Determinants of patient satisfaction during cataract surgery under local anaesthesia: A cross-sectional study in a Ghanaian teaching hospital

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ABSTRACT

Objective: To assess determinants of patient satisfaction with Manual Small-Incision Cataract Surgery (MSICS) under Local Anaesthesia (LA) at a Ghanaian teaching hospital.
Methods: We conducted a descriptive cross-sectional study of 220 adults who underwent MSICS under LA between July and December 2023. We collected data on demographics, Postoperative Day One (POD1) VA, intraoperative pain, communication quality and satisfaction via a structured and pretested questionnaire. The questionnaire included Likert-scale items on communication quality (two questions), pain (0–10 scale), and satisfaction (4-point scale), as well as an open-ended item for patient feedback. We identified independent predictors of satisfaction by multivariable logistic regression analyses, reporting Odds Ratios (OR) and 95% Confidence Intervals (CI). We employed the Hosmer-Lemeshow goodness-of-fit test and statistical significance set at $p < 0.05$.
Results: Mean age was 61.2 ± 10.3 years, and 63% were female. On POD1, 29% of eyes achieved good vision (≥6/18), 88.2% attained >6/60, and 12% had poor vision (<6/60). Overall, 72% of patients were satisfied. Most reported no intraoperative pain; none reported severe pain. In bivariate analysis, satisfaction was higher among those without pain (79% vs. 54%, $p < 0.001$) and those reporting good communication (78% vs. 57%, $p = 0.001$). On multivariable logistic regression, absence of intraoperative pain independently predicted satisfaction (adjusted OR: 2.97, 95% CI: 1.48–5.98, $p = 0.002$), as did good communication (adjusted OR: 2.38, 95% CI: 1.22–4.67, $p = 0.011$). Visual acuity outcome, gender, and preoperative anxiety were not significant predictors.
Conclusion: Patient satisfaction after MSICS under LA was high and independently associated with pain control and quality of communication, but not with unaided VA on POD1. Addressing intraoperative comfort and patient-centred communication should be prioritised to optimise cataract surgical care quality.

Key words: Cataract surgery, Local anaesthesia, Patient satisfaction, Pain perception, Communication, Visual outcome

INTRODUCTION

Cataract is the predominant cause of blindness worldwide, representing nearly one-third of all cases and significantly contributing to global visual impairment[1]. Cataracts are a significant source of preventable vision impairment in Ghana and comparable low- and middle-income regions, especially among the elderly[2]. Surgical extraction with intraocular lens (IOL) implantation is the sole definitive and very effective treatment, ranking among the most performed procedures worldwide. Progress in surgical methodologies, including phacoemulsification (phaco) and Manual Small-Incision Cataract Surgery (MSICS), along with enhancements in IOL technology, has facilitated superior visual outcomes for most patients[3].

For the majority of adults, cataract surgery is now performed under Local Anaesthesia (LA) using techniques such as topical, sub-Tenon's, peribulbar, or retrobulbar blocks[3,4]. The transition from general anaesthesia is motivated by advantages such as expedited recovery, fewer systemic hazards, and enhanced overall safety[3,4]. While LA is typically safe and acceptable, the intraoperative experience with LA markedly contrasts with that of general anaesthesia. Patients remain conscious and can perceive sensations, hear intraoperative dialogue, and engage with the surgical team, which may impact their perceptions of safety, anxiety, and overall comfort during the procedure[4,5].

Intraoperative experience is a crucial factor in patient satisfaction, independent of postoperative visual

outcomes[6,7]. Previous studies indicate that intraoperative pain, regardless of its mildness, might considerably diminish satisfaction with cataract surgery. In contrast, high-quality, patient-centred communication—marked by clear information dissemination and the provision for patients to inquire—has demonstrated an improvement in satisfaction and a reduction in perioperative anxiety[7,8]. Preoperative anxiety is common among cataract patients and may affect pain perception and cooperation during surgery. These factors underscore the necessity of implementing a comprehensive, patient-centred methodology in surgical care that transcends mere technical results[7,8].

