

Master of Science in Public Health



Quality of Life of Patients After Keratorefractive Surgery in Tertiary Eye Care Hospital of District Rawalpindi, Pakistan: A Cross Sectional Study

MSPH Thesis

by

MEHMONA ASGHER

**AL-Shifa School of Public Health, PIO,
Al Shifa Trust Eye Hospital
Quaid-i-Azam University
Islamabad, Pakistan
(2021-2023)**

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Surgery in Tertiary Eye Care Hospital of District
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MEHMONA ASGHER

(362896-PIO/MSPH-2021)

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To

**Al-Shifa School of Public Health, PIO, Al-Shifa Trust Eye
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Faculty of Medicine
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Islamabad**

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Declaration

I, Mehmona Asgher, hereby state that my thesis titled “Quality of Life of Patients After Keratorefractive Surgery in Tertiary Eye Care Hospital of District Rawalpindi, Pakistan: A Cross Sectional Study” submitted to the Department of Public Health, Faculty of Medicine, Al-Shifa School of Public Health, Quaid-e-Azam University Islamabad, Pakistan for the award of the degree of Master of Science in Public Health is the result of research work carried out by me. I certify that I have read and understood the rules and regulations of ASOPH and QAU regarding assessment procedures and offenses and formally declare that all work contained within this document is my own apart from properly referenced quotations.

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Prof Dr. Ume Sughra

Director Research

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I would like to start by showing my thankfulness to Allah Almighty, as all my achievements are because of his benevolence and mercy. After that, I would like to depict my immense gratitude to my parents for believing in me and supporting me throughout my journey.

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LIST OF ABBREVIATIONS

PRK	Photorefractive Keratectomy
Trans PRK	Transepithelial Photorefractive Keratectomy
LASIK	Laser In Situ Keratomileusis
SMILE	Small Incision Lenticule Extraction
QOL	Quality of Life
QIRC	Quality of Life Impact of Refractive Correction
WHO	World Health Organization

ABSTRACT

Background:

Keratorefractive surgery, which includes procedures like LASIK (Laser-Assisted In Situ Keratomileusis) and PRK (Photorefractive Keratectomy), has become a widely accepted and popular means of correcting refractive errors.

Objectives:

- To assess the quality of life (QOL) of patients who underwent keratorefractive surgery.
- To determine association of sociodemographic and surgery related factors with quality of life.

Methodology:

A Descriptive Cross-Sectional Study was carried out over a period of six months from March 2023 to August 2023 to assess the quality of life (QOL) of patients who underwent keratorefractive surgery. Data was collected using non-probability consecutive sampling strategy using a validated and interview-based Quality of Life Impact of Refractive Correction (QIRC) Questionnaire tool for this study. Data was analyzed using Statistical Package for Social Science (SPSS) version 26.

Results:

The results of this study showed no significant association between level of education (p-value=0.09), occupation (p-value=0.70), age groups (p-value=0.30) and gender (p-value=1.00) with quality of life of patients after keratorefractive surgery. The results showed that there was no significant association observed among type of refractive surgery, post-surgery duration and quality of life (p-value=0.107) and (p-value=0.512) respectively.

Conclusion:

The findings indicate a moderate increase in the quality of life among individuals who underwent keratorefractive surgical procedures. The majority of the patients reported an improvement in their quality of life following keratorefractive surgery.

Keywords: Keratorefractive Surgery, Quality of Life (QOL), Laser-Assisted in Situ Keratomileusis (LASIK), Photorefractive Keratectomy (PRK), Transepithelial Photorefractive Keratectomy (Trans PRK), Quality of Life Impact of Refractive Correction (QIRC)

Chapter 1: Introduction

1. Introduction:

Myopia is a major cause of distance vision impairment, affecting a significant portion of the global population. It was estimated to affect approximately 2.62 billion people in 2020, with projections suggesting that this number will increase to 3.361 billion by 2030.

In recent years, the field of ophthalmology has witnessed remarkable advancements, with keratorefractive surgery emerging as a transformative solution for various refractive errors. This innovative surgical approach, encompassing techniques such as LASIK (Laser-Assisted in Situ Keratomileusis) and PRK (Photorefractive Keratectomy), has revolutionized the way individuals experience visual correction. As the demand for enhanced visual acuity and reduced dependency on corrective eyewear continues to grow, keratorefractive surgery has gained prominence as a means to significantly improve the quality of life for patients.

Surface ablation and lamellar ablation using an excimer laser are two types of refractive surgery that have been developed. However, people are hesitant to undergo such surgery due to possible complications such as unpredictable outcomes, flap-related problems, and corneal ectasia. Recent advancements have been made to make refractive surgeries safer, such as Femtosecond-LASIK (FS-LASIK) and single-step Transepithelial Photorefractive Keratectomy (Trans-PRK) with SmartPulse technology. Another emerging option is small incision lenticule extraction (SMILE), which offers greater biostability and quicker recovery than Trans-PRK.

