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Factors Influencing Patients Decision Making Between Refractive Surgeries

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1. ABSTRACT

Background: With the increasing availability of refractive surgical procedures such as LASIK and Implantable Collamer Lens (ICL), understanding the factors that influence patient decision-making has become essential for effective counselling and surgical planning. While advances in technology have ensured safety and visual outcomes, the relative contribution of clinical, economic, and psychosocial factors to patient choice remains unclear.
Aim: To evaluate the factors influencing patient decision-making for refractive surgery and to compare determinants involved in the selection between LASIK and ICL procedures.
Methods: A cross-sectional survey-based study was conducted among individuals seeking refractive surgery consultation. Demographic details, refractive status, sources of information, and perceived importance of various decision-making factors—including cost, safety, recovery time, discomfort, peer influence, and surgeon or clinic reputation—were collected. Data were entered in MS Excel 2019 and analysed using SPSS version 23.0. The Mann–Whitney U test was applied to identify statistically significant factors influencing surgical decision-making and procedure selection.
Results: The majority of participants were male, (n=66) with astigmatism being the most common refractive error (p value 1.000) Friends and family emerged as the primary source of information not applicable followed by advertisements and ophthalmologists. Among all evaluated factors, surgeon and clinic reputation was the only variable showing a statistically significant association with the decision to undergo refractive surgery ($p = 0.023$). Cost, safety, recovery time, discomfort, and peer experience, although rated as important, did not independently influence the final decision. No significant demographic or clinical differences were observed between patients choosing LASIK and those opting for ICL, and both groups rated key factors similarly.
Conclusion: The study highlights that trust in surgeon and clinic reputation is the most critical determinant in refractive surgery decision-making. While cost, safety, and recovery expectations are universally valued, they do not independently drive surgical acceptance or procedure choice. Selection between LASIK and ICL is primarily guided by clinical

evaluation and surgeon counselling rather than patient demographics or socioeconomic factors.

Keywords : Refractive surgery; LASIK; Implantable Collamer Lens (ICL); Patient decision-making; Surgeon reputation

INTRODUCTION

Refractive errors remain one of the leading causes of visual impairment worldwide and significantly affect an individual's quality of life, daily activities, and psychological well-being [1][2]. Dependence on spectacles and contact lenses may impose lifestyle limitations and reduce visual satisfaction, particularly among young adults and working populations. Advances in refractive surgical techniques have provided effective alternatives for the correction of ametropia, reducing dependence on optical aids and improving patient-reported visual outcomes [2][3].Procedures such as Laser-Assisted in Situ Keratomileusis (LASIK), Small Incision Lenticule Extraction (SMILE), and Implantable Collamer Lens (ICL) implantation are widely practiced and have demonstrated favourable visual outcomes with high safety and predictability when appropriate patient selection criteria are followed [3][4][5]. Comparative clinical studies have shown that these procedures effectively correct refractive errors and improve postoperative visual function, with high levels of patient satisfaction across different surgical modalities [4][5].Over the past two decades, continuous technological advancements, refinement of laser platforms, and improved screening protocols have contributed to increased success rates and wider acceptance of refractive surgery [2]. Despite comparable clinical outcomes among different refractive procedures, patient acceptance and willingness to undergo surgery vary considerably. This variation suggests that decision-making is influenced not only by clinical suitability but also by non-clinical factors such as perceived safety, cost, recovery time, fear of complications, and expectations regarding postoperative quality of life [6][7].Patient decision-making in refractive surgery is therefore complex and multifactorial, involving psychological, social, and experiential components in addition to clinical considerations. Preoperative anxiety, perception of surgical risk, and individual tolerance to uncertainty have been shown to influence patient attitudes toward refractive surgery [1][6][7]. Studies evaluating patient satisfaction and regret following refractive surgery have further demonstrated that dissatisfaction is often associated with unmet expectations or inadequate counselling rather than with surgical outcomes themselves [8][9].Earlier research has indicated that infrastructural facilities and cost alone do not independently determine patient preference for refractive surgery. Trust in the surgeon and confidence in the clinical environment have been shown to play an important role in influencing the final decision to undergo refractive surgery [10].Recent comparative studies assessing LASIK, SMILE, and ICL procedures have reported excellent postoperative visual acuity and quality-of-life improvements across all modalities [4][11]. Implantable Collamer Lens implantation, particularly in patients with moderate to high myopia, has demonstrated favourable safety indices and stable refractive outcomes when compared with corneal refractive procedures [11][12]. Both LASIK and ICL have been associated with significant improvements in visual function and patient satisfaction when appropriately indicated

