The Effect of Pre-Operative Education, Healthcare Provider Communication, and Waiting Time on Patients' Perceived Quality of Cataract Surgery Services

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Abstract.
This study examines the quality of cataract surgery determined not only by clinical outcomes but also by patients' experiences throughout the care process. Preoperative education, healthcare provider communication, and waiting time are important process components that may shape patients' perceived quality. This study aimed to analyze the effect of preoperative education, healthcare provider communication, and waiting time on patients' perceived quality of cataract surgery services at Royal Prima Hospital Jambi, Indonesia. This quantitative analytic study used a cross-sectional design and involved 33 postoperative cataract patients. The questionnaire used a four-point Likert scale. Instrument testing was conducted among 30 postoperative cataract patients at Arafah Islamic Hospital Jambi, Indonesia. Validity was assessed using Corrected Item-Total Correlation (CITC >0.30), while reliability was assessed using Cronbach's Alpha (>0.70). Data were analyzed using descriptive statistics, Shapiro-Wilk testing, Spearman Rank correlation, and multiple linear regression. Preoperative education was strongly correlated with perceived quality ($r=0.701$; $p<0.001$), healthcare provider communication showed a moderate positive correlation ($r=0.449$; $p=0.009$), and waiting time showed a strong positive correlation ($r=0.651$; $p<0.001$). In multiple regression, preoperative education had a significant effect ($B=0.282$; $\beta=0.427$; $p=0.008$), whereas communication ($p=0.155$) and waiting time ($p=0.111$) were not statistically significant. Simultaneously, the three variables significantly affected perceived quality ($F=18.845$; $p<0.001$) and explained 66.1% of its variance ($R^2=0.661$). Preoperative education contributed the most among the three variables studied. As a result, hospitals should strengthen standardized preoperative education, audiovisual educational media, effective communication, and transparent scheduling information to improve patients' experiences and perceived quality.

Keywords: *cataract surgery, healthcare provider communication, patient education, perceived quality and waiting time.*

I. INTRODUCTION

Cataract remains a major cause of visual impairment, particularly among older adults. Cataract surgery is an effective intervention to restore visual function and improve quality of life [1], [3]. Nevertheless, quality of cataract services cannot be evaluated solely from clinical outcomes. Patients also judge the service through their experiences before, during, and after surgery, including the clarity of information, interactions with healthcare providers, waiting processes, responsiveness, and continuity of care [4], [5].

Donabedian's quality-of-care framework describes quality through structure, process, and outcome. In this study, preoperative education, healthcare provider communication, and waiting time represent process components, while patients' perceived quality represents an outcome reflecting how the service is experienced and evaluated [8].

This perspective is relevant to cataract surgery because many patients are older adults and may require repeated, simple, and understandable information before an elective procedure [2], [6], [7]. Preoperative education may improve patient readiness by explaining the disease, surgical preparation and procedures, expected benefits and risks, postoperative care, and realistic expectations. Previous studies have shown that structured and multimodal education can improve understanding, reduce anxiety, and enhance satisfaction [9–12,24]. Video-based and QR-code-linked educational materials may also allow patients and families to review information outside face-to-face encounters [9], [13]. Healthcare provider communication is another important element of patient-centered care. Effective clinician-patient communication supports information exchange, trust, therapeutic relationships, uncertainty management, and patient participation in decision-making [14], [15]. Communication and education are conceptually different but closely related because education is delivered through communication.

This overlap is important when both variables are analyzed simultaneously. Waiting time is also part of the patient's experience. In elective cataract services, patients may evaluate not only the duration of waiting

but also the clarity of scheduling, explanations for delays, certainty of the service pathway, and updates while awaiting surgery [16], [18]. At Royal Prima Hospital Jambi, cataract surgery is scheduled, and the patient population is predominantly covered by the Indonesian National Health Insurance (JKN-BPJS).

