

VISUAL OUTCOME OF AGE-RELATED CATARACT SURGERY IN PATIENTS 50 YEARS AND ABOVE WHO UNDERGO CATARACT SURGERY. A CROSS-SECTIONAL STUDY AT JINJA REGIONAL REFERRAL HOSPITAL.

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ABSTRACT

Purpose of the study

The study was to evaluate the visual outcome of age-related cataract surgery among patients 50 years and above who underwent cataract surgery at Jinja Regional Referral Hospital. It was carried out from December 2022 to April 2023.

Study methods

A hospital-based descriptive retrospective study methodology was used. Data was extracted from patients' records and 80 files of patients aged 50 years and above who had undergone age-related cataract surgery in JRRH were analyzed. The data was captured using an interview guide and was presented in tables, figures, and narratives.

Principle finding

Out of 80 eyes analyzed, at 3-4 weeks good outcome was in 31.25% of eyes, borderline outcome in 17%, and poor outcome in 6.25%. Good and borderline outcome was due to biometry performed before surgery and turned up for review. Poor outcome was due to complications, pre-existing co-morbidity, and failure to turn up for review as required. 20% did not turn up at 1-2 weeks for review and 45% did not turn up for review at 3-4 weeks. Complications included; corneal edema, shallow anterior chamber, uveitis, elevated IOP, posterior capsule rupture, iridodialysis, and lens dislocation. Visual outcomes had a positive impact on quality of life after cataract surgery in all patients.

Conclusion

Visual outcome at the fourth week of follow-up was below the WHO recommendations and this was due to pre-existing co-morbidity, complications, and failure to turn up for review.

Recommendations

Devise a better information capture technique and find means to reach out to patients to come for follow-up visits, use modern technology and equipment, practice refraction for all post-operative patients, and encourage early uptake of cataract surgery services.

Keywords: *Visual Outcome, Cataract Surgery, Jinja Regional Referral Hospital*

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Background

A cataract is the clouding of the normally clear lens. For people with cataracts seeing through cloudy lenses is a bit like looking through a frosty or fogged-up window. Clouded vision caused by cataracts makes it more difficult to read, drive (especially at night), or see an expression on a friend's face. Most cataracts develop slowly and do not disturb one's sight early on but with time cataracts interfere with vision. If impaired vision interferes with your usual activities, then cataract surgery is needed.

Types of cataracts include congenital/ developmental and senile as classified according to age when people are affected. A congenital cataract is present at birth or develops in early childhood while senile cataracts develop later as one age (usually after 50 years of age). A cataract may be

nuclear, cortical, capsular, or polar according to the part of the lens affected.

Senile Cataract is caused by degeneration and opacification of lens fibers. Symptoms include diminished visual acuity, monocular diplopia, glares, and colored halos.

Risk factors include, factors include increasing age, diabetes, hypertension, atopic dermatitis, smoking, and drinking alcohol. (J Kanski, 2016)

Globally, cataract is the leading cause of preventable blindness. It accounts for 94 million cases out of the 1 billion cases of blindness (WHO 2022). In Africa, it is estimated that about 6 million people are affected by cataracts. In Uganda, health experts say 57% of blindness cases are due to cataracts (Daily Monitor, 2022). Busoga sub-region has the highest number of blind people and cataract is the leading cause of blindness in people in this region. (Daily

Monitor, 2021). Cataract surgery is the safe, effective, and mainstay treatment of cataracts.

Cataract surgery is one of the most commonly performed surgical procedures worldwide. Over the last two decades, the number of surgeries performed annually has increased from 5 million to 15 million. Although many cataract surgeries are being performed, there are concerns about the quality of outcomes. The visual outcome of cataract surgery is measured either as visual acuity in the operated eye or in terms of ability to function, quality of life, or economic rehabilitation.

According to WHO recommendations, good outcome is defined as 6/6-6/18, borderline outcome as <6/18-6/60 and poor outcome as <6/60

Studies in Nepal, China, and India revealed that 40–75% of cataract surgery outcomes were worse than 6/18 in the operated eye with 21–53% having VA of <6/60

In Sub-Saharan Africa, poor outcome with VA less than 6/60 after cataract surgery often comprises 20% or more in published case series. (Bulus et al 2022)

In Uganda, out of 42 patients the proportion of patients with visual acuity \leq 6/60 was 25.0%, and patients with visual acuity \geq 6/12 was 17.5%. (E Kim et al 2018)

The visual outcome in most developing countries is not up to the standards recommended by WHO with a percentage of poor outcomes ranging from 11.4% to as high as 44.0%.