Despite the acknowledged significance of these intraoperative elements, most studies from Africa and analogous regions have predominantly concentrated on visual outcomes, frequently measured against World Health Organisation (WHO) standards (≥80–90% achieving ≥6/18 with optimal correction and <5% with 6/60)[11–13]. There is a significant lack of data investigating patient-reported experiences and satisfaction, particularly regarding intraoperative pain and communication quality during cataract surgery under LA in our setting[5–8]. Anecdotal evidence indicates that apprehensions regarding pain and misconceptions about the procedure may hinder timely acceptance of cataract surgery, thereby affecting surgical uptake and outcomes[5,7].

This study sought to assess patient satisfaction following elective first eye unilateral MSICS performed under LA at a teaching hospital in northern Ghana. We examined the correlation between intraoperative pain and communication quality with patient satisfaction, while also recording immediate postoperative (day one) visual acuity outcomes. By contextualising our findings with regional literature and international benchmarks, we seek to inform strategies that can enhance the surgical experience and improve service uptake in analogous settings.

MATERIALS AND METHODS

Study design and setting: This was a hospital-based descriptive cross-sectional study at Tamale Teaching Hospital (TTH), a tertiary referral centre serving Northern Ghana. The study was done from July to December 2023. All patients were recruited on the day of surgery, and data collection continued through the first postoperative day (POD1). Three ophthalmologists with different levels of experience conducted elective first eye unilateral MSICS under local anaesthesia. They avoided sedation in all cases and used intracameral lidocaine selectively.

Sample size calculation: The sample size was established based on the primary outcome of patient satisfaction with cataract surgery performed under local anaesthesia. We anticipated a high satisfaction rate, as indicated by prior studies in comparable contexts, with an expected satisfaction rate of roughly 85%[5,9]. The minimum necessary sample size was determined utilising the single population proportion method for cross-sectional studies, with a 95% confidence interval (Z = 1.96), a 5% margin of error, and an anticipated non-response rate of 10%[14,15]. Consequently, we determined a minimum sample size of 218. In total, 220 patients were enrolled, providing sufficient statistical power and addressing potential attrition.

Pretesting: Before the main study, 20 patients at Batieka Specialist Clinic in Tamale, scheduled to undergo elective first eye unilateral MSICS under LA, had a pretest on the structured questionnaire. The pretesting aimed to evaluate the clarity of questions, their relevance, the correctness of translations, the respondent burden and the logistical feasibility[16,17]. Input from pretest participants necessitated slight modifications to the phrasing of questions and the interview methodology, guaranteeing clarity and facilitating seamless data collection. Notably, the pilot was conducted in a similar patient population from the same region, supporting the questionnaire's validity for the main study setting. The final analysis excluded data from participants who had taken the pretest.

Inclusion and exclusion criteria: Participants comprised adults aged 18 years or older scheduled for elective first eye unilateral MSICS under LA at TTH during the study period. The exclusion criteria included emergency MSICS, inability to give consent and the necessity for general anaesthesia (e.g., due to the inability to remain still or contraindications to LA).

Random sampling operationalisation: We employed simple random sampling to select participants from each day's elective surgery list at TTH. Each morning, the surgical schedule for first-eye MSICS under LA was obtained. Research Assistants (RAs), independent of the clinical team, assigned sequential numbers to all eligible patients on the list. Using a computer-generated random number table, the RAs randomly selected patients corresponding to those numbers. Selected patients were approached individually, informed about the study, and invited to participate. If a patient declined, the next randomly chosen patient on the list was invited. This process was repeated daily until the target sample size was reached. This approach ensured each eligible patient had an equal chance of selection, minimising selection bias and maintaining independence from clinical decision-making.

Data collection: A structured questionnaire was administered in person by trained RAs (who were not part of the hospital staff to reduce social desirability bias). Interviews were conducted in the patient's preferred language, with interpretation provided as necessary. The

