study** – refers to analyzing observational data within a population a given time.
17. **Quantitative** – measuring and analyzing data in terms numbers or an amount as instead of its quality
18. **County** – refers to an area from which a country is divided into smaller units to control the maintenance through an administrated body.
19. **Descriptive statistics** – an explained summary of quantitative data.

20. **Multistage random sample method** – is a procedure of collecting smaller cluster samples each time in different stages.
21. **Multi-variance logistic regression** – is a method used to analyze the extent to which more than one dependent and independent variable is related linearly.

Definitions citation:

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CHAPTER TWO

2.0 LITERATURE REVIEW

Corneal diseases constitute a significant cause of visual impairment and blindness, but it is considered an avoidable disease. It is the 4th cause of blindness globally, 3.46% of global blindness is caused by some form of corneal opacity and 1.65% of global visual impairment.[11] Some causes can be congenital, nutritional, infectious, traumatic, hereditary, or degenerative. The main cause of corneal blindness in children are xerophthalmia due to Vitamin A deficiency (350,000 cases per year), others are ophthalmia neonatorum, herpes simplex keratitis, etc. teenagers, keratoconus and chronic allergic conjunctivitis causes corneal blindness. [33] In adults reoccurring trachoma, inflammatory diseases, corneal infections, poor quality cataract surgery, corneal dystrophy and keratoconus are contributors to visual impairment. [18] Most significantly hereditary corneal dystrophies and keratoconus are not preventable and require treatment such as corneal transplants.

2.1 Cornea Transplant and Eye banking

The popularity of corneal transplantations increased tremendously as the years went by and this was due to the increase of awareness and advancements in surgical technology. Currently in countries such as China at least 8,000 corneal transplantation surgeries are done every year. When compared to the number of corneal transplants performed in US, there were 50,000 cases per year and 100,000 cases worldwide. [14] A study conducted in China using a survey done by 121 corneal specialists reported that the reasons for the small number of corneal transplantation surgeries was the result of the lack or inexperience of surgical training (71%) , the lack of education about the surgeries (42%) and a few number of donated corneas (52%). [24] Other challenges faced worldwide by corneal specialists include a shortage of funding required to perform the surgeries.

Also, there are a lot of patients with corneal abnormalities who requires treatment but there are not enough corneas that have been donated to perform such surgeries. In Italy, a study was conducted for a total of seven years to determine the causes for the altering trends for corneal translation. The results indicated that keratoplasties for keratoconus had decreased over the years, however, because of advance in technology and surgical techniques like PKs, corneal grafting had increased. Once corneal transplantation was proven to be an effective way of managing corneal disease, the numbers of donation increased. [1]

Globally, over nine million individuals are dealing with eye diseases that can be cured with a corneal transplantation. On study showed the emotional and psychological benefits of corneal transplants, demonstrated that this procedure not only allowed the patient improved vision but it also improved their longing for life by giving them hope and a chance to live an independently, appreciating their regained vision. [5]

2.2 Level of Awareness

Various studies were conducted in parts of India studying different groups of people to assess the level of awareness of eye donations. The results varied depending on the area but mainly those who had access to media and tertiary education showed basic knowledge on eye donation. The areas that had more literate people attending universities etc. were more knowledgeable about corneal transplants in comparison to those slum areas where the awareness was poor. [43] [29] [38] [28] [27] [47] [42] A similar study was conducted in Saudi Arabia to assess knowledge regarding corneal donations, but the results showed that there was poor awareness for eye donations, but it was indicated that with better awareness more persons would be inclined to donate. [4] In Malaysia, a study assessed the level awareness in first year university students but found that the overall knowledge was poor, even though they were aware of eye donation, their knowledge of the process was poor and in conclusion more

needed to be done to raise awareness. [7] In Nigeria, a study was also conducted on medical students and the results showed that while they were aware, they did not know the details of eye donation and corneal transplants. [13] The students also indicated that they were unwilling to donate their eyes after death and in conclusion the lack of education and awareness is hampering successful donation. Based on the various studies it can be concluded that access to education and different forms of media plays a vital role in awareness of corneal donations for eye banking.

2.3 Attitudes

In China, the attitudes of residents towards eye donations and eye banking were investigated. The results showed generally positive attitudes towards eye banking; however, this did not increase the willingness to donate. Participants expressed their need for more information about corneal transplants and eye donations before willing to pledge their eyes for donation. [51] [9] In Northwest Ethiopia, a similar study was conducted and it yielded similar results but this sample of people were more educated hence the conclusion that positive attitudes about eye donation comes from those who are more knowledgeable about the topic. [25] However, in another part of Ethiopia, another similar study was conducted, and it was found that there were negative attitudes surrounding eye donations due to many myths and misconceptions about donation. [20] In Nigeria, a study amongst university students was done to assess their attitudes towards eye donations and a generally positive attitude was found. [13] In conclusion more educated persons had more positive attitudes towards eye banking.

2.4 Perceptions

Studies based in India determined the perceptions people had about corneal donations and results showed that the participants were unwilling to donate because of misconceptions they

had about eye donations due to a lack of proper education. [8] [35] Similarly, a study conducted in China where the same responses were found, resulting in a very poor outcome for eye donations. Participants believed that such a procedure would damage the body and thus showing the poor perception that needs to be rectified. [49] In Ethiopia, a similar study showed results that participants believed many myths surrounding eye donation therefore, lessening the willingness to donate. [13] In conclusion about perception, it can be inferred that a lack of knowledge can lead to misconceptions surrounding eye donations but with good awareness and proper knowledge being distributed in many forms to the population, the issue of misconceptions and myths can be resolved.

2.5 Willingness

Studies were done in various parts of India to determine factors affecting willingness to donate corneal tissues to eye banks as well as to quantify the percentage of people willing to donate. Those willing to donate had greater levels of knowledge, however, that only applied to few areas since the participants were unwilling to donate because of a lack of awareness and education about eye donations and corneal transplants. Other reasons for not willing to donate were because of religion, misconceptions or myths about eye donation and family objection. [46] [21] [41] [37] [30] In Ethiopia, a study showed that, only 1/3 of the populations participated (774 adults) were willing to donate. The other remaining 2/3 explained that due to a lack of knowledge about eye donations they were unwilling to donate. [26] The same results were found in Ghana. [3] A study in Nigeria that found similar results with respect to the unwillingness to donate but the participants expressed that their unwillingness was due misconceptions or myths and a lack of education.[2] In comparison, participants in a Singapore study were more willing to donate (67% of participants). This sample of participants however, had greater levels of knowledge about corneal transplants and eye

donations, also their culture and ethnicity were more encouraging of donations. Only few Malays and Muslims expressed.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Ethical Consideration

To begin this study, we got permission from the UWI Optometry Unit. Afterwards we applied to the UWI Ethics committee to get approval to work on this research topic. We also formally completed a consent form that was approved by the UWI Ethics committee too. This was distributed to each of the participants along with the questionnaire. It was a basic consent form that briefly explained what our study entailed and who conducted this study. It also stated that this was simply a self-administered questionnaire being distributed to them, based on the subject giving their opinion about the topic of the study. The consent form also outlined the rights of the participants explaining that no harmful acts would be done to the subject. Participants are free to ask any questions pertaining to the study and understand what benefits they may get out of it, the decision to consent to participate is entirely theirs and if they decide to withdraw from the study, their decision will be duly respected. It briefly explained that all the information that the participants give to us would be strictly confidential between the co-investigators, the primary investigator and themselves. It also stated that the questionnaires will remain anonymous. The results from each questionnaire in each county would be inputted into a datasheet of each county. The datasheet from each county will be kept in a secured place during and after the study is done. This data will be stored on a password protected computer for at least 5 years and after 5 years, the data will be shredded and destroyed. There will be no personal health information used outside of this research study. After the subjects approved and signed the consent form, we would give them the self-administered questionnaire to fill in their response.

3.2 Research Design

A quantitative observational cross-sectional study was conducted amongst the Trinidadian population, with the use of a structured questionnaire which assessed the key variables such as awareness, attitude, perception, and willingness. We carried out this study across the country in various towns residing in each county. This method was used to fully quantify the key variables we wished to analyze, so that at the end of this research we were able to provide a statistical value for the level of awareness, willingness, and perception. The findings of this data will help us to address the issues at hand and we can now find ways to change the misconceptions and influence people into eye donation, which could eventually lead to the creation of an Eye Bank.

3.3 Study population

The study population included only Trinidadian citizens, from areas across the nation randomly selected. It consisted of persons who were between the ages of 18 years to 85 years old. All races, ethnicities and genders were included. We avoided persons who would have a background that included the study of medicine to avoid bias. There was no exclusion of persons with disabilities or pregnant women. No socioeconomic class was taken into consideration as we tried to keep the study open to persons of all classes. No restriction on education was included either to lessen bias.

3.3.1 Study site/ Area of study

This study was carried out in 5 counties around Trinidad. The questionnaires were distributed equally in the towns residing in each of the randomly chosen counties. These counties were St George, St David and St Andrew, Caroni, Victoria, and St. Patrick.

The county of St George is the northwestern part of Trinidad and within this county exists the country's capital Port of Spain. Some major business areas that were visited were Arima,

Tunapuna, San Juan to name a few. Also, within this county lies the Halsey Crawford Stadium, The University of the West Indies, Eric Williams Medical Sciences Complex, and the Piarco International Airport. This county is urban, and several multimillion-dollar businesses populate this area, there are various places of business, universities, clubs, restaurants, malls, beaches, etc.

The county of St Andrew lies in the northeastern part of Trinidad. Its main town areas are Sangre Grande, Valencia, Matura, and Manzanilla. St David also lies a little further northern and therefore it was joint to St Andrew since Tobago is considered a part St David as well. No questionnaires were distributed in Tobago due to the lack of funding and time. These two counties are considered rural and the main business areas are in Sangre Grande and Toco. Fewer business places can be found such as shopping centers, groceries, and eateries. This area is well known for the beaches and fishing areas.

The county of Caroni lies in the central western part of Trinidad and it consists of the towns and cities such as Chaguanas, Couva, Cunupia and Point Lisas. Point Lisas is known as the industrial hub where the oil infirmary exists. Caroni is home to the Caroni Bird Sanctuary the home of the National Bird. This county can be considered more urban than rural, as over the last decade many businesses have opened, and the cities are more developed. Today there exists many multimillion-dollar business such as restaurants, shopping centers, groceries, cinemas, etc. Couva is home to the Ato Bolton Stadium and Aquatic Center and The Couva Hospital and Multi-Training Facility where the UWI Optometry Clinic is located.

The county Victoria lies in the upper south western part of Trinidad and it consists of the cities and towns such San Fernando, Princes Town and Debe to name a few. This area is considered urban as many businesses exist there. Victoria is home to the Brian Lara Stadium, San Fernando General Hospital, and the Southern Academy for Performing Arts. There are

many prestigious secondary schools, shopping malls and centers, entertainment hubs, restaurants, clubs, etc.

The St Patrick County lies in the southwestern part of Trinidad and the main towns are Point Fortin, La Brea, Siparia, Cedros, Fyzabad and Penal. This area is considered rural as the business areas are considered smaller towns with only few shopping centers, malls, groceries, eateries, etc. The main attractions in St Patrick are the pitch lake, beaches, and nature related leisure activities.

3.3.2 Inclusion Criteria

The inclusion criteria consist of people in the population of Trinidad who are over 18 years old. The age range in this study is between 18 years old to 85 years old. People who are of all genders, racial and ethnic composition are also included in this study. People who have been living in the country for more than 6 months were also included.

3.3.3 Exclusion Criteria

The exclusion criteria consisted of persons who were not citizens of Trinidad and Tobago and people who held a residency in Trinidad of less than 6 months. Persons under the age of 18 years were also excluded. Also, persons who have medical related backgrounds were avoided in the study to remove bias.

3.4 Sample size and sampling technique

The sample size for this study is 398 participants all chosen randomly and who all fit the inclusion criteria. During our sampling, our exclusion criteria came into effect where we excluded those under 18 years of age and those who have a medical educational background.

3.4.1 Sample size determination

We used the Raosoft sample size calculator tool to do the sample size calculation. This was used to calculate the sample size based on the total Trinidadian population.

3.4.2 Sampling technique

The multistage random sampling method was used in selecting the subjects for this study. Firstly, we divided the country into its respective counties such as St. George, St. David, St. Andrew, Caroni, Victoria, Mayaro and St. Patrick. Since its 8 counties in Trinidad, we grouped St. David and St. Andrew so that it became 7 counties in total. Then we divided and grouped those counties into their various constituencies and further into their districts and towns. Given our sample size, we decided to distribute the questionnaires equally in each randomly chosen county, so our aim was to go to 5 towns in each of the 5 counties randomly chosen. We aimed to get a very diverse and broad amount of the population involved in this study. This multistage process also involved individuals who were not a part of the research. These individuals helped in the selection of the 5 districts and eventually the 5 towns in each district we went to. These individuals outside of the research were chosen so that bias would not be involved in this study.

3.5 Tests and instrument/equipment

For our tests and instruments, we used self-administered questionnaires. These were distributed to the public at each public place in each district that we visited. The questionnaires consisted of both socio-demographic questions and questions that related to each objective in this study.

3.6 Data collection procedure

People who were around these public areas such as malls, shopping centers, eateries and outside of businesses were approached and asked if they were interested in participating in a study. The purpose and eventual outcome of the study was explained to these people. Then they were given a consent form to sign, and we explained the need for consent and confidentiality, reiterating that the questionnaire is anonymous too. After we gave them the questionnaire to fill out and explained to them that if they had any queries about it to let us know. After completing the questionnaire, we found out about their thoughts and opinion on the topic eye donation and corneal transplant. Once we completed a county, we then input all the data into an excel sheet that was saved on a password protected computer.

3.7 Data Analysis

The data collected from each county was coded with a specific letter and number. The total amount of questionnaires for each county was gathered until the total was between 77 to 80 anonymous questionnaires. The data collected from each questionnaire was input into an excel sheet under their respective letter-coded county. The data was checked, coded, and analyzed using the Statistical Package for Social Sciences software (SPSS) version 20 for windows. Descriptive statistics and multi-variance logistic regression analysis were used in generating descriptive data for continuous variables and frequencies and for many simultaneous confounding variables.

