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## Original Research Article

## Assessment of quality of life of patients which visual impairment and a diagnosis of cataract

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## ABSTRACT

**Background:** Cataract is the leading cause of blindness, reducing economic productivity further leading to reduced quality of life (QOL). Various studies done around the globe have demonstrated that cataract and its diagnosis have been associated with poor quality of life and increased mortality. A thorough literature search showed limited study to assess the quality of life in patients with cataract in India. Hence, we designed this study to assess the quality of life of patients which visual impairment and a diagnosis of cataract.

**Materials and Methods :** This cross-sectional study was conducted in patients diagnosed with cataract with visual impairment visiting the tertiary care center. The study was approved by the Institutional Ethics Committee and patients were recruited after they gave written informed consent. The participants were divided into two groups, Group 1 consisted of male patient whereas Group 2 consisted of female patients. The participant was assessed for visual functioning (VF) and Quality of Life.

**Result:** The results of our study have demonstrated that out of total 84 participants recruited in the study, majority of them were female (n=50) and both groups were comparable at the time of presentation. All patients had a significant visual impairment at the time of presentation with 22 male participants and 33 female participants had grade III or more visual impairment. All patients had compromised quality of life as evident by the responses obtained from the participants on the visual functional score and quality of life scores. There was also a statistically (p<0.05) higher number of female participants as compared to male participants who had quite a lot of problems of noticing of objects off to side, had to make adjustment to darkness after being in bright light, problem in locating things when it was surrounded by lot of other things.

**Conclusion:** All patients had compromised quality of life as evident by the responses obtained from the participants on the visual functional score and quality of life scores. Though participants in both groups with grade III onwards had higher visual functional scores and quality of life scores.

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## 1. Introduction

Cataract is the leading cause of blindness worldwide which is defined as any opacification in one or more layers of the crystalline lens that that obstruct the passage of

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light and cause a reduction of vision.<sup>1–3</sup> It is responsible for 47.8% blindness affecting approximately 17.7 million people worldwide.<sup>1,2</sup> Cataract accounts for 39% cases of blindness all over the world with India adding up an estimate of 20 lakhs new cases to burden every year which accounts for 80% of blindness in our country.<sup>1,2</sup> Blindness due to cataract or any other cause can reduce economic productivity leading to increased poverty and declining social conditions<sup>4,5</sup> and increased mortality.<sup>3</sup> Visual function (VF) that can be used to perform task using sight is called as functional vision which is essential to perform activities of daily life and people with same vision loss may function differently with same level of visual impairment. The extent of visual loss can be assessed clinically by visual acuity (VA).<sup>6</sup> VA alone might not be able to measure the amount of visual impairment and hence VF becomes a more important parameter.<sup>7</sup> VF which describes the measurement of important vision dependent task performed by the patient is an important measure for patients perceived outcomes for surgical outcome.<sup>6,7</sup> Visual impairment coupled with decreased visual function leads to diminished quality of life, indirect subsequent physical disability and increased mortality.<sup>3,4</sup> A patients with cataract has an adversely affected health related quality of life which could be due to repeated hospital visits, fear of surgery, distress of diagnosis, and associated expenditure besides limited mobility and dependency on others.<sup>3</sup> Furthermore, blindness increases poverty which further could lead to reduced quality of life (QOL). This means reduced vision and quality of life is directly dependent on each other.<sup>1</sup> Various studies done around the globe have demonstrated that cataract and its diagnosis have been associated with poor quality of life and increased mortality. To understand the burden of cataract on society, it is important to assess functional vision and quality of life of these patients and not just visual acuity.<sup>1,4–6</sup> A thorough literature search showed limited study to assess the quality of life in patients with cataract in India. Hence we designed this study to assess the quality of life of patients which visual impairment and a diagnosis of cataract.