1. Significance of Keratorefractive Surgery:

Keratorefractive surgery, which includes procedures like LASIK (Laser-Assisted In Situ Keratomileusis) and PRK (Photorefractive Keratectomy), has become a widely accepted and popular means of correcting refractive errors such as myopia, hyperopia, and astigmatism. These surgeries offer the prospect of significantly reducing or eliminating the need for glasses or contact lenses, thereby enhancing the visual experience and convenience for patients.

2. Increasing Popularity and Prevalence:

Keratorefractive surgeries have seen a substantial increase in popularity over the past few decades. Millions of people worldwide undergo these procedures each year, making it one of the most common elective surgeries. With such a substantial number of patients opting for keratorefractive surgery, understanding its impact on their quality of life becomes imperative.

3. Diverse Patient Profiles:

Patients who undergo keratorefractive surgery come from diverse backgrounds, age groups, and professions. This diversity presents an opportunity to study the quality of life changes resulting from these surgeries across a broad spectrum of individuals. Assessing the outcomes in terms of quality of life can help in tailoring the surgical approach and pre-operative counseling to meet the specific needs and expectations of different patient groups.

4. Varied Expectations and Experiences:

The expectations and experiences of patients undergoing keratorefractive surgery can vary widely. While many patients report significant improvements

in their visual acuity and quality of life, others may experience complications or have unrealistic expectations. Investigating these variations in experiences can offer valuable insights into the factors that contribute to patient satisfaction and well-being post-surgery.

5. Long-term Impact:

Keratorefractive surgery is often perceived as a life-changing procedure, and its outcomes are expected to have a long-lasting impact on the quality of life of patients. However, it is essential to study these outcomes over an extended period to assess their sustainability and any potential late-onset complications or changes

6. Psychosocial and Economic Implications:

Beyond the physical benefits, keratorefractive surgery can have psychosocial and economic implications. Patients may experience improved self-esteem and job opportunities as a result of reduced dependence on corrective eyewear. Conversely, they may face psychosocial challenges if the surgery does not meet their expectations or if they experience post-operative complications. Understanding these aspects is crucial for a comprehensive evaluation of post-surgical quality of life.

7. Lack of Comprehensive Research:

Despite the widespread adoption of keratorefractive surgery, there is a relative scarcity of comprehensive, long-term studies that examine its impact on the quality of life of patients. Much of the existing research focuses on clinical outcomes, such as visual acuity and refractive error, while neglecting the broader implications of these surgeries on patients' daily lives and well-being

The main goal of this study is to delve into the complex relationship between keratorefractive surgery and the subsequent quality of life that patients who undergo these procedures experience. Quality of life, a multidimensional construct encompassing physical, psychological, social, and emotional well-being, stands as a vital metric to assess the holistic impact of medical interventions. As such, investigating the impact of keratorefractive surgery on the quality of life of patients is of paramount importance, both from a clinical and a patient-centred perspective.

This study seeks to bridge the existing gap in the literature by comprehensively evaluating the multifaceted dimensions of quality of life following keratorefractive surgery. By examining factors such as visual outcomes, patient satisfaction, psychological well-being, and daily functionality, this research aims to provide a comprehensive overview of the postoperative journey of individuals who have undergone keratorefractive procedures. Moreover, by identifying potential predictors and challenges that may influence the quality of life outcomes, this thesis endeavors to contribute valuable insights that could inform clinical practice, patient counselling, and healthcare policy.

Few publications compare the QoL following the ReLEx SMILE technique, and there are not enough comparative measures. QoL includes physical condition, functional capabilities, psychological state, general condition, and social interaction. Patients' satisfaction with their life conditions, work, education, home environment, and even political beliefs in relation to their visual status are evaluated using QoL questionnaires. The Quality of Life Impact of Refractive Correction (QIRC) Questionnaire, developed and validated by Pesudovs et al 2003, is specifically for patients with the refractive error corrected by spectacles, contact lenses, and refractive surgery. This study aims to compare the QoL of

patients who underwent myopic correction with PRK, TransPRK, ReLEx SMILE or Femto-LASIK procedures, using the QIRC questionnaire.

QoL combines various aspects, which include physical condition, functional capabilities, psychological state, general condition, and social interaction. 24–26 Various QoL questionnaires have been used to evaluate patients' satisfaction with their life conditions, their work, education, home environment, and even political beliefs in relation to their visual status.