CHAPTER FOUR

4.0 RESULT

NOTE: BOTH TABLES ARE UNIVARIATE

Table 1 Summary of all demographic data collected

Characteristic	***Number of Participants (%)***
Population Demographics	
Sex	
Male	170 (42.7)
Female	228 (53.7)
Religion	
Muslim	35 (8.8)
Hindu	105 (26.4)
None	22 (5.5)
Christian	236 (59.3)
Ethnicity	
Indo- Trinidadian	218 (54.8)
Afro- Trinidadian	76 (19.1)
Chinese	2 (0.5)
Caucasian	3 (0.8)
Mixed	99 (24.9)
Age (years)	
15-19	43 (10.8)
20-24	130 (32.7)
25-29	61 (15.3)
30-34	44 (11.1)
35-39	28 (7.0)
40-44	21 (5.3)

45-49	20 (5.0)
50-54	20 (5.0)
55-59	16 (4.0)
60 and above	15 (3.8)
District	
St George	79 (19.8)
St Andrew/ St David	80 (20.1)
Caroni	79 (19.8)
Victoria	80 (20.1)
St Patrick	80 (20.1)
Education Level	
No formal education	2 (0.5)
Primary school	11 (2.8)
CSEC/CXC/O Levels	78 (19.6)
CAPE/A Levels	42 (10.6)
College/University (Undergraduate)	191 (48.0)
University (Postgraduate)	74 (18.6)

Table 2 Summary all of data collected

Characteristic	**Number of Participants (%)**
Awareness of Participants	
Existence of Eye Donation	
Yes	216 (54.3)
No	182 (45.7)
Mode of awareness on eye donation	
Medical Personnel	42 (10.6)
Newspaper/Magazines	19 (4.8)
Television	61 (15.3)

Radio	1 (0.3)
Family/Friends	32 (8.0)
Online	63 (15.8)
Unaware of eye donation	180 (45.2)
Perception of Participants	
Removal of donor's eyes after death	
Yes	168 (42.2)
No	83 (20.9)
Don't know	147 (36.9)
Living person pledge to donate eyes	
Yes	281 (70.6)
No	21 (5.3)
Don't know	96 (24.1)
Eligibility of eye donation	
Anyone of age after death	69 (17.3)
Those who did not undergo cataract surgery	31 (7.8)
People below the age of 50 years	30 (7.5)
Persons without a history of chronic illness	131 (32.9)
Don't know	137 (34.4)
Part of the eye removed	
Whole eyeball	114 (28.6)
Cornea	134 (33.7)
Lens	4 (1.0)
Don't know	146 (36.7)
Ideal time to retrieve eyes after death	
As soon as possible	169 (42.5)
Within 6 hours	58 (14.6)
Within 48 hours	27 (6.8)
Within 48 hours	9 (2.3)
Don't Know	135 (33.9)
Who cannot donate eyes	
People suffering from hepatitis B&C/other chronic disease	76 (19.1)

Diabetic Persons	42 (10.6)
People who have HIV	98 (24.6)
People who got into Accidents	12 (3.0)
Don't Know	170 (42.7)
Willingness of Participants	
Willingness to donate	
Yes	140 (35.2)
No	258 (64.8)
Reason for unwillingness	
Yes, I am willing to donate	139 (34.9)
I need more information to decide	146 (36.7)
Family members object to eye donation	3 (0.8)
It is against my religion	10 (2.5)
I want my body to be intact after death	57 (14.3)
I have eye problems	38 (9.5)
I am too old	5 (1.3)
Attitudes of Participants	
Attitude towards eye donation	
Eye donation is a noble work	98 (24.6)
Eye donation is both a pleasure to help a blind person and a noble act	170 (42.7)
Eyes are not useful to someone after death therefore someone else should have it	130 (32.7)

NOTE: ALL TABLES AND GRAPHS ARE BIVARIATE WITH RESPECT REGION

Region with respect to age

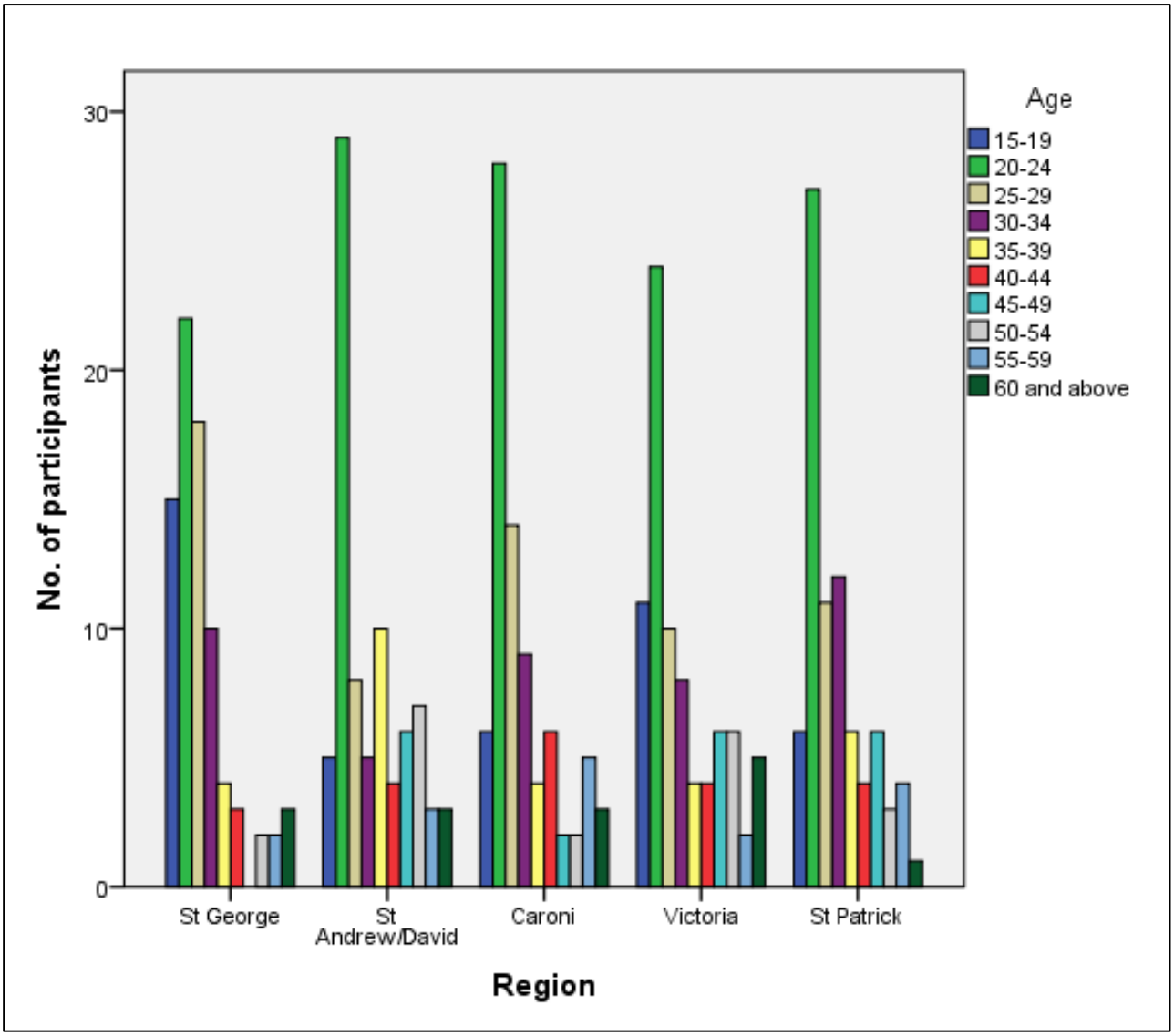

Figure 2 Bar Graph showing demographic characteristics with respect to region

Ages 20-24 dominated each region by a landslide being the majority of participants. Ages 55-59 were the smallest age group.

Region with respect to sex

Among all regions women outnumbered men, for every 3 men there were roughly 5 women that participated in the study. This pattern was constant for each region.

Region with respect to religion

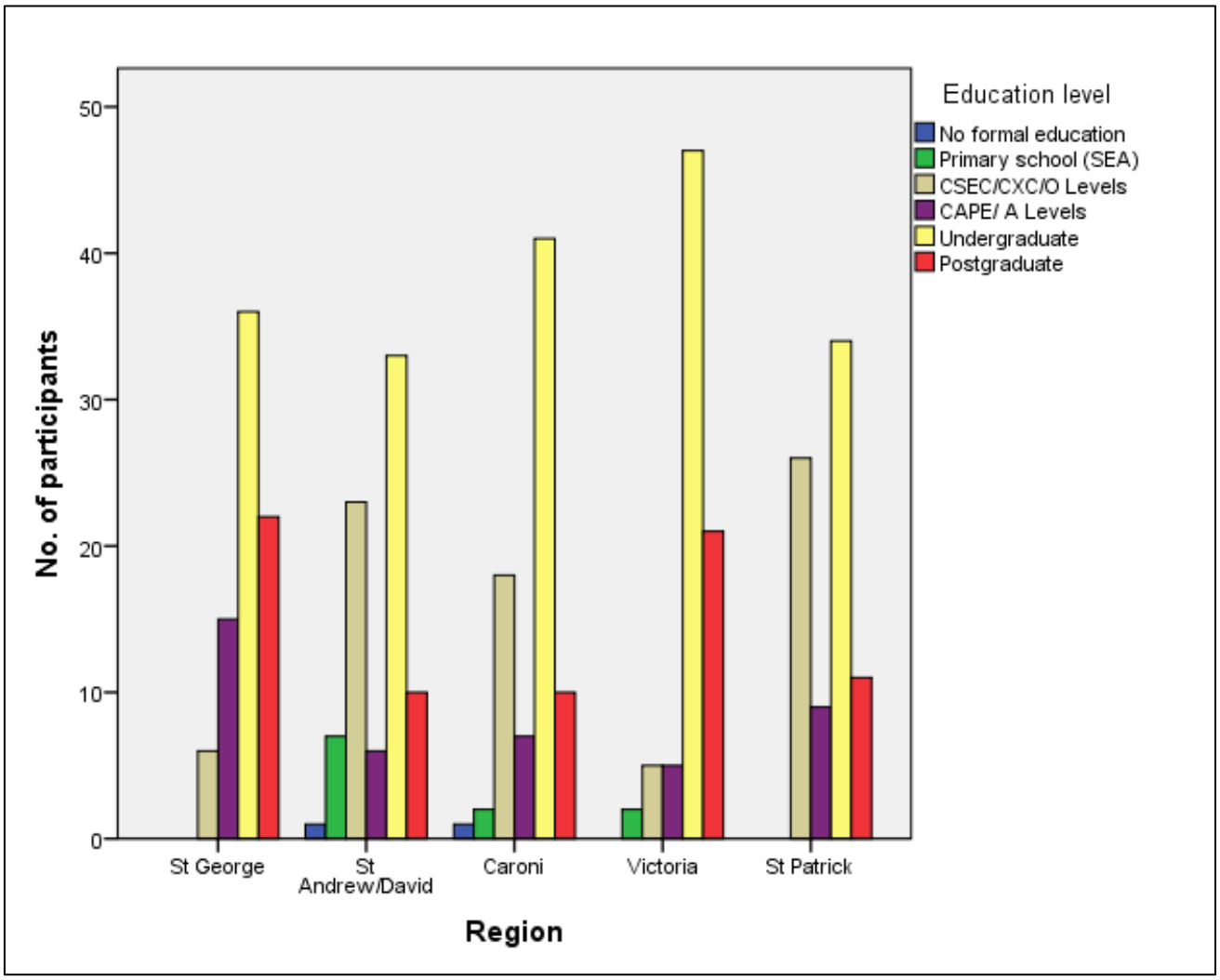

Figure 3 Bar Graph showing educational level with respect to region

Among all region Christianity was the largest group for each district followed by Hinduism. The largest number of Muslims were found in Victoria.

Region with respect to education level

For each region, most participants had undergraduate level of education. The smallest group were those with no formal education only present in two regions.

Region with respect to mode of awareness of participants

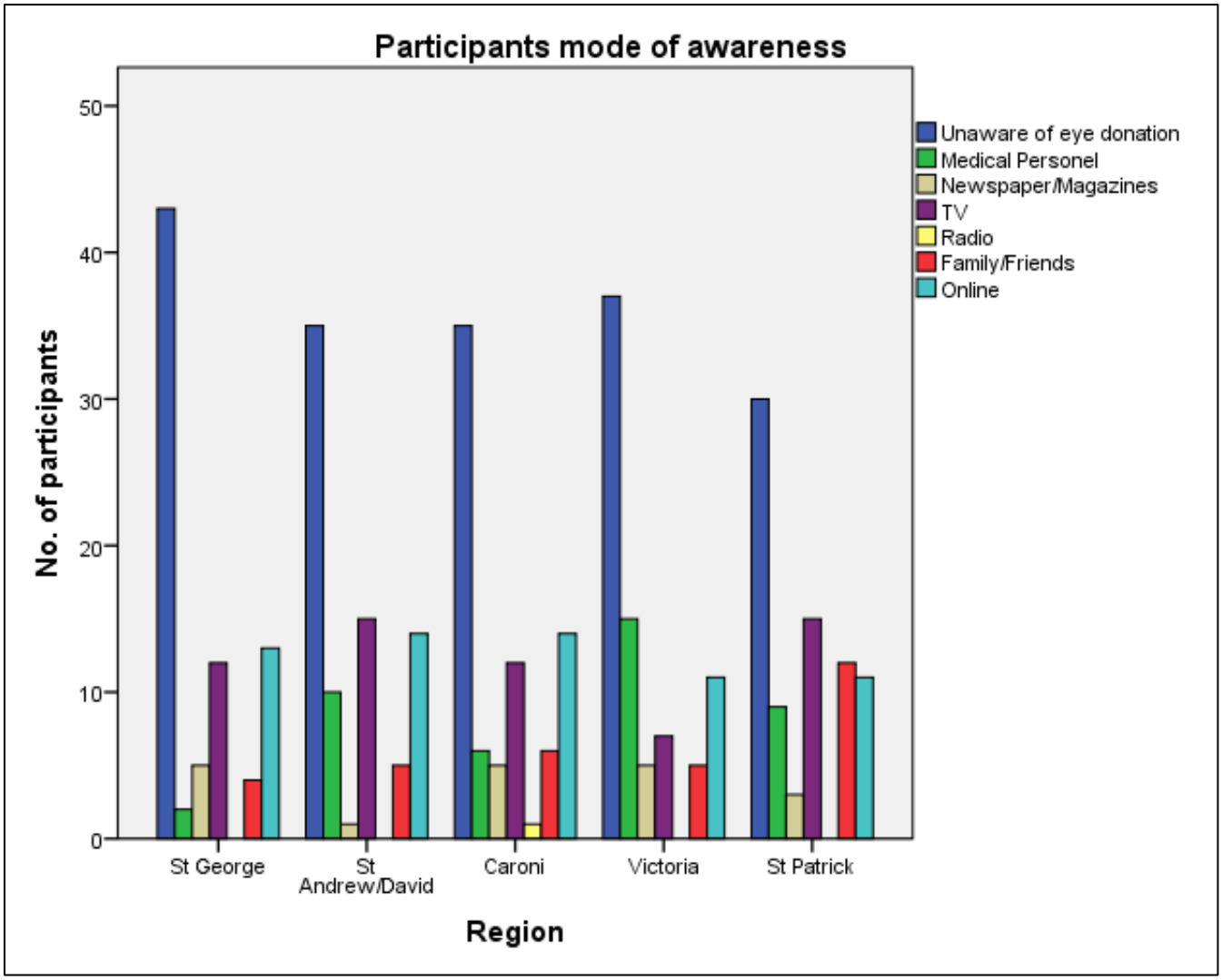

Figure 4 Bar Graph showing mode awareness with respect to region

The most popular modes of awareness were TV and online media, and the least was radio.

