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Article

Analyzing relationships and distribution between age, sex, and eye disease at IGMCH eye OPD

Om Sareen[1], Arti Sareen[2]

[1] Eastside Catholic School, Sammamish, Washington

[2] Ophthalmology Department, Indira Gandhi Medical College, Shimla, Himachal Pradesh, India

SUMMARY

This study analyzes the patient demographics in an ophthalmology department at the Indira Gandhi Medical College and Hospital (IGMCH), an Indian government hospital. We hypothesized data collected from IGMCH patients would reveal relationships between both age and biological sex at birth and reveal the prevalence of specific eye conditions. Specifically, we expected that the sex distribution would be mostly equal across eye conditions, while the age distribution would differ based on condition. Knowing these relationships would help medical facilities better allocate finite resources, leading to better patient care. We used data from 670 patients collected by doctors between June 19th and July 12th, 2023. There was equal male and female distribution overall, while the distribution of individual eye conditions had more variance. Of the conditions, 30.15% were lens-related. Refractive errors were evenly split between sexes (p=0.385), while cataracts predominantly affected male patients. Among patients with retinal disorders, 60.67% were male (p=0.338). Of conjunctiva patients, 57% of were female (p=0.347). Patients over 40 constituted 71.79% of the total patients. Those suffering from cataracts, retinal disorders, and glaucoma tended to be older patients. Refractive error and conjunctiva patients had more consistent age distribution. However, all relationships were statistically insignificant with p-values >0.05, except for cataract patients ages 50–89, who showed significant differences with a p-value <0.001. We advocate for more studies like this one to be undertaken, as the more data is available and analyzed, the more information there is to help medical facilities allocate their resources and provide better treatment.

INTRODUCTION

Our eyes define our world. We cannot function without our sight–to perceive, to act, to avoid dangers, to learn, to work, and to express emotion. Unfortunately, not everyone has perfect eyesight. Today, 2.2 billion people have some sort of visual impairment, defined as any kind of vision loss by the World Health Organization (WHO) (1). One billion of these people could either have had their condition prevented or still need their impairment addressed (1). Only 36% of people with a distance impairment and 17% of people with cataracts have treatment options available or have received treatment (2,3). With cataract specifically, 65.2 million people have them undiagnosed (1). These startling statistics show how important it is to continue epidemiological efforts to reduce these numbers.

Data is one of the better ways to improve health in the eye. It provides evidence for relationships between different conditions and the demographics of patients. There is still much to be known on the connection between eye diseases and the people that have them. Getting data in the field can help drive research and let medical facilities better allocate resources to positively impact patients. Our study uses data from the Indira Gandhi Medical College and Hospital (IGMCH) to find these demographic relationships.

The present study had two objectives: to identify the demographics of patients visiting eye outpatient departments (OPD), and to test our hypothesis that the data would reveal relationships between both age and biological sex at birth along with the prevalence of specific conditions in the eye. The OPD in IGMCH is a government funded hospital, one that accepts patients from all social and economic areas of the region. This diversity in socio-economic backgrounds makes the patient sample ideal for a study of patient demographics. This study primarily focused on four categories of condition: lens conditions, conjunctival conditions, refractive errors (like myopia), and retinal disorders. These were the four most common categories of condition found in our patient sample. They were the most prevalent, so we could analyze a larger body of data as a result. This would potentially lead to more powerful and more statistically relevant results. We also looked for relationships between males and females for each of those conditions to find potential links and the age distribution for each of those conditions. Certain eye conditions may be affected by sex and age, and we looked to find that. As an example, cataracts (a common eye condition that involves the clouding of the lens) have long been thought to be affected by aging (3), and we looked for that trend in the present study.

The study grouped patients by eye disease category, age and biological sex. We chose these demographics because of their availability and importance in visual impairments and conditions. The data can help hospitals better allocate their resources towards these patients. Finally, this study provides insight into the eye, showing us the most common conditions and the most eye conditions that can occur.

