

An Overview of the Quality of Life of Cataract Patients after Cataract Surgery at the Tabanan Regional General Hospital

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Abstract: *Cataract is a disease which an opacification process happened in the crystalline lens. Assessment of quality of life will give an overview about cataract's impact individually. The purpose of the study is to: 1) determine the quality of life; and 2) determine clinical factors that affect patients' quality of life after cataract surgery at Tabanan Regional General Hospital in the period of January 2021 to January 2022. This research is a cross-sectional analytic study. Data collected using the National Eye Institute Visual Function Questionnaire-25 (NEI VFQ-25) and medical records at Tabanan Regional General Hospital. The study sample was 23 respondents who had undergone cataract surgery which were selected through consecutive sampling method. Socio-demographic characteristics were obtained, namely the average age of respondents was 63.45 years, female respondents was 65.2%, respondent's occupation with frequent UV exposure was 65.2%, and respondent's education level who graduated from elementary school was 52.2%. Respondents with mature senile cataract were 69.6%. The most frequent surgery was Small Incision Cataract Surgery (SICS) with 69.6%. There was no significant association between postoperative visual acuity, type of cataract surgery, postoperative duration, and comorbid on the respondent's quality of life. The average quality of life obtained in this study was 82.29%.*

Keywords: Cataract, Quality of life, risk factors

1. Introduction

Cataract is an opacification disease in the crystalline lens of the eye which is mostly caused by a degenerative process. The increasing life expectancy causes the growth in the prevalence of blindness due to cataracts to increase every year [1, 2]. As many as 36 million people experience blindness worldwide and 12 million of them are caused by cataracts [3]. According to the Rapid Assessment of Avoidable Blindness (RAAB) conducted in 15 provinces in Indonesia, the prevalence rate of blindness in the population aged over 50 years in Indonesia reached 3% of the total population. As many as 34.4% of the total blindness cases were caused by cataract [4].

Cataracts have mild symptoms at first and worsen with aging process [2]. Respondents with visual impairment will have difficulty in carrying out daily activities and affect the patient's independence [5]. Social and economic disturbances can also occur significantly due to visual impairment if it is not treated immediately. Visual impairment with the same value in visual function examination can have a different impact on each individual [6]. An individual assessment of the impact of visual impairment must be carried out based on the individual's point of view. Assessment of the level of quality of life is a way to measure the impact of the disorder experienced by the individual personally [5].

One of the instruments used massively by researchers worldwide to assess visual impairment is the National Eye Institute Visual Function Questionnaire-25 (NEI VFQ – 25), assessing the general health, visual health, eye discomfort, near vision, far vision, social functioning, mental health, role

limitations, independence, driving ability, color vision, and peripheral vision [7, 8].

Cataract is a preventable and treatable visual disturbance through surgery. The development of surgical methods makes cataract treatment possible earlier with minimal risk of complications. Preventive measures and targeted treatment will improve the visual system and visual function of the sufferer. It is hoped that the reduced level of independence of each individual will have a positive impact on improving the patient's quality of life [7]. The level of quality of life of cataract patient which is assessed subjectively can give knowledge to healthcare workers how much impact cataract disease has on the life of the patient. With this knowledge, it is hoped that health worker can provide better health services in the future.

2. Methods

Study design and setting

This is a cross-sectional analytic study. The research was carried out at the Eye Clinic of the Tabanan Regional General Hospital. The population of this study were cataract patients who were undergoing treatment at the Tabanan Regional General Hospital from January 2021 to January 2022. The inclusion criteria in this study were: 1) patients had been diagnosed with cataracts and 2) patients who have received cataract surgery treatment and are undergoing treatment at the Tabanan Regional General Hospital during January 2021 to January 2022. The exclusion criteria in this study were: 1) there were other visual disturbances caused by systemic disease that was not controlled before the procedure of cataract surgery so that it interferes with the visual axis such as pterygium grade III – IV, central corneal

scarring, all types of glaucoma, retinopathy, and optic neuropathy.

Study population

This study used a consecutive sampling technique. Sample selection determined subjects who meet the research criteria are included as research samples. The sampling period in this study was done in one month. The number of samples obtained were 23 subjects that have qualified the inclusion criteria.

