

Quality of Life of Cataract Patients Before and After Surgery-Evidence From Four Rural Communities in Ghana

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ABSTRACT

Background: Cataract is one of the main causes of blindness worldwide and the quality of life of such patients is reported to be low. Cataract surgery has been reported to improve the quality of life of patients in developed countries. The purpose of this study was to investigate the quality of life of cataract patients before and after surgery in four rural communities in Ghana.

Methods: Seventy patients who had been scheduled for cataract surgery at hospitals in the rural communities were studied using a slightly modified National Eye Institute's Visual Functioning Questionnaire (NEI VFQ-25) before the surgery and two months after surgery. Visual acuity was assessed using a Snellen Chart at 6 metres. Data was analyzed using SPSS version 20.

Results: 70 participants aged 12 to 99 years comprising 52.3% females were interviewed before surgery and 13(18.57%) were lost to follow up after surgery. There was significant improvement in all subscale scores ($p < 0.001$) and an 18.48 points increase in the composite score. Improvement in visual acuity and reduction in visual impairment after surgery were significant. Patients who could not perform certain daily living activities resumed such activities two months after cataract surgery.

Conclusion: Cataract surgery improved the quality of life in patients living in the rural communities and underscores the need to increase the rate of cataract surgery in developing countries and low income settings.

INTRODUCTION

Cataracts are symptomatic lens opacities that obstruct the passage of light onto the retina due to loss of transparency and cause a reduction in vision. Globally, cataract is reported to be the main cause of blindness, responsible for about seventeen (17) million (39%) of the 45 million cases of blindness, and the vast majority of cases live in low income countries [1, 2]. In Ghana, it is estimated that 600,000 people are visually

impaired and 200,000 blind, and that cataract causes 100,000 of the avoidable blindness in the country [3].

Visual impairment due to cataract is largely confined to the elderly population (aged above 50 years), and as populations continue to grow and age, the magnitude of this condition is predicted to increase [4]. Cataract is reported to cause severe visual impairment and negatively affects quality of life [5-7]. With the prevalence of this condition increasing, the impact of

cataract extraction on patients' quality of life could influence policy development if fully explored. One study reported that reduction in distance vision is the primary visual deficit in majority of cataract patients [8]. Visual impairment is reported to have greater impact on the quality of life of adults than other age-related conditions, including increased difficulties in daily activities, increased depression, social isolation, increased risk of falls and fractures, poorer general health, lower social status and increased mortality [5, 9-16]. Visual acuity measurement used to be the standard procedure for the assessment of the indication for cataract surgery and the postoperative outcome. It has been established recently that the disability cataract patients suffer goes beyond the loss of visual acuity, as decreased visual function is associated with poor quality of life and reduced involvement in daily social activities [8].

The main treatment for cataract is surgery (cataract extraction). It has been reported that cataract extraction is one of the most cost-effective surgical procedures when evaluated with disease-specific outcome measures [17-20]. Significant improvements have been obtained in clinical, functional and perceived vision by cataract surgery [21]. Strong evidence exists that cataract surgery significantly improves vision-related quality of life (VRQOL) [22-24]. Thus, the goal of cataract extraction is not only to improve functional vision, but also performance in daily living activities and this is largely due to the effect that poor vision has on the quality of life, general health, social status and mortality rates [25-27]. It has been reported that the rate of cataract surgery has increased considerably over the past decade in many low income countries [28].

Health-related quality of life includes the physical, functional, social and emotional well-being of an individual. It is a patient-reported outcome usually measured with carefully designed and validated questionnaires. These questionnaires have become increasingly important for evaluating the benefits and harms of new instruments being tested in clinical trials [29]. Notable shortcomings have been revealed in a number of these questionnaires used in previous studies [5, 30, 31]. However, the National Eye Institute Visual Function Questionnaire (NEI VFQ-25) has been structured to address a wider range of visual concerns, including social and mental outcomes of visual impairment and facilitates probing into the specific aspects of vision-related quality of life (VRQOL) that improve after cataract surgery [27, 32]. Some studies have reported on its independence and strong association with objective assessment of visual impairment [33]. The tool has been widely used in many countries and is employed in this study [34-38].