Our study shows some relationships between age and sex and anatomical sites of disease in eye patients at the IGMCH. Some conditions were correlated with age, like cataracts, mostly seen in elderly patients, and some conditions, like refractive error and conjunctiva, didn't have these trends with age. There was an overall lack of correlation between sex and disease sites in the eye. We also found that lens-related

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Category of Eye Disease	No. of Patients	Percentage
Lid Disorder	20	3.0%
Conjunctiva	93	13.9%
Cornea	33	4.9%
Lens	203	30.3%
Glaucoma	29	4.3%
Squint	6	0.9%
Lacrimal apparatus	6	0.9%
Uvea	17	2.5%
Misc	41	6.1%
Normal	11	1.6%
Refractive error	122	18.2%
Retina	89	13.3%
Total	670	100.0%

Table 1. Pattern of eye disease in relation to anatomical site of disease. The table portrays ten of the most common anatomical sites for eye disease to occur, a miscellaneous section, and normal patients that came into the eye OPD but were found to have no eye disease or condition. Lens conditions were the most common (30.3% of our 670-patient population), followed by refractive error (18.2%), conjunctiva (13.9%), and retinal disorders (13.3%). The least common disease sites were squint and lacrimal apparatus (0.9% each).

conditions were the most common in our patient population (4). We advocate for more extensive research with larger patient groups to enhance understanding and treatments as well as condition-based research to get better insight into specific eye conditions.

RESULTS

This study looks to find relationships between age, sex, and eye condition in eye patients. We hypothesized that data collected from eye patients at the Indira Gandhi Medical College and Hospital (IGMCH) would reveal relationships between both age and biological sex at birth along with the prevalence of specific conditions in the eye. We analyzed data from 670 total patients to find relationships between age, sex, and specific conditions in the eye.

Lens-related, refractive error, conjunctival, and retinal disorder impairments were the four most common sites for an eye condition, accounting for 75.7% of patient visits (**Table 1**). Lens-related conditions were the most common category of eye disease, as 30.3% of patients visited for those conditions (**Table 1**). This made lens-related impairments the most common impairment in the data set.

Of patients visiting the eye outpatient department (eye OPD), 51.2% were male (**Table 2**). For refractive errors, patient sex was split evenly with 50% of refractive error patients male and 50% female. Males made up 53.19% of cataract patients (p=0.326, Chi-Square Test) and 60.67% of retinal disorder patients (p=0.338, Chi Square Test, **Table 2**). In conjunctiva, 56.99% of patients (p=0.347, Chi-Square Test) were females (Table 2, Chi-Square Test). There was no observed sex bias in the total number of patients (p = 0.368, ANOVA test), nor for each individual ocular disorder as the p-value was greater than the significance cutoff of 0.05 (**Table 2**).

The mean age of all patients observed in the study was 49.68 ± 20.75 years (**Table 3**). The mean age of males reported was 50.37 ± 21.82 years and that of females was 48.97 ± 19.57 years (**Table 3**). Patients over 60 years of age made up 40.60% of the sample, and patients over 40 years made up 71.79% of the sample (**Table 3**). We found a statistically significant relationship between the incidence of cataracts and age, with 91.49% of cataract patients being between the ages of 50–89 (p=0.0, Chi-Square test) (**Table 3**). The refractive error patients (p=0.000) showed statistical significance as well (p<0.05, **Table 3**). Of refractive error patients, 17.2% were over the age of 60 (**Table 3**). Of conjunctiva patients, 39.78% were between the ages of 20 and 39. Patients with conjunctival disorders also displayed a statistically significant relationship with age, with p-value of 0.034 (p<0.05) (**Table 3**).