Region with respect to awareness of participants

For each region except for St George participants were found to be more aware than unaware. St Andrew/David, Caroni and Victoria all displayed similar results where those who were aware were only more than those who were unaware by approximately 6 persons. St Patrick should that for every 3 persons unaware, 5 were counted as aware. St George residents were found to be more unaware than aware about eye donations.

Region with who cannot donate their eyes

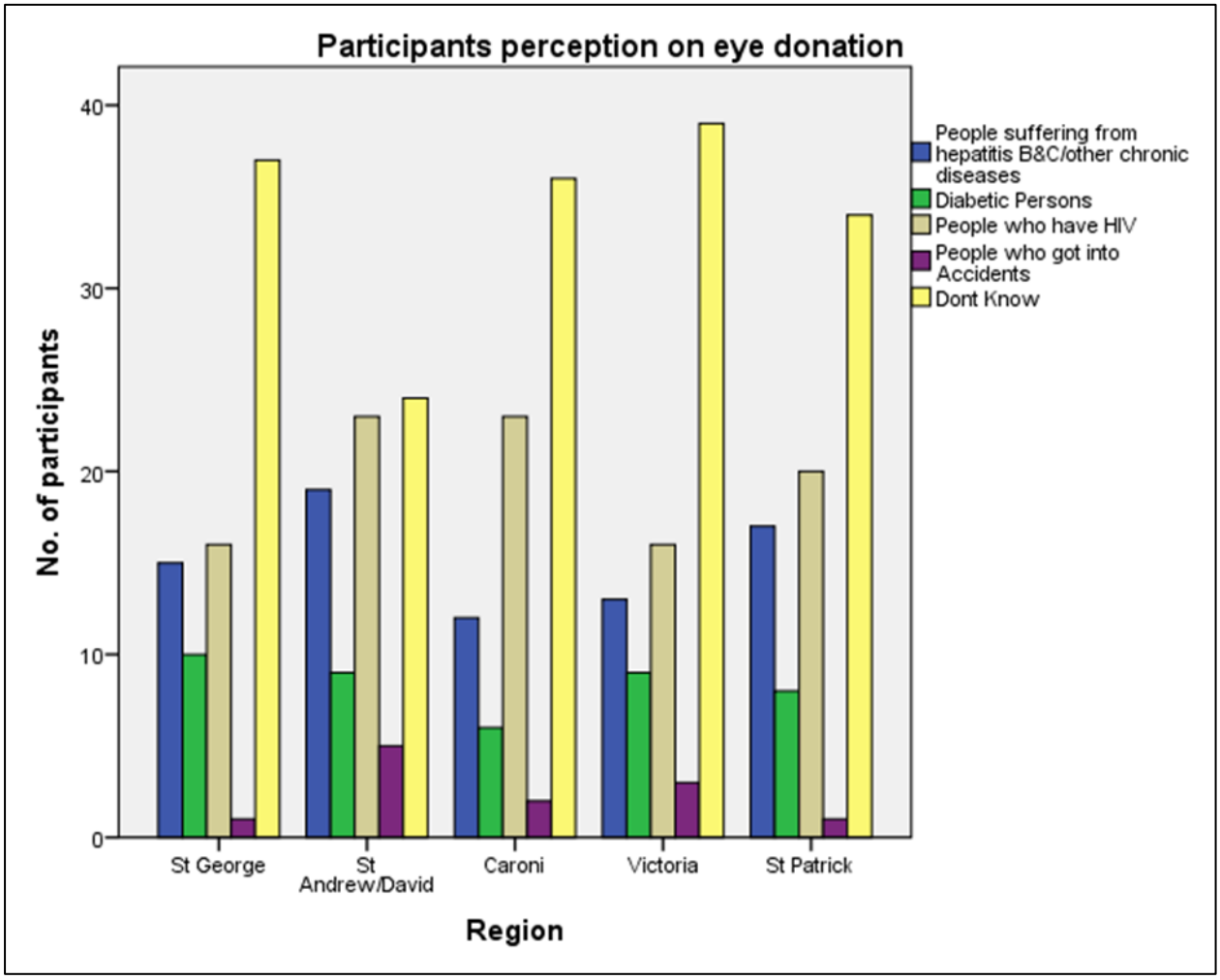

Figure 5 Bar Graph showing perception on who cannot donate their eyes with region

From the graph, most persons said they do not know who cannot donate their eyes. The second popular answer was 'persons with HIV'.

Region with reason for not willing to donate

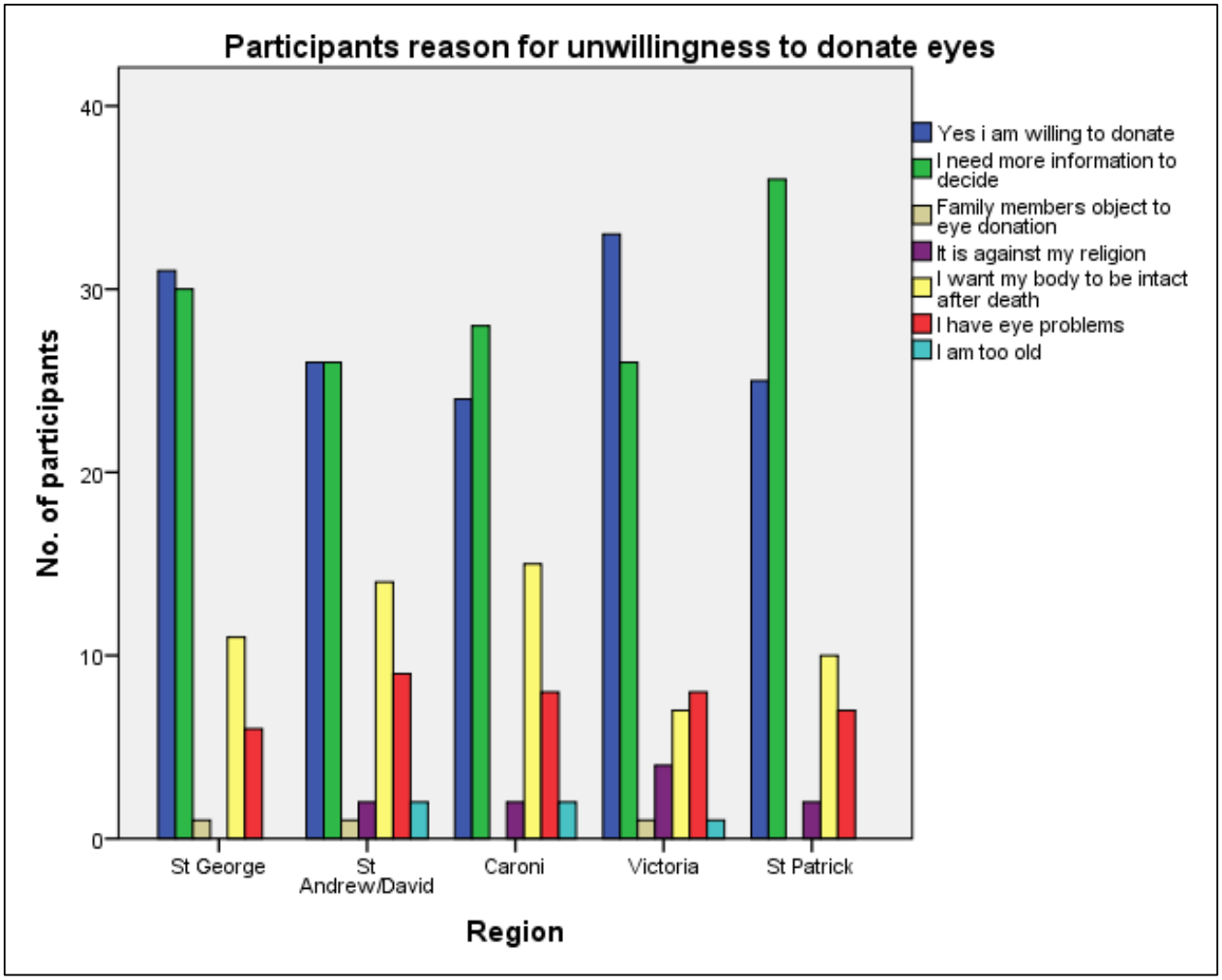

Figure 6 Bar Graph showing reasons for unwillingness with region

The graph above shows the reasons persons were unwilling to donate and number one response across all regions were 'I need more information to decide'. The second most popular answer was 'I want my body to be intact after death'.

Region with attitudes

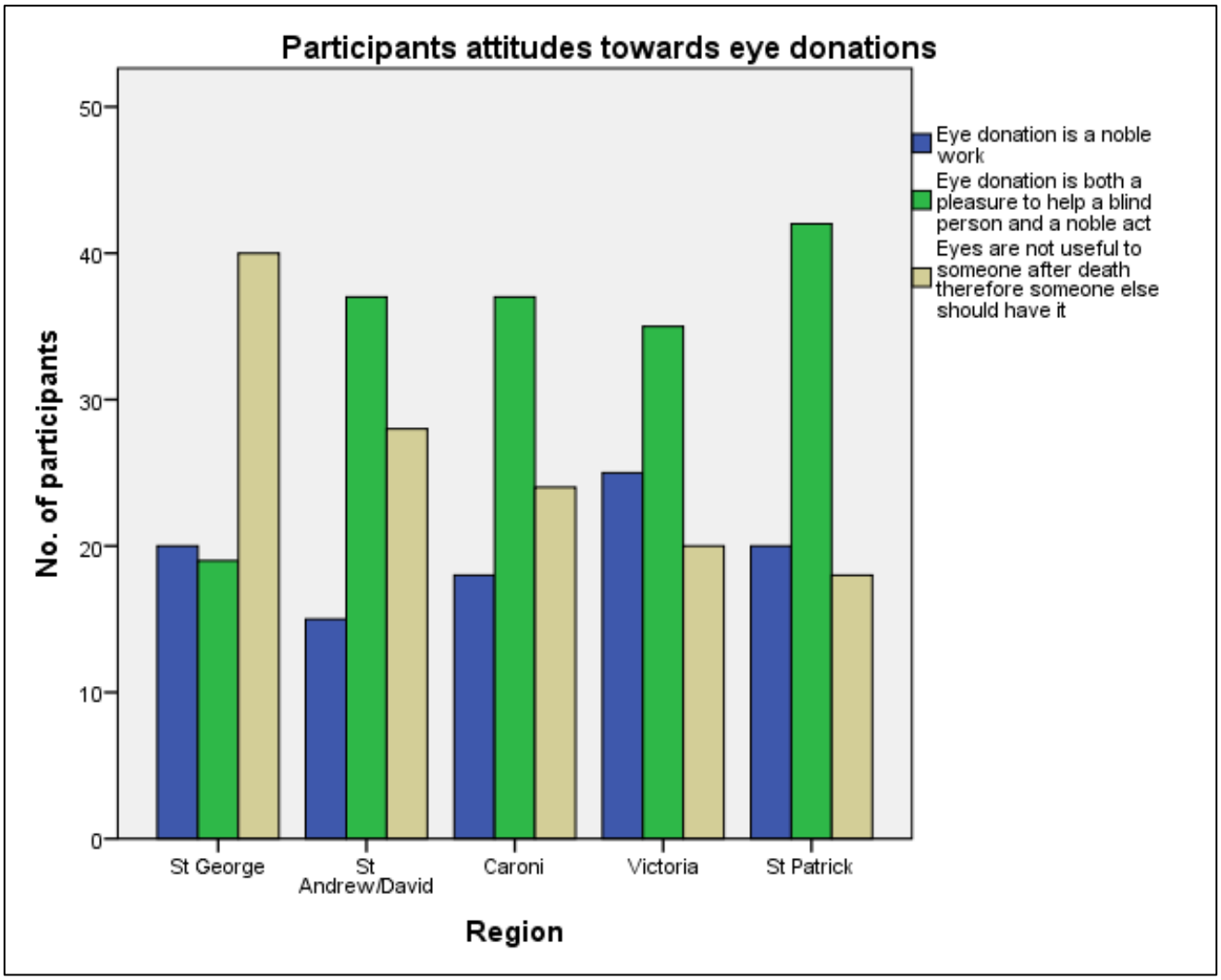

Figure 7 Bar Graph showing attitudes towards eye donation with region

The number one response for attitude towards eye donations was that 'Eye donation us both a pleasure to help a blind persona and a noble act for all regions except for St George. The number one response was that 'Eyes are not useful to someone else after death, so someone else should have it'.