Factors associated with the surgical outcome after age-related cataract surgery.

Factors associated with the visual outcome include pre-existing ocular co-morbidities, surgical complications, surgical skill, inadequate post-surgical vision correction, and improper pre-operative biometry measurement. Additional factors include old age, female gender, lower education attainment, rural residence, and treatment at government hospitals or through free surgery camps.

Complications that affect the visual outcome of age-related cataract surgery

A complication may occur before surgery, during the surgery, immediately after the surgery, or even weeks after the surgery and affect the visual outcome of the surgery. Complications include; early acute endophthalmitis, capsular rupture, vitreous loss and retinal detachment, retained lens fragments, cystoid macular edema, and also lens dislocation.

Impact of Visual Outcome on quality of Life after age-related cataract surgery

After surgery, the visual outcome (measured by visual acuity and vision-related quality of life) is associated with increased capability for daily activities, social functioning, and also increased life expectancy. Other benefits for elderly patients include; greater social inclusion and participation, engagement in productive activities, increased self-esteem, and improved social communication and relationships.

Epidemiology

Senile cataract is the most common cause of visual acuity loss in the elderly population. It also impairs the overall quality of life. Significantly, cataract is considered to affect approximately 50% of people in their 70s and 100% in their 90s (Toyama et al, 2018). Unoperated cataracts remain one of the most common causes of blindness responsible for around 50% of all global blindness. More than 90% of cataract-associated blindness is found in low- and middle-income countries. To evaluate the visual outcome of cataract surgery among patients 50 years and above with senile cataracts who undergo cataract surgery in Jinja Regional Referral Hospital Jinja City, Busoga Sub-region in Eastern Uganda

Specific Objectives

1. To determine the factors associated with surgical outcomes after age-related cataract surgery
2. To identify the complications that affect the visual outcome of age-related cataract surgery
3. To find out the impact of visual outcome on quality of life after age-related cataract surgery.

METHODOLOGY

Study design

The researcher used a hospital-based descriptive retrospective cross-sectional study design in this study

Study population

All patients (both men and women) above 50 years who had undergone cataract surgery at Jinja Regional Referral Hospital Eye Department from June 2022 to October 2022.

Sampling size determination.

The sample size was calculated using the method below according to Mbuto Samuel (2004)

Sample size= where

D- Number of days available for data collection

T-total time was spent on each event

H- Number of hours per day

D=20 days H=2 hours

T=30minutes

$(20 \times 120) / 30 = 80$ patient files.

Sampling procedure

A consecutive sampling method was used to collect patient files. Patient files were allocated serial numbers.

Files of patients were selected consecutively beginning with the first file till the number of files was exhausted. In the course of sampling, files that did not meet the criteria were removed and the next file was taken.

Data collection method

Information was extracted from patient files and filled into the interview guide.

Information was also collected from health workers at the eye clinic who were involved in the management of the patients using the same tool.

Data collection tool

The data collection tool used was an interview guide.

Data collection procedure

Information that was collected included; socio-demographic data, pre-operative examination, intra-operative findings, and also post-operative examination. Pre-operative examination included; visual acuity, intra-ocular pressure, biometry, and any preexisting systemic and ocular

comorbidity. Intraoperative findings included; date of surgery, type of anesthesia, type of cataract surgery, intra-ocular lens implantation, and intra-operative complications. Post-operative examination included; visual acuity at day 1, 1-2 weeks, and 3-4 weeks and complications after surgery. Information also included the benefits of the surgery to the patient.

Study variables

Independent variables included age, gender, type of cataract surgery, and preoperative examination. Dependent variables included visual acuity after surgery and benefits of the surgery.

Table 1: Table showing study variables, source and information collected, and tools used with study objectives.

Specific objective	Variable(s)	Information that was collected	Source of information	Tools to be used
Factors associated with visual outcome	Age, gender, occupation, place of residence, pre-operative examination	Socio-demographic data, pre-existing comorbidities	Patient files	Interview guide
Complications that affect the visual outcome	Type of cataract surgery	Complications before, during, and after surgery	Patient files	Interview guide
Impact of visual outcome on quality of life	Visual acuity after surgery	Benefits of cataract surgery to patients	Health workers in the eye clinic	Interview guide

Quality control

Before the study, the principal researcher visited the eye clinic at Iganga General Hospital to assess the feasibility of the study and pre-test the interview guide.