Questionnaire design

The research's data was collected by interviewing the respondents with a research questionnaire guide. The questionnaire used in this study referred from NEI VFQ-25. The aspects covered in this questionnaire are general health, visual health, eye discomfort, near vision, far vision, social functioning, mental health, role limitations, independence, driving ability, colour vision, and peripheral vision divided into 25 questions [6]. Beside the question from the NEI VFQ-25, there are also closed question about sociodemographic aspects which is age, sex, occupation status, and educational level.

In addition to using questions in the questionnaire, this study also collected secondary data. Visual acuity, postoperative period, type of cataract surgery, and medical history were collected through the respondents' medical record. Data were collected after the interview process was conducted.

Data collection, management, and statistical analysis

The aims of this study are to 1) determine the quality of life of cataract patients after cataract surgery at Tabanan Regional General Hospital and 2) determine the clinical factors associated with the quality of life of cataract patients after cataract surgery. Quality of life was assessed based on respondent's answers to the NEI VFQ-25 questionnaire. Each question item is assessed with a value range of 0-100% with the best score of 100% and the lowest score of 0%. The scores for each question were averaged and based on these results, the quality of life categories were divided into good quality of life (>80%), sufficient quality of life (50%-79%), and poor quality of life (<50%). The assessment of each aspect of quality of life is assessed based on the average score of each question that is correlated with each aspect in percentage.

The statistical analysis was carried out between clinical factors and the category of quality of life. Clinical factors consist of visual acuity, postoperative period, type of cataract surgery, and medical history. These clinical factors were divided into categorical groups. Data analysis was carried out using the Chi-Square test. Data have been entered and analysed using Statistical Product and Service Solutions (SPSS) 26th version.

3. Results

The research was conducted at the eye clinic of the Tabanan Regional General Hospital using the NEI-VFQ 25 questionnaire as the primary data source. Researchers have conducted interviews with 23 respondents who met the inclusion criteria.

Sociodemographic

Respondents in this study had an average/mean age of 63.45 years old with the youngest respondent's age being 41 years and the oldest respondent being 92 years old. Based on sex, there were 15 female respondents (65.2%) and 8 male respondents (34.8%). Respondents who have a history of work with frequent UV exposure are 15 people (65.2%) and respondents who have a history of work with rare UV exposure are 8 people (34.8%). The education level of the most respondents was elementary school graduates as many as 12 people (52.2%), followed by respondents who did not go to school as many as 4 people (17.4%), respondents graduated from high school as many as 3 people (13%), respondents graduated from junior high school as many as 2 people (8.7%), and respondents from college graduates as many as 2 people (8.7%) (**Table 1**).

Clinical factors

The respondent's clinical factor assessed in the form of post-operative visual acuity, type of cataract surgery, the respondent's post-operative period, and the respondent's previous illness history. Postoperative visual acuity of respondents with mild vision impairment or no complaints was found among 18 respondents (78.3%) and 5 respondents had moderate visual impairment (21.7%). The surgery that was carried out at Tabanan Regional General Hospital was the Small Incision Cataract Surgery (SICS) method and phacoemulsification. A total of 16 people (69.6%) underwent SICS and 7 (30.4%) underwent phacoemulsification surgery. A total of 10 people (43.5%) were interviewed after surgery in a period of 1 week – 1 month, 10 people (43.5%) interviewed after undergoing cataract surgery in a period of 1 month to 6 months, and 3 people (13, 0%) interviewed 6 months after undergoing surgery. Respondents without previous medical history were 9 people (39.1%), 3 people (13.0%) with diabetes mellitus (DM), 10 people (43.5%) with hypertension (HT), and 1 person (4.3%) with diabetes mellitus and hypertension (**Table 2**).

Quality of life

Respondents' assessment of general health was 64.1%, visual health conditions after cataract surgery was 61.9%, eye discomfort was 79.1%, near and far vision were 85.5% and 86.2%, respectively, peripheral vision ability was 92.3%, and color vision ability was 97.8%. The average value of the respondent's quality of life is 82.2% which shows that the respondent's quality of life is in the good category (**Table 3**). The number of respondents who reported a good quality of life was 15 respondents (65.2%), the number of respondents who reported sufficient quality of life was 8 respondents (34.8%) and there are no respondents who reported a poor quality of life after cataract surgery (**Table 4**).

Association between the type of cataract surgery and the level of quality of life

Respondents who underwent SICS surgery with good quality of life and sufficient were 10 respondents and 6 respondents, respectively. Compared to respondents who underwent phacoemulsification, 5 respondents and 2 respondents reported good quality of life and sufficient, respectively. The chi square test between types of surgery

and quality of life showed no significance with a P value of 0.679 (Table 5).