[3][11].In addition to clinical and psychological factors, social influences have become increasingly important in modern healthcare decision-making. Recommendations from friends and family, peer experiences, and exposure through advertisements and digital media have emerged as important sources of information for patients considering refractive surgery [13][14]. Increasing awareness of refractive surgery procedures and improved surgical outcomes have contributed to a steady rise in refractive surgery demand worldwide [15][16]. Clinical outcome studies have also reported consistent improvements in visual acuity and patient satisfaction following refractive surgery procedures [17].Despite extensive literature evaluating visual outcomes and patient satisfaction following refractive surgery, limited evidence specifically addresses the factors influencing patient decision-making between different refractive procedures. Understanding these determinants is essential for improving patient counselling, managing expectations, and enhancing long-term satisfaction. Therefore, the present study aims to evaluate the factors influencing patient decision-making in refractive surgery and to compare patient perceptions toward LASIK and Implantable Collamer Lens procedures [18].

2. METHODOLOGY

The present study was conducted as a cross-sectional observational survey aimed at evaluating the factors influencing patient decision-making toward refractive surgical procedures, with specific emphasis on LASIK and Implantable Collamer Lens (ICL). The study was carried out in a tertiary eye care and refractive surgery clinical setting, where patients seeking consultation for refractive surgery were approached for participation.

Questionnaire Development

The questionnaire used in the present study was developed through a systematic, multi-phase process to ensure its validity, reliability, and clinical relevance. The Content Validity Index (CVI) was assessed using ratings from five reviewers on a 4-point relevance scale. The Scale-level CVI (CVI/Ave) was 0.96, indicating excellent content validity of the questionnaire.

Phase I: Item Generation and Domain Formation

An initial pool of items was generated based on an extensive review of existing literature and the study objectives. The questions were designed to capture various factors influencing patient decision-making regarding refractive surgery. These items were then organized into distinct domains, including demographic, clinical, psychological, and decision-related factors.

Phase II: Expert Review and Content Refinement

The preliminary questionnaire was submitted to a panel of subject experts comprising refractive surgeons, ophthalmologists, optometrists, and psychologists. Their feedback was sought to evaluate the clarity, relevance, and comprehensiveness of the items. Based on their suggestions, necessary modifications were made, including rephrasing of questions, elimination of redundant items, and improvement in structure.

Phase III: Content and Clinical Validity Assessment

To establish content validity, the revised questionnaire was further evaluated by a group of experts who assessed each item for its relevance and appropriateness in addressing the study

objectives. Clinical validity was ensured by involving experienced clinicians who reviewed the questionnaire for its applicability in real-world clinical settings. Their inputs helped refine the questionnaire to better reflect practical considerations in patient decision-making.

Phase IV: Finalization of the Questionnaire

Following expert validation, the questionnaire was finalized. It consisted of structured items, primarily close-ended questions, designed for ease of administration and analysis. Participants included individuals with refractive errors who were eligible for refractive surgery evaluation. Both patients who decided to undergo refractive surgery and those who deferred the decision were included to assess differences in influencing factors.