Inclusion criteria.

Eyes of patients 50 years and above who had age-related cataract surgery at Jinja Regional Referral Hospital.
Residents of the Busoga sub-region
Health workers at eye clinics who were involved in the management of patients who underwent cataract surgery from June 2022 to October 2022.

Exclusion criteria

Any eye with missing or incomplete information
Eyes of patients who had surgery related to other causes.
Health workers who were not involved in the management of patients from June 2022 to October 2022

Data analysis and presentation

The data collected at the end of each day was entered in the interview guide daily and analysis was done by use of the Statistical Package for Social Sciences (SPSS) Version 20 and with daily backups on an external hard disc.

Data was presented using tables, graphs, charts, and texts.

Ethical consideration

Before carrying out this study, an introductory letter from the school research committee board was sent to the Hospital director JRRH to seek permission to carry out the study in the hospital eye clinic.

The researcher also wrote an application letter to the hospital director JRRH asking permission to conduct the study. The researcher clearly explained the purpose of the study to leaders in the hospital like the director, head of the department of ophthalmology, and the in-charge eye clinic. All data was handled with strict confidentiality and remained so until the end of the study. Names of patients and health workers were not reflected in the study to maintain confidentiality.

Health workers who were included in the study were fully informed about the purpose, benefits, and objectives of the study. Consent from health workers was sought verbally.

The researcher also sought consent from the in charge to allow her to use patients' records to get information.

Health workers who declined to give information were given due respect.

RESULTS

Factors associated with visual outcome of age-related cataract surgery.

Table 2: Table showing factors associated with visual outcome of age-related cataract surgery. (n=80)

Factor	Variable	Number of eyes	Percentage (%)
Age	50-59	6	7.5
	60-69	10	12.5
	70-79	44	55
	80 and above	20	25
Biometry	Done	80	100
Type of anesthesia	Local	80	100
Type of cataract surgery	SICS	80	100
IOL implantation	PENCIL	80	100
Pre-existing co-morbidity	Ocular	23	28.75
	Systemic	35	43.75
Complications	Operative	6	7.5
	Postoperative	37	46.25

From Table 2, 6(7.5%) eyes of patients between 50-59 years were operated on, 10(12.5%) eyes were for patients between 60-69 years, and 44 (55%) eyes were for patients between 70-79 years and 20 (25%) eyes for patients aged 80 years and above.

Biometry was done for all the eyes to be operated

The type of anesthesia used for all the eyes was local anesthesia

The type of cataract surgery performed on all eyes was SICS An intraocular lens was implanted in all the operated eyes 23(28.75%) eyes were found to have ocular co-morbidities before surgery and 35(43.75%) had systemic co-morbidities. 6(7.5%) eyes had operative complications and 37(46.25%) had post-operative complications

Complications that affect the visual outcome of age-related cataract surgery Operative complications

Table 3: Table showing operative complications. (n=80)

Complication	Number of eyes	Percentage (%)
Posterior capsular rupture	5	6.25
Iris injury and iridodialysis	1	1.25
None	74	92.5

From Table 3, 5(6.25%) had posterior capsular rupture during surgery and 1(1.25%) eye had iridodialysis whereas 74(92.5%) eyes did not have any complications during surgery.

Post-operative complications

Table 4: Table showing post-operative complications. (n=80)

Period	complication	Number of eyes	percentage
Day one	Corneal edema	11	13.75
	Shallow anterior AC	3	3.75
	None	66	82.5
1-2 weeks	Uveitis	12	15
	Elevated IOP	8	10
	Shallow AC	5	6.25
	IOL dislocation	1	1.25
	none	38	47.5
3-4 weeks	Elevated IOP	6	7.5
	Shallow AC	5	6.26
	uveitis	3	3.75
	none	30	37.5

At day one post-operatively 11(13.75%) eyes had corneal oedema, 3(3.75%) eyes had shallow anterior chamber and 66(82.5%) did not have any complications. Corneal edema was the commonest complication because of the type of surgery done as there is a risk of corneal endothelium damage. The shallow anterior chamber was due to a wound leak.