DISCUSSION

It is vital to study trends in the demographics of eye patients. These trends can help us to study the eye and can help medical facilities better allocate resources for their patients. We hypothesized that there would be relationships between age, sex, and specific categories of disease condition in the eye. We analyzed data from 670 patients visiting the Indira Gandhi Medical College and Hospital in India. We designated ten categories of eye disease: lid disorders, conjunctiva, cornea, lens, glaucoma, squint, lacrimal apparatus, uvea, refractive error, retinal disorders. We also designated a category for normal patients that were not found to have an eye condition and a miscellaneous category for patients with conditions that did not fit the ten categories of eye disease

Sex (assigned at birth)	No. of Refractive Error Patients	No. of Cataract Patients	No. of Conjunctiva Patients	No. of Retinal Disorder Patients	No. of Glaucoma Patients	Total No. of Patients
Female	61 (50%)	44 (46.81%)	53 (56.99%)	35 (39.33%)	13 (44.83%)	327 (48.8%)
Male	61 (50%)	50 (53.94%)	40 (43.01%)	54 (60.67%)	16 (55.17%)	343 (51.2%)
Total	122	94	93	89	29	670

Table 2. Sex Distribution based on Disease Category. The table divides the patients by category of disease and sex. It portrays the five of the most common disease categories along with the distribution of the overall patients. Refractive error was equally split (p=0.385). Cataract (p=0.326), glaucoma (p=0.378), and retinal disorders (p=0.338) had a male majority. Conjunctiva (p=0.347) had a female majority. All sex distribution results were statistically insignificant with p > 0.05. Statistical comparisons were made using Pearson-Chi Square Test between male and female sex assigned at birth and patients.

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Patient Age	No. of Refractive Error Patients	No. of Cataract Patients	No. of Conjunctiva Patients	No. of Retinal Disorder Patients	No. of Glaucoma Patients	Total No. of Patients
0–9	10	0	5	3	0	27
10–19	18	0	11	3	0	54
20–29	16	0	18	3	2	54
30–39	13	1	19	4	0	54
40–49	24	7	13	9	3	99
50–59	20	15	12	21	4	110
60–69	16	38	8	28	9	148
70–79	4	25	7	13	8	95
80–89	0	8	0	5	3	27
90+	1	0	0	0	0	2
Total	122	94	93	89	29	670

Table 3. Age distribution based on disease category. The table divides overall patients and patients in the five of the most common categories of disease by age group. Overall, the majority of patients were older, with 71.79% of patients being over 40 years of age. There was a significant association between age and eye disease as a whole ($p<0.05$, Chi Square test). Majority of cataract patients were older, with 91.49% of cataract patients ($p=0.000$) being between 50 and 89 years of age. In addition to cataracts, retinal disorder ($p=0.000$) and glaucoma patients ($p=0.115$) were more likely to be older. Refractive error patients ($p=0.000$) and conjunctiva patients (0.034) had more consistent age distribution compared. Cataract, retinal disorder, refractive error, and conjunctiva patients had statistically significant age distribution. ($p<0.05$). Glaucoma ($p=0.115$) was statistically insignificant with age. Four conditions with small sample sizes, cornea ($p=0.128$), squint ($p=0.572$), lacrimal apparatus ($p=0.881$), and uvea ($p=0.790$), were statistically insignificant with age ($p>0.05$). Statistical comparisons made using Chi-Squared Test between age groupings and patients.

(5–15). We believe that patient visits should be broken down into separate conditions, as some conditions are different than others.

Results from the present study mostly confirm our hypothesis, which stated there would be relationships between sex and age and anatomical sites of disease in eye patients at the IGMCH. There are clear trends between sex and age and the kinds of conditions. Cataracts, for example, are mostly seen in elderly patients. However, some conditions, like refractive error and conjunctiva, did not have these trends with age. There was an overall lack of correlation between sex and disease sites in the eye. Other studies have shown that age-related macular degeneration, cataracts, and glaucoma are all more common in women, while in the present study cataracts and glaucoma affected more men than women.