Patients aged 18 years and above who were diagnosed with refractive errors such as myopia, hypermetropia, or astigmatism. Patients who had attended refractive surgery counselling were willing to participate and provide informed consent. Patients with ocular pathology contraindicating refractive surgery, History of previous ocular surgery &Incomplete or improperly filled questionnaires

- Data Collection Tool
- Data was collected using a structured, self-designed questionnaire that assessed:
- Demographic details (age, gender, education level, income)
- Type of refractive error
- Source of information regarding refractive surgery.
- Factors influencing decision-making such as cost, safety, recovery time, discomfort, peer experience, and surgeon/clinic reputation
- Final decision regarding refractive surgery and choice of procedure (LASIK or ICL)
- The questionnaire was explained to participants prior to administration to ensure clarity and accuracy of responses.
- Data Collection Procedure

  Eligible participants were recruited through convenience sampling. After obtaining informed consent, the questionnaire was administered either through direct interaction or self-completion under supervision all responses were anonymized to maintain confidentiality.

  Collected data were entered into Microsoft Excel 2019 and subsequently transferred to IBM SPSS Statistics version 23.0 for statistical analysis. Descriptive statistics were used to summarize demographic variables, refractive errors, and information sources. The Mann–Whitney U test was applied to compare decision-making factors between participants who decided to undergo refractive surgery and those who did not. Comparative analysis between LASIK and ICL groups was performed to evaluate differences in demographic and clinical variables. A p-value of < 0.05 was considered statistically significant.
- Ethical Considerations

Ethical approval for the present study was obtained from the concerned authorities of the study setting, Eye Mantra Hospital, Delhi, prior to the commencement of data collection. The

study was conducted in accordance with established ethical principles for research involving human participants. All participants were informed about the purpose and nature of the study, and written informed consent was obtained before their inclusion. Participation was entirely voluntary, and respondents were assured of their right to withdraw from the study at any point without any consequences.The study adhered to ethical principles for human research.

3. STATISTICAL ANALYSIS

The survey data was entered in MS Excel 2019 and prior to statistical analysis using SPSS (IBM Statistical Package for Social Science Version 23.0) following steps were performed. Standardisation of words: Under the variable of "chosen surgeries" it was consolidated under two primary terminologies 'LASIK' and 'ICL'. Grouping: As the data for the variable 'decided surgery' was categorical, hence was grouped under two cohorts; decided (Patients who confirmed a surgery decision 'Yes') and not decided (patients who were still considering options 'Still Comparing Option' or 'No')

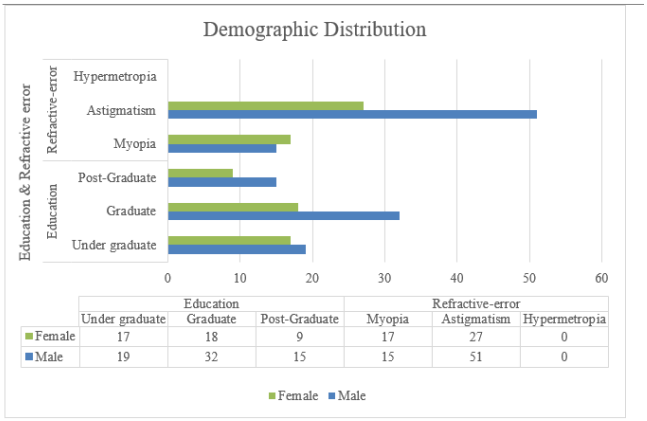
Descriptive Analysis: For analysing categorical data (Gender, Refractive Error, Education), frequencies and percentages were calculated. Numerical data (age and income) were analysed using mean and standard deviation.

Decision factor was assessed utilising 5-point likert scaling with mean and standard deviation for estimating overall importance of each factor.

Mann-Whitney U Test was used to compare the mean ranks of the responses across the two independent groups. This test was run for each of the 10 decision factors independently. The Chi-square Test was used to assess whether the distribution of the categorical factors was independent of the chosen surgery type LASIK vs ICL. The Mann-Whitney U Test was again used to compare the mean ranks of Age and Income between the LASIK and ICL, addressing the potential non-normality of these distribution groups. Kruskal-Wallis H Test was used to evaluate whether the importance differs based on the chosen surgery (LASIK vs. ICL),and the importance of the three key decision factors; Cost, Recovery Time, and Safety & Risks.