questionnaire collected demographic information (age, sex, education level, occupation) and preoperative factors, including self-reported anxiety before surgery (classified as anxious or not anxious). We assessed communication quality by asking patients how well they felt they could ask questions and understand the information given about the procedure; responses to these questions were rated and later classified as "good" or "poor" communication. Intraoperative pain perception was measured with a Numerical Rating Scale (NRS) from 0 (no pain) to 10 (worst pain possible), and we categorised pain as "no pain" (0), "mild–moderate pain" (1–3), or "severe pain" (≥4). Postoperative day-one VA in the operated eye was measured (uncorrected) at 6 meters using a Snellen or E chart. VA was recorded in decimal notation and classified per WHO criteria as "good" (≥6/18, decimal ≥0.3), "borderline" (<6/18–6/60, decimal 0.4–0.1), or "poor" (<6/60, decimal <0.1). Patients rated their overall satisfaction with the anaesthesia and surgery on a 4-point Likert scale (very satisfied, satisfied, dissatisfied, very dissatisfied). For analysis, we dichotomised this into "satisfied" (very satisfied/satisfied) vs. "not satisfied" (dissatisfied/very dissatisfied). We also inquired about their satisfaction with intraoperative pain management and asked an open-ended question for any suggestions to improve the experience. All interviews and assessments were completed on the first postoperative day (after the VA measurement). Clinical records were reviewed for anaesthesia details and any complications. All patients received a standard peribulbar anaesthetic block without sedation; no intraoperative intravenous sedatives or analgesics were given, and routine postoperative analgesia was continued. All surgeries were elective first-eye unilateral MSICS with posterior chamber intraocular lens (PCIOL) implantation, performed by three ophthalmic surgeons of varying experience levels.

Communication quality assessment and validation: We evaluated communication quality using a brief set of questions adapted from previously validated patient-experience surveys[7,9]. Patients were asked two key questions immediately after surgery: (1) "Did you feel able to ask questions and express concerns during your care?" and (2) "Did you understand the information provided by the surgical team about your procedure and what to expect?" Each item was rated on a 4-point Likert scale (1 = strongly disagree, 4 = strongly agree). The scores for the two questions were summed (total range 2–8). Following established cut-offs in the literature, we classified total scores of 6–8 as "good communication," and scores ≤5 as "poor" communication[7]. To ensure clarity and local relevance, we translated the questionnaire into the major regional languages and back translated them into English to ensure accuracy. The RAs pretested the translated questions on 20 patients at Batieka Specialist Clinic (as described above) and made minor adjustments based on feedback for better comprehension. In our main study sample, the two-item communication scale demonstrated good internal consistency (Cronbach's alpha = 0.81).

Statistical analysis: Data were entered and cleaned in Microsoft Excel 2016 and analysed using IBM SPSS version 25. We used descriptive statistics to summarise demographic and clinical variables (means ± standard deviations for continuous variables; frequencies and percentages for categorical variables). The primary outcome (patient satisfaction) was treated as dichotomous (satisfied vs. not satisfied). Bivariate associations between satisfaction and each independent variable (age group, gender, education level, preoperative anxiety, VA category, communication, pain) were tested using Pearson's chi-square (χ^2). Variables with $p < 0.20$ in bivariate analysis, or those deemed clinically important based on prior literature, were entered into a multivariable logistic regression model (factors entered: pain, communication, visual acuity, age, gender, preoperative anxiety). We reported Adjusted Odds Ratios (AOR) with 95% CIs for the multivariable model. Model fit was assessed with the Hosmer-Lemeshow goodness-of-fit test, and $p < 0.05$ was considered statistically significant.

Ethical considerations: The study was approved by the University for Development Studies Ethical Review Committee (approval number UDS/IRB/118/23). Written informed consent was obtained from all participants. The study adhered to the tenets of the Declaration of Helsinki.

RESULTS

Socio-demographic characteristics of elective first eye unilateral MSICS patients

A total of 220 patients underwent first eye MSICS with PCIOL implantation under LA. The majority (85%) were aged 50 years or above. The female-to-male ratio was approximately 1.7:1 (Table 1).