In this study we will explore the theoretical underpinnings of quality of life assessments, review pertinent literature surrounding keratorefractive surgery outcomes, and present a rigorous methodology employed to investigate the various facets of quality of life. Through this comprehensive exploration, we aspire to shed light on the transformative potential of keratorefractive surgery and its role in enhancing the overall well-being and quality of life of patients. Ultimately, this research aims to empower both healthcare providers and patients with a deeper understanding of the intricate interplay between surgical interventions and the profound impact they have on the lives of those seeking visual correction.

1.1 Rationale:

Keratorefractive surgery is increasingly popular in Pakistan, yet there's limited research on how it specifically impacts patients' quality of life in this context. Understanding the quality of life post-keratorefractive surgery in Pakistan can aid in tailoring healthcare services and patient counseling to local needs and expectations. This research can potentially contribute to improved patient satisfaction, informed decision-making, and better healthcare policies regarding refractive surgery in the Pakistani healthcare system.

1.2 Objectives:

- To assess the quality of life (QOL) of patients who underwent keratorefractive surgical procedures.
- To determine association of sociodemographic and surgery related factors with quality of life.

Chapter 2: Literature Review

2. Literature Review:

Keratorefractive surgery, which includes LASIK (Laser-Assisted in Situ Keratomileusis) and PRK (Photorefractive Keratectomy), has changed the field of ophthalmology by making it possible to treat refractive errors effectively. These procedures aim to improve visual acuity and reduce dependency on corrective eyewear. However, the impact of keratorefractive surgery on patients' quality of life (QoL) extends beyond visual acuity, involving physical, psychological, and social dimensions. Understanding the impact of these procedures on the quality of life of patients is crucial, especially in the context of Pakistan where the prevalence of refractive errors is high, and access to eye care services is variable. This literature review aims to examine existing research on the quality of life of patients following keratorefractive surgery in Pakistan.

1. Prevalence of Refractive Errors in Pakistan:

To appreciate the importance of this topic, it is essential to acknowledge the high prevalence of refractive errors in Pakistan. A study estimated that nearly 36.5% of Pakistan's population suffers from myopia, highlighting the significant demand for vision correction interventions such as keratorefractive surgery.

2. Clinical Outcomes and Patient Satisfaction:

Several studies conducted in Pakistan have reported favorable clinical outcomes of keratorefractive surgeries, including improved visual acuity and refractive

error correction. However, patient satisfaction and quality of life post-surgery are multifaceted. Research by Negishi et al, 2020 found that a majority of patients reported increased satisfaction and improved quality of life after LASIK surgery.

3. Psychosocial Impact:

Keratorefractive surgery not only addresses the physical aspects of vision but can also have profound psychosocial implications. A study by Schmidt et al, 2007 highlighted that patients often experience increased self-confidence and reduced social limitations post-surgery, contributing positively to their quality of life.

4. Economic Considerations:

The economic aspect is significant, as refractive surgeries can be seen as an investment in reducing the long-term costs associated with eyeglasses and contact lenses. Research conducted by Nichols et al, 2005 suggested that the economic benefits of keratorefractive surgery can positively influence the quality of life of patients by reducing financial burdens.

5. Complications and Challenges:

While most studies in Pakistan have reported positive outcomes, it is crucial to acknowledge potential complications and challenges. Some patients may experience post-operative discomfort, dry eyes, or night vision issues. Understanding these challenges and their impact on the quality of life is essential for comprehensive patient care.

6. Long-term Follow-up:

Research with longer follow-up periods is relatively limited, making it challenging to assess the sustainability of the quality of life improvements. Studies tracking patients over several years would provide valuable insights into the long-term impact of keratorefractive surgery in Pakistan.

7. Cultural and Societal Factors:

Cultural and societal factors can influence patients' perceptions of quality of life. Factors such as gender roles, cultural beliefs, and societal expectations may affect how individuals perceive and experience the benefits of keratorefractive surgery. This aspect warrants further exploration.

Keratorefractive surgery, including procedures such as LASIK (Laser-Assisted In Situ Keratomileusis) and PRK (Photorefractive Keratectomy), has gained widespread popularity as a means to correct refractive errors and reduce dependence on glasses or contact lenses. One critical aspect of assessing the success of keratorefractive surgery is its impact on the quality of life (QOL) of patients. This literature review aims to provide an in-depth analysis of worldwide studies that have explored the QOL of patients following keratorefractive surgery, considering various dimensions, including visual function, psychosocial well-being, and patient satisfaction.

1. Visual Function and Quality of Life

The primary goal of keratorefractive surgery is to improve visual function and reduce visual impairment, which directly influences a patient's QOL. Numerous studies have reported substantial improvements in visual acuity and patient-reported visual function after these surgeries. For example, a meta-analysis by

Solomon et al, 2009 found that LASIK and PRK significantly improved uncorrected visual acuity (UCVA) and best-corrected visual acuity (BCVA) in patients with myopia, hyperopia, and astigmatism. These improvements in visual function contribute positively to a patient's overall QOL.