Association between postoperative period and the level of quality of life

It can be seen that there are 5 respondents who have a post cataract surgery period of less than 1 month with a good quality of life and 5 respondents also have sufficient. Next, the respondents who had undergone cataract surgery 1-6 months earlier with good quality of life were 8 respondents and 2 respondents were sufficient. Finally, there were two respondents with a post cataract surgery period of more than 6 months and good quality of life and one respondent is sufficient. Next is testing the period hypothesis with quality of life status using the Chi-square test. Based on the chi square test between the postoperative period and the level of quality of life showed a p value of 0.370. The post-cataract surgery period has no effect on the quality of life (Table 5).

Association between post-cataract visual acuity and quality of life

The third is the exposure between the categories of visual acuity after cataract surgery and the level of the group of respondents who had mild vision impairment with a good quality of life there were 12 respondents and there were 6 respondents with sufficient quality of life. Next, respondents who have moderate vision impairment with good quality of life are 3 respondents and 2 respondents have sufficient quality of life. Based on the chi-square test between postoperative visual acuity and quality of life showed a P value of 0.78 which means that postoperative visual acuity has no effect on the level of quality of life. (Table 5)

Association between comorbid with quality of life

The last is the association between previous illness history and the level of quality of life. In respondents who do not have a history of disease with good quality of life there are 6 respondents and adequate quality of life there are 3 respondents. Next, respondents diagnosed with type II DM with good quality of life were 2 respondents and 1 respondent had sufficient quality of life. Furthermore, there are 6 respondents diagnosed with hypertension with good quality of life and 4 respondents with sufficient quality of life. The last respondent who was diagnosed with type II DM and hypertension with a good quality of life was 1 respondent and the quality of life was quite non-existent or zero. Next is testing the hypothesis of past medical history with quality of life status using the Chi-square test. Based on the chi square test between previous illness history and quality of life shows a p value of 0.88 which means comorbid has no effect on the level of quality of life. (Table 5)

4. Discussion

Based on the age aspect, the results of this study are in accordance with research conducted by Lisnawati *et al.* where in this study the age of the majority of respondents in the study was mostly in the age group of 65-70 years [9]. The results of the study by Fadhillah, *et al* also showed that the number of cataract respondents aged > 57 years [5]. Cataract is a progressive disease that develops with increasing age. Respondents over 50 are at risk for having

nuclear cataracts. Nuclear cataracts usually occur due to a degenerative process of lens cells that causes the lens to turn yellow or brown and affect the patient's vision. The pathophysiology of cataracts is strongly influenced by the ongoing metabolic processes of the crystalline lens, resulting in lens opacification [10].

The ratio between sexes in this study is similar to the results of a study conducted by Fadhillah *et al.* which stated that there were more female cataract sufferers than male. Another study conducted by Lisnawati *et al* showed similar results, namely the proportion of female cataract sufferers was greater than male [9]. Women have a greater likelihood of developing cataracts due to the process of changing estrogen levels along with the menopause process. Changes in estrogen levels stimulate the production of inflammatory cells such as C-reactive protein which causes the cataract formation process to occur more quickly. This process also increases the likelihood of developing PSC-type cataracts [12].

Occupational status in this study were divided into jobs with frequent UV exposure and infrequent UV exposure. The results obtained in this study are similar to those of Miyashita which showed that there was a relationship between cataract formation in individuals with higher levels of ultraviolet exposure compared to groups exposed to lower levels of UV light [13]. The process of clouding of the lens can be accelerated by the formation of oxidative stress produced through the reaction of UV light with protein composition in the lens. UV light can replace oxygen in lens metabolism so that oxidative stress is formed in the glycation process [10]

In this study, all respondents experienced improved vision after cataract surgery. The majority of new cataract patients want treatment when their visual acuity is very bad. This condition can occur due to several factors, namely the respondent's low level of education and increasing age, causing literacy of improvements in cataract treatment impacts cataract management to be delayed [1]. Overall cataract surgery causes postoperative visual acuity of cataract sufferers to increase resulting improvement the quality of life. However, these results lead to a homogeneous data set in this study due to the small number of samples so that the results of the postoperative visual acuity analysis do not correlate with the level of quality of life of the respondents in this study.