Awareness

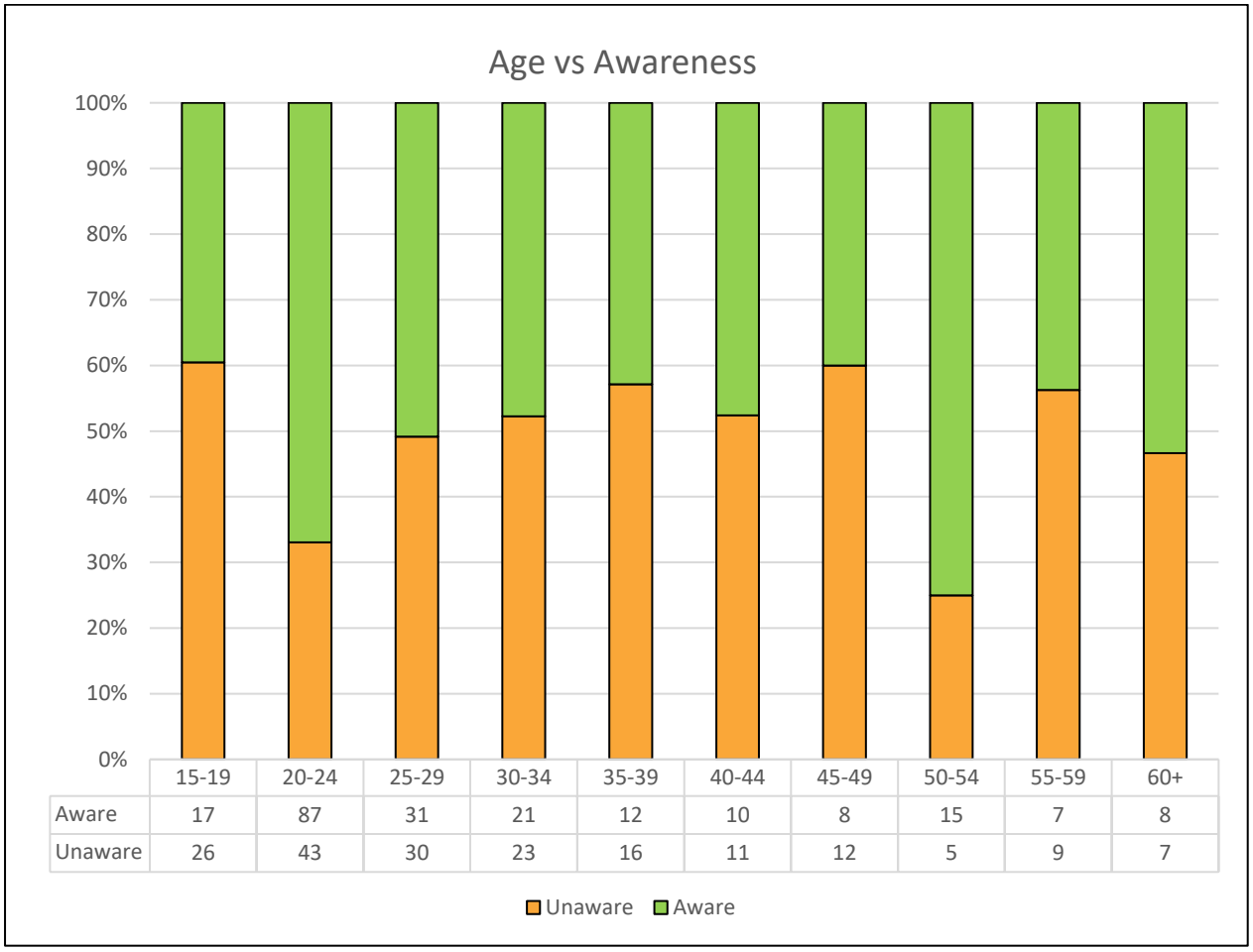

Figure 8 Graph showing the relationship between Age and Awareness

For the graph above the green represents those who are aware, only age groups 20-24 and 50-54 outnumber the persons who are unaware.

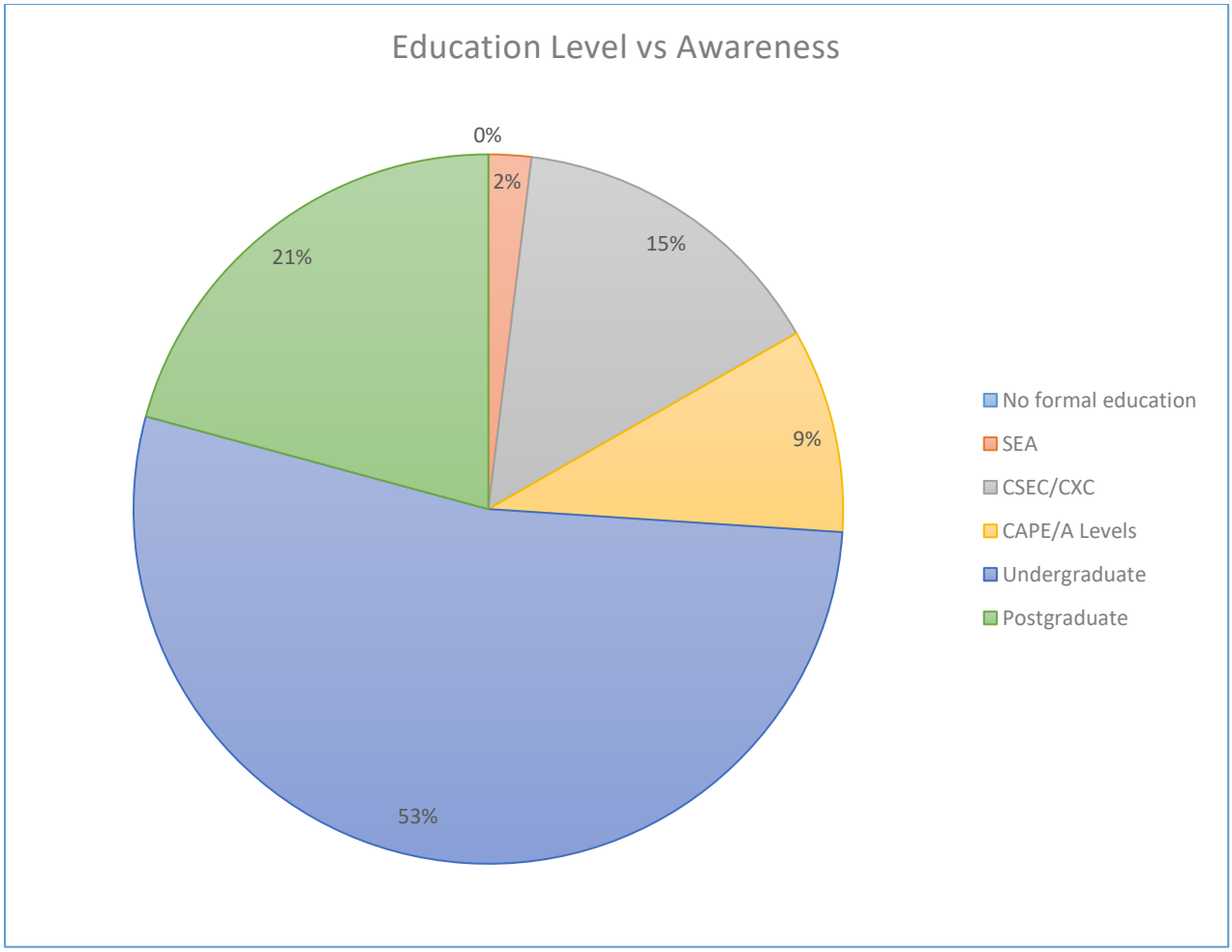

Figure 9 Pie Chart showing the relationship between educational level with respect to level of awareness

The pie chart shows that 53% of the individuals who are aware have undergraduate degrees, in the majority, in the minority with 2% are those with SEA level of education.

Perception:

			Education Level						Total
			No formal education	*Primary school (SEA)*	*CSEC/CXC/O Levels*	*CAPE/ A Levels*	*Undergraduate*	*Postgraduate*	
Can a living person pledge to donate	**Yes**	Count	1	7	59	28	135	51	281
		% within	.4%	2.5%	21.0%	10.0%	48.0%	18.1%	100.0 %
	No	Count	1	3	2	1	12	2	21
		% within	4.8%	14.3%	9.5%	4.8%	57.1%	9.5%	100.0 %
	Do not know	Count	0	1	17	13	44	21	96
		% within	0.0%	1.0%	17.7%	13.5%	45.8%	21.9%	100.0 %

Table 3 Education level with respect to perception on persons pledging to donate

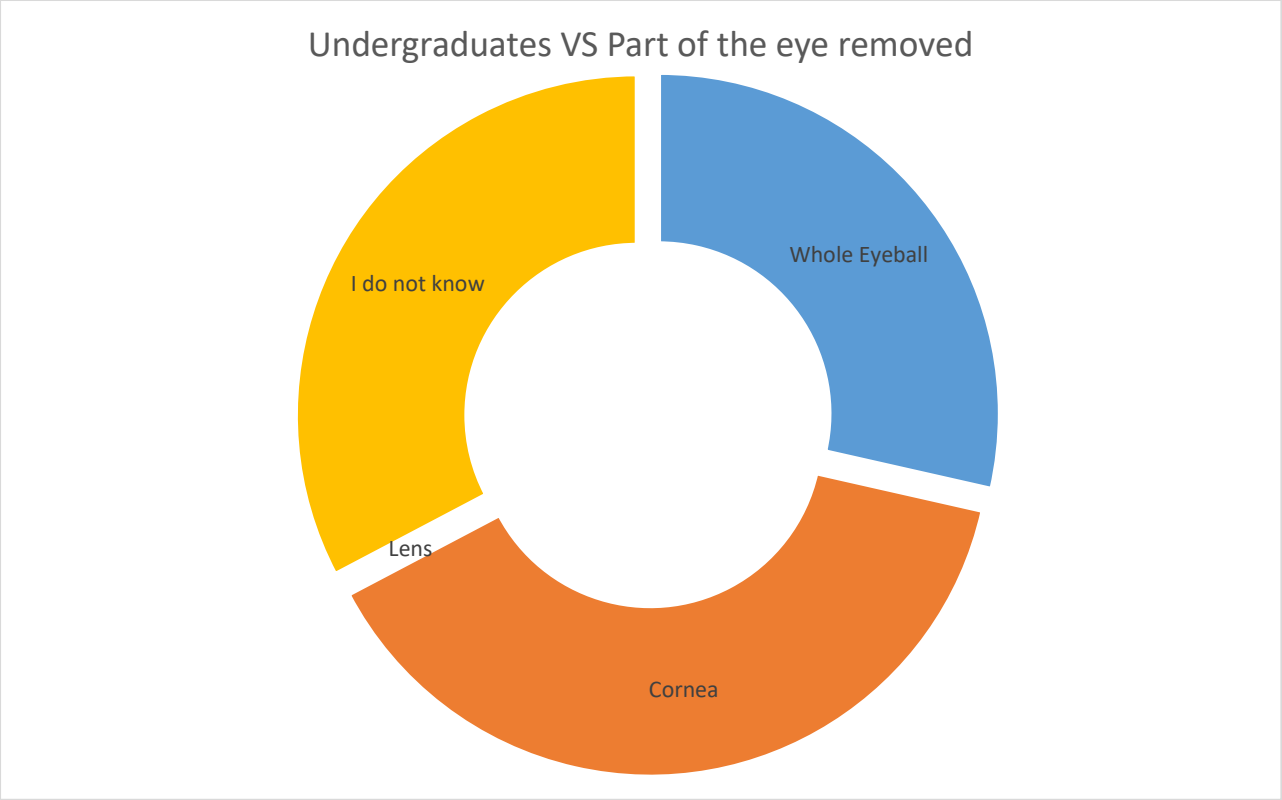

Figure 100 Donut chart representing responses by education level undergraduate to what part of the eye is removed

This donut chart shows the relation to undergraduate level of education and what part of the eye is believed to be removed. All answers between whole eyeball (41.2%), cornea (56%), and 'I don't know' (47.3%) are very close.

