INTRODUCTION

Cataracts cause decreased vision due to the opacification of the lens in the form of changes in color, density, and clarity in response to increased age, trauma, or other toxic exposures. Degenerative processes cause most cataracts. Globally, cataracts accounted for 51% of total blindness in 2010. Based on the Rapid Assessment of Avoidable Blindness (RAAB) survey, the prevalence of blindness at the age of 50 years ranges from 1.7 to 4.4%, with cataracts occupying 77.7% of the total blindness in Indonesia. Cataracts will cause disorders, limitations, and restrictions in patients that impact their physical, social, and daily activities. These problems will impact socioeconomics due to the limitations in independence and productivity. Even though people are still at a productive age, if they have activity limitations, such as the consequences of cataracts that cause visual impairment, they cannot work properly and will be classified as a non-productive age.

Cataract surgery is the only treatment for cataracts with a high success rate in restoring vision. Cataracts are extracted and replaced with artificial intraocular lenses. The number of cataract surgeries can be determined from the Cataract Surgical Rate (CSR) number. In Indonesia, CSR reached 1,600 in 2018, with a target of reaching 2,000-3,000 in 2030. The low rate of cataract surgery in Indonesia causes many untreated cases, with an increase in new cases by 0.1% (240,000 new cases) every year, which causes a backlog of cataracts. Even if a cataract surgical procedure is safe for more than 95% of cases, complications are still possible. The most frequent intraoperative complications are posterior capsule rupture (PCR), ranging from <1 to 4.1% and zonular dehiscence, ranging from 0.46%. While the most frequent postoperative complication is posterior capsule rupture (PCO), which can be treated with a capsulotomy procedure YAG reaches 20.4%. Observation of the impact of this treatment that has been carried out is very important to be monitored, as is observing the quality of life after surgery.

Quality of life is an individual's perception of his position in the context of the culture and value system in which he lives and relates to one's goals, expectations, established standards, and concerns. Quality of life includes four dimensions: physical health, psychological well-being, social relationships, and relationships with the environment. Objective assessments of the impact of cataracts, such as visual acuity, contrast sensitivity, and stereopsis, have not been able to describe overall visual function, so a subjective assessment is carried out in the form of a quality of life assessment.

METHODS

After doing a literature search and gathering information from numerous reliable sources, this narrative review of the quality of life after cataract surgery was created. There are 21 research publications that were found using the keywords “cataract”, “cataract surgery”, “patient-reported outcome”, and “quality of life” to compile this overview of the literature. The journals used in this literature review are sourced from reputable academic
Factor Related to the Outcome of Cataract Surgery

Monitoring cataract surgical outcomes can be observed in four categories: selection (selection of patients related to poor visual acuity due to preoperative comorbidities such as corneal opacity, glaucoma, and damage to the retina and optic nerve); surgery (surgery-related intraoperative and postoperative complications that affect visual acuity, including lens capsule rupture, iridodialysis, zonular dehiscence, presence of residual material, wound leakage, severe uveitis, and keratopathic striae); spectacles (eyeglass correction); and sequelae (post-operative complications such as posterior capsule opacification, retinal detachment, uveitis, and secondary glaucoma).15,16

Recommendations for evaluation of surgical outcomes in each patient can be measured, including (1) visual acuity with or without the best correction; (2) measurement of refraction and deviation from the postoperative refractive target; (3) incidence of intraoperative or postoperative complications; and (4) return to the operating room for any secondary surgical intervention.15,16