At 1-2 weeks, out of 64 eyes reviewed 12 (15%) eyes had uveitis, 8(10%) eyes had elevated intraocular pressure(IOP), 5(6.25%) eyes had a shallow anterior chamber, and 1(1.25%)

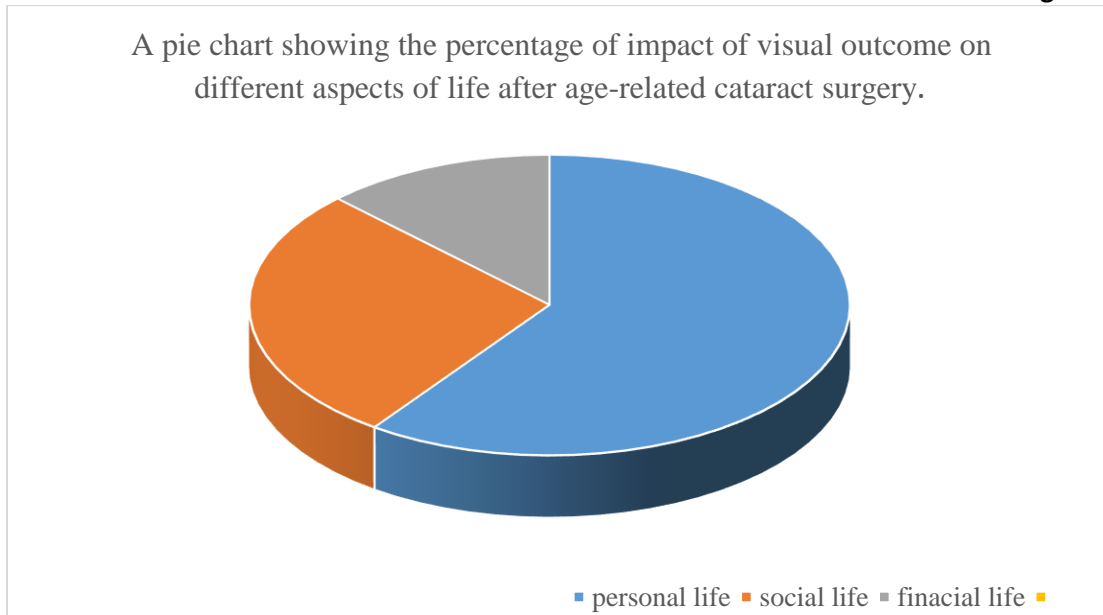
eye had lens dislocation. 38 (47.5%) eyes did not have any complications. Uveitis in the second week was due to operative complications such as posterior capsule rupture. Elevated IOP was due to uveitis and shallow anterior chamber

At 3-4 weeks, out of 44 eyes reviewed 6(7.5%) eyes had elevated IOP, 5(6.26%) eyes had a shallow anterior chamber, 3(3.75%) eyes had uveitis and 30 (37.5%) eyes did not have any complications. Elevated IOP was due to a shallow anterior chamber and uveitis.

Impact of visual outcome on quality of life after age-related cataract surgery.

A pie chart represents the visual outcome's impact on different aspects of life after age-related cataract surgery. (n=80)

A pie chart showing the percentage of impact of visual outcome on different aspects of life after age-related cataract surgery.



From the pie chart, 60% of the people reported improvement in their personal life, 27.7% reported improvement in their social life and 12.5% reported improvement in their financial life.

Out of 80 eyes operated on, 48(60%) reported improvement in quality of life on a personal basis like being able to walk without support, dressing up, cooking, and feeding. This reduced their level of dependency on other family members. 22 (27.7%) reported improvement in social relations such as more interactions with friends and family, and enjoying their hobbies and 10(12.5%) reported improved financial life like being able to go back to their jobs.

Discussions

Factors associated with surgical outcome after age-related cataract surgery.