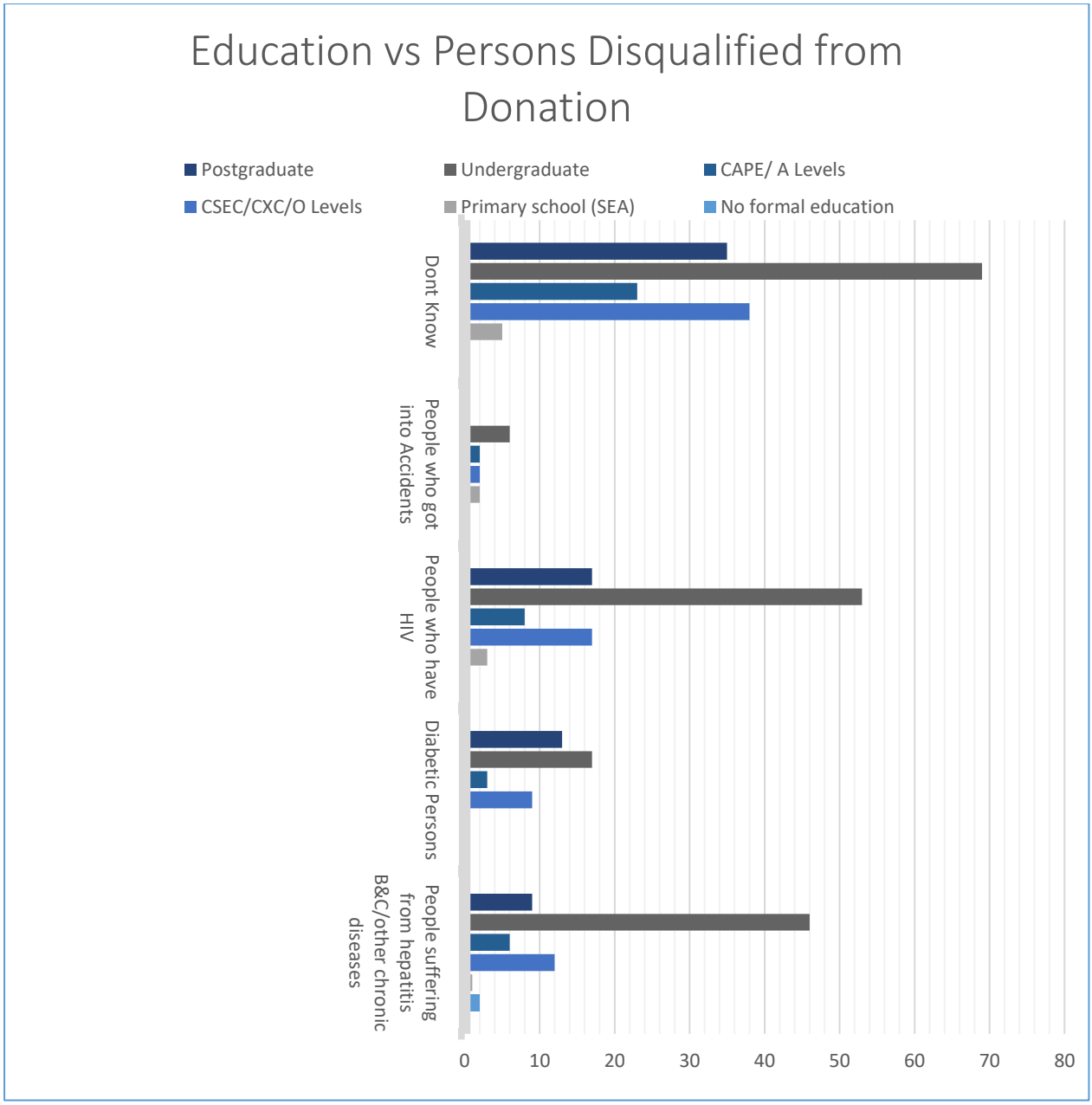

Figure 12 Bar Graph showing persons perceptions of who cannot donate with respect to education levels

Most participants expressed that they do not know the correct response, but the second popular responses were 'persons with HIV'.

Willingness:

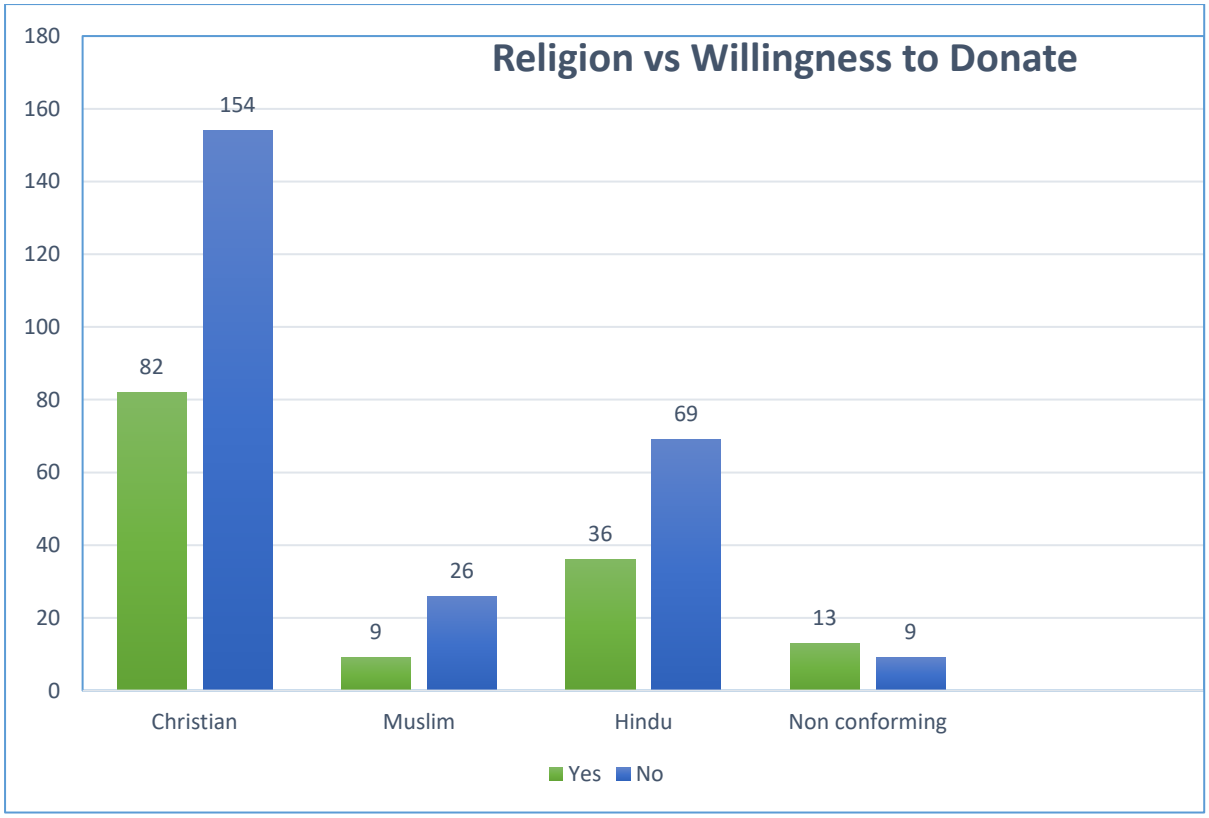

Figure 13 Graph showing religion with respect to willingness to donate

Among all religious groups most persons agreed they were not willing to donate, out numbering the persons who were willing. However, it was the opposite for non-conforming or persons of the agnostic religion.

		Education Level					
		No formal education	*Primary school (SEA)*	*CSEC/CXC/O Levels*	*CAPE/ A Levels*	*Undergraduate*	*Postgraduate*
Willing to donate eyes	Yes	0	2	22	16	65	35
	No	2	9	56	26	126	39

Table 4 educational level with respect to willingness to donate

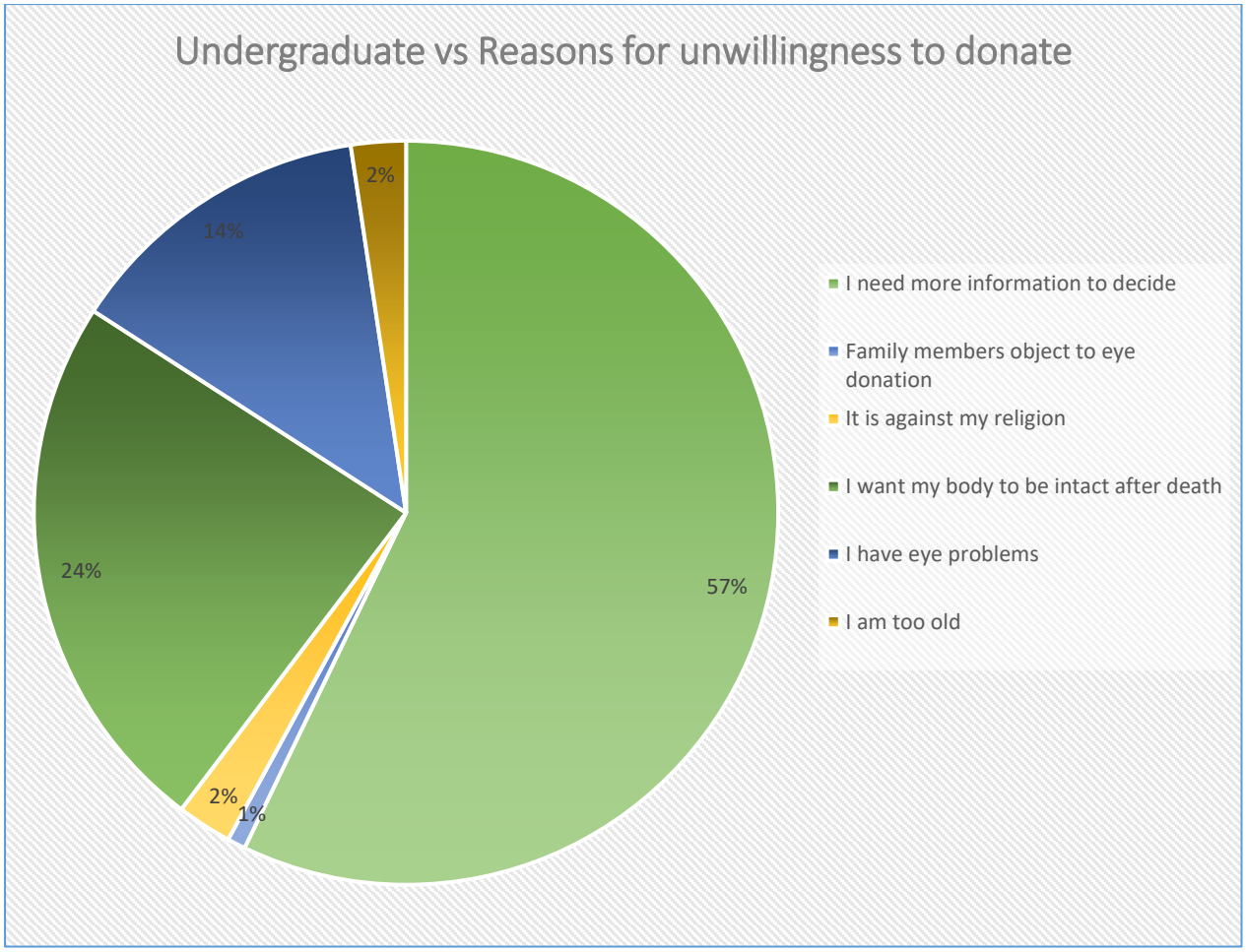

Figure 15 Pie Chart showing relationship between undergraduate level of education and reasons for not being willing to donate

Undergraduates expressed that their reason for being unwilling to donate was that they needed more information. The lowest number of responses were 'I have eye problems'.

Attitude:

		Education Level					
		No formal education	*Primary school (SEA)*	*CSEC/CXC/O Levels*	*CAPE/ A Levels*	*Undergraduate*	*Postgraduate*
Attitude toward eye donations	Eye donation is a noble work	0.0%	2.0%	11.2%	10.2%	55.1%	21.4%
	Eye donation is both a pleasure to help a blind person and a noble act	0.0%	1.8%	23.5%	8.2%	49.4%	17.1%
	Eyes are not useful to someone after death therefore someone else should have it	1.5%	4.6%	20.8%	13.8%	40.8%	18.5%

Table 5 Educational level with respect to attitudes

CHAPTER FIVE

5.0 DISCUSSION, CONCLUSION AND RECOMMENDATION

In this study, the aim was to investigate the level of awareness, perceptions, willingness, and attitudes towards corneal transplants and eye donation of persons who live in Trinidad. The process involved questionnaires structured with questions applicable to the objectives of this study. Questionnaires were distributed collectively by regions where equal amounts were distributed among all five; St George, St Andrew/David, Victoria, Caroni, and St Patrick. Once all 398 questionnaires were obtained, we then analyzed the data using quantitative, descriptive univariate, bivariate and multivariate statistical analysis. The data acquired would aid in the greater goal, to determine what can be done to facilitate Eye Bank(s) in the Caribbean. With this research and more studies to improve on this topic the aim is to get persons of Trinidad and Tobago aware, educated, and willing to donate their eyes after death to help others in need of corneal transplants. The problem we aimed to eventually solve is to use local rather than export since the majority of corneas required for surgery are imported from the United States of America, with this costs, time and availability of usable corneas locally would be a problem of the past.

With respect to demographics more females would have participated in the study compared to males within each region, for every 3 males, 5 females would have taken part. Persons ages 20-24 dominated the study with 32.7%, but the majority of participants were under the age of 35. The age range started at eighteen and included person over the age of sixty as seen in Figure 2. In terms of religion, Christianity was in the majority for each region (59.3%) followed by Hinduism (26.4%), Islam (8.8%), and Agnosticism (5.5%) in that order. Indo-Trinidadians (54.8) made up approximately half the sample in terms of ethnicity, then followed persons of Mixed Race (24.9), Afro-Trinidadians (19.1%), Caucasians (0.8%) and

Chinese (0.5%). In terms of education approximately half of the participants had undergraduate degrees (48%), this would co-relate to the majority of participants being around the ages of 20-25. Although, only 3.3% of subjects had an educational level below CXC/CSEC/O-Levels, so we can say the vast majority of participants had secondary level of education and with regards to higher level education, 66.6% of subjects obtained tertiary level education with undergraduate and postgraduate (18.6%) degrees.

Awareness

In Trinidad, citizens are free to donate their eyes if they wish by signing the waiver to donate their eyes once they have passed on. We investigated and collected data to quantify the number of persons who were aware of this. The results showed an almost fifty-fifty split between those aware and unaware that eye donation existed in their country. 54.3% were aware of its existence and 45.7% were not out of the 398 participants. Chi-Square Test and Cramer's Value found a moderate relation between age and awareness. Persons aged 20-24 made up 40.3% of all the subjects that said they were aware of eye donations. The oldest group of over sixty (60+) made up 3.7% but so did persons ages 45-49 as seen in Figure 8. There was no linear trend that indicated as age increased awareness decreased. Further analysis found a moderate relationship between education level and awareness. Persons with undergraduate degrees made up more than half the persons who were aware of eye donation as seen in Figure 9.

When asked what their source of information was, undergraduates said that online resources were their mode of awareness. Among all participants that were considered aware their main sources of this knowledge were from online (15.8%) and TV (15.3%). Responses to Radio and Newspapers/magazines were under 5%, but 8% said they heard about it from family/friends and 10.6% learnt about eye donations from a medical professional. Links were

also found between sex and religion towards level awareness. Women were found to be more aware than men, woman made up 63.9% of the aware subjects and men covered 36.1%. Between men and woman in the group of unaware persons the percentages were 50.5% (men) and 49.5% (women), almost fifty-fifty. In terms of religion and awareness, Christians were the most aware out of all four groups but 62.1% of Christians were unaware and 56.9% were aware. Among all the Hindus, more subjects were aware (31.5%) than unaware (20.3%), this is the only religious group that showed more awareness compared to being unaware.