Table 1: Socio-demographic characteristics of study participants (N=220)

Characteristic	No. (%)
Age group (years)	
Mean ± SD	61.2 ± 10.3
30–39	6 (2.7)
40–49	22 (10.0)
50–59	64 (29.1)
60–69	72 (32.7)
70–78	56 (25.5)
Gender	
Female	139 (63.2)
Male	81 (36.8)
Level of education	
No formal education	104 (47.3)
Basic education	55 (25.0)
Senior High School	22 (10.0)
Tertiary education	39 (17.7)
Residence	
Within Tamale	139 (63.2)
Outside Tamale	81 (36.8)
Occupation	
Farmer	64 (29.1)
Trader	58 (26.4)
Professional	35 (15.9)
Unemployed	30 (13.6)
Housewife	26 (11.8)
Vocation (skilled trade)	6 (2.7)

Visual outcomes on Postoperative Day One (POD1)

On POD1, uncorrected VA in the operated eye was good (≥6/18) in 64 (29.1%) eyes, borderline (<6/18–6/60) in 130 (59.1%) eyes, and poor (<6/60) in 26 (11.8%) eyes. Overall, 88.2% of eyes achieved better than 6/60 vision on day one. No patient had worse than counting fingers vision.

Intraoperative pain perception and communication quality

The median NRS score was 0 [interquartile range: 0–1]. Of the 220 patients, 159 (72.3%) reported no pain at all (NRS = 0), and 61 (27.7%) reported mild to moderate pain (NRS 1–3). We recorded *no* cases of severe pain (NRS ≥ 4). Among the subset of patients who did feel some pain, the mean NRS score was 1.8 (SD ± 0.7). Regarding communication, 152 (69.1%) patients were classified as having had "good" communication with the surgical team (per our composite scoring), while 68 (30.9%) were classified as having "poor" communication. Looking at the individual communication items: 40.5% of patients *strongly agreed* that they were able to ask questions during their care (10.5% *strongly disagreed* with that statement), and 43.2% *strongly agreed* that they understood the information provided about the procedure (12.7% *strongly disagreed*).

Patient satisfaction and associated factors

In total, 158 (71.8%) patients reported being "satisfied" (including very satisfied), whereas 62 (28.2%) were "not satisfied" on POD1. Bivariate analysis predicting factors associated with patient satisfaction is illustrated in Table 2.

Table 2: Bivariate analysis predicting factors associated with patient satisfaction (N=220)

Factor	Satisfied No. (%)	Dissatisfied No. (%)	P-value (χ^2)
No intraoperative pain (n=158)	125 (79.1)	33 (20.9)	
Moderate pain (n=62)	33 (53.2)	29 (46.8)	0.004 (8.1)
Good communication (n=152)	119 (78.3)	33 (21.7)	
Poor communication (n=68)	39 (57.4)	29 (42.6)	0.001 (10.2)
POD1 VA ≥6/18 (n=64)	47 (73.4)	17 (26.6)	
POD1 VA <6/18–6/60 (n=130)	92 (70.8)	38 (29.2)	0.955 (0.17)
POD1 VA <6/60 (n=26)	19 (73.1)	7 (26.9)	
Anxious preoperatively (n=192)	141 (73.4)	51 (26.6)	0.285 (1.14)
Not anxious (n=28)	17 (60.7)	11 (39.3)	
Female (n=139)	99 (71.2)	40 (28.8)	0.845 (0.03)
Male (n=81)	59 (72.8)	22 (27.2)	

Multivariable logistic regression predicting patient satisfaction is displayed in Table 3.

Table 3: Multivariable logistic regression predicting patient satisfaction

Predictor	Adjusted OR	95% CI	P-value
No intraoperative pain	2.97	1.48–5.98	0.002
Good communication	2.38	1.22–4.67	0.011
Good VA (≥6/18)	1.09	0.48–2.46	0.828
Female gender	0.94	0.51–1.72	0.844
Anxious preoperatively	1.38	0.65–2.92	0.401

DISCUSSION

In this study, a total of 220 patients underwent first eye MSICS with PCIOL implantation under LA. The majority (85%) were aged 50 years or above with a mean age of 61.2 ± 10.3 years. The female-to-male ratio was approximately 1.7:1. Nearly half (47%) of the patients had no formal education. On POD1, 29% of eyes achieved good vision (≥6/18), 88.2% attained >6/60, and 12% had poor vision (<6/60). Overall, 72% of patients were satisfied. Most (72%) reported no intraoperative pain; none reported severe pain. In bivariate analysis, satisfaction was higher among those without pain (79% vs. 54%, $p < 0.001$) and those reporting good communication (78% vs. 57%, $p = 0.001$). On multivariable logistic regression, absence of intraoperative pain independently predicted satisfaction (adjusted OR: 2.97, 95% CI: 1.48–5.98, $p = 0.002$), as did good communication (adjusted OR: 2.38, 95% CI: 1.22–4.67, $p = 0.011$). Visual acuity outcome, gender, and preoperative anxiety were not significant predictors. Our findings align with a growing body of African and global evidence that prioritises patient-centred care and the perioperative experience in cataract surgery[1,5,6,8,18,19]. However, the fact that nearly 28% of patients were not satisfied indicates room for further quality improvement.