2. Psychosocial Well-being and Quality of Life

Psychosocial well-being plays a vital role in assessing the QOL of individuals undergoing keratorefractive surgery. Many patients opt for these procedures to enhance their self-esteem, body image, and overall well-being. Several studies have reported improvements in psychosocial outcomes following surgery. Schalhorn et al, 2016 conducted a prospective cohort study and found a significant improvement in self-esteem and self-confidence among patients who underwent LASIK. Similarly, a study by Katzen J et al, 2002 revealed a significant reduction in symptoms of anxiety and depression after keratorefractive surgery.

3. Patient Satisfaction and Quality of Life

Patient satisfaction is a crucial determinant of QOL in the context of keratorefractive surgery. High levels of satisfaction are often linked to improved QOL. Numerous studies have reported high levels of patient satisfaction following these procedures. A systematic review by Smith et al, 2020 found that over 90% of patients reported satisfaction with their outcomes after LASIK and PRK. High patient satisfaction is associated with reduced anxiety and improved QOL, as individuals experience less concern about their vision and greater confidence in their daily activities.

4. Factors Influencing Quality of Life After Keratorefractive Surgery

Several factors can influence the QOL of patients following keratorefractive surgery. These factors include preoperative visual acuity, refractive error, surgeon experience, patient expectations, and postoperative complications. For instance, patients with higher preoperative myopia often report greater improvements in QOL post-surgery Solomon et al, 2019. Additionally, patients with unrealistic expectations may experience lower QOL if their postoperative outcomes do not meet their exaggerated hopes.

5. Long-term Quality of Life and Stability of Outcomes

While many studies have focused on short-term QOL outcomes after keratorefractive surgery, understanding the long-term impact is equally important. Research by Kim et al, 2021 suggests that QOL improvements are generally maintained over the long term. However, it's essential to consider the potential for regression of outcomes and the development of late complications that could affect long-term QOL.

6. Societal and Occupational Implications:

Keratorefractive surgery can exert a considerable impact on patients' social interactions and occupational roles. Enhanced unaided vision often leads to increased participation in social activities and improved performance in professional settings. Additionally, reduced dependence on eyeglasses can influence self-perception and interpersonal relationships. Nonetheless, transient visual disturbances such as halos and glare may impact nighttime driving and certain occupational tasks, potentially affecting patients' QoL. The ability to

return to work and daily activities promptly following surgery is noted as a significant contributor to post-operative QoL.

Katzen et al published a paper in 2002 related to the anxiety of patients undergoing laser refractive surgery, noting that as refractive surgery has rapidly evolved and the quest to obtain faster visual recovery, fewer complications, and early stability continues, there is little in the literature that addresses the anxiety experienced by most refractive surgical patients. Unfortunately in the 16 years since that publication, minimal steps have been taken to further study the anxiety and management of anxiety or fears in refractive surgery patients

A study by P Lazon de la Jara et al, 2011 stated that satisfaction with LASIK is related to visual function, preoperative expectations, psychological characteristics, and uncorrected CVA achieved. An increased sense of subjective well-being, adaptability, and self-efficacy was evident after LASIK. Patients reported a more optimistic attitude to life and increase perceived QOL after surgery.

Another study by Klokova et al, 2019 reported that the results of the study suggest that patients require some time to adapt to their new visual function and its impact on their daily living, delaying detectable improvements in QoL. Moreover, these results may suggest a higher satisfaction trend and long-term QoL in patients undergoing ReLEx SMILE in comparison to Femto-LASIK. Long-term results from the study demonstrated high patient satisfaction with both methods.

Matsuguma et al, 2023 concluded that LASIK positively affected patients' overall subjective happiness postoperatively and this improvement in subjective

happiness was correlated with satisfaction with surgery, which could be increased by the increased QOL after LASIK surgery.