Throughout the present study, it has seemed that sex is not a predictor of patient visits. Overall sex distribution was near-equal ($p=0.368$) and sex distribution was statistically insignificant throughout conditions as well ($p>0.05$). There were few strong majorities in sex distribution within individual conditions. It seems sex doesn't have as much of an effect on diseases than age or another demographic does, which makes sense – cataract ($p=0.0$) or glaucoma ($p=0.115$) is linked to age whilst there are fewer eye conditions that are linked to sex. Age ($p=0.000$) is more statistically correlated with eye conditions than sex. More studies will need to be done, as this study may just be an outlier. Still, there is definitive evidence with our 670 patients here of age being more of an influence on eye conditions than biological sex.

The patients visiting the eye OPD were categorized into 12 anatomical sites of disease: Lid disorders, conjunctiva, cornea, lens, glaucoma, squint, lacrimal apparatus, uvea, miscellaneous, refractive error, and retinal disorder (**Table 1**). The four most common of these anatomical sites of disease were lens, refractive error, conjunctiva, and retinal disorders (**Table 1**). 75.7% of the patients visited for a condition relating to one of these four anatomical sites of disease (**Table 1**). From these data, we found that lens-related conditions were the most common medical concern in this cohort of people (**Table 1**). 30.3% of all patients visited for a lens condition (**Table 1**). Lens conditions cover cataracts, a very common condition, so it makes sense that the lens is the most common site of disease.

A study by R. Gotekar et al. (16) in 2020 studied the patients visiting a teaching hospital in Sangli, India. Sangli is in Southeastern India. Shimla, where the present study was conducted, is in Northern India. The study in Sangli can be used as a frame of reference to compare the data from the patients in Shimla to the patients in Sangli, and to compare regions. The present study shows a small majority of male patients, with the male to female ratio (M:F) being 1.05:1 compared to 1.17:1 in the study by R. Gotekar (16) (**Table 2**). There is little discrepancy between the number of males and females visiting eye OPD. In the present study, only 16 more male patients (around 2% of the total patient population) visited eye OPD than female patients, but this number could be a result of experimental error, as some patients walked in without registering (**Table 2**).

Sex distributions varied depending on anatomical site of disease. According to the National Eye Institute, refractive errors result when it is hard to see clearly (2). Refractive errors include nearsightedness and myopia (17). The same amount

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of each sex visited for refractive error-related conditions, 61 for each (p=0.385) (**Table 2**). The study by R. Gotekar et al. also showed results in sex distribution wherein they observed 67% of refractive error patients being male in contrast to the 50% of refractive error patients being male in the present study (16). This is a noticeable difference.

Cataracts occur due to the clouding of the eye with age, or with injury (3). More males visited for cataract-related issues than females did in the present study where 53.19% of cataract patients (p=0.326) were male (**Table 2**). The study by R. Gotekar et al. had a larger difference between male and female patients with cataracts, as 65% of patients were male in that study (16). However, a separate study by Lixia Lou et al. in China found cataracts more common in female patients, not male patients (18). Tables by the national eye institute write that 19.67% of American females develop cataracts compared to only 14.26% of American males (19), pointing to a higher number of females developing cataracts. India, China, and America are far apart, and there could be different environmental, social, and cultural factors that may contribute to the different findings. More males were in R. Gotekar et al. and the present study than females, so that could explain more males than females with cataract in those studies (16). More research needs to be conducted as to why these studies present different conclusions on sex distribution in cataract.

Retinal disorders are problems with the tissue at the back of the eye (15). For retinal disorders, 60.67% of patients in the present study were male, a noticeable yet statistically insignificant (p=0.338) difference between males and females (**Table 2**). The study by R. Gotekar et al. also had roughly 60% of retinal disorder patients being male (16). Retinal disorders, like age-related macular degeneration, seem to be more common in women than men, even when adjusted for women's longer life expectancies, per a study by I. Aninye et al. (20). It is interesting how cataracts and retinal disorders are thought to be more prevalent in women, yet in both ours and R. Gotekar's study, there were more males than females with cataracts and retinal disorders (20, 16). This may be explained by the fact that both the present study and R. Gotekar's study had more males visit than females. With so few studies, it is hard to call any conflicting study an outlier. Additional studies must be done to better understand the relationships between sex and different diseases.