Therefore, understanding how education, communication, and waiting time jointly relate to perceived quality is important for managerial quality improvement. This study aimed to analyze the effect of preoperative education, healthcare provider communication, and waiting time on patients' perceived quality of cataract surgery services at Royal Prima Hospital Jambi, Indonesia.

II. RESEARCH METHOD

This study used a quantitative analytic approach with a cross-sectional design. The study population consisted of patients who had undergone cataract surgery at Royal Prima Hospital Jambi. A total of 33 respondents who met the study criteria were included. The independent variables were preoperative education, healthcare provider communication, and waiting time, while the dependent variable was patients' perceived quality of cataract surgery services.

Data were collected using a structured questionnaire with a four-point Likert scale. Instrument testing was conducted among 30 postoperative cataract patients at Arafah Islamic Hospital Jambi. Item validity was assessed using Corrected Item-Total Correlation (CITC), with values >0.30 considered valid. Reliability was assessed using Cronbach's Alpha, with values >0.70 considered reliable. One waiting-time item (W6) had a CITC of 0.243 and was removed from subsequent analysis; the remaining items met the validity criterion.

Univariate analysis was used to describe respondent characteristics and variable scores. Normality of the main study variables was assessed using the Shapiro-Wilk test. Because the variables were not normally distributed, bivariate associations were tested using Spearman Rank correlation. Multiple linear regression was used for multivariable analysis after assessment of regression assumptions, including residual normality using the Normal P-P Plot, multicollinearity using tolerance and variance inflation factor (VIF), and heteroscedasticity using the Glejser test. Statistical significance was set at $p<0.05$.

III. RESULT AND DISCUSSION

Instrument Validity and Reliability

The instrument testing results demonstrated satisfactory psychometric properties. All nine preoperative education items, all seven healthcare provider communication items, and all seven perceived-quality items had CITC values above 0.30. For waiting time, six items met the criterion, while item W6 had a CITC of 0.243 and was eliminated. Cronbach's Alpha values were above 0.70 for all variables, indicating good to excellent internal consistency.

Respondent Characteristics

Most respondents were aged ≥60 years (75.8%), were female (57.6%), had completed elementary school as their highest education (48.5%), were not employed (54.5%), and underwent cataract surgery for the first time (78.8%). All respondents were JKN-BPJS participants. These characteristics are important for interpreting the findings because older age, lower formal education, first surgical experience, and the insurance-based service pathway may influence information needs and perceptions of the care process.

Table 1. CITC Range and Cronbach's Alpha

Variables	Initial Items	CITC range	Cronbach's Alpha	Interpretation
Preoperative Education	9	0.779–0.931	0.969	Valid; highly reliable
Healthcare Provider Communication	7	0.735–0.947	0.958	Valid; highly reliable
Waiting time	7	0.243–0.854	0.877	W6 removed; reliable
Perceived quality	7	0.840–0.915	0.966	Valid; highly reliable

Table 2. Characteristic Hospital Respondent

Characteristic	Category	n	%
Age	32–44 years	2	6.1
	45–59 years	6	18.2
	≥60 years	25	75.8
Sex	Male	14	42.4
	Female	19	57.6
Education	Elementary school	16	48.5
	Junior high school	3	9.1
	Senior high school	11	33.3
	Bachelor's degree	3	9.1
First cataract surgery	Yes	26	78.8
	No	7	21.2
Financing	JKN-BPJS	33	100

Overall responses were favorable; however, several service gaps remained. In preoperative education, 24.2% of respondents disagreed that educational media such as leaflets, videos, or pictures helped them understand cataract surgery, and 24.2% disagreed that they had adequate opportunity to ask questions before surgery.

By contrast, postoperative eye care and medication instructions were rated positively by all respondents. These findings suggest that the content of education was generally well received, but the delivery method and opportunity for interaction could be strengthened. For healthcare provider communication, respondents generally reported positive experiences, particularly regarding doctors' explanations in understandable language. Nevertheless, 15.2% disagreed that they were involved in discussion and decision-making, and 12.1% disagreed that nurses were easy to contact when information or assistance was needed.