The first objective was to determine the factors associated with surgical outcomes after age-related cataract surgery. Data analysis and interpretation revealed the following major findings under this objective. It revealed that operative and post-operative complications within 4 weeks, and pre-existing systemic and ocular co-morbidities were responsible for poor surgical outcomes. Pre-operative biometry and IOL implantation in all patients were responsible for good surgical outcomes. Post-operative complications are probably due to poor turn-up for follow-up visits and, the presence of intra-operative complications. Pre-existing ocular and systemic co-morbidities are due to the age of patients as the majority of them were aged between 70-79 years. A good surgical outcome is since biometry was done to find out the power of the IOL to implant in the eye after surgery and IOL implantation was done in all the operated eyes. These factors agree with the factors by Owolabi et al 2020 which were complications within six weeks, the presence of ocular and systemic co-

morbidity, and the presence of intra-operative complications. The rate of postoperative complications(67.5%) was lower than that reported in the Eastern region of Ghana which was above 90% as shown by the study done by A Danso-Appiah et al 2022, thus These findings disagree with the findings in this study.

Complications that affect the visual outcome of age-related cataract surgery.

The second objective was to identify complications that affect visual outcomes of age-related cataract surgery. Data analysis and interpretation revealed that operative complications included posterior capsular rupture (6.25%), and iridodialysis (1.25%). Post-operative complications included the following, on day one corneal edema (13.75%) was the commonest complication, at 1-2 weeks uveitis (15%) was the commonest complication and at 3-4 weeks elevated IOP was the commonest complication. Other complications included shallow AC (10%) and IOL dislocation (1.25%) Operative complications and corneal edema on the first day are probably due to the type of cataract surgery (SICS) that was performed on all the eyes. Uveitis in 1-2 weeks is probably due to intra-operative complications, elevated IOP in 3-4 weeks is probably due to posterior capsular rupture during surgery, uveitis, and surgical trauma such as iris injury. The percentage of posterior capsular rupture (6.25%) is higher and disagrees with that in Tehran province Iran from the study by Hashemi et al 2016 which was (2.86%). These findings agree with the complications reported by Rachael Zimlich 2021 which included corneal edema, increased pressure, iris prolapsed, wound leaks, toxic anterior segment syndrome, intraocular and lens dislocation

Impact of visual outcome on quality of life after age-related cataract surgery.

The third objective was to find out the impact of visual outcomes on quality of life after cataract surgery. Data analysis and interpretation revealed that all patients reported an improvement in personal (60%) social (27.7%) and financial (12.5%) aspects of their life. These findings indicate that the visual outcome of the age-related cataract surgery had a positive impact on the quality of life after the surgery. This is probably due to the new and improved visual acuity obtained after undergoing the surgery. These findings agree with the findings by Signes-Soler et al 2022 in West Africa (Burkina Faso) which show that cataract surgery increases the quality of life of patients living in low-income countries and the improvement correlates with the recovery of visual acuity. These findings also agree with the findings by Danquah et al 2014 in Bangladesh and the Philippines which show that cataract surgery increases the health-related quality of life, participation, and time spent in productive activities and per capita expenditure and also a reduction in assistance with activities.

Conclusions

The study specifically sought to evaluate the visual outcome, factors associated with the surgical outcome, complications that affect the outcome, and the impact of visual outcome on quality of life after cataract surgery among patients 50 years and above with senile cataracts who undergo cataract surgery in Jinja Regional Referral Hospital. The study established that good outcome was 31.25% of eyes, borderline was 17% of eyes, and poor outcome was 6.25% of the eyes at 3-4 weeks of follow-up. 20% of the eyes were not reviewed at 1-2 weeks and 45% of the eyes were not reviewed at 3-4 weeks because of poor turn-up for follow-up visits. Complications and pre-existing co-morbidities were factors associated with poor outcomes whereas biometry and IOL implantation were associated with good outcomes. Complications that affect the visual outcome include; posterior capsular rupture, iridodialysis, uveitis, shallow AC, elevated IOP, and IOL dislocation. There is a positive impact of visual outcome on quality of life including personal social and financial aspects of life after cataract surgery.

Recommendations.

The Ministry of Health through the hospital should devise a better information capture technique and find means of reaching out to patients to ensure that they turn up for follow-up visits such as sending them messages when the follow-up date is due and working with community health workers to reach out to them in case they fail to turn up. The hospital should request the government of Uganda through the Ministry of Health to provide modern equipment that uses modern technology to carry out surgery such as phacoemulsification to reduce infections and prevent complications after surgery that affect the visual outcome.

Eye health workers should put into practice the refraction of all patients to provide the best corrected visual acuity to enhance the visual outcome.

The cataract surgery uptake rate should be increased by increasing awareness, providing free cataract surgery services, and encouraging people to come for surgery when it is still early as age at the time of surgery influences the surgical outcome.