In the present study, 56.99% of patients were female (p=0.347, **Table 2**). The study by R. Gotekar had 57.65% of conjunctiva patients as males, a significant difference from the present study (16). A research letter by D. Ramirez et al. found more women than men had conjunctivitis (21). Conjunctivitis is a contagious disease transmitted by viruses and bacteria (22). Therefore, women having more conjunctivitis than men may be more of a random occurrence. However, it is also possible that R. Gotekar's study may be an outlier while the present study provides more evidence that women are more likely to develop conjunctiva than men. This again shows the need for more studies. More studies would indicate whether sex distribution in conjunctiva is randomly distributed or if there is something deeper at play.

More males than females had glaucoma-related conditions in the present study (**Table 2**). Per a study by T. Vajaranant et al., glaucoma has been shown to be more common in females than males (23). In the present study, more males than females had glaucoma, and this was statistically insignificant (p=0.378). As there were only 29 glaucoma patients with recorded sex in the present study, future studies with more glaucoma patients are needed to see if this trend holds or may be limited to this specific region (**Table 1**). These studies could solely focus on glaucoma patients.

Overall, we found no statistically significant relationships between sex and eye condition prevalence. Similarly, the sex distribution among the total patient population also showed no statistical significance (p=0.368). This supports the conclusion that there is no evidence of a relationship between biological sex and eye condition prevalence in this study.

The OPD had a wide range of age groups as patients. Most patients visiting eye outpatient department at the IGMCH were older patients (**Table 3**). Of the total patients, 71.79% were over the age of 40 and 40.6% of patients were over the age of 60 (**Table 3**). In comparison, in the study by R. Gotekar, only 33.5% of patients were over the age of 60 (16).

Cataracts are more prevalent in the elderly due to the clouding of the lens with age and the need for cataract surgery to replace the lens (3). Of cataract patients, 91.49% were between the ages 50 and 89 (Table 3). This age group has a p-value <0.001, using an ANOVA test (Table 3). Using p-value<0.05, this shows age being statistically significant between age group 50–89 and cataract onset. The study by R. Gotekar et al. showed 80.5% of patients over the age of 60 (16). This is interesting as a lower percentage of patients from that study were over the age of 60. This indicates cataract as more common among older people. Both our study and the study by R. Gotekar et al. have majority of cataract patients over the age of 50 (**Table 3**, 16). Cataracts have been believed to be more common in older patients, and this data backs that up (3).

In contrast, refractive error was distributed equally amongst all ages (**Table 3**). Refractive error was spread evenly throughout all age groups (**Table 3**). Only 16.94% of patients were over the age of 60, a difference from the percentage of patients over 60 in other disease categories (**Table 3**). There was a slight increase of patients between ages 40 and 59 (**Table 3**). Refractive error patients (p=0.0) had a statistically significant relationship with age (**Table 3**). This would indicate refractive error and age being associated. However, very few patients over the age of 70 had refractive error (**Table 3**). Patients over the age of 70 with refractive error may have had more pressing eye conditions or could simply have been deceased (**Table 3**). This could explain refractive error patients having a statistically significant relationship with age. Similarly, conjunctiva was distributed evenly amongst all age groups (**Table 3**). Of patients with conjunctiva-related conditions, 39.78% were between the ages of 20 and 39 (**Table 3**). Most conjunctiva conditions were related to conjunctivitis, a contagious disease that is not presumed to be affected by age (22).