Table 3. Descriptive Results

Variable	Mean	Median	SD	Minimum–Maximum
Preoperative Education	27.06	27.00	3.464	21–36
Healthcare Provider Communication	21.42	21.00	2.000	18–28
Waiting time	17.30	18.00	2.518	12–24
Perceived quality	21.88	21.00	2.288	20–28

These findings highlight that communication quality involves not only clarity but also accessibility, participation, and responsiveness. Waiting-time responses revealed the most prominent operational issue: 45.5% of respondents disagreed that they received periodic information about their position on the cataract surgery waiting list. In addition, 24.2% disagreed that the reasons for and estimated duration of waiting were clearly explained, and 24.2% disagreed that they continued to receive attention and information while waiting. Therefore, waiting-time management should address both duration and information transparency.

Patients' perceived quality was generally positive, with a mean score of 21.88. All respondents reported that the service process from beginning to end was generally good and that staff responded promptly to their needs. However, 15.2% disagreed that healthcare providers gave personal attention and understood their specific needs. This indicates that overall quality was perceived positively while individualized care could still be improved.

Bivariate Analysis

Shapiro-Wilk testing showed that preoperative education ($p<0.001$), healthcare provider communication ($p<0.001$), waiting time ($p=0.006$), and perceived quality ($p<0.001$) were not normally distributed. Therefore, Spearman Rank correlation was used. All three independent variables were positively and significantly associated with perceived quality.

Table 4. Spearman Rank Correlation

Independent variable	Spearman r	p-value	Interpretation
Preoperative education	0.701	<0.001	Strong positive correlation
Healthcare provider communication	0.449	0.009	Moderate positive correlation
Waiting time	0.651	<0.001	Strong positive correlation

Regression Assumption Tests and Multivariable Analysis

The Normal P-P Plot indicated that residual points generally followed the diagonal line. Multicollinearity testing showed tolerance values >0.10 and VIF values <10 for all independent variables. The Glejser test showed p-values >0.05, indicating no evidence of heteroscedasticity.

The simultaneous F-test produced F=18.845 with p<0.001, indicating that preoperative education, healthcare provider communication, and waiting time jointly had a significant effect on patients' perceived quality. The model produced R=0.813 and R^2=0.661, indicating that 66.1% of the variance in perceived quality was explained by the three variables, while 33.9% was attributable to other factors not included in the model.

Table 5. The Glejser Test

Variable	Tolerance	VIF	Glejser p-value
Preoperative education	0.527	1.896	0.490
Healthcare provider communication	0.516	1.938	0.387
Waiting time	0.397	2.519	0.914

Table 6. The T-Test

Variable	B	Standardized β	t	p-value	Result
Preoperative education	0.282	0.427	2.870	0.008	Significant
Healthcare provider communication	0.251	0.220	1.459	0.155	Not significant
Waiting time	0.256	0.280	1.642	0.111	Not significant

Preoperative Education and Perceived Quality

Preoperative education showed a strong positive bivariate relationship with perceived quality (r=0.701; p<0.001) and remained statistically significant in the multivariable model (β=0.427; p=0.008). The standardized beta coefficient was the largest among the three predictors, indicating that preoperative education made the greatest independent contribution to perceived quality within this model. Education before surgery helps patients understand cataract, preparation, the surgical procedure, expected benefits, possible risks, and postoperative care. Such understanding can reduce uncertainty and anxiety and can create more realistic expectations of the service [9], [12], [19].

This finding is consistent with Donabedian's framework, in which education is part of the care process that can influence patient-reported outcomes [8]. It also supports patient-centered care and respect for patient autonomy because understandable information enables patients to participate meaningfully in decisions and informed consent. Previous cataract-related studies have emphasized the value of multimodal preparation, video-based education, and patient-centered approaches in improving awareness, readiness, satisfaction, and self-care [9], [13]. The respondent profile reinforces the importance of education. Most participants were ≥60 years old, almost half had only elementary-school education, and 78.8% were undergoing cataract surgery for the first time. Older patients may require slower, simpler, and repeated explanations, while first-time surgical patients have no prior experience with preparation, procedural stages, or postoperative care. Family involvement may therefore be useful when appropriate. The hospital may also consider standardized educational videos hosted on an official channel and shared through a link or QR code so that patients and families can review the material before surgery. Audiovisual media should complement, rather than replace, direct professional education [9], [13].