Visual Acuity

Visual acuity before the surgery was a poor predictor of postoperative visual function, even though it was often used as a primary indication when to do cataract surgery. It was assumed that postoperative visual function depends on retinal and optic nerve conditions instead of the severity of the cataract itself. In addition, preoperative visual acuity was measured monocularly, while the function was measured binocularly. Thus, the difference in visual function across the eyes rather than the visual function of each eye being evaluated separately may be more closely related to the patient's perceived visual difficulties. When examining binocular function and subjective visual function, patients with bilateral cataracts have better outcomes following bilateral cataract surgery than unilateral cataract surgery. The advantages of cataract surgery increase after the second cataract surgery. A study by Kessel et al. found that 98.1% of patients with fair preoperative visual acuity (≥40 ETDRS) and 98.8% of patients with poor preoperative visual acuity ≤39 ETDRS experienced an improvement in visual acuity following cataract surgery and there was no statistically significant difference.17–19

Co-existing Ocular Comorbidities

Preoperative comorbidities were also risk factors for poor outcomes. Ocular comorbidities include corneal scars, old iritis, retinal disease, glaucoma, and others. For example, as retinopathy grading became more severe, visual acuity and visual function improvements became less significant.20

Surgeon

Surgical Technique

The transition of surgical techniques from intracapsular cataract extraction (ICCE) to extracapsular cataract extraction (ECCE) and Small Incision Cataract Surgery (SICS) has occurred in the last decade. Poor outcomes were a risk factor for those who underwent the ECCE technique. Even SICS or phacoemulsification was probably the preferred treatment, ECCE being used as a conversion technique when the surgeon found difficulties such as small pupil, pseudo-exfoliation, corneal haze, etc. In addition, Gogate et al. found improved outcomes as they changed technique from ECCE to SICS over time.2,20

In developed countries, manual ECCE has been replaced by phacoemulsification techniques, demonstrating their superiority. The superiority of rapid visual improvement, or at least astigmatic induced by cataract surgery, is also considered in developing countries. However, the high price of phacoemulsification equipment is not comparable to the ability of poor or developing countries to eradicate cataract blindness.2,20 Between the two cataract extraction procedures, such as SICS and phacoemulsification, it is questionable which procedure is safer and provides good visual acuity for patients. The nucleus is extracted with SICS, and the polymethyl methacrylate (PMMA) intraocular lens is implanted through a self-sealing scleral incision. This technique is cheaper regarding capital equipment, equipment maintenance, and disposable costs per case. SICS is a good alternative for countries requiring very high-volume operations with inexpensive instruments. It is the best method of community-based surgery and has cost-effectiveness and early rehabilitation of patients. Although phacoemulsification is the preferred cataract surgery technique worldwide, cheaper methods are gaining popularity in developing countries where a growing backlog of cataract blindness has resulted from insufficient eye health resources.20,22

Surgeon’s Skill

Increased surgical experiences from the cataract surgeon are associated with a lower risk of intraoperative and postoperative complications, as well as the need for re-surgery. Gupta et al. reported that odds decreased by 17% (intraoperative complications), 12% (postoperative complications measured 1 day after surgery), and 7% (re-surgery) per 100 additional surgical experiences performed. This study recommends ophthalmology residency programs in developing countries that teach SICS provide the opportunity to perform 300 or more surgeries on residents to achieve intraoperative and postoperative complication rates of less than 2%.21 In addition, Haripya et al. reported SICS is a safer initial procedure to learn for inexperienced cataract surgeons in developing countries.23

Complications of the Surgery

Numerous efforts are made to minimize the occurrence of intraoperative and postoperative complications. Patients are prepared carefully since initial screening as the feasibility of surgery. Patients who have systemic diseases such as diabetes mellitus and hypertension should be regulated first. Complicating factors such as shallow anterior chamber depth (ACD), small pupils, and the presence of synechiae require special preparation and the selection of appropriate surgical techniques.
techniques. Surgery time is also significantly influenced by the type of anesthesia, the level of case complexity, the size of the pupil and the pupil expander devices used, and intraoperative complications.24,25 Intraoperative complications such as iris prolapse, posterior capsule rupture, zonular dialysis with or without vitreous loss, etc. Postoperative complications include hyphema, retained lens material, choroidal effusion, endophthalmitis, etc. A study by Winarti et al. found a significant difference between the number of complications of the posterior lens capsule tearing and aphakia with different operator skill levels.26