## 2. Materials and Methods

This cross-sectional study was conducted in the Department of Ophthalmology and Pharmacology, Teerthanker Mahaveer Medical College and Research Center, Moradabad for 2 months between December 2022 and May 2023. Patients diagnosed with cataract with visual impairment visiting the tertiary care center were recruited in the study. The study was approved by the Institutional Ethics Committee and patients were recruited after they gave written informed consent. Patients more than the ages of 18 years, with impaired vision due to cataract were included in the study. All patients with cataract which was of acute onset due to either infective or traumatic etiology

were excluded from the study. Patients with history of hypertension (Blood Pressure > 140/100 mmHg), and diabetes mellitus at any center for 12 months were excluded from the study. Patients with chronic renal disease or end stage renal disease, history of heart or respiratory failure, recent myocardial infarction (MI), shock, liver disease, chronic alcohol use, pregnant or lactating females were excluded from study as they could impair the self-care, social functioning, mobility of mental functioning of the participants. Procedure: The participants were divided into two groups, Group 1 consisted of male patient suffering from cataract with visual impairment whereas Group 2 consisted of female patients suffering from cataract with visual impairment. A detailed history was also taken, and the participants underwent a thorough medical examination, they were also given counselling for lifestyle modifications. The participant was assessed for visual functioning (VF) and Quality of Life. The Quality-of-Life scale used in our study was Quality of Life (QOL) Questionnaire which has been developed by Aravind Eye Hospital, Madurai.<sup>8</sup> Both these questionnaires have been extensively used in Asian countries and have been validated for use in India.<sup>9–11</sup> The VF and QOL were scored as per the protocol and instructions given by the authors of the instruments. A four-point rating scale was scored, and cumulative total of individual item responses expressed as percentages was calculated for each subscale. The overall VF and QOL scale scores were calculated by aggregating across all items in each scale. Scales were calibrated between 100 ('best' possible score) and 0 ('worst' possible score).

### 2.1. Statistical analysis

The data was tabulated as mean  $\pm$  standard deviation (SD). Results were analyzed using non parametric tests (Chi-Square Test), parametric tests (two tailed student t-test) and correlation (Pearson correlation coefficients) analysis. A  $p < 0.05$  was considered as statistically significant.

## 3. Results

A total of 84 patients which included 34 males and 50 females diagnosed with cataract and visual impairment were recruited in the study after they signed in the written informed consent. The mean age of patients was 59.41 years with a standard deviation of [11–15]<sup>11,12</sup> The range of age of participants was from 40 years to 78 years. The participants were divided into two groups – Group 1 was male participants and Group 2 were female participants. The demographic profile of both sexes is shown in Table 1.

As shown in Table 1 both groups were comparable with the most common symptom presented by participant in both groups being glare followed by floaters. The diagnosis of patients with cataract was similar in both groups with most patients diagnosed with posterior subcapsular cataract

**Table 1:** Demographic characteristics of both groups

Parameter	Group 1 (n=34)	Group 2 (n=50)	p value
Age in years (Mean ±SD)	58.71±12.36	59.88±10.36	>0.05*
Duration of Illness in Years (Mean±SD)	1.33±1.46	2.01±2.24	>0.05*
Presentation of Symptoms (n)			>0.05#
Corneal Opacities	2	4	
Glare	15	19	
Floater	9	18	
Colored haloes	7	6	
Diagnosis at time of Presentation (n)			>0.05#
Nuclear Sclerosis 1	2	0	
Nuclear Sclerosis 2	14	17	
Nuclear Sclerosis 3	7	22	
Nuclear Sclerosis 4	6	14	
Posterior Subcapsular Cataract	23	31	
Mature Senile Cataract	12	22	
Cortical	1	0	
Black cataract	0	1	
Immature Senile cataract	4	0	
Both groups were comparable			
* Using Student 't' test; # Using Chi-Square Test			

followed by mature senile cataract.