Corneal conditions are issues with the cornea, like injuries and inflammation (7). In the study by R. Gotekar et al., the authors found that 10% of the eye conditions were related to the cornea (16). Their study included ulcers, opacities, and uveitis all as corneal conditions while the present study separated uveitis from other corneal conditions (16). For the sake of comparison, we will include the uveitis patients with the separate corneal patients. Our total corneal patients made up 7.46% of total patients (**Table 1**). The R. Gotekar et al. study had 10% of patients with corneal conditions.

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Interestingly, the R. Gotekar et al. study mentioned a lack of corneal patients because the sugarcane industry was not in season, which meant less corneal injuries. Still, they had a higher percentage of corneal patients than the present study did (**Table 1**, 16).

Age and sex assigned at birth were chosen as two demographic factors to analyze in this study for a few reasons. One reason was clinical relevance, as age and sex are related to many conditions and diseases (as demonstrated in this study). Understanding the age and sex distribution of patients helps give insight into the eye conditions encountered in the hospital's patient population. A study by I. Aninye et al. analyzed the role of sex in women's eye health in the United States (20), referencing many eye conditions that have an imbalance of prevalence when it comes to sex. This shows that sex is important to understanding patients. As for age, an article by J. Ma et al. described how aging is important to many eye diseases like cataract (24). A disease like cataract usually occurs due to the clouding of eye over time (3). This article by J. Ma et al. shows that it is important to consider the influence of age in eye conditions (24). Another piece of literature by G. Chader and A. Taylor described how dry eye, cataracts, glaucoma, macular degeneration, diabetes, and overall low vision are all affected by age (25). These studies show how age and sex are important demographics to consider. Age and sex are also more readily available as demographic information and are more practical and feasible to assess. Demographics like socioeconomic status and ethnicity, for example, may also influence outcomes but are much more complex to measure accurately. The goal of this study was to provide hospitals like the one sampled with data to use when allocating resources and treating patients, and age and sex are very easy ways for clinics to implement findings. Finally, age and sex are easier to compare with other hospitals and external patient populations to find unique characteristics and disparities.

Socioeconomic status is an important variable when it comes to eye health. Often, poorer people have less access to treatment. However, the present study did not analyze socioeconomic status because of the difficulty of getting that information. The hospital where this patient sample is from, the IGMCH, is a government hospital. Therefore, the patient sample of the present study was made up of patients with differing socioeconomic status. Many people coming to the IGMCH were those who were poorer and could not afford private care. Future studies should take this into account. Not only would socioeconomic status information for patients help ophthalmology studies, as they would also help us understand the wealth gap and the economy.

As for other demographics, difference in location may be a factor in distribution of conditions. A study examining blindness in the Konkan coast region of India analyzed patients older than age 50 (26). We can use this to compare regions. They found nearly half (47%) of patients were in age group 50–59, with each subsequent age group having a smaller percentage of patients (26). In the present study based in Shimla (in Northern India), we found a much more even distribution in patients older than 50 (**Table 3**). This is a noticeable difference in distribution of patient ages between the Konkan coast study and the present study (26). Perhaps those in the Konkan coast region just happened to visit more between the ages 50–59. Coastal regions may have unique environmental factors that could influence patient distribution. There could also be a different culture around healthcare access in the region. The Konkan coast study also found that most older patients with blindness had it because of cataracts, like the present study (26). This makes sense, as the prevalence of cataracts is more influenced by biological factors associated with aging than by regional differences.

Another region is Khartoum in Sudan where a study by K. Lakho et al. analyzed the pattern of eye diseases at a hospital in Khartoum (27). The study had 61% of patients over the age of 36 (27). In the present study, 71.79% of the patients in the present study were over the age 40 (**Table 3**). This means a higher percentage of older patients were coming into the hospital in Shimla than the one in Khartoum, although both had more older patients than younger (**Table 3**, 27). Per the Central Intelligence Agency, the median age of a person in Sudan as a whole is 19.3 years old, while the median age of a person in India is 29.8 years old (28). While the entire countries as a whole do not reflect the age of persons in one region in the country, this is a large difference in median age. There may have been more younger patients visiting the hospital in Khartoum than the IGMCH in our present study due to the higher population of younger people in the country of Sudan (28). The present study in the IGMCH was conducted during the peak travel season where many people visited Shimla. There may have been more older people visiting with their children.