2.1 Conceptual Framework:

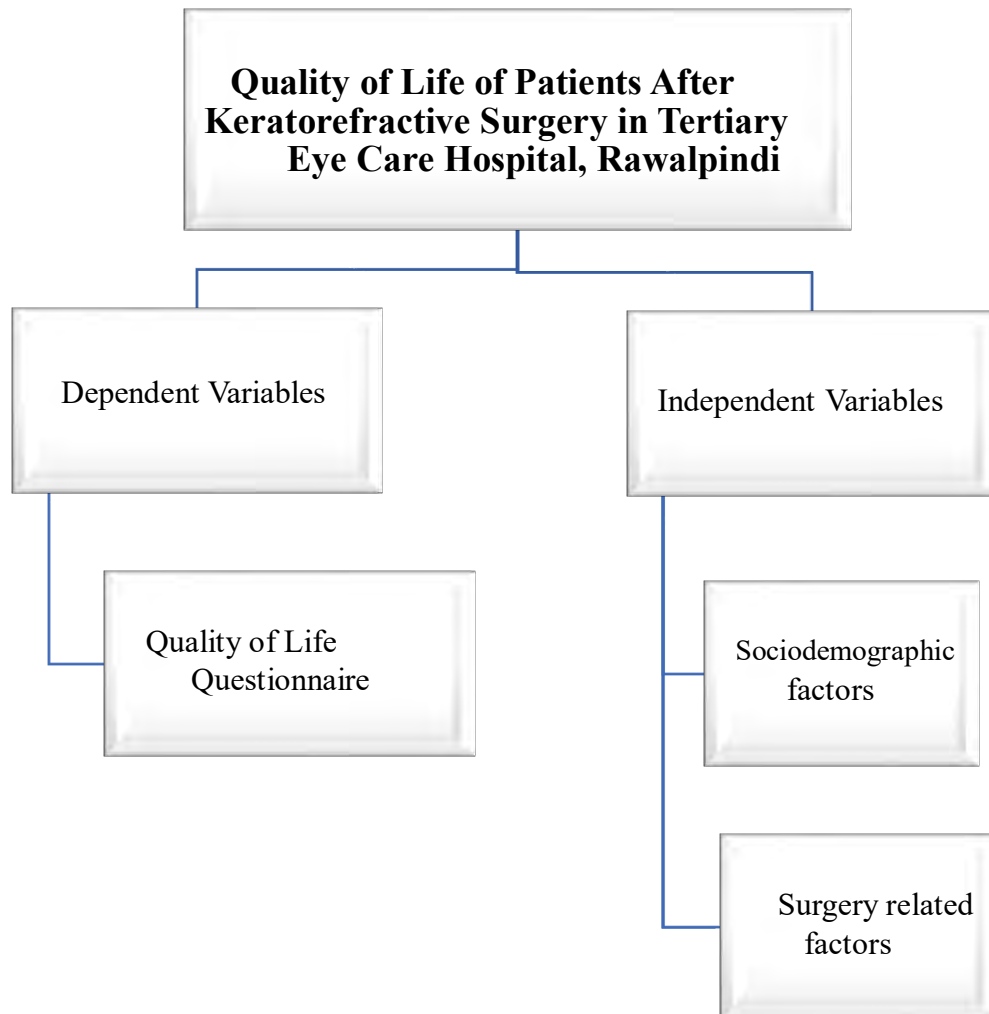


Figure 1: Conceptual Framework

2.2 Hypothesis:

2.2.1 Null hypothesis:

Sociodemographic factors do not affect the quality of life of patients after keratorefractive surgery.

2.2.2 Alternate hypothesis:

Sociodemographic factors significantly affect quality of life of patients after keratorefractive surgery.

2.3 Operational definitions:

1. Refractive Errors:

Refractive errors are optical abnormalities of the eye that result in an inability to focus light properly onto the retina, leading to blurred or distorted vision. They can be operationally defined by measuring the following parameters:

- **Visual Acuity:** Refractive errors can be quantified by assessing the clarity of vision using standardized eye charts, such as the Snellen chart, and recording the smallest line of letters or symbols that a person can read accurately at a specific distance.

- **Refractive Power:** Refractive errors can also be defined in terms of the eye's refractive power, typically measured in diopters (D), by assessing the deviation of the eye's focal point from the retina. Myopia (nearsightedness), hyperopia (farsightedness), and astigmatism are common refractive errors, each characterized by specific diopter values.

- **Prescription for Corrective Lenses:** An operational definition can involve the prescription needed for corrective eyeglasses or contact lenses, indicating the type and strength of lenses required to correct the specific refractive errors.

2. Keratorefractive Surgery:

Keratorefractive surgery is a surgical procedure designed to correct refractive errors by reshaping the cornea, the clear front surface of the eye. Operational definitions for keratorefractive surgery can include:

- **Corneal Reshaping:** Keratorefractive surgery involves reshaping the cornea to change its refractive properties. This can be operationally defined by specifying the surgical technique used, such as LASIK (Laser-Assisted In Situ Keratomileusis), PRK (Photorefractive Keratectomy), Trans PRK (Transepithelial Photorefractive Keratectomy).