Multivariate analysis for awareness and sex, using males as the reference found that males were 57% less aware than females. For Religion, using Christianity as the reference, found that Muslims were just as aware as Christians, but Christians were less aware than Hindus. Christians were 1.661 times more aware than persons who were Agonistic. When compared to persons with no education, all other levels of education were considered more aware.

Comparing regions to decide which was most aware about eye donations and corneal transplants, using St George as the reference, St George was 0.422 times less aware than St Andrew/David. For Caroni, St George was 0.777 times less aware. St George was 0.771 times less aware than Victora and 0.563 times less aware than St Patrick. St Patrick displayed the highest percentage of persons who were aware and the least being St George. St Andre/David, Caroni and Victoria all had the same percentage for level of awareness. Although all the regions were close in terms of number of aware subjects, the number of aware persons outweighed the number of persons who were unaware, except for St George. The number of persons unaware was more than the number of persons aware for St George.

Like this study Bhandary et al (2011) also found that more women were aware than men about eye donations, however their willingness was quite poor.[6] This study was conducted amongst clinical staff in Malaysian clinics. In comparison to the study done Tiwari R et al

(2014) in India, more males were aware than females, this is the opposite for this study, also the main sources of information were found to be TV, radio and print media. [46] We can assume that due to the difference in time and location the sources of information about eye donations vary. In 2019 &2020 the availability of a smart device, computers, and internet access it is expected that in this study the number one source of information would be online articles.

Two other studies found that men were more aware than women, Bhavaan Sharma et al (2017) conducted a study specifically on the attendants of the ill and deceased where results found that men under the age of 40 were found to be more aware and willing to donate, the study also included that the most influence to donate came from grief counsellors. [42] The second study by Anuradha Raj et al (2018) in India with a sample size like ours focus on students and results found that men were more aware than females but despite being aware the participants were unwilling to donate. [41] Therefore, the conclusion of both these studies were to raise more awareness.

Acharya et al (2018), found similar results to this study, where awareness was related to the level of education as well as socioeconomic status. This study was carried out on India and the main sources were from mass media. No religious connects were found in this study. Socioeconomic status related to level of education and by extension awareness and willingness, this can be a recommendation for further research in Trinidad to incorporate socioeconomic status.

Another study in India by Nida Khan et al (2015) investigated awareness of eye donation in a tertiary hospital, results showed that awareness was raised by campaigning on the subject to further educate people with the use of videos, media, TV and radio. [28] In Nigeria, Abadom E G et al (2014) conducted a study that found the main source of awareness came from mass

media however, the turn out for the level of awareness and knowledge was poor, this sample group consisted of doctors. [2]

Perception

There are a few ways eye donations can be interpreted to many individuals, all with varying ideas. Understanding and having clarity with regards to the way eye donation works as well as corneal transplants should be something everyone should try to understand to commit to donating. Perception can play an important role in determining whether a person chooses to donate. This study aimed at finding out what persons believed about eye donations and to test the knowledge people had, this could also be related to willingness.

A series of questions were asked to gauge what people know about eye donations out of the sample of 398 persons. The first being if eyes were removed before or after one's death, 42.2% said yes, 20.9% said no and 36.9% said they do not know. The second question asked if a living person could pledge to donate their eyes, 70.6% said yes, 5.3% said no and 24.1% said they do not know. The next question tested knowledge about what part of the eye is removed, 28.6% said the whole eyeball, 33.7% said the cornea, 1% said the lens and 36.7% said they did not know. The following question asked about the time frame after death to remove the eyes, the responses were as follows; 42.5% said it needed to be removed as soon as possible, 14.6% said within 6 hours of a person's passing, 6.8% said within 48 hours after death and 33.9% said they do not know.

The subjects were asked to choose who out of a group of choices who they believe is the most eligible to donate their eyes, 17.3% of persons said anyone of age after death, 7.8% said persons who did not undergo cataract surgery is most eligible for donating their eyes, 7.5% said that anyone under the age of 50 could donate, 32.9% said that only persons with no chronic illness can donate and 34.4% said they do not know. The last question was similar to

the one discussed previously; a group of options were given to choose from based on who they thought should not donate, 19.1% said that people suffering from hepatitis B&C/other chronic disease should not donate, 10.6% said diabetics cannot donate, 24.6% said people who have HIV should not donate, 3% said persons who have been in accidents should not donate and 42.7% said they do not know the answer to this question.

The option to say 'I do not know' was included to make the choosing process easier for the participants, rather than have them guess an answer based on whim and pressure to answer. Though when asked more in-depth questions the greatest percentage would be for the 'I don't know' response. This response represents the level of awareness that exists, with it being low and the need to do more to educate and ensure that when someone considers donation, they know the process. According to the Chi-Square and Cramer's Values, a strong relationship was found between educational level and a living being able to pledge to donate your eyes. The results suggest that persons with higher education were aware that a living person can pledge to donate their eyes. Subjects with CSEC/CXC/ O-Levels (21%), Undergraduate (48%) and Postgraduate (18.1%) degrees responded with 'yes' to if a living person can pledge to donate their eyes, refer to Figure 10.

Another relationship was found between education level and what part of the eye is removed. When the responses for 'whole eyeball' and 'cornea' were combined, since these are the two closest answers to being correct, they outweighed the responses that stated, 'I do not know'. Again, persons with education levels CSEC/CXC/O-Levels, Undergraduate (see Figure 11) and Postgraduate degrees all had more accurate responses, therefore, linking education levels and knowledge on part of the eye that is removed for donation.

No other links were found for the remaining variables, this is an indication that the levels of knowledge are low, and that people have not formed any perceptions about eye donations.

Some persons may not have ever given this topic any thought until participating in this study. During the time collecting data many remarks were made that suggested barely any thought had been given to eye donations from the citizens approached. For many subjects this was the first time they have ever sat and thought about donating their eyes.

No region showed outstanding knowledge and accurate perceptions, but St Andrew/David was the least to say, 'I don't know', see Figure 5. St Patrick and St Andrew had the most accurate answers overall, even though significant relation was found. Sex, age, religion, and ethnicity had no significance with respect to perceptions. Multivariate analysis found that all regions were less accurate in their perceptions when compared to St George; 2.682 times more than St Andrew/David, 1.918 times more than Caroni, 2.819 more than Victoria and 2.285 time more than St Patrick.

In the multivariate analysis males were found to have more accurate perceptions compared to women, Christians also had more accurate perceptions than the other religions. Age did not affect on perception as this remained the same as age increased. When compared to person with no formal education, persons with CSEC/CXC/O-Level and postgraduate degrees were found to have more accurate perceptions. A Levels and undergraduates have fewer positive perceptions compared to persons with no formal education.

V.M. Bijapur et al (2015) asked the question of retrieval time to a group of ICU patients in a hospital in India, only 36.9% knew the ideal time, this result is far better than the results obtained in this Trinidadian study. Bijapur also asked about what part is removed and the accurate response was poor, can be considered similar to this study. In conclusion more needed to be done to give accurate answers to these questions to the public, information was suggested to be put forth using pamphlets, TV, doctors, radio, newspapers, etc. [8]

Radhika et al (2018) found that there were many misconceptions surrounding eye donations that stunted the number of persons willing to donate. These barriers needed to be addressed to improve the number of donations. [35] In Ethiopia, Gelaw Yl (2010) found that religion played a role in the perceptions people had towards eye donation and therefore concluded that more should be done by religious leader to clear up misconceptions. [20] Although no link was found between perceptions and religion for this study, further research can be done to investigate the possible misconceptions that may exist in Trinidad and Tobago. When asked why they were not willing to donate 38 persons expressed that they have eye problems, this is a common misconception that eye problems, be it pathology or refractive error, makes an eye unfit for donation.

Jena et al (2017) investigated time of retrieval and storage of tissues in India among a group of first year nursing students. Majority knew about retrieval time but the responses to the storage were very poor and the study concluded that more needed to be done to detail the procedure from retrieval to recipient. [27] Though this study did not include storage it can be a recommendation for future research. This, however, is another study that had more positive responses to what was found in this current study.

Education has shown a relationship to perceptions, but is does the type of education affect the level of knowledge and perception? Vallinayagam et al (2017) conducted a study between engineering and medical students to gauge who was more knowledgeable on the topic of eye donations and corneal transplants. The results did not prove that the medical students knew more but in fact, both focus groups were aware of corneal donations. [47] This is one study done in India, that can be replicated here in Trinidad to improve on this research.

Willingness

Based on the previous discussion on awareness and perception, an aim is to investigate whether the other objectives are linked to willingness. From the results collected, out of all 398 participants, 35.2% said they were willing to donate their eyes and 64.8% said they would not. Reasons for not willing to donate were represented in Figure 6. The most popular response for the unwillingness was 'I need more information', followed by 'I want my body to be intact after death'. With majority of the sample saying they are unwilling to donate and the number one cause for this being they need more information, is a clear indication that more needs to be done to clarify the perceptions and raise more awareness. The Chi-square and Cramer's Value indicate that there is a moderate relationship between religion and unwillingness to donate.

For Christians 82 subjects said they would donate but 154 said they would not, with their number one reason being they need more information. Out of the 35 Muslims that participated in the study only 9 were willing to donate, the number one reason for not donating was that they wanted their body to be intact after death. 36 Hindus said they would donate and 69 said they would not, and the number one reason why was that they needed more information (refer to Figure 13). Interestingly, more persons of the agonistic religion were willing (9.3% of all willing to donate) to donate compared to those not willing (3.5% of all not willing to donate). Since most of the reasons were that of lack of information, we cannot infer that religion and its practices hamper persons from donating.

No other relationships were found with respect to sex, age, ethnicity, and education. It was expected that education would be related to willingness however it was not as seen in figure 14. In fact, persons with higher levels of education stated that they needed more information

to make such a decision. In Figure 15 we can observe the distribution of reasons in undergraduates.

According to the multivariate results, males were found to be more willing to donate than women and Christians were the most willing compared to all other beliefs. Willingness was not affected by the increase in age as it remained the same.

Among all regions, Victoria and St George were the most willing to donate their eyes. An interesting point is that St George displayed the lowest level of awareness among all groups, yet it had the second largest group of persons willing to donate. The multivariate analysis found that St George and Victoria were equally willing to donate. However, all the other regions compared St George were found to be more willing to donate. St George was 0.87 times less willing than St Andrew/David, 0.937 than Caroni and 0.648 less willing than St Patrick. It is possible to say that awareness may not be related to willingness, but maybe perception has more to do with willingness.

In other studies, this point has been made as well, where awareness is high yet willingness to donate is low. Ackuake-Dogbe et al (2014) found that despite being unaware and having little knowledge participants were still willing to donate, this study was conducted in Ghana. [3] Similarly, this conclusion was also found in India by Reshma Patil et al (2017). [37]

On the other hand, many studies support that awareness is related to number of persons willing to donate. Alanazi et al (2019) conducted a study in Saudi Arabia which found that more awareness would result in greater donation rate as participants expressed that if they had more information, they would be more willing to donate. [4] Williams and Muir (2018) also found the same conclusion in their study based in China. [51] Wang Xl et al (2016) researched that higher levels of education and more positive attitudes resulted in participants being more willing to donate, this study was also done in China. [49] Mohammed Seid et al

(2017) did a study in Ethiopia that also relates to these studies. [26] A similar theme that can be related to this current study, would be that more information is needed to decide if a person is willing to donate.

Attitude

Assessing attitudes proved to be a difficult task, the approached used only one question with positive responses to viewing eye donation. This may not accurately display the true feeling one may have about eye donations. The question asked how best one would describe eye donations from the given choices, the responses were; 'Eye donation is a noble work' with 24.6%, 'Eye donation is both a pleasure to help a blind person and a noble act' with 42.7% and 'Eyes are not useful to someone after death therefore, someone else should have it' with 32.7%. Since all responses were positive, gauging if attitudes were positive or negative was not possible. From this no relation to age, sex, ethnicity, education, or region was found. A multinational analysis was carried out, but the model was insignificant therefore the results were invalid to conclude.

Other studies that successfully concluded from attitudes indicated that higher education levels were associated with better and more positive attitudes. This was seen in a study done in Northwest Ethiopia by Mohammed Seid et al (2018). [26] Ting Chu et al (2013) also found that more positive attitudes were linked to more persons being willing to donate, this study was done in China comparing the attitudes of registered donors to residents of a community. [9]

5.2 Conclusion

The levels of awareness were found to be fair with a lot of room for a lot improvement, awareness was linked to education, age and religion and the main sources of information came from online media. Perceptions about eye donations and corneal donations were poor as

only few knew about the time for retrieval, part of the eye and who can donate. The results for willingness were poor as most persons said they were unwilling to donate. More persons were aware yet very little were willing to donate and main reason for unwillingness was that more information was required. This study failed at assessing attitudes due to the information obtained being biased towards only positive attitudes and the limited questions asked to assess this. All this information can be used as evidence to encourage awareness campaigns about educating the public about the benefits of corneal transplants and eye donation to further facilitate plans of Eye Banking in the Caribbean.

5.3 Recommendation

There were many limitations for this study that have affected the results obtained therefore, some recommendations to adjust the distribution of subjects partaking in the study should be implemented. A fixed number for each group concerning education, age, religion, etc. should be achieved to ensure the study is not bias or dominated by one focus group. Variables like socioeconomic status and occupation should be included and assessed in determining the level of awareness, willingness and perceptions people have towards eye donations and corneal transplants.

To fully assess attitudes more questions involving both positive and negative aspects should be involved to thoroughly gauge the existing attitudes. This study failed to do so due to the limited number of questions that were only based on positive attitudes. Perceptions can be investigated in more depth by researching the misconceptions that persons have about eye donations and corneal transplants. Misconceptions can be linked to education level and religion and this can be investigated.

Investigating the challenges of setting up an eye bank would be essential information that can assist in accomplishing the main goal of creating an eye bank. This can be obtained from

ophthalmologists and persons involved in the handling and storage of live human tissue. Another set of information can be obtained from the public regarding their level of knowledge about the donating process and receiving process. Since this study confirms that awareness exists about eye donations the next question to be asked is how one can go about pledging to donate. This information can further raise more awareness and willingness to donate.