Post Operative Follow Up Care

Visual acuity should be evaluated at follow-up for all patients undergoing cataract surgery up to the twelfth week. The recommended postoperative visual acuity is divided into three categories uncorrected visual acuity (UCVA) and the best uncorrected visual acuity (BCVA): good (20/20-20/60) 80% and 90%, borderline (<20/60-20/200) 15% and 5%, and poor (<20/200) 5% and 5%,27-29 Postoperative follow-up is very important to find out the results of surgery, therapy, and plan to provide valid feedback on the quality of surgical results for cataract surgery for future improvement.24,25,30 Some strategies to improve the follow-up rate after surgery should be considered, such as transportation reimbursement, free spectacles, reminders, and proper counseling needed.2

Based on some studies, another risk factor for poor cataract outcomes is increasing age and gender. Increasing age could come along with ocular co-morbidities, which could be underdiagnosed before surgery because the cataracts in older patients were more likely to be denser. Even after controlling or managing those ocular comorbidities, it was discovered that increasing age predicted poor outcomes.2,20,21 On the other hand, cataract patients in younger age groups have more active and important social and family roles than those in older age groups. This can lead to higher expectations of visual ability and may encourage cataract sufferers in younger age groups to seek treatment sooner. This results in their visual impairment becoming milder in the early stages.31 Poor outcomes of cataract surgery were also associated with the female gender, as mentioned in several research. The pre-existing ocular comorbidity or condition may have been obscured because females were probably examined for cataracts later than males and had worse cataracts, likely impacting outcomes.2,21 But in contrast with the study by Matta et al., good outcomes after cataract surgery are most likely in female patients.20,32

Visual Acuity Related to the Quality of Life After Cataract Surgery

Zhu et al. showed that visual acuity is the most important factor associated with decreased vision and quality of life, and a study conducted by Chan et al. reported that visual acuity has a high correlation with quality of life.5,33 Polack et al. sought to explore factors related to changes in preoperative and postoperative quality of life scores. The influence of overall vision and general and psychosocial functioning consistently had a major impact on each level of visual acuity, indicating that surgery at the visual level of <6/24 is beneficial to the quality of life associated with visual acuity. Improvements in quality of life also consistently improved in people who had bilateral cataract surgery compared to unilateral surgery alone, so it was concluded that surgery in both eyes provided more benefits, so efforts were made to support surgery until the second eye. Poor postoperative visual acuity is associated with minimal improvement in quality of life. Visual acuity results that unmet the World Health Organization (WHO) target criteria indicate the need for improved surgical outcomes to optimize quality of life. Monitoring visual acuity is a priority in postoperative cataract services to assess the cause and determine the appropriate intervention.34,35

Psychosocial

Blindness leads to disability, leading to social exclusion and stigmatization that interfere with access to social networks, formal services, or social institutions. To assess the social status of patients who had undergone cataract surgery, Finger et al. assessed whether patients who were widowed before and after cataract surgery were married as a result of reduced stigma and increased community skills. There is an increase in remarriage among widows or widowers with cataracts who have been operated on. Conversely, the failure of cataract surgery results in continued poverty and decreases the chance of remarriage for widows. This assessment was conducted because social status and stigmatization are difficult to measure.34,35

Education

Cataract patients with higher levels of education have better mental health compared to those with lower education. Patients with a higher education level may have better knowledge of eye health. Zhu et al. report that knowledge of eye health conditions positively predicts quality of life. Knowledge about cataracts affects the quality of life associated with visual acuity,
especially mental health, so clinicians must be able to deliver general education about cataracts when examining patients.5

Environment
The impact of cataract surgery on general health and quality of life in high-income countries has been inconsistent; some studies show significant improvements, but others do not. This result could be influenced by poor awareness of vision function to improve quality of life or poor sensitivity to the questionnaires used. In addition, the severity of bilateral cataracts, especially in low-income countries, also affects this difference. Differences in living standards and the availability of eye health care also contribute.34