3. Quality of Life: Quality of life is a multidimensional concept that encompasses various aspects of an individual's overall well-being and satisfaction with life. Operational definitions for quality of life can involve:

- **Subjective Well-Being:** Quality of life can also be operationally defined as an individual's subjective assessment of their life satisfaction, happiness, and overall sense of fulfillment, typically measured through self-report scales or interviews.
- **Functional Measures:** In some contexts, quality of life may be operationalized by evaluating an individual's ability to perform daily activities and tasks, such as self-care, work, and leisure activities, as an indicator of their overall well-being.

Chapter 3: Methodology

Methodology:

3.1 Study Design:

A Descriptive Cross-Sectional Study was carried out to assess Quality of Life of Patients After Keratorefractive Surgery in Tertiary Eye Care Hospital of District Rawalpindi, Pakistan. Study Data was collected one point in time and it was primary research.

3.2 Study Duration:

This study was carried out during a period of six months after the approval of the Institutional Review Board i.e. from March to August 2023.

3.3 Study Setting:

This study was carried out in the tertiary eye care hospital of district Rawalpindi. The data was collected with the help of QIRC questionnaire through google form.

3.4 Sample Selection:

3.4.1 Inclusion Criteria:

1. Patients who had Photorefractive Keratectomy surgery.
2. Patients who had Transepithelial Photorefractive Keratectomy.
3. Patients who had Femto LASIK Surgery.
4. Patients who are above age 19.

3.4.2 Exclusion Criteria:

1. Patients with all ocular pathologies.
2. Patients who had history of any ocular surgery other than keratorefractive surgery.

3.5 Sample Size Calculation:

Sample size was calculated using Open Epi software. Hypothetical frequency of outcome variable was taken as 50% because population was unknown. Sample size obtained was 68 with margin of error 10.

3.6 Sampling Strategy:

Desired sample was collected using non-probability consecutive sampling strategy.

3.7 Data Collection Instrument:

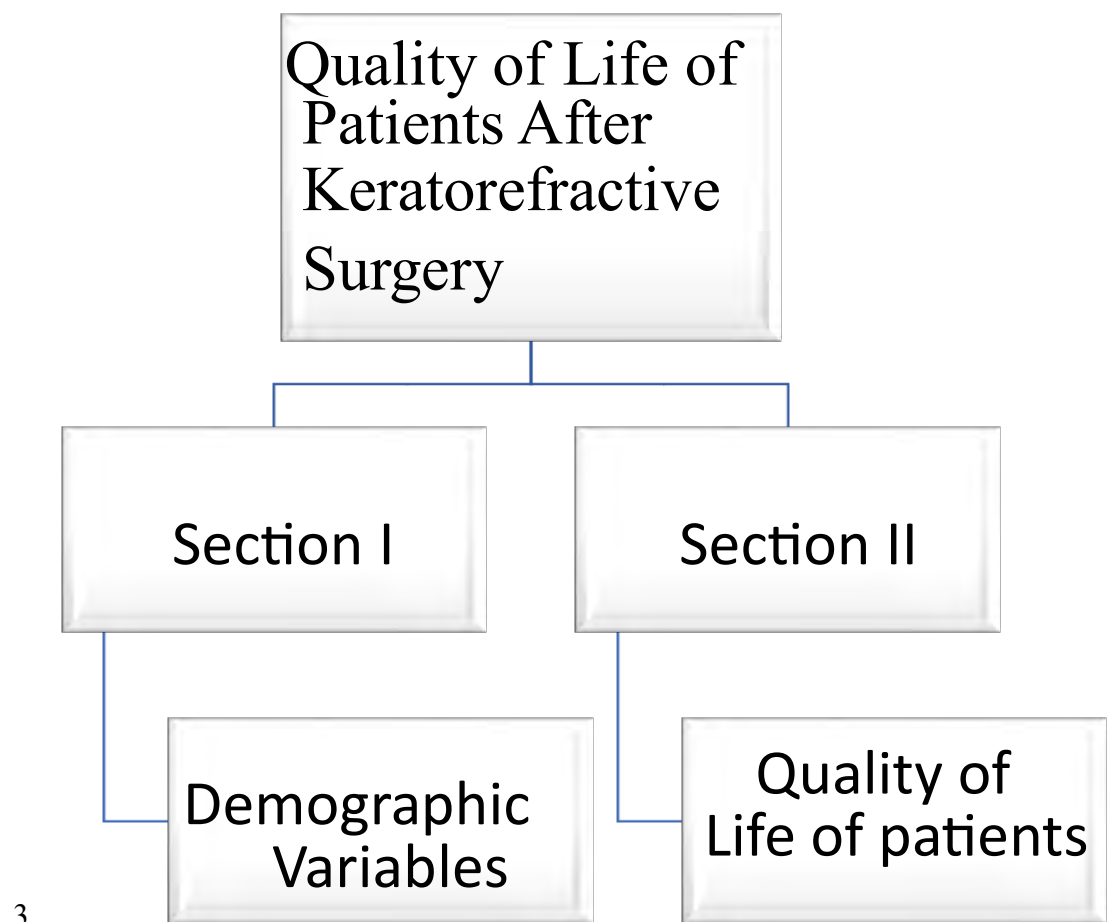
Data was collected using a validated and interview-based questionnaire. The Quality of Life Impact of Refractive Correction (QIRC) tool was adapted for this study. The "Quality of Life Impact of Refractive Correction (QIRC) questionnaire tool" is a specialized assessment instrument used in the field of ophthalmology and optometry to measure the impact of refractive correction procedures (such as LASIK, PRK, and others) on a patient's quality of life. This questionnaire is designed to gather information from patients regarding their vision-related experiences and the changes they perceive in their daily lives following refractive correction surgery or treatment. The scoring was done using 5-point Likert scale, scores of each participant were calculated by