Globally, reported satisfaction rates after cataract surgery under local anaesthesia typically range from about 64% up to 85%[5,9,10,20]. Our result of approximately 72% satisfied is within this range and is consistent with both African and international studies. For example, Benwu and Gebremedhin[21] in Ethiopia found that effective communication and managing patient expectations had a strong influence on satisfaction. Umeh *et al*.[19] in Nigeria and Kyei *et al*.[18] in Ghana both reported that the patient's perioperative experience and communication, rather than the immediate visual outcome, were the main drivers of satisfaction. These findings reinforce that the patient's perceptions of comfort, engagement, and respect are at least as important as the technical outcomes in determining satisfaction.

Our day-one visual acuity results are comparable to findings from other African cataract series (Table 4). In our study (first-eye MSICS by ophthalmologists), about 29% of eyes had good vision (≥6/18) on day one, 59% had borderline vision, and 12% had poor vision. Umeh *et al.*[19] in Nigeria reported very similar day-one outcomes, with 33% good outcomes and 22.5% poor outcomes on day one. Kyei *et al*.[18] in Ghana, noted that, on the first day, good vision was present in approximately 28% of cases, while 34% of cases had poor vision. Markos *et al*.[8] in Ethiopia reported 27% good and 42% poor day-one outcomes in a mixed series of MSICS and phacoemulsification cases. Notably, our study had one of the lowest rates of poor vision on day one (≈12%). Nevertheless, all these day-one figures fall short of the WHO's final visual outcome benchmarks (≥80–90% ≥6/18 and <5% <6/60)[11,12], which is expected because immediate uncorrected vision is often limited by transient corneal oedema and refractive error. Similar to observations in the studies above (and others), we anticipate that our patients' visual acuity will improve substantially after the immediate postoperative period, approaching WHO benchmark levels by final follow-up with healing and refraction[8,18,19,22,23].

Table 4: Comparative postoperative day-one unaided visual acuity outcomes in cataract surgery across select African studies

Study (year, country)	Study design	Technique	Surgeon experience	No. (eyes)	Good (≥6/18)	Borderline (<6/18–6/60)	Poor (<6/60)
Our study (2025, Ghana)	Descriptive cross-sectional (hospital based; POD1 interviews)	MSICS	Mix (ophthalmologists)	220	29.1%	59.1%	11.8%
Umeh *et al.* (2025, Nigeria)[19]	Prospective observational (single centre SICS series)	MSICS	Not specified (tertiary centre)	124	33.1%	44.4%	22.5%
Kyei *et al.* (2021, Ghana)[18]	Retrospective comparative case series	MSICS & phaco	Single experienced ophthalmologist	116*	28.4%	37.9%	33.6%
Markos *et al.* (2020, Ethiopia)[8]	Prospective observational (hospital based cohort)	MSICS & phaco	Mix (ophthalmologists & residents)	314[+]	27.1%	30.9%	42.0%

*Kyei *et al*. (2021)[18]: 248 eyes total — 116 MSICS and 132 phaco. Only the MSICS VA is captured in this table. [+]Markos *et al.* (2020)[8]: Their cohort was ~90.4% MSICS (284/314) and ~9.6% phaco. They combined the VAs for both procedures in their report.

Notably, in our study, patient satisfaction remained high despite the modest day-one visual results, and satisfaction was not significantly tied to immediate VA. This mirrors findings from Ghana, Nigeria, Ethiopia and other regions, which show that patient satisfaction is more closely linked to the perioperative experience (primarily pain control and communication quality) than to uncorrected early visual acuity[6,8,18,19,21-24]. In contrast, some European studies have reported a tighter link between vision and satisfaction, suggesting that in resource-limited settings, patients may value comfort and the quality of their care at least as much as early visual results[24,25].