Studies have shown that cataract patients have low health-

related quality of life in several dimensions and these patients show significant improvement in daily activities and in vision-related quality of life assessed with disease-specific instruments after surgery [5, 30, 39]. Majority of these studies were conducted in developed countries where visual impairment prior to cataract surgery is less severe and social circumstances differ considerably from low income countries [5, 40]. It has been reported that patronage of cataract surgeries is low in developing countries [41]. Unfortunately, surgeries performed in Ghana currently take care of only a quarter of the cataract cases [3]. Some local cataract patients reject the option for surgery or delay undergoing surgery until blindness for a number of reasons including the unpleasant experience of poorer vision among known cataract surgery patients. This study was undertaken to evaluate the quality of life of cataracts patients before and after surgery in four rural areas (Bibi-ani, Ejisu, Juaben and Effiduase) in Ghana.

METHODS

Study Design and Sampling

A prospective cross-sectional study was undertaken. Convenient sampling was used to select patients for the study before and after surgery. All patients 12 years and above diagnosed of unilateral or bilateral cataract who had been scheduled to undergo first eye cataract surgery were eligible for the study. Patients who were positive for previous cataract surgery, a diagnosis of glaucoma or any other significant retinopathy, psychological disorders and wheelchair bound were excluded from the study. Also, patients living in urban areas who had reported for surgery were excluded.

Data Collection

Participants were recruited between September 1, 2014 and October 1, 2014. Before any data was collected, informed consent was obtained from each participant. Participation was completely voluntary. We collected data at two time points; on the day of schedule for surgery (mostly a week before surgery) and then two months after surgery.

Data was collected using a researcher-administered NEI VFQ-25 questionnaire. The basis and design of this questionnaire have been described in full elsewhere [32]. The questionnaire was translated into the local Twi language and back translated into English by trained translators. Questions in each subscale that bordered activities not common in the study population were substituted with tasks embedded in the people's culture with the same visual requirements. An additional question of how cataract had affected the participants' lives in general was added.

The questionnaire also sought to obtain demographic information bordering age, gender, educational level, marital status, employment status, living situation (alone or not alone), ethnicity, any prescription medications (no/ yes), other medical conditions and use of glasses after surgery (no/ yes). Visual acuity in the operated eye before and after surgery was measured using a Snellen chart at 6 metres. Scores were expressed in a Snellen fraction. All cataract surgeries were undertaken by extra-capsular cataract extraction by the same surgeon in all study areas.

Statistical Analysis

The Statistical Package for Social Scientists (SPSS) version 16.0 (SPSS, Inc., Chicago, IL, USA) was used to analyze the data. Continuous variables were expressed as mean ± standard deviation (M ± SD) (at 95% confidence interval). The statistical tests used were t-tests of the paired samples to compare data before and after surgery for participants who completed both assessments as well as chi-square test to compare proportions. A p-value less than 0.05 (p < 0.05) was considered to be statistically significant.

Ethical Consideration

The study was reviewed and approved by the Committee on Human Research, Publications and Ethics of the Kwame Nkrumah University of Science and Technology, School of Medical Sciences, Kumasi. The study and all eye examination procedures were clearly explained to all participants and informed consent obtained before each participant was registered for the study. The study was carried out in accordance with the tenets of the Declaration of Helsinki.

RESULTS

Out of 70 participants who began the study, approximately 18.57% were lost to follow-up, with 57 of them completing both assessments.

Demographic Data

Table 1 shows the age and gender distribution of participants who completed the preoperative assessment (n = 70) and those who completed the follow-up assessment (n = 57). Majority of participants at baseline and follow-up were females (52.3% and 50.9% respectively). The mean age of the participants was 65.56±17.72 years and ranged from 12 years to 99 years. Majority were aged between 69-87 yrs. There were more females than males in all age groups. There were more farmers, followed by retired personnel and then traders among the participants. The occupational distribution of participants is shown in table 2.

Table1: Age and gender distribution of participants.

| Age in years | Gender | | | | | |
|--------------|-----------------|------------|-----------|------------------|-----------|-----------|
| | Pre-op (n = 70) | | | Post-op (n = 57) | | |
| | Male | Female | Total (%) | Male | Female | Total (%) |
| 12-29 | 1 | 3 | 4 (5.7) | 1 | 3 | 4 (7.0) |
| 30-49 | 2 | 3 | 5 (7.1) | 1 | 2 | 3 (5.3) |
| 50-69 | 16 | 7 | 23 (32.9) | 13 | 6 | 19 (33.3) |
| 70-89 | 12 | 20 | 32 (45.7) | 11 | 17 | 28 (49.1) |
| >89 | 2 | 4 | 6 (8.6) | 2 | 1 | 3 (5.3) |
| Total (%) | 33 (47.1%) | 37 (52.3%) | 70 (100) | 28 (49.1) | 29 (50.9) | 57 (100) |