4. RESULTS

A total of n=100 subjects were included, who were the candidates of the surgery with a mean age of 22(±3) years, ranged from 22 to 34 years. Males were majority in number n=66. Among the participants n=50 were undergraduates and n=25 each in graduate and post graduates shown in Figure 1.



	Education			Refractive-error		
	Under graduate	Graduate	Post-Graduate	Myopia	Astigmatism	Hypermetropia
Female	17	18	9	17	27	0
Male	19	32	15	15	51	0

Figure 1: Demonstrates the demographic profile of the participants

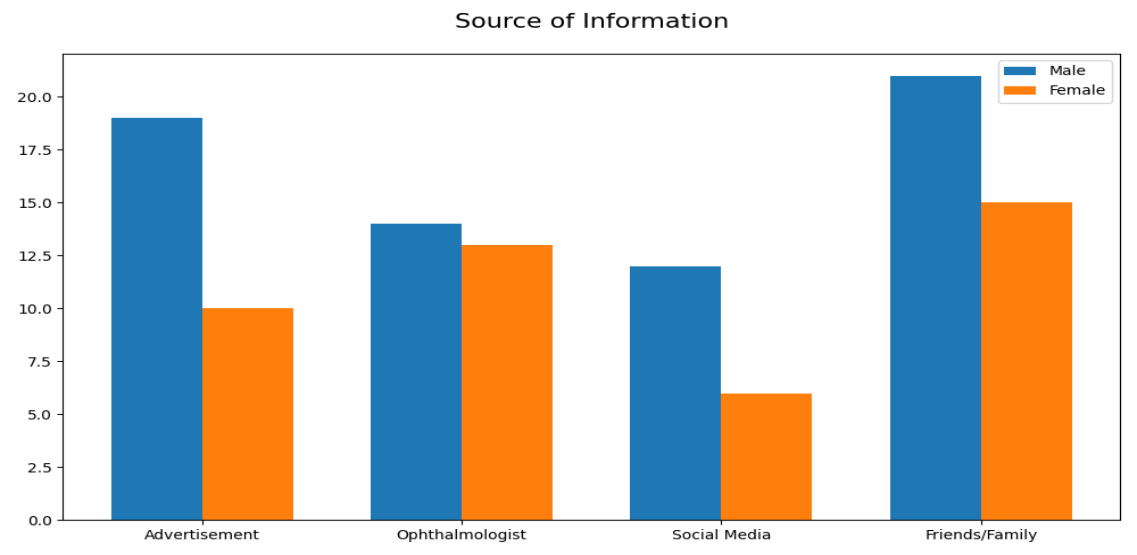


Figure 2: Displays the information distribution among refractive surgery participants.

Out of the total participants n=53 made the surgical decision (Decided group), rest n= 47 were still in a state of comparison or indecision (Not Decided Group). Out of the decided group most of the participants chose LASIK n=35 (73.6%) comparing to those all whose chose ICL n=17 (26.4%). Friends and family remain the top source of information regarding refractive surgery for the participants for both male (n=21) and female (n=15). See figure 2

Factors influencing surgery decision: The importance ratings of 10 decisions factors were compared between decided group (n=53) and non-decided group (n=47) to identify the factors influencing a subject's final decision to undergo refractive surgery.

Table 1: Mann-Whitney U Test Comparing Decision Factor Importance (Decided vs. Not Decided Groups)

Decision Factor	Mean Rank (Decided)	Mean Rank (Not Decided)	U Statistic	p-value	Interpretation
Surgeon/Clinic Reputation	59.08	437	1563.0	0.023	Significant Difference
Cost	54.76	45.80	1417.5	0.207	No Significant Difference
Doctor Recommendation	51.09	49.79	1235.5	0.946	No Significant Difference
Recovery Time	50.77	49.20	1187.0	0.670	No Significant Difference
Discomfort	48.25	52.70	1053.0	0.124	No Significant Difference
Time Off Work	527	50.81	1216.0$	0.831	No Significant Difference