An improvement of this study would be to carry out educational campaigns for eye donation and Eye Banks and then assessing how the new information would influence an individual's willingness to donate. Tobago should also be included in the study as those citizens were not included in this study.

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APPENDIX A

THE UNIVERSITY OF THE WEST INDIES
ST AUGUSTINE, TRINIDAD AND TOBAGO, WEST INDIES
CAMPUS RESEARCH ETHICS COMMITTEE
TEL: (1-868) 662-2002 ext. 82755 E-mail: campusethics@sta.uwi.edu

September 26 2019

Ekemiri Kingsley (Megan Seebalack & Sarita Dean)
UWI Optometry, Gordon Street, St. Augustine
Email: kingsley.ekemiri@sta.uwi.edu

Dear Ekemiri Kingsley,

Ref: CREC-SA.0038/09/2019

Title: Perception and Attitude Towards Eye Donation and Corneal Transplant Among Trinidadian Population

I am pleased to advise that your application for research on the above captioned topic has met the criteria for Exemption from Review from the Campus Research Ethics Committee, St. Augustine.

Sincerely,

Surendra Arjoon (Prof.)
Chairman
Ethics Committee

Figure 11 showing the Exemption letter given by the U.W.I Ethics Committee

THE UNIVERSITY OF THE WEST INDIES
ST AUGUSTINE, TRINIDAD AND TOBAGO, WEST INDIES
CAMPUS RESEARCH ETHICS COMMITTEE
TEL: (1-868) 662-2002 ext. 82705 E-mail

CONSENT TO PARTICIPATE IN RESEARCH

Complete Protocol Title: Perception and Attitude Towards Eye Donation and Corneal Transplant Among Trinidadian Population

Principal Investigator: Ekemiri Kingsley

Co Investigator(s): Megan Seebalack & Sarita Dean

Research Sites: Trinidad and Tobago

Sponsors: No

Why is this research being done?

This research will add to the body of evidence for the need of an Eye Bank in Trinidad and Tobago.

What is the duration of taking part in the study (for each subject)?

Each subject is expected to answer the questionnaire in 10 minutes. There will be no form of enrollment. Only subjects willing to participate in the study.

What will happen to me?

The activity will have no harmful effect on the subject.

What is in in for me?

The subject will be counselled and advised accordingly.

What will happen if I drop out of the study early?

There will be no consequences to the subject.

What are my responsibilities if I join and what about confidentiality?

The subject is expected to fill out a self administered questionnaire. All the information gathered will be stored on a password protected computer.

What if I get hurt in the study?

Figure 12 showing the consent form generated by the U.W.I Ethics Committee

The appropriate measures would be taken accordingly.

CONSENT

I have read and understood this explanation. The researcher has also explained the study to me. I have had a chance to ask questions and have them answered to my satisfaction. I agree to take part in this study. I have not been forced or made to feel like I had to take part.

I have read the attached experimental Subject's Rights, which contain some important information about research studies. I have also read the Authorisation to use my Private Health Information. **I must sign this Consent Form, the Experimental Subject's Rights and the Authorisation to use my Private Health Information. I will be given a signed copy of each to keep**.

Print Name of Subject

_____

Signature of Subject Date

_____ _____

Signature of Person conducting the informed consent discussion Date

_____ _____

Role of person named above in the research project

_____

Signature of Second Witness Date

_____ _____

By Chairman:

This document was approved by Campus Ethics Committee on:
September 26 2019
This document expires on:
2020-01-30

THE UNIVERSITY OF THE WEST INDIES
Chairman
CAMPUS ETHICS
COMMITTEE
ST. AUGUSTINE

Figure 13 showing part 2 of the consent form

EXPERIMENTAL SUBJECT'S RIGHTS

If I am asked to consent to participate as a subject in a research study involving a medical experiment, or if I am asked to consent for someone else, I have the right to:

1. Learn the nature and purpose of the experiment (also called "study" or "clinical trial").
2. Receive an explanation of the procedures to be followed in the study, and any drug or device used.
3. Receive a description of any discomforts and risks that I could experience from the study.
4. Receive an explanation of any benefits I might expect form the study.
5. Learn about the risks and benefits of any other available procedures, drugs or devices that might be helpful to me.
6. Learn what medical treatment will be made available to me if I should be injured as a result of this study.
7. Ask any questions about the study or the procedures involved.
8. Quit the study at any time, and my decision will not be used as an excuse to withhold necessary medical treatment.
9. Receive a copy of the signed and dated consent form.
10. Decide to consent or not to consent to a study without feeling forced or obligated.

If I have questions about a research study, I can call the contact person listed on the consent form. If I have concerns about the research staff, or need more information about my rights as a subject, I can contact the Principal Investigator, The University of the West Indies at: kingsley.ekemiri@sta.uwi.edu, +1(868) 735-2586.

By signing this document, I agree that I have ready and received a copy of this document.

Signature of Subject or Legal Representative Date

REQUEST FOR PERMISSION TO USE AN INDIVIDUAL'S PRIVATE HEALTH INFORMATION

Name of Study: Perception and Attitude Towards Eye Donation and Corneal Transplant Among Trinidadian Population

Investigators: Ekemiri Kingsley, Megan Seebalack & Sarita Dean

What is private health information?

Private health information is any information that can be traced back to you. We need your permission to use your private health information in this research study. The type of private health information that will be used and shared for this study includes:

- Your past and present physical and mental health information
- Information that can be used to contact you
- Results of your medical tests and DNA
- Questionnaires and information on your drug/alcohol usage and that of your family.

Who else will see my information?

Principal Investigator and co-investigators.

Figure 14 showing part 3 of the consent form

How long will the investigators use and share my information?

For a period of at least 5 years.

What if I change my mind about sharing my research information?

The opinion of the subject will be duly respected.

Do I have the right to see and copy my research information?

Yes

If you agree to share your information, you should sign this form below. You will receive a copy of this form.

I agree to share my information as described in this form

Print Name	Signature	Date

If you have questions or concerns about your privacy and the use of your personal medical information, please contact the investigator at the telephone number listed in the consent form.

Figure 15 showing part 4 of the consent form

Figure 6 showing the questionnaire that was distributed along with the references where the questions were adapted from

Title: Perception and Attitude Towards Eye Donation and Corneal Transplant Among Trinidadian Population Questionnaire

Dear participants,

We are 3rd Year Optometry students at the University of the West Indies St. Augustine. We are conducting research on the "Perception and Attitude Towards Eye Donation and Corneal Transplants Among Trinidadian Population". This questionnaire will be used to obtain necessary information pertinent to our research. Please answer each question by placing a tick in the box where appropriate and any open ended questions. This questionnaire also remains anonymous and will be kept confidential. Thank you for your time.

Regards,

_____

Megan Seebalack and Sarita Dean

Perception and attitude towards eye donation and corneal transplant among Trinidadian population Questionnaire

Please answer the following questions and indicate your answer where appropriate by placing a tick mark (✓) in one of the boxes of your choice.

Part 1: Socio-demographics

1. Code ID: EDCT
2. Age: _____
3. Sex: □ Male □ Female
4. Religion: □ Christian □ Muslim □ Hindu □ Pentecostal □ Catholic

Other: _____

5. Ethnicity: □ Indo-Trinidadian □ Afro-Trinidadian □ Chinese □Caucasian □ Hispanic □ Mixed Other: _____
6. Marital Status: □ Single □ Married □ Divorced □ Widowed
7. Highest educational level completed:

□ No formal education

□ Primary school (SEA)

□ CSEC/CXC/O Levels

□ CAPE / A Levels

□ College/ University (undergraduate)

□ University (Postgraduate)

8. Occupation:

_____

Part 2: Awareness

1. Can eyes be donated?

□ Yes
□ No

If **YES**, answer the following: What does eye donation mean? (Please tick only one (1) option.)

□ Giving corneas to a blind person
□ Donation of eyes after one's death
□ Do not know

2. Have you ever heard about eye donation?
   □ Yes

□ No

□ Don't know

If **YES**, answer the following- How did you hear about it? (Please tick only one (1) option.)

3. □ Medical personnel
   □ Newspapers/Magazines
   □ TV
   □ Radio
   □ Family/Friends
   □ Online
   Other:_____
   _____

4. When did you hear about eye donation?

□ In the last year

□ In the last 1- 5 years

□ 5 years previously

□ Never

5. Are you aware that corneal transplant surgeries are performed in Trinidad and Tobago

□ Yes □ No □ Don't know

6. Is it mandatory to get the consent of family members for eye donation after the death of the person?

□ Yes □ No □ Don't know

Part 3: Perception

7. Can the donor's eyes only be removed after death

□ Yes □ No □ Don't know

8. Can a living person pledge to donate his/her eyes?

□ Yes □ No □ Don't know

9. Who is most eligible to donate his/her eyes?

□ Anyone of age after death

□ Those who did not undergo cataract surgery

□ People below the age of 50 years

□ Persons without a history of any chronic illness

□ Don't know

10. Do you think a human eye can be bought or sold?

□ Yes □ No □ Don't know

11. What part of the eye is removed from the donors eye?

□ Whole eye ball

□ Cornea

□ Lens

□ Don't know

Other:_____

12. What is the ideal time duration to retrieve eyes after the death of the person?

□ As soon as possible

□ Within 6 hours

□ Within 24 hours

□ Within 48 hours

□ Don't know

Other:_____

13. Who cannot donate their eyes? (Please tick only one (1) option.)

□ People suffering from hepatitis B &C / other chronic diseases

□ Diabetic persons

□ People who have HIV

□ People who got into Accidents

□ Don't know

14. Do you think eye donation can cure all types of blindness?

□ Yes □ No □ Don't know

Part 4: Willingness

15. Do you know of anyone who has donated their eyes after death?

□ Yes □ No □ Don't know

If **YES,** then who do you know that has pledged to donate their eyes (eg. Relative, friend, etc)

_____
_____

16. Are you willing to donate your eyes?

□ Yes

□ No

17. If **YES,** answer the following: Would you like to inform your family regarding your wish to donate your eyes?

□ Yes □ No

18. If **NO**, then what is your perceived reason for **not** willing to donate? (Please tick only one (1) option.)

□ I need more information to decide

□ Family members object to eye donation

□ It is against my religion

□ I feel like my body will be ill-treated by donating my eyes

□ I want my body to be intact after death

□ I have eye problems

□ I am too old

Other:

_____
_____

Part 5: Attitude

19. What is your perceived reason for willing to donate? (Please tick only one (1) option.)

□ Eye donation is a noble work.

□ Eye donation is both a pleasure to help a blind person and a noble act.

□ My eyes are not useful to me after my death therefore someone else should have it.

Other:

_____

_____

(Singh, Ganger, Gupta, Vashist, & Tandon, 2017), (Mohammed Seid Hussen, Gizachew Tilahun Belete
2018)

APPENDIX B

Chi Square & Pearson's Analysis

	Hypothesis	*Pearson Chi-Squared Value*	*df*	*Significance Level*	*Decision*	*Cramer's V Value (ES)*	*Conclusion*
Age of Participants	H0: No relationship exist between age and awareness of participants H1: There is a relationship between age and awareness of participants	20.867	9	0.013	***Reject H0***	0.229	*There exist a **MODERATE** relationship between age and awareness of participants*
	H0: No relationship exist between age and participants perception on eligibility of eye donation H1: There is a relationship between age and participants perception on eligibility of eye donation	31.554	36	0.680	***Do not reject H0***	0.141	*There exist a WEAK relationship between age and participants perception on eligibility of eye donation*
	H0: No relationship exist between age and participants willingness to donate eyes H1: There is a relationship between age and participants willingness to donate eyes	10.476	9	0.313	***Do not reject H0***	0.162	*There exist a WEAK relationship between age and participants willingness to donate eyes*
	H0: No relationship exist between age and reason for participants unwillingness to donate eyes H1: There is a relationship between age and reason for participants unwillingness to donate eyes	83.569	63	0.181	***Do not reject H0***	0.163	*There exist a WEAK relationship between age and reason for participants unwillingness to donate eyes*
	H0: No relationship exist between age and participants attitudes towards donating eyes H1: There is a relationship between age and participants attitudes towards donating eyes	15.488	18	0.628	***Do not reject H0***	0.139	*There exist a WEAK relationship between age and participants attitudes towards donating eyes*
Sex of Participants	H0: No relationship exist between sex and awareness of participants H1: There is a relationship between sex and awareness of participants	8.415	1	0.325	***Reject H0***	0.145	*There exist a **MODERATE** relationship betweenbetween sex and awareness of participants*

	H0: No relationship exist between sex and participants willingness to donate eyes H1: There is a relationship between sex and participants willingness to donate eyes	0.146	1	0.703	***Do not reject H0***	0.019	*There exist a WEAK relationship between sex and participants willingness to donate eyes*
	H0: No relationship exist between sex and reason for participants unwillingness to donate eyes H1: There is a relationship between sex and reason for participants unwillingness to donate eyes	6.155	7	0.554	***Do not reject H0***	0.111	*There exist a WEAK relationship between sex and reason for participants unwillingness to donate eyes*
	H0: No relationship exist between sex and participants attitudes towards donating eyes H1: There is a relationship between sex and participants attitudes towards donating eyes	2.631	2	0.268	***Do not reject H0***	0.081	*There exist a WEAK relationship between sex and participants attitudes towards donating eyes*
Religion of Participants	H0: No relationship exist between religion and awareness of participants H1: There is a relationship between religion and awareness of participants	8.131	3	0.427	***Reject H0***	0.143	*There exist a **MODERATE** relationship between religion and awareness of participants*
	H0: No relationship exist between religion and participants willingness to donate eyes H1: There is a relationship between religion and participants willingness to donate eyes	6.948	3	0.074	***Do not reject H0***	0.132	*There exist a WEAK relationship between religion and participants willingness to donate eyes*
	H0: No relationship exist between religion and reason for participants unwillingness to donate eyes H1: There is a relationship between religion and reason for participants unwillingness to donate eyes	67.923	21	0.000	***Reject H0***	0.238	*There exist a **MODERATE** relationship between religion and reason for participants unwillingness to donate eyes*
	H0: No relationship exist between religion and participants attitudes towards donating eyes H1: There is a relationship between religion and participants attitudes towards donating eyes	7.777	6	0.255	***Do not reject H0***	0.099	*There exist a WEAK relationship between religion and participants attitudes towards donating eyes*
Ethnicity of	H0: No relationship exist between ethnicity and awareness of participants H1: There is a relationship between ethnicity and awareness of participants	3.925	4	0.416	***Do not reject H0***	0.099	*There exist a WEAK relationship between ethnicity and awareness of participants*