Table 2: Occupational distribution of participants.

| Occupation | Pre-op (n = 70) | | Post-op (n = 57) | |
|-----------------------|-----------------|------|------------------|------|
| | N | % | N | % |
| Farming | 30 | 42.9 | 23 | 40.4 |
| Trading | 15 | 21.4 | 12 | 21.1 |
| Teaching | 2 | 2.9 | 1 | 1.8 |
| Retired Civil service | 16 | 22.9 | 15 | 26.3 |
| Students | 3 | 4.3 | 3 | 5.3 |
| Others | 4 | 5.7 | 3 | 5.3 |

Visual Impairment and Visual Acuity Data

Thirty three patients (57.8%) were visually impaired (visual acuity worse than 6/18 in the better seeing eye). This reduced to 40.4% after surgery. The distribution of visual impairment among participants is shown in figures 1 and 2. The best corrected visual acuities in the eyes to be operated on were worse than 6/18 before surgery. This improved after surgery, as shown in Figure 3.

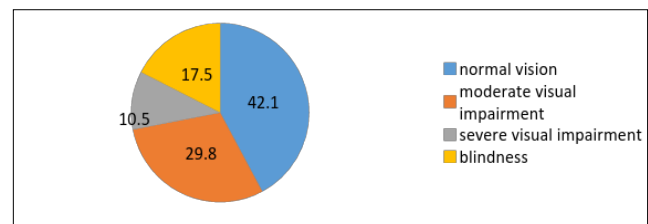


Figure 1: visual impairment before cataract surgery.

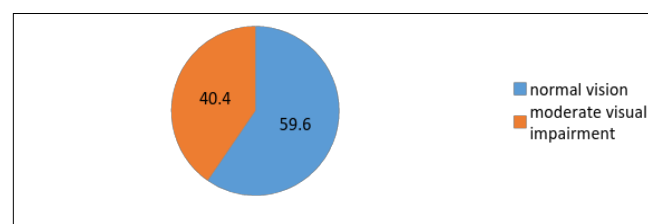


Figure 2: Visual impairment after surgery.

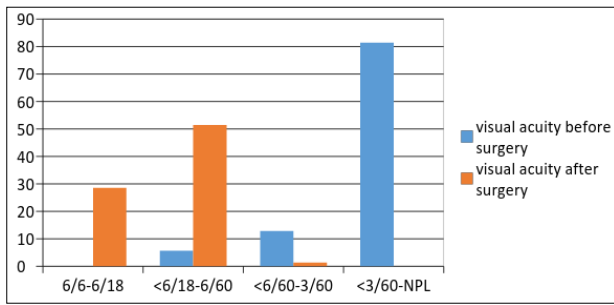


Figure 3: Percentage of patients and their respective best corrected visual acuities before and after surgery.

Vision Related Quality of Life (VRQOL) Scores

VRQOL scores were studied for participants who completed the study. There were improvements in both the composite and subscale VRQOL scores after cataract surgery, shown in figure 4. Before surgery, the mean composite VRQOL score was 62.58 ± 7.23 . None of the participants scored 100.00. The mean composite score improved by 18.48 points to 81.06 ± 8.47 after surgery and was found to be statistically significant ($p=0.002$). VRQOL subscale scores before surgery were lowest for general health with a score of 44.74 ± 13.50 and highest for colour vision (78.95 ± 11.26). Improvements in all subscale scores were statistically significant ($p < 0.05$ in all subscale score comparisons).

The impact of cataract and surgical treatment on daily living activities of the participants was also studied and this is illustrated in figure 5. All participants who reported inability to perform certain daily living activities due to cataract were able to resume such activities two months after surgery.

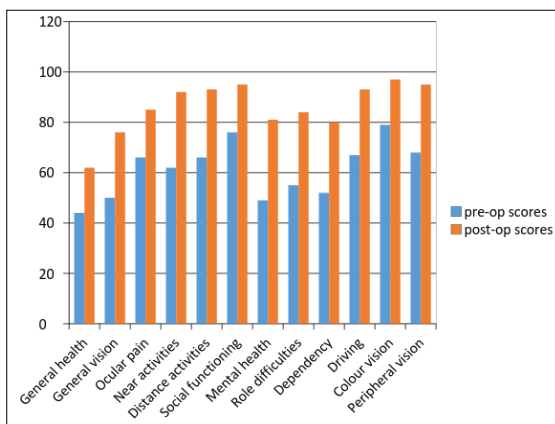


Figure 4: Quality of life subscale scores before and after surgery.