Healthcare Provider Communication and Perceived Quality

Healthcare provider communication was significantly correlated with perceived quality in bivariate analysis (r=0.449; p=0.009) but was not statistically significant after adjustment for preoperative education and waiting time (β=0.220; p=0.155). This finding should not be interpreted as indicating that communication is unimportant. Communication remains fundamental to information exchange, trust, therapeutic relationships, patient participation, and the delivery of patient-centered care [14], [15], [20].

A plausible interpretation is the conceptual and operational overlap between communication and education. Communication and education are different aspects of care, but they are closely intertwined because patient education is delivered through communication. When healthcare providers explain the disease, surgical preparation, procedure, benefits, risks, and postoperative care, communication is occurring simultaneously through information delivery, opportunities for questions, and responses to patients' informational needs. This overlap may help explain why communication was associated with perceived quality in bivariate analysis but did not retain an independent statistical effect when analyzed together with preoperative education.

The descriptive findings also indicate areas for improvement: 15.2% of respondents did not feel adequately involved in discussions and decisions, and 12.1% did not find nurses easy to contact when information or assistance was needed [14]. Considering that most respondents were older adults and many had limited formal education, communication should be clear, respectful, empathetic, paced appropriately, and supported by simple language. Training in effective and therapeutic communication, patient education, and teach-back may strengthen both communication quality and educational effectiveness [15], [20].

Waiting Time and Perceived Quality

Waiting time had a strong positive association with perceived quality in bivariate analysis (r=0.651; p<0.001), but its independent effect was not statistically significant in the multivariable model (β=0.280; p=0.111). Waiting time nevertheless remains an important process indicator because patients experience scheduling, uncertainty, and delays as part of the overall service pathway [16], [18].

The finding that 45.5% of respondents did not receive periodic information about their waiting-list position is particularly relevant for hospital management. Patients may perceive a necessary waiting period more favorably when the reasons, expected timing, scheduling process, and any changes are communicated transparently. Thus, improvement should focus not only on shortening waiting time but also on providing consistent updates and a clear contact pathway for patients awaiting surgery [16], [18].

All respondents were JKN-BPJS participants, and cataract surgery was managed through a scheduled service pathway. This context may influence how waiting is experienced, but the study did not measure "resignation," acceptance, or passivity toward the JKN-BPJS system. Therefore, the findings should not be interpreted as evidence that JKN-BPJS patients were passive or resigned to the waiting process. Visual, the managerial implication is that the hospital should maintain fair scheduling, provide clear and periodic information, and avoid delays beyond patients' clinical needs, especially because most participants were older adults whose visual function is important for daily independence and quality of life [1], [3].

Simultaneous Effect and Managerial Implications

The three process variables jointly explained 66.1% of the variance in patients' perceived quality. This finding supports the view that perceived service quality is formed by an integrated care process rather than by a single isolated factor [4], [7]. Preoperative education had the greatest independent contribution, communication supported the delivery and understanding of education, and waiting-time management reflected the organization and transparency of the service pathway. Similar literature emphasizes that cataract service quality should incorporate patient experience, access, information, and continuity in addition to clinical outcomes [21], [23].

For hospital management, the priority should be strengthening standardized preoperative education through a written standard operating procedure (SOP), an education checklist, and monitoring of implementation. Educational content should be adapted to older patients and those with limited formal education, use simple language, involve family members when needed, and apply teach-back to confirm understanding. The hospital can provide short official educational videos on cataract preparation, topical anesthesia, the surgical process, postoperative medication, warning signs, and follow-up. Links or QR codes

can be given to patients and families for repeated viewing [9], [13].