adding up the responses. A higher score on the QIRC indicate a more positive response after refractive surgery. The data was computed using SPSS and divided into categories.

3.8 Content of the Questionnaire:

The questionnaire contained two major sections.

1. First part included questions about socio-demographic characteristics.
2. Second part of the QIRC questionnaire includes a series of structured questions and scales that assess various aspects of a patient's quality of life.



3.

Figure 2: Components of Questionnaire

3.9 Study Variables:

3.9.1 Outcome Variable:

The QIRC questionnaire tool is valuable for both clinicians and researchers in assessing the outcomes and patient-reported experiences related to refractive correction procedures.

3.9.2 Independent Variables:

The Performa included socio-demographic variables such as gender, age, education level, occupation and surgery related variables such as type of keratorefractive surgery, post-surgery duration.

3.10 Data Collection:

Data was collected using a validated and interview-based questionnaire. The Quality of Life Impact of Refractive Correction (QIRC) tool was adapted for this study. The "Quality of Life Impact of Refractive Correction (QIRC) questionnaire tool" is a specialized assessment instrument used in the field of ophthalmology and optometry to measure the impact of refractive correction procedures (such as LASIK, PRK, and others) on a patient's quality of life. This questionnaire is designed to gather information from patients regarding their vision-related experiences and the changes they perceive in their daily lives following refractive correction surgery or treatment. The scoring was done using 5-point Likert scale, scores of each participant were calculated by adding up the responses. Consent was taken online from all the participants and only those participants were selected who agreed to take part in the research process and fulfill the inclusion criteria. After taking informed consent, the participants were asked to fill the questionnaire on google form.

3.11 Data Analysis:

Data was analyzed using Statistical Package for Social Science (SPSS) version 26. Data of qualitative demographic variables were entered in SPSS by using codes that were assigned to each category. The data was computed and divided into categories. First category was very low QOL, ranging from 0 to 25. Second category was low QOL ranging from 26 to 50, third category was moderate QOL ranging from 51 to 75 and fourth category was high QOL ranging from 76 to 100. Data of quantitative variables were entered in numerical form. Association between type of surgery and quality of life was calculated using Chi- Square test of association after confirming the assumptions. After applying the test, results were interpreted and represented using tables and figures. The independent categorical variables were represented in table with frequencies and percentages, while quantitative variables were provided with mean and standard deviation. A P-value of ≤ 0.05 was considered statistically significant.

3.12 Ethical Considerations:

Before starting formal data collection, approval from Institutional Review Board (IRB) of Al-Shifa School of Public Health Rawalpindi, Pakistan was taken (Annexure-I). Permission letter from the Head of Department of Al-Shifa School of Public Health was obtained. Individuals were explained the purpose of the research and oral consent was taken from each participant (Annexure-3). Participants were assured for the confidentiality of their data. Data collected from the respondents was kept anonymous and was not shared with anyone. Data was entered in SPSS anonymously.

Chapter IV: Results

4.1. Descriptive Results

Pie graph representing percentages of people went through different types of keratorefractive surgery which shows that majority 71% had Lasik surgery done, while 19% had gone through Trans PRK. Those who had smile and PRK were 5%.