### 3.1. Visual impairment in both groups

Visual Impairment in both groups is shown in Table 2. All patients participating in the study had visual impairment with Grade 3 impairment being the most common presentation to the tertiary care center though few patients also had grade 5 impairment. There was statistically significant difference in both groups ( $p>0.05$ )

**Table 2:** Visual impairment in both groups<sup>12</sup>

Grade	Group 1 (n=34)	Group 2 (n=50)
Grade I	5	8
Grade II	7	9
Grade III	12	18
Grade IV	8	11
Grade V	2	4
$p>0.05$ using Chi-square Test		

## 4. Visual Functioning Score in Both Groups

The Visual Functioning Score is shown in Table 3, a higher number of participants had impairment in visual functioning. There was a statistically significant ( $p<0.05$ ) number of participants in both groups who had quite a lot of problems of noticing of objects off to side, had to make adjustment to darkness after being in bright light, had to adjust brightness after being in dark place and problem in locating things when it was surrounded by lot of other things. There was also a statistically ( $p<0.05$ ) higher number of female participants as compared to male participants who had quite a lot of problems of noticing of objects off to side, had to make adjustment to darkness after being in bright light, had to adjust brightness after being in dark place and problem in locating things when it was surrounded by lot of other things.

### 4.1. Quality of life responses in both groups

The quality-of-life response is participants of both groups is shown in Table 4. Both the groups had a comparable response, and the quality of life was affected in all individuals though there was no statistically significant ( $p>0.05$ ) difference within the groups on the activities of Self-care, mobility, social and mental activities of participants.

There was not statistically significant ( $p>0.05$ ) difference in both the groups with presentation of grades of visual impairment. Though participants in both groups with grade III onwards had higher visual functional scores and quality of life scores but it was not statistically significant.

## 5. Discussion

The results of our study have demonstrated that out of total 84 participants recruited in the study, majority of them were female ( $n=50$ ) and both the groups were comparable at the time of presentation. All patients had a significant visual impairment at the time of presentation with 22 male participants and 33 female participants had grade III or more visual impairment. All patients had compromised quality of life as evident by the responses obtained from the participants on the visual functional score and quality of life scores. There was also a statistically ( $p<0.05$ ) higher number of female participants as compared to male participants who had quite a lot of problems of noticing of objects off to side, had to make adjustment to darkness after being in bright light, had to adjust brightness after being in dark place and problem in locating things when it was surrounded by lot of other things. Though participants in both groups with grade III onwards had higher visual functional scores and quality of life scores but it was not statistically significant.

Cataract has been one of the principal causes of blindness in India amounting to 62.6% of all cases as depicted in the

**Table 3:** Visual functioning scores in both groups

Q. No	Questions	Responses (n)							
		Gr 1	Gr 2	Gr 1	Gr 2	Gr 1	Gr 2	Gr 1	Gr 2
1	In general, would you say your vision (with glasses if you wear them) is:	Very Good		Good		Fair		Poor	
		1	2	5	8	15	24	13	14
2	To what extent your sight limits you in your daily activities?	Not at all		A little		Quite a lot		A lot	
		2	4	8	11	18	22	6	13
3	How much problem do you have recognizing people across the street?	1	1	7	12	20	25	6	12
4	How much problem do you have recognizing the face of the person standing near you?	4	7	10	14	16	20	4	9
5	How much problem do you have recognizing smaller minute objects (such as grains or the lines in your hand)?	1	3	5	7	18	22	10	16
6	When you are walking along how much problem do you have noticing objects off to the side?	2	3	7	9	20*	26*#	5	12
7a	How much problem do you have adjusting to darkness after being in bright light?	1	2	6	8	21*	30*#	6	10
7b	How much problem do you have adjusting to brightness after being in dark place?	2	3	8	12	22*	32*#	2	3
8	How much problem do you have locating something when it is surrounded by a lot of other things (like finding a specific food item on your plate)	1	4	7	11	21*	31*#	5	4
9	How much problem do you have in recognizing colors?	4	6	13	15	14	22	3	7
10	When you reach for an object (example to take a glass) how much problem do you have in finding it, because it is further away or closer than you thought?	2	5	10	18	17	23	5	4
11a	How much problem do you have in recognizing a person when you are in a bright light?	6	10	12	18	14	12	2	10
11b	How much problem do you have seeing with bright light shining on your face (such as from a oncoming bus or car)?	5	9	12	19	13	19	4	3

\*p<0.05 within group using Chi-square Test #p<0.05 between group using Chi-square Test