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LIST OF ACRONYMS AND ABBREVIATIONS

ACIOL Anterior Chamber Intraocular Lens

BCVA. Best Corrected Visual Acuity

ECCE Extracapsular Cataract Extraction

HRQoL Health-Related Quality of Life

ICE

Intracapsular Cataract Extraction

IOL Intra ocular lens

IOP Intraocular pressure

JRRH Jinja Regional Referral Hospital

LMCs in Low- and Middle-income countries

PCO Posterior Capsular Opacification

VA. Visual Acuity

WHO. World Health Organization

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Conflict of interest

The author declares no conflict of interest.

REFERENCES

- 1) Abiola T.Owolabi, Susannah T. Adepoju, Olawale Oladejo, Kunle I.Oreagba; Factors associated with cataract surgery outcomes in a tertiary health facility in Oyo state, Nigeria; A retrospective study 2020;4(3):146-153
- 2) Anthony Danso-Appiah, Agatha Mena-Debrah, Kwado Owuso Akuffo, Priscilla Nortey, Isaiah Osel Duah Junior; post-operative vision outcomes after cataract surgery in the Eastern region of Ghana; 2022
- 3) Bulus SS, Baker AS, Diyala PS, Mahmoud Z. Visual outcome of cataract surgery from a free outreach camp among rural areas of Southern-

Kaduna, Nigeria. *Glob J Cataract Surg Res Ophthalmol* 2022; 1:15-20.

- 4) Daily Monitor Monday, December 27, 2021
- 5) Daily monitor Sunday, April 4th 2022
- 6) Danquah L, Kuper H, Eusebio C, Rashid MA, Liza Bowen, Foster A, Sarah Polack; The long-term impact of cataract surgery on quality of life, activities, and poverty: Results from a six-year Longitudinal study in Bangladesh and the Philippines, 2014. *PLoS ONE* 9(4).
- 7) Eunyoo Kim, Donghae Kim, Jaeyun Kim, Lisa Park; A cross-sectional study on Outcomes of Cataract Surgery in Kampala, Uganda Using VFQ-25. 2018; 59(9):
- 8) Hashemi, Hassan; Rezvan, Farhad; Etmad, Koroush; Galasi Hamidreza, Asgari, Soheila, Mahdavi, Alizera, Mohzabi-Torabi, saman, Yekta, Abbasali, Khabazhoob, Mehdi, intraoperative complications of cataract surgery in Tehran province, Iran, 2016 Volume 93-Issue 3-P 266-271 doi: 10.1097/OPX.0000000000000795
- 9) Isabel Signes-Soler, Jaime Javaloy, Robert Montes Mico, Gonzalo Munoz, Raul Montalban, Ana Maria Hernandez, Ceasar Albarran; Vision-related Quality of Life after Cataract surgery in West Africa, 2022; <https://doi.org/10.21203/rs.3.rs-1675926/v1>
- 10) Jack J. K., Brad B., Kanski Clinical Ophthalmology, a systematic approach, Elsevier publishers,2016, 8th edition page 270, 288,293
- 11) Jessica Randolph, Brandon Baartman, Kelly Miller, Jamie Choi, Alpa S.Patel, Derek W DelMonte; cataract surgery complications; 2022
- 12) Markos CM, Tamrat LT, Asferaw MA. Outcomes and Associated Factors of Cataract Surgery among Adults Attending a Tertiary Hospital in Addis Ababa, Ethiopia. *Patient Relat Outcome Meas.*2020 Dec 9; 11:231-239. Doi:10.2147/PROM.S280049. PMID:
- 13) Racheal Zimlich, RN, BSN; What to know about cataract surgery complications, 2021
- 14) Renu Jogi(©2009)Basic Ophthalmology(fourth edition)
- 15) Taku Toyama, Takashi Ueta, Masato Yoshitani, Rei Sakata, Jiro Numaga; Visual acuity improvement after phacoemulsification
- 16) cataract surgery in patients aged \geq 90 years, 2018.
- 17) Yong G-Y, Mohamed-Noor J, Salowi MA, Adan TH, Zahari M(2022) Risk factors affecting cataract surgery outcome: The Malaysian cataract surgery registry. *PLoS ONE* 17(9): e0274939.doi:10.1371/journal.pone.0274939.

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