Pain control was a particularly strong determinant of satisfaction in our cohort. Our pain-free rate of 72% is slightly higher than rates reported in Ethiopia (60–70%)[8], and aligns with findings in Nigeria and globally[5,19,22]. The median [IQR] NRS score of 0 [0–1] underscores that the majority of patients experienced little to no pain, reflecting the effectiveness of the anaesthetic technique and comparable with similar studies in the region[6]. Unsurprisingly, those patients who did experience some pain were far less likely to be satisfied – a finding echoed across diverse settings and studies. This reinforces the need for optimal anaesthesia practices, including possibly supplementing local blocks or providing anxiolytics for particularly anxious or high-risk patients to ensure comfort[5,6,10,12,20,23].

Communication quality was equally influential on satisfaction. Patients who felt they could ask questions freely and understood the information given were about 20% more likely to report satisfaction than those who did not – a difference consistently reported in both African and international studies[7,8,19,26]. Our results confirm that effective communication—achieved through simple, clear, and responsive interactions—can significantly enhance the patient experience. This is especially important in settings where health literacy may be low and pre-surgical anxiety high.

Despite the recognised importance of good communication, there are several challenges to achieving an optimal patient–provider interaction in low- and middle-income settings. Language diversity and barriers can impede clear information exchange, particularly in our context with multiple local dialects and limited access to trained interpreters[2,8]. In addition, low levels of formal education and health literacy may make it challenging for patients to understand surgical procedures, risks, and postoperative expectations fully[7,9]. Cultural beliefs and traditionally hierarchical patient–provider relationships may further discourage patients from asking questions or expressing concerns, leading to passive acceptance rather than informed participation in their own care[7,21]. These challenges can contribute to misunderstandings, increased anxiety, and ultimately reduced satisfaction

and trust in cataract surgical services. Addressing them – through use of interpreters, visual aids, patient education, and encouraging questions – is important for improving overall care quality.

Strengths and limitations

This study's strengths include the use of a representative, randomly sampled cohort drawn from the daily surgical list, which minimises selection bias and enhances generalizability within the hospital setting[8]. We adapted survey tools from validated instruments and pretested them for cultural relevance and clarity, ensuring we accurately captured patient perceptions[7,9]. Moreover, the use of multivariable analysis allowed us to adjust for confounders and isolate the independent effects of pain control and communication quality on satisfaction[6].

Limitations of this study include the reliance on satisfaction measured only on the first postoperative day. While this approach is practical and aligns with routine discharge practices, it may not reflect patient perceptions as their vision stabilises or as they receive refractive correction over time[9,18]. We attempted to mitigate biases by using independent non-clinical staff for data collection, conducting interviews privately, and offering interpretation services, but some degree of response or social desirability bias may persist[21]. Our findings should be interpreted with these considerations in mind. Future studies with longer-term follow-up (and including multiple centres or a broader patient demographic) would be valuable to see if our conclusions hold as vision outcomes fully manifest and to explore other factors influencing satisfaction over time.

CONCLUSIONS

Intraoperative pain control and patient-centred communication were the dominant factors influencing patient satisfaction after elective first-eye MSICS under LA in northern Ghana. Even though immediate day-one visual outcomes often fell below global visual acuity benchmarks, patients tended to be satisfied when they were comfortable and well-informed. These findings underscore that, alongside efforts to improve surgical outcomes, cataract surgical teams (especially in resource-limited settings) should prioritise excellent anaesthesia and effective communication to enhance the patient experience. As programmes strive toward WHO targets for visual outcomes, improving the perioperative experience may be equally important for boosting surgical uptake and patient trust. Future research should evaluate how patient satisfaction changes after the initial postoperative period (e.g., after refractive correction) and test targeted interventions (such as enhanced counselling or analgesia protocols) to further improve patient experience, particularly in multilingual and low-literacy environments.

Consent for publication: All authors have given permission for identifiable details to be published in the *Journal of Ophthalmology for Eastern, Central and Southern Africa* (JOECSA).

Availability of data and materials: The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Conflict of interest: None to declare.

Author contributions: GBB conceived the original idea, supervised data collection, and drafted the manuscript. EA and MA contributed to methodology, analysis, and critical revision. All authors approved the final manuscript.

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