National Survey on Blindness done in 2006-07. Blindness has been associated with reduced productive capacity and further associated with poverty. Visual impairment has been associated with reduced quality of life and increased mortality.<sup>4</sup>

A population-based survey done in Nepal to evaluate the visual acuity and vision related quality of life outcomes in cataract surgery demonstrated that quality of life significantly worsened in patients with poor visual outcome. Higher grades of visual impairment had significant impact on quality of life. The results of our study are quite like

this study as our study also demonstrated that patients with higher grade of visual impairment had poor quality of life though it was statistically significant.<sup>9</sup>

Another cross-sectional study done in Southern India to measure the visual function and quality of life amongst cataract patients attending camps demonstrated that nearly half of the patients had severe or grade IV visual impairment as per WHO criteria of visual impairment. The visual function score and the quality-of-life score worsen as the visual acuity deteriorated due to cataract and early diagnosis and treatment are essential for a better quality of life. The

**Table 4:** Quality of life response in both groups

Activity	Responses (n)								
	Gr 1		Gr 2		Gr 1		Gr 2		
	Not at all	A little	Quite a bit	A lot	Gr 1	Gr 2	Gr 1	Gr 2	
<b>Self-care</b> How much problem do you have because of your vision in doing the following activities unaided?	Bathing	6	10	7	11	10	15	11	14
	Eating	9	13	10	15	11	12	4	10
	Dressing	10	11	9	16	10	15	5	8
	Toileting	11	13	12	14	10	15	1	8
<b>Mobility</b> How much problem do you have because of your vision in doing the following activities unaided?	Walking to neighbors	10	12	11	17	11	14	2	7
	Walking to shops	8	15	17	20	5	8	4	7
	Doing your usual household chores	11	18	9	16	8	10	6	6
<b>Social</b> Because of your usual problem do you feel less inclined to participate in the following?	Attending social functions like weddings, funerals, festivals	9	17	13	19	9	10	3	4
	Meeting with friends and relatives	10	18	12	22	6	7	6	4
<b>Mental</b> Because of your vision problems do you feel any of following?	A burden on others	8	19	11	19	7	8	8	4
	Dejected	11	17	13	19	7	10	3	4
	Loss of confidence in doing usual activities	12	20	11	18	6	9	5	3

p>0.05 within group and between group using Chi-Square Test

results of our study are quite like this study as in our study also most patients had grade III or more of visual impairment and they were associated with greater loss of activities though it was not statistically significant.<sup>6</sup>

A study done in East India in the state of Orissa tried to find the effect of cataract surgery on the quality of life. The study showed that cataract surgery in patients above 50 years of age had a significant improvement in the quality of life after cataract surgery with an overall improvement in mobility, usual activity, pain, anxiety/depression and self-care. The result of our study are quite similar to this study as our study also showed that patients had an effect of the mobility, and other domains of care though in our study we did not include the post operative cases as our study intended to find the effect of cataract on the quality of life of patients.<sup>4</sup>

Few studies done in various parts of India, to study the impact of cataract on the quality of life of patients showed that there was decrease in quality of life amongst all domains. The results of our study also showed that all domains of quality of life were affected in participants diagnosed with cataract. The results of our study differed from these studies as they also demonstrated the effect of cataract surgery on the quality of life as it is expected to improve with surgery.<sup>1,3,5,7</sup>

There are a few limitations of our study, firstly our study is a cross-sectional study where we only observed the effect of cataract on the quality of life of patients with visual impairments, although we could have included an intervention in the form of cataract surgery, but this would have been more time consuming, and we had limited time. Secondly the same size of our study is small and larger sample would have yielded different results but due to paucity of time we restricted ourselves as this study had to be completed on three months.

To conclude the results of our study showed all patients had a significant visual impairment at the time of presentation with 22 male participants and 33 female participants had grade III or more visual impairment. All patients had compromised quality of life as evident by the responses obtained from the participants on the visual functional score and quality of life scores. Though participants in both groups with grade III onwards had higher visual functional scores and quality of life scores but it was not statistically significant.

## 6. Source of Funding

None.

## 7. Conflict of Interest

None.

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