Not all respondents can have optimal visual acuity after cataract surgery is performed. It requires time to heal, adjust, and correct eyeglasses after surgery [6]. In the post-cataract surgery period some patients will experience pain and an uncomfortable sensation in the eye. These sensations include itching, feeling lumpy, and burning sensation in the area around the eye that has been operated on. Total recovery after cataract surgery will occur in the sixth week [15]. The healing process affected the collection of questionnaires in this study. The majority of respondents are cataract sufferers who have just been operated on in a period of less than 1 month so that almost half of the total respondents have not achieved optimal results from the cataract surgery process

they underwent. These results lead to data analysis that does not have a significance with quality of life individually.

The results of the analysis between the history of comorbidities and the level of quality of life in this study were not in accordance with the research conducted by Hidayaturahmah *et al* which stated that the history of comorbid diseases was one of the factors that influenced the level of quality of life [16]. In the study conducted by Hidayaturahmah *et al*, Quality of life assessment is carried out when cataract sufferers have not been operated on so that this causes the quality of life of cataract patients to be lower than the sample population in this study. This causes a difference in the results of the analysis of the quality of life level where the quality of life in this study is higher than in similar studies.

5. Conclusion

The majority of cataract patients who underwent cataract surgery at Tabanan regional General Hospital for the period January 2021 to January 2022 have good quality of life. Clinical factors such as type of cataract surgery, post-cataract surgery period, postoperative visual acuity, and comorbid did not have a significance with the quality of life of cataract patients after cataract surgery.

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Tables

Table 1: Sociodemographic characteristic of the respondents

Characteristic	N	%
Age (year)		
40 – 45	2	8.7
46 – 50	1	4.3
51 – 55	3	13.0
56 – 60	5	21.7
61 – 65	2	8.7
66 – 70	6	26.1
>70	4	17.4
Sex		
Male	8	34.8
Female	15	65.2
Occupation Status		
Frequent UV exposure	15	65.2
Infrequent UV exposure	8	34.8
Educational status		
Not in school	4	17.4
Elementary school	12	52.2
Junior high school	2	8.7
Senior high school	3	13.0
College	2	8.7

Table 2: Clinical factor of the respondents

Category	N	%
Cataract diagnosis		
Immature senile cataract	7	30.4
Mature senile cataract	16	69.6
Preoperative visual acuity		
Mild impairment	0	0
Moderate impairment	2	8.7
Severe impairment	5	21.7
Blind	16	69.6
Postoperative visual acuity		
Mild impairment	18	78.3
Moderate impairment	5	21.7
Severe impairment	0	0
Blind	0	0
Surgical method		
SICS	16	69.6
Phacoemulsification	7	30.4
Postoperative period		
1 week-1 month	10	43.5
1 month – 6 month	10	43.5
> 6 month	3	13.0
Comorbid		
None	9	39.1
Diabetes Mellitus	3	13.0

Hypertension	10	43.5
DM and HT	1	4.3

Table 3: Assessment of each aspect from quality of life of the respondents

Category	Mean value (%)
General health	64.13
Visual health	61.95
Eye discomfort	79.13
Near vision	85.51
Far vision	86.23
Social function	89.67
Mental health	85.97
Role impairment	85.65
Dependencies	76.81
Color vision	97.82
Peripheral vision	92.39
Mean of quality of life	82.29

Table 4: Quality of life category

Category	N	%
Good quality of life	15	65.2
Sufficient quality of life	8	34.8
Less quality of life	0	0

Table 5: Association between clinical factors and quality of life

	Quality of life category		Total	P Value
	Good quality of life (N=15)	Sufficient quality of life (N=8)		
Surgical methods				
SICS	10 (62.5%)	6 (37.5%)	16 (100%)	0.679
Phacoemulsification	5 (71.4%)	2 (28.6%)	7 (100%)	
Postoperative period				
1 week-1 month	5 (50.0%)	5 (50.0%)	10 (100%)	0.370
1-6 month	8 (80.0%)	2 (20.0%)	10 (100%)	
>6 month	2 (66.7%)	1 (33.3%)	3 (100%)	
Postoperative visual acuity				
Mild impairment	12 (66.7%)	6 (33.3%)	18 (100%)	0.782
Moderate impairment	3 (60.0%)	2 (40.0%)	5 (100%)	
Comorbid				
None	6 (66.7%)	3 (33.3%)	9 (100%)	0.882
Diabetes mellitus	2 (66.7%)	1 (33.3%)	3 (100%)	
Hypertension	6 (60.0%)	4 (40.0%)	10 (100%)	
DM + HT	1 (100%)	0 (0.0%)	1 (100%)	