Communication quality should be maintained through training for physicians, nurses, and relevant staff in effective, therapeutic, ethical, and patient-centered communication. Waiting-time management should include clear information about scheduling, estimated waiting periods, changes in the schedule, and periodic updates. These recommendations are complementary: standardized education will be more effective when communicated empathetically, while transparent scheduling information can reduce uncertainty during the waiting-period.

IV. CONCLUSION

Preoperative education, healthcare provider communication, and waiting time simultaneously had a significant effect on patients' perceived quality of cataract surgery services at Royal Prima Hospital Jambi and explained 66.1% of the variance in perceived quality. Preoperative education was the only statistically significant independent predictor and had the largest standardized beta.

Communication and waiting time were significantly associated with perceived quality in bivariate analysis but did not show significant independent effects in the multivariable model. The hospital should prioritize standardized preoperative education supported by audiovisual media, effective and patient-centered communication, and transparent scheduling information. These strategies are particularly relevant for older patients, patients with limited formal education, and first-time cataract surgery patients.

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REFERENCES

[1] K. Błachnio et al., "Quality of life after cataract surgery," ***Journal of Clinical Medicine***, vol. 13, no. 17, p. 5209, 2024, doi: 10.3390/jcm13175209.

[2] A. Grzybowski, P. Kanclerz, and V. Huerva, "Cataract surgery and quality of life," ***Asia-Pacific Journal of Ophthalmology***, vol. 8, no. 5, pp. 345–350, 2019.

[3] A. J. Zitha and N. Rampersad, "Impact of cataract surgery on vision-related quality of life," African Vision and Eye Health, vol. 79, no. 1, p. a498, 2020, doi: 10.4102/aveh.v79i1.498.

[4] M. Yoshizaki et al., "How can we improve the quality of cataract services for all? A global scoping review," Clinical & Experimental Ophthalmology, vol. 49, no. 7, pp. 672–685, 2021, doi: 10.1111/ceo.13976.

[5] M. B. D. Andrade, B. B. D. Andrade, J. G. L. Filho, and A. Manetta, "Assessment of the quality of the ophthalmological service at the Hospital of the State Public Servant of São Paulo based on the number of ombudsman cases," ***Brazilian Journal of Health Review***, vol. 7, no. 1, pp. 2729–2733, 2024, doi: 10.34119/bjhrv7n1-220.

[6] M. M. Han et al., "Ophthalmology provider ratings and patient, disease, and appointment factors," ***Journal of Patient Experience***, vol. 8, 2021, doi: 10.1177/23743735211033750.

[7] T. S. Bedaiwi, A. A. Alkhalifa, R. Khandekar, and S. A. AlKhaldi, "Patient satisfaction with regard to ophthalmic ultrasound services offered at King Khaled Eye Specialist Hospital," Acta Scientific Ophthalmology, vol. 4, no. 5, pp. 90–94, 2021, doi: 10.31080/asop.2021.04.0296.

[8] A. Donabedian, "The quality of care: How can it be assessed?" JAMA, vol. 260, no. 12, pp. 1743–1748, 1988.

[9] R. Farwana et al., "Watch this space: a systematic review of the use of video-based media as a patient education tool in ophthalmology," Eye, vol. 34, no. 9, pp. 1563–1569, 2020, doi: 10.1038/s41433-020-0798-z.

[10] B. M. Khalil et al., "Multimodal preparation package: improving patients' awareness and satisfaction with day case cataract surgery," ***Egyptian Journal of Health Care***, vol. 9, no. 3, pp. 149–162, 2018, doi: 10.21608/ejhc.2018.15555.

[11] K. C. Fibrian, C. Suryawati, and Suhartono, "Peran komunikasi dan edukasi pra operatif terhadap kepuasan pasien pasca operasi katarak: Literature review," Media Publikasi Promosi Kesehatan Indonesia (MPPKI), vol. 6, no. 2, pp. 222–231, 2023, doi: 10.31934/mppki.v2i3.