Permanent Correction	49.56	52.70	1097.0	0.238	No Significant Difference
Safety and Risks	53.31	47.34	1330.5	0.535	No Significant Difference
Peer Experiences	52.47	48.24	1314.0	0.625	No Significant Difference
Follow-up Visits	50.72	49.73	1181.5	0.646	No Significant Difference
Note: * $p < 0.05$					

As decision factor 'surgeon/ clinic reputation' was found to be statistically significant ($p<0.05$). On being compared to participants 'not-decided' the mean rank 437, then those who 'decided' the mean rank was 59.08. This highlights that gaining confidence in surgeon's or clinic's reputation is a critical psychological threshold which leads to final decision for undergoing refractive surgery. Other factors such as Cost, Recovery Time, and Safety & Risks remained non-significant upon decision making for surgery.

Factors Affecting the Decision Between ICL and LASIK : Among the 'decided' group participants, demographic and clinical factors were assessed to assess if ant specific prediction is made upon choosing LASIK and ICL (n=53)

Table 2: Comparison of Demographic and Clinical Factors by Chosen Surgery

Factor	Test	LASIK Group (Mean/N)	ICL Group (Mean/N)	Test Statistic	p-value	Interpretation
Gender (F/M)	Chi-square	17/22	7/7	0.009	0.920	Not Significant
Refractive Error (Astig./Myopia)	Chi-square	19/20	7/7	0.000	1.000	Not Significant
Age (Years)	Mann-Whitney U	22.31	214	1080.5	0.189	Not Significant
Income (INR)	Mann-Whitney U	21,538	22,786	1000.5	0.566	Not Significant

The distribution of Gender ($p>0.05$), Refractive Error ($p>0.05$), Age ($p>0.05$), and Income ($p>0.05$) did not differ statistically significant among patients who choose ICL and LASIK. This point up the kind of surgery chosen within this group was not influenced by the clinical and demographic factors that were assessed among the participants.

Key Factors' Relative Importance in Surgery Selection : To determine whether the two selected operation types differed in how much value was given to important aspects (Cost, Recovery Time, and Safety & Risks), additional analysis was conducted.

Table 3: Kruskal-Wallis H Test Comparing Importance of Key Factors (LASIK vs. ICL)

Decision Factor	Mean Score (LASIK)	Mean Score (ICL)	H Statistic	P value	Interpretation
Cost	10	14	0.030	0.862	Not Significant
Recovery Time	4.03	4.07	0.033	0.856	Not Significant
Safety and Risks	3.95	4.07	0.203	0.652	Not Significant

The results show that patients who choose LASIK and those who selected ICL had statistically similar relative importance ratings for Cost (p=0.862), Recovery Time (p=0.856), and Safety and Risks (p=0.652). These criteria were consistently assessed as extremely essential by both groups (all mean ratings were over 3.90 out of 5.00). Figure 3 provides a visual representation of this homogeneity.