Quality of Life and Assessment Tools
Globally, there is no agreed definition of quality of life. The quality of life of each individual is different because each individual has different life goals, expectations, standards, and concerns. Therefore, quality of life is considered a broad concept for a person because it affects their physical health, psychological health, level of dependence, social relationships, personal beliefs, and relationship with their desires for their environment.39,40 According to the World Health Organization Quality of Life Brief Version (WHOQOL-BREF), there are four dimensions regarding the quality of life: 1) The dimension of physical health, which includes daily activities, dependence on drugs, energy and fatigue, mobility, pain and discomfort, sleep and rest, and work capacity; 2) Dimensions of psychological well-being, which include physical appearance, negative and positive feelings, self-esteem, spiritual/religious/personal beliefs, thinking, learning, memory, and concentration; 3) The dimension of social relationships, including personal relationships, social support, and sexual activity; 4) The dimension of the relationship with the environment, including financial resources, freedom, security, and physical safety; health and social, including accessibility and quality; home environment, opportunities to gain new information and skills; participation and the opportunity to engage in recreation and fun activities in free time; physical environment, including pollution, noise, traffic, and climate; as well as transportation.11

The quality of life after cataract surgery can be measured using assessment tools such as questionnaires.11 There are two generations of questionnaires as instruments that can be used. Traditional first-generation patient-reported outcome (PRO) instruments have been developed and validated using classical theory. This instrument uses a score inference method that incorrectly assumes that the number of answers represents a fundamental measurement, therefore allowing arithmetic uses such as addition or subtraction and all assessments in the questionnaire to have the same difficulty level. One of this first generation’s most widely used instruments is the Visual Functioning Index-14 (VF-14).41,42 In contrast to the second-generation PRO, which uses modern psychometric theory, this method shows that all hypotheses can be wrong. Rasch analysis assesses the assumptions about which assessment methods were agreed upon in the first generation. Rasch’s study presents empirical evidence of estimates of interval scales from participants and scoring scores on the same matrix. Also, it provides comprehensive psychometric validation not presented on first-generation PRO instruments. One of the second-generation PRO instruments is the Catquest-9SF questionnaire, designed to determine the benefits of cataract surgery in various populations.29,30,33,34 Catquest-9SF is now widely available in several countries and has been validated in various populations and translated into various languages: Chinese (Mandarin), Malay, Italian, Austrian (German), Australian, Danish, Spanish, Dutch, English, and Swedish.43–45

The limitation of this literature review is a bias due to the difference in objective visual function between the eyes that evaluate monocularly and the perception of visual ability that comes from binocular function. In addition, there are also differences in outcomes and impacts on quality of life for patients with unilateral or bilateral cataract surgery. Unilateral cataract surgery may change the quality of life, while the other changes after bilateral cataract surgery. These may result from the different severity of visual impairment in both eyes, barriers to eye care, or other reasons. These issues will likely be settled by conducting a larger research scale with clearly determined criteria. Also, a brief explanation to the respondents should be granted so that patient-related outcomes to assess quality of life will be appropriate.

CONCLUSION
The quality of life assessment after cataract surgery is a global concern for eye health issues. Cataract surgery significantly improved the quality of life across all studies in developed and developing countries. This research has a major contribution to policymaking related to managing blindness due to cataracts in various countries, considering that cataracts are the second largest cause of blindness in the world after refractive errors. After cataract surgery, patients get postoperative ocular outcomes in the form of visual acuity improvements and non-ocular outcomes such as increased productivity, income, and improved social status that will improve quality of life. Thus, high-quality cataract surgery must also be provided to the community so that blindness rates can be overcome, and the achievement of a good quality of life for postoperative patients will also support the achievement of the Millennium of Development Goals (MDGs).

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REFERENCES