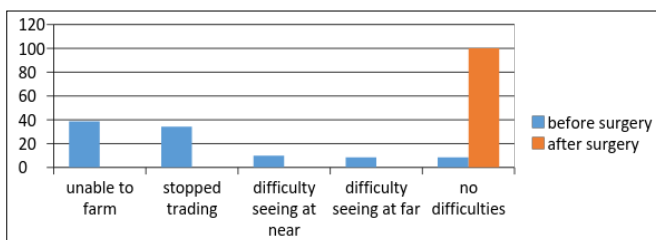


Figure 5: Impact of cataract and post-surgery on daily activities of participants.

DISCUSSION

The study showed more females with cataract than males, consistent with findings in other studies [27]. Females are known to suffer more visual impairment in developing countries due to barriers such as financial constraints, culture and tradition. The study revealed that visual acuities in the operated eyes improved after surgery, and no patient was blind after surgery. Even though some studies have shown that visual acuity has a weak association with vision-related quality of life (VRQL) after surgery (an association which has been found to be strong with stereopsis and binocular contrast sensitivity), other studies have reported that the best corrected visual acuity in the better eye is the most important determinant associated with changes in vision-related quality of life [42-44]. This partly explains the improvements in vision-related quality of life scores after surgery. Fagerström et al. also showed that psychiatric symptoms increased with the deterioration of visual acuity and diminished when visual acuity improved [45]. Also, it has been reported that improvement in visual acuity enhances quality of life, participation in daily living activities and improves household economic status [46]. It is therefore likely that the improvement in visual acuity after first eye surgery had positive impacts on the daily lives of the participants.

In addition, a statistically significant reduction in visual impairment was observed after surgery ($p = 0.04$). Similar visual outcomes have been reported in other studies [47, 48]. However, visual impairment of 40.8% after surgery was considered high by the authors. This could be due to the need for second eye surgery, other ocular comorbidities and post-operative complications. The quality of vision after cataract surgery is not always optimal. A considerable proportion of patients were still visually impaired after cataract surgery in low income settings and in Hong Kong [25 49, 50]. Ocular comorbidities such as undiagnosed diabetic retinopathy and presbyopia also have a negative impact on visual outcomes after surgery [51, 52].

The study also revealed marked improvement in quality of life after surgery. There were improvements in scores for all subscales. A six point change in composite score has been considered meaningful [53]. 18.48 points improvement in composite score was statistically significant ($p = 0.004$). These results are consistent with findings of similar studies that examined change in NEI VF Q-25 scores after cataract surgery in other settings [27, 54, 55]. The significant improvements in subscale scores add to the findings in other studies that cataract surgery improves physical, social and mental aspects of patients' lives [56]. There was no improvement in nursing homes in US, and this could be due to depression from dependency before

and after surgery [26]. Improvement in the general health score predicts the important role good vision plays on the general health of participants.

The significant reduction in visual impairment along with improvements in VRQL scores predicts the reduction in limitations in daily living activities after surgery. No patient who completed the study two months after surgery reported difficulties in daily living activities. Limitations in daily living activities lead to decrease in social interactions, increase in dependency and greater psychosocial symptoms [44]. The reduction in these limitations shown in this study suggests that, for patients who reject cataract surgery or who cannot receive cataract surgery, it might be beneficial to provide low vision aids to enhance their functional vision (and hence reduce visual impairment) at least temporarily.

One notable shortfall of this study is the lack of a control group from the general population. Thus, the possible influence of changes in environmental conditions confounding the results in this study cannot be completely ruled out. In addition, assessment of cognitive ability of participants was beyond the scope of this study, and this is a well-known confounder in research among the elderly populations [27].

CONCLUSION

Cataract patients have a low vision-related quality of life. This study has shown that cataract surgery improves the vision-related quality of life in many dimensions including enhanced participation in social activities and reduced limitations in work-related activities. With its high success rates and cost-effectiveness, it is likely that increasing the rate of cataract surgeries in developing countries and low income settings may contribute immensely towards reducing poverty and enhancing the quality of life of such populations.

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