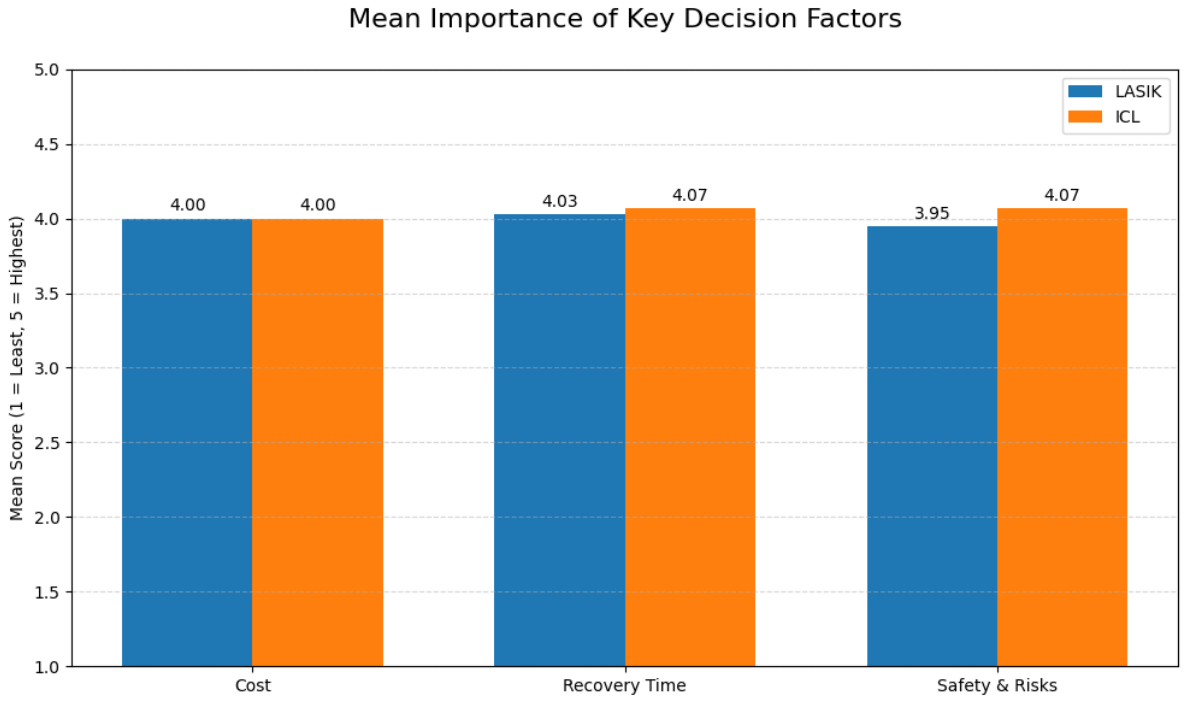


Figure 3: Mean Importance of Key Decision Factors by Chosen Surgery

5. DISCUSSION

The present study was conducted to evaluate the factors influencing patient decision-making in refractive surgery and to compare determinants involved in the selection between LASIK and Implantable Collamer Lens (ICL) procedures. Although advances in refractive surgical techniques have resulted in excellent visual outcomes and high safety profiles, patient acceptance of surgery continues to vary, indicating that decision-making extends beyond clinical eligibility alone. Earlier literature reviews such as the *LASIK world literature review*

by Solomon et al. reported high levels of patient satisfaction and improvement in quality of life following refractive surgery, highlighting that clinical success alone does not fully explain patient acceptance of these procedures [2][3].In the present study, a higher proportion of participants were young adults, with male predominance. Similar demographic trends have been reported in previous refractive surgery studies. Reilly and Casserly, who investigated gender differences in LASIK decision-making, also observed that younger individuals are more likely to seek surgical correction to achieve spectacle independence for academic, occupational, and lifestyle-related reasons [7][9]. The predominance of myopia and astigmatism among participants aligns with existing literature, as these refractive errors are most commonly associated with refractive surgery consultations. Comparative outcome studies such as those conducted by Varshney et al. and systematic reviews by Dichen et al. similarly report that myopia remains the most common indication for refractive surgery procedures [9][11].Friends and family emerged as the most common source of information regarding refractive surgery in the present study. This finding is consistent with earlier reports indicating that peer experiences and personal recommendations significantly influence initial patient perceptions and expectations. Studies examining patient motivations for undergoing LASIK surgery, such as those by Wilson et al., have highlighted that informal information sources frequently shape attitudes toward refractive surgery even before professional consultation occurs [13][14]. While ophthalmologists and optometrists remain essential in final counselling, the influence of non-professional sources appears substantial in the early decision-making phase.Among all evaluated factors, surgeon and clinic reputation was the only variable that demonstrated a statistically significant association with the decision to undergo refractive surgery. This finding strongly correlates with earlier studies emphasizing the importance of trust and confidence in the surgeon. Gupta et al., in their study on factors influencing patient choice of refractive surgery centres, reported that infrastructural facilities and cost alone did not significantly influence patient choice and that perceived credibility of the surgeon played a central role in surgical acceptance [10]. Similarly, Salmon et al. demonstrated that perception of surgical risk and trust in the treating surgeon significantly influenced patient willingness to undergo refractive surgery, even when clinical outcomes were favourable [6].Although factors such as cost, safety, recovery time, discomfort, permanence of correction, and peer experiences were rated as important by most participants, none of these showed a statistically significant independent influence on the final decision. This observation is consistent with findings by Davidorf et al., who reported that psychological reassurance and confidence in the surgeon outweighed individual concerns such as fear of complications or recovery time [7]. McGwin et al. further noted that postoperative regret following LASIK was more closely associated with unmet expectations and inadequate counselling than with actual surgical outcomes, reinforcing the importance of trust-based decision-making in refractive surgery [9].The comparison between patients opting for LASIK and those choosing ICL revealed no statistically significant differences in demographic or clinical variables, including age, gender, income, or refractive error. These findings are consistent with recent comparative studies. Varshney et al., who compared