Future studies should be performed in a similar way to this one. The more patient data that is available and analyzed, the better we can understand the needs of patients. Perhaps a future study could combine data from several different regions to get a better understanding of general eye care. Alternatively, they could focus on one specific condition or demographic. Demographical studies don't have to be limited to the eye; rather, they can be spread into other fields of medicine to achieve the same goals.

Studies should also be performed in individual regions, such as this study, to shed light on the issues in those sectors. For example, this study demonstrates that lens conditions (4) are the most common kind of eye conditions, in Shimla, Himachal Pradesh. The patients were predominantly over 40. The Indira Gandhi Medical College is funded by the government – finite funding that must be spread well in order to best treat patients. The findings in this study show that hospitals and eye care centers (like the IGMCH) in this Himachal region could focus their resources on lens conditions and the elderly (specific to eye treatments and ophthalmology). In another region (like the study by R. Joshi et al.), there could be different ways to focus resources.

Results from the present study mostly confirm our hypothesis, which stated there would be relationships between sex and age and anatomical sites of disease in eye patients at the IGMCH. The lack of significant sex distribution differences prompts further investigation to back up this finding. The lack of certain eye impairments compared to other eye impairments may need to be analyzed further. We advocate for more extensive research with larger patient groups to enhance understanding and treatments as well as condition-based research to get better insight into specific eye conditions.

MATERIALS AND METHODS

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We worked with the ophthalmology outpatient department for three weeks at Indira Gandhi Medical College in Shimla, Himachal Pradesh. The doctors documented patient information, documenting information like age, sex, and eye disease. The data would then be transferred to an Excel sheet. Excel was used to sort patients into separate groups and to count patients to see demographic relationships. Data was also analyzed using IBM SPSS Statistics 23. The patients were sampled by convenience, as some of the patients may have been left out of the register or may have visited different rooms in the OPD. There were 763 patients sampled and studied, all from Eye OPD in Room No 1115, at Indira Gandhi Medical College, between June 19th, 2023, and July 12th, 2023. For statistical and consistency purposes, we only considered 670 patients out of those 763, as these patients had age, sex, and eye condition all available at once. There were no other exclusion criteria.

We have designated ten categories of disease along with a normal category for patients lacking a condition and a miscellaneous category. These categories are lid disorders (chalazion, stye, ptosis), conjunctiva (conjunctivitis, vernal keratoconjunctivitis), cornea (keratitis, corneal dystrophies), lens (idiopathic sclerochoroidal calcification, cataract), glaucoma (glaucoma, primary open angle glaucoma), squint (asthenopia), lacrimal apparatus (dacryocystitis, watering), uvea (uveitis, endothelitis), refractive error (myopia, hyperopia, astigmatism), retinal disorders, normal, and miscellaneous.

Lid disorders are infections and inflammations in the eyelid (5). Conjunctiva is a contagious disease transmitted by viruses and bacteria (6). Corneal conditions are issues with the cornea, like injuries and inflammation (7). Lens conditions are issues with the lens in the eye, like calcium buildup (ISC) and cataract (8, 9). Glaucoma are eye conditions that effect the optic nerve, related to pressure in the eye (10). Squint occurs when the eyes face different directions (11). Lacrimal apparatus conditions affect the eyes' tear system and its lacrimal gland (12). The uvea is the middle layer of the eye, and uveitis is inflammation in the eye that causes redness and pain and can affect vision and cause vision loss (13). Refractive errors result when it is hard to see clearly (14). Retinal disorders are problems in the back of the eye (15). Normal patients were not found to have an eye condition. Miscellaneous patients had conditions like headaches that could not be attributed to the aforementioned categories of condition.

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