	H0: No relationship exist between ethnicity and participants willingness to donate eyes H1: There is a relationship between ethnicity and participants willingness to donate eyes	9.285	4	0.054	***Do not reject H0***	0.153	*There exist a WEAK relationship between etween ethnicity and participants willingness to donate eyes*
	H0: No relationship exist between ethnicity and reason for participants unwillingness to donate eyes H1: There is a relationship between ethnicity and reason for participants unwillingness to donate eyes	59.675	28	0.000	***Reject H0***	0.188	*There exist a WEAK relationship between ethnicity and reason for participants unwillingness to donate eyes*
	H0: No relationship exist between ethnicity and participants attitudes towards donating eyes H1: There is a relationship between ethnicity and participants attitudes towards donating eyes	6.346	8	0.609	***Do not reject H0***	0.089	*There exist a WEAK relationship between ethnicity and participants attitudes towards donating eyes*
Education Level of Participants	H0: No relationship exist between education level and awareness of participants H1: There is a relationship between education and awareness of participants	14.047	5	0.224	***Reject H0***	0.188	*There exist a **MODERATE** relationship between education level and awareness of participants*
	H0: No relationship exist between education level and mode of awareness of participants H1: There is a relationship between education and mode of awareness of participants	38.235	30	0.144	***Do not reject H0***	0.139	*There exist a WEAK relationship between education level and mode of awareness of participants*
	H0: No relationship exist between education level and particapants perception on eye removal after death H1: There is a relationship between education level and particapants perception on eye removal after death	11.541	10	0.317	***Do not reject H0***	0.12	*There exist a WEAK relationship between education level and particapants perception on eye removal after death*
	H0: No relationship exist between education level and particapants perception on living persons pledging to donate eyes H1: There is a relationship between education level and particapants perception on living persons pledging to donate eyes	24.467	10	0.645	***Reject H0***	0.175	*There exist a **STRONG** relationship between education level and participants perception on living persons pledging to donate eyes*

H0: No relationship exist between education level and participants perception on eligibility to donate eyes H1: There is a relationship between education level and participants perception onon eligibility to donate eyes	15.448	20	0.750	***Do not reject H0***	0.099	*There exist a WEAK relationship between education level and participants perception on eligibility to donate eyes*
H0: No relationship exist between education level and participants perception on part of the eye removed H1: There is a relationship between education level and participants perception on part of the eye removed	55.828	15	0.000	***Reject H0***	0.216	*There exist a **MODERATE** relationship between education level and participants perception on part of the eye removed*
H0: No relationship exist between education level and participants perception on ideal time duration to retrieve eyes after death H1: There is a relationship between education level and participants perception on ideal time duration to retrieve eyes after death	15.958	20	0.719	***Do not reject H0***	0.1	*There exist a WEAK relationship between education level and participants perception on ideal time duration to retrieve eyes after death*
H0: No relationship exist between education level and participants perception on eligibility to donate eyes H1: There is a relationship between education level and participants perception on eligibility to donate eyes	37.289	20	0.011	***Reject H0***	0.153	*There exist a WEAK relationship between education level and participants perception on eligibility to donate eyes*
H0: No relationship exist between education level and participants willingness to donate eyes H1: There is a relationship between education level and participants willingness to donate eyes	9.176	5	0.102	***Do not reject H0***	0.152	*There exist a WEAK relationship between education level and participants willingness to donate eyes*
H0: No relationship exist between education level and participants perceived reason for not willing to donate eyes H1: There is a relationship between education level and participants perceived reason for not willing to donate eyes	79.502	35	0.050	***Reject H0***	0.148	*There exist a WEAK relationship between education level and participants perceived reason for not willing to donate eyes*
H0: No relationship exist between education level and participants attitudes towards donating eyes H1: There is a relationship	16.843	10	0.078	***Do not reject H0***	0.145	*There exist a WEAK relationship between education level*

		between education level and participants attitudes towards donating eyes					*and participants attitudes towards donating eyes*
Region	***Socio Demographic***	H_0: No relationship exist between region and age of participants H1 There is a relationship between region and age of participants	42.166	36	0.022	***Reject H0***	0.163	*There exist a WEAK relationship between region and age of participants*
		H0: No relationship exist between region and sex of participants H1: There is a relationship between region and sex of participants	2.912	4	0.571	***Do not reject H0***	0.086	*There exist a WEAK relationship between region and sex of participants*
		H0: No relationship exist between region and religion of participants H1: There is a relationship between region and religion of participants	21.645	12	0.042	***Reject H0***	0.135	*There exist a WEAK relationship between region and religion of participants*
		H0: No relationship exist between region and ethnicity of participants H1: There is a relationship between region and ethnicity of participants	39.934	16	0.010	***Reject H0***	0.158	*There exist a WEAK relationship between region and ethnicity of participants*
	Awareness	H0: No relationship exist between region and awareness of participant H1: There is a relationship between region and awareness of participant	4.675	4	0.322	***Do not reject H0***	0.108	*There exist a WEAK relationship between region and awareness of participant*
		H0: No relationship exist between region and mode of awareness of participants H1: There is a relationship between region mode of awareness of participants	31.565	24	0.138	***Do not reject H0***	0.141	*There exist a WEAK relationship between region and mode of awareness of participants*
	Perception	H0: No relationship exist between region and particapants perception on living persons pledging to donate eyes H1: There is a relationship between region and particapants perception on living persons pledging to donate eyes	17.814	8	0.023	***Reject H0***	0.15	*There exist a WEAK relationship between region and particapants perception on living persons pledging to donate eyes*
		H0: No relationship exist between region and participant perception on part of the eye removed H1: There is a relationship between region and participant perception on part of the eye removed	29.748	12	0.003	***Reject H0***	0.158	*There exist a WEAK relationship between region and participant perception on part of the eye removed*

	H0: No relationship exist between region participant perception on eligibility to donate eyes H1: There is a relationship between region participant perception on eligibility to donate eyes	14.454	16	0.565	***Do not reject H0***	0.095	*There exist a WEAK relationship between region participant perception on eligibility to donate eyes*
Willingness	H0: No relationship exist between region and willingness of participants to donate eyes H1: There is a relationship between region and willingness of participants to donate eyes	4.043	4	0.400	***Do not reject H0***	0.101	*There exist a WEAK relationship between region and willingness of participants to donate eyes*
	H0: No relationship exist between region and participants perceived reason for not willing to donate eyes H1: There is a relationship between region and participants perceived reason for not willing to donate eyes	18.896	24	0.758	***Do not reject H0***	0.109	*There exist a WEAK relationship between region and participants perceived reason for not willing to donate eyes*
Attitude	H0: No relationship exist between region and participants attitudes towards eye donations H1: There is a relationship between region and participants unwillingness to donate eyes	23.518	8	0.003	***Reject H0***	0.172	*There exist a WEAK relationship between region and participants attitudes towards eye donations*

Multivariate Analysis

		B	***Exp(B)/Odds ratio***	***95% C.I.for EXP(B)***		***Conclusion***
				Lower	***Upper***	
Awareness of Participants	**Sex**					
	Male **(Reference category)**					
	Female	-.568	**.567**	.371	.864	*Males are 0.567 times aware (less aware) when compared to females*
	Religion					
	Christian (Reference category)					
	Muslim	-.004	**.996**	.402	2.470	*Christians and Muslims are equally aware*
	Hindu	-.598	**.550**	.180	1.680	*Christians are 0.55 times aware (less aware) than Hindu participants*
	None	.507	**1.661**	.628	4.394	*Christians are 1.661 times aware (more aware) than participants with no religion*

	Age	.000	**1.000**	.982	1.018	*For every 1 year increase in age, awareness remains the same*
	Education Level					
	No formal education **(Reference category)**					
	Primary School (SEA)	-21.725	**.000**	0.000		*N/A - Insufficent sample size of persons with primary school education*
	CSEC/CXC/O Levels	-1.004	**.367**	.090	1.496	*Participants with no formal education are 0.367 times aware (less aware) when compared to participants with CSEC/CXC/O Levels*
	CAPE/ A Levels	-1.135	**.321**	.158	.656	*Participants with no formal education are 0.321 times aware (less aware) when compared to participants with CAPE/A Levels*
	College/ Univeristy (Undergraduate)	-.518	**.596**	.257	1.380	*Participants with no formal education are 0.596 times aware (less aware) when compared to participants with an undergraduate degree*
	University (Postgraduate)	-.109	**.897**	.490	1.639	*Participants with no formal education are 0.897 times aware (less aware) when compared to participants with a postgraduate degree*
	Region					
	St. George **(Reference Category)**					
	St. Andrew/David	-.862	**.422**	.213	.839	*Participants in St. George are 0.422 times aware (less aware) than St. Andrew/David*
	Caroni	-.252	**.777**	.395	1.530	*Participants in St. George are 0.777 times aware (less aware) than Caroni*
	Victoria	-.341	**.711**	.364	1.391	*Participants in St. George are 0.771 times aware (less aware) than Victoria*
	St Patrick	-.574	**.563**	.285	1.114	*Participants in St. George are 0.563 times aware (less aware) than St. Patrick*
	Constant	1.137	3.118			

		B	***Exp(B)/Odds ratio***	***95% C.I.for EXP(B)***		***Conclusion***
				Lower	***Upper***	
	Sex					

	Male (Reference category)					
	Female	.609	**1.839**	1.195	2.830	Males are 1.195 times perceptive (more positive perception) when compared to females
	Religion					
	Christian (Reference category)					
	Muslim	.748	**2.114**	.843	5.301	*Christians and Muslims are equally aware*
	Hindu	.845	**2.328**	.753	7.200	*Christians are 2.328 times perceptive (more positive perception) than Hindu participants*
	None	.558	**1.748**	.658	4.643	*Christians are 1.748 times perceptive (more positive perception) than participantsith no religion*
	Age	-.017	**.983**	.966	1.001	For every 1 year increase in age, perception remains the same
	Education Level					
	No formal education (Reference category)					
Perception Positive Perception	Primary School (SEA)	-21.980	**.000**	0.000		N/A - Insufficent sample size of persons with primary school education
	CSEC/CXC/O Levels	-.435	**.647**	.164	2.553	*Participants with no formal education are 0.647 times perceptive (less positive perception) when compared to participants with CSEC/CXC/O Levels*
	CAPE/ A Levels	.243	**1.275**	.632	2.573	*Participants with no formal education are 1.275 times perceptive (more positive perception) when compared to participants with CAPE/A Levels*
	College/ University (Undergraduate	.660	**1.936**	.776	4.829	*Participants with no formal education are 1.936 times perceptive (lmore positive perception) when compared to participants with an undergraduate degree*
	University (Postgraduate)	-.230	**.795**	.440	1.434	*Participants with no formal education are 0.795 times perceptive (less positive perception) compared to participants with a postgraduate degree*
	Region					
	St George (Reference Category)					
	St Andrew/David	.987	**2.682**	1.344	5.355	*Participants in St. George are 2.682 times perceptive (more positive perception) than St. Andrew/David*

	Caroni	.651	**1.918**	.989	3.717	*Participants in St. George are 1.918 times perceptive (more positive perception) than Caroni*
	Victoria	1.036	**2.819**	1.444	5.502	*Participants in St. George are 2.819 times perceptive (more positive perception) than Victoria*
	St Patrick	.819	**2.268**	1.161	4.428	*Participants in St. George are 2.268 times perceptive (more positive perception) than St. Patrick*
	Constant	-.721	**.486**			

		B	***Exp(B)/Odds ratio***	***95% C.I.for EXP(B)***		***Conclusion***
				Lower	***Upper***	
Willingness of Participants	***Sex***					
	Male (Reference category)					
	Female	.074	**1.076**	.698	1.660	Males are 1.076 times willing (more willing) when compared to females
	Religion					
	Christian (Reference category)					
	Muslim	.985	**2.677**	1.074	6.670	*Christians are 2.677 times willing (more willing)) than Muslim participants*
	Hindu	1.546	**4.694**	1.451	15.180	*Christians are 4.694 times willing (more willing)) than Hindu participants*
	None	1.023	**2.781**	1.049	7.373	*Christians are 12.781 times willing (more willing) than participantsith no religion*
	Age	.010	**1.010**	.992	1.030	For every 1 year increase in age, willingness remains the same
	Education Level					
	No formal education (Reference category)					
	Primary School (SEA)	20.936	**1237336066.466**	0.000		N/A - Insufficent sample size of persons with primary school education
	CSEC/CXC/O Levels	1.187	**0.761**	.624	17.194	*Participants with no formal education are 0.761 times willing (less willing) when compared to participants with CSEC/CXC/O Levels*
	CAPE/ A Levels	.760	**0.767**	1.049	4.356	*Participants with no formal education are 0.767 times willing (less willing) when compared to participants with CAPE/A Levels*

	College/ Univeristy (Undergraduate	.520	**0.682**	.728	3.884	*Participants with no formal education are 0.682 times willing (less willing) when compared to participants with an undergraduate degree*
	University (Postgraduate)	.663	**0.710**	1.074	3.509	*Participants with no formal education are 0.71 willing (less willing) when compared to participants with a postgraduate degree*
	Region					
	St George (Reference Category)					
	St Andrew/David	-.140	**.870**	.437	1.732	*Participants in St. George are 0.870 times willing (less willing) than St. Andrew/David*
	Caroni	-.066	**.937**	.469	1.870	*Participants in St. George are 0.937 times willing (less willing) than Caroni*
	Victoria	.003	**1.003**	.504	1.997	*Participants in St. George are 1.003 times willing (equally willing) when compared to Victoria*
	St Patrick	-.434	**.648**	.328	1.279	*Participants in St. George are 0.648 times willing (less willing) than St. Patrick*
	Constant	-1.146	**.318**			