quality of life outcomes following FS-LASIK and Implantable Collamer Lens implantation, reported that both procedures produced comparable improvements in visual function and patient satisfaction when appropriately selected based on clinical parameters [11]. Similarly, systematic analyses conducted by Dichen et al. have demonstrated comparable visual outcomes and patient satisfaction levels across LASIK, SMILE, and ICL procedures when appropriate patient selection criteria are followed [11].Furthermore, both LASIK and ICL groups in the present study assigned similar importance to key factors such as cost, recovery time, and safety. This homogeneity in perception suggests that once patients decide to undergo refractive surgery, expectations regarding these factors remain consistent across different surgical modalities. Comparative studies evaluating refractive procedures have similarly reported comparable patient satisfaction levels when procedures are performed based on appropriate clinical criteria [4][11].Overall, the findings of the present study reinforce the concept that patient decision-making in refractive surgery is multifactorial, with psychological trust in the surgeon and clinic playing a dominant role. While clinical outcomes and procedural safety are essential prerequisites, they do not independently determine surgical acceptance. Instead, effective communication, professional credibility, and reassurance significantly influence patient confidence and willingness to proceed with refractive surgery. Broader refractive surgery literature has similarly emphasized that structured patient counselling and expectation management are key determinants of overall patient satisfaction following refractive procedures [15].

6. CONCLUSION

In this cross-sectional study, surgeon and clinic reputation was the only factor significantly associated with the decision to undergo refractive surgery. Other evaluated factors, including cost, safety, recovery time, discomfort, and peer experience, did not independently influence surgical acceptance despite being rated as important by participants. No significant demographic or clinical differences were observed between patients selecting LASIK and those opting for Implantable Collamer Lens (ICL) implantation. The relative importance assigned to key decision-making factors was comparable between both groups, indicating that procedure selection was not driven by patient demographics or socioeconomic status.

These findings suggest that patient acceptance of refractive surgery is influenced primarily by trust in the treating surgeon and clinical environment rather than by individual practical considerations. Incorporating structured, patient-centred counselling that addresses psychological reassurance alongside clinical evaluation may improve surgical acceptance and patient confidence.

Limitations: Despite providing valuable insights, this study has several limitations. First, the research was conducted using a cross-sectional survey design, which captures patient perceptions at a single point in time and does not allow evaluation of how opinions or decisions may change over time. Second, the sample size was relatively limited and drawn from a specific clinical setting, which may restrict the generalizability of the results to broader or more diverse populations seeking refractive surgery. Third, the study relied on

self-reported responses, which may introduce response bias or recall bias when participants report the factors influencing their decisions.

Implications: Despite these limitations, the study provides valuable insights for clinical practice and patient counselling in refractive surgery. The findings suggest that trust in the surgeon and the reputation of the clinic play a critical role in patient decision-making, emphasizing the importance of effective communication, transparency, and patient–doctor relationships in ophthalmic care. Understanding that factors such as cost, safety, and recovery expectations are universally valued but may not independently drive the final decision can help clinicians tailor their counselling strategies to address patient concerns more effectively. The results also highlight the influence of social networks, such as friends and family, in disseminating information about refractive procedures. These insights can guide eye care professionals in developing patient education programs and improving awareness strategies.

Conflict of Interest: The authors declare that there is no conflict of interest regarding the publication of this study.

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