[12] N. M. M. Nassar, A. Shehata, and A. Hassan, "Effect of patient-centered care on self-care practices and satisfaction among patients with cataract surgery," ***Menoufia Nursing Journal***, vol. 9, no. 1, pp. 115–132, 2024, doi: 10.21608/menj.2024.351251.

[13] W. H. Ong, J. Ashby, and J. Ellis, "Optometrist to operation: patients' perspective on the innovative use of QR code-linked patient information video on cataract surgery," Cureus, 2023, doi: 10.7759/cureus.49336.

[14] R. L. Street, G. Makoul, N. K. Arora, and R. M. Epstein, "How does communication heal? Pathways linking clinician-patient communication to health outcomes," Patient Education and Counseling, vol. 74, no. 3, pp. 295–301, 2009, doi: 10.1016/j.pec.2008.11.015.

[15] S. Septina, A. Trigono, and E. A. Rinaldi, "Pengaruh kepemimpinan transformasional terhadap peran perawat dalam komunikasi etik profesi dan implikasinya terhadap branding rumah sakit Bunda," ***Jurnal Manajemen Kesehatan Indonesia***, vol. 13, no. 3, pp. 302–310, 2025.

[16] N. Dhillon, D. Ghazal, J. Harcourt, and M. Kumarasamy, "A proposed redesign of elective cataract services in Scotland – pilot project," Eye, vol. 36, no. 11, pp. 2116–2121, 2021, doi: 10.1038/s41433-021-01810-9.

[17] B. Weingessel, S. Richter-Mueksch, and P. V. Vécsei-Marlovits, "Which factors influence patients' maximum acceptable waiting time for cataract surgery?" Acta Ophthalmologica, vol. 89, no. 3, 2011, doi: 10.1111/j.1755-3768.2010.01938.x.

[18] B. Weingessel, M. Wahl, and P. V. Vécsei-Marlovits, "Patients' maximum acceptable waiting time for cataract surgery: a comparison at two time-points 7 years apart," Acta Ophthalmologica, vol. 96, no. 1, pp. 88–94, 2017, doi: 10.1111/aos.13439.

[19] B. Baartman, "The state of preoperative patient education for cataract surgery," touchREVIEWS in Ophthalmology, vol. 16, no. 2, pp. 63–66, 2022, doi: 10.17925/USOR.2022.16.2.63.

[20] J. Hoffman and L. Pelosini, "Telephone follow-up for cataract surgery: feasibility and patient satisfaction study," ***International Journal of Health Care Quality Assurance***, vol. 29, no. 4, pp. 407–416, 2016, doi: 10.1108/IJHCQA-08-2015-0096.

[21] B. J. Kirkwood, K. Pesudovs, P. Latimer, and D. J. Coster, "The efficacy of a nurse-led preoperative cataract assessment and postoperative care clinic," ***Medical Journal of Australia,*** vol. 184, no. 6, pp. 278–281, 2006, doi: 10.5694/j.1326-5377.2006.tb00237.x.

[22] I. Gabbay, U. Gabbay, D. A. Goldstein, and Y. Nahum, "Should every candidate for cataract extraction be scheduled to the preoperative clinic? The Rabin Medical Center experience," ***European Journal of Ophthalmology,*** vol. 30, no. 6, pp. 1268–1271, 2019, doi: 10.1177/1120672119865842.

[23] A. A. Owokole, E. Hennessy, E. Greenan, and C. Hurley, "Waiting times for cataract surgery in a dedicated cataract clinic: A retrospective audit," ***The Operating Room Global Journal***, vol. 1, no. 2, 2025, doi: 10.64573/torgj2512005.

[24] E.-K. Panagiotopoulou, P. Ntonti, E. Vlachou, K. Georgantzoglou, and G. Labiris, "Patients' expectations in lens extraction surgery: a systematic review," Acta Medica, vol. 61, no. 4, pp. 115–124, 2018, doi: 10.14712/18059694.2018.129.