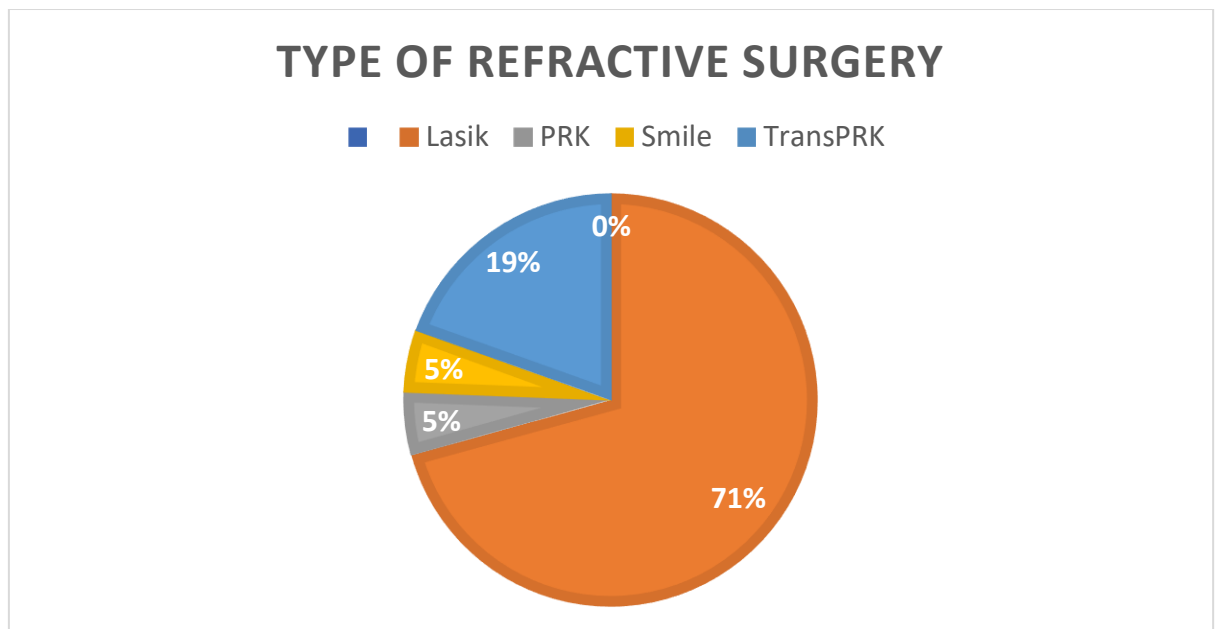


Figure 3: Type of refractive surgery

The pie graph showed score categories of Quality of life score of patients underwent keratorefractive surgery. There were total three categories of which first category was low QOL ranging from 26 to 50, second category was moderate QOL ranging from 51 to 75 and third category was high QOL ranging from 76 to 100. While majority 63% had moderate quality of life after keratorefractive surgery. Moreover 29% had low and 8% had high QOL score.

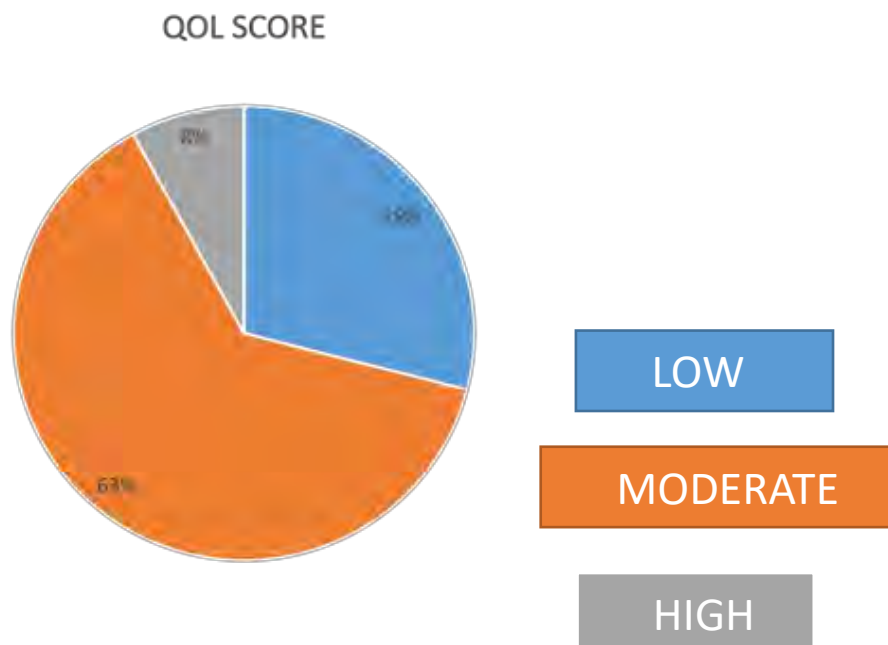


Figure 4: Quality of life score

4.1.1. Demographic characteristics

A total of 69 patients were included in this study. Among those, only 42 responded out of which 17(40.5%) of the patients were male and 25(59.5%) were females. While, 2(4.8%) of them were matriculated, 6(14.3%) were intermediate, 17(40.5%) were graduates and 17(40.5%) had educational level of more than 18 years. Majority about 29(69.0%) had Lasik type of keratorefractive surgery, 9(21.4%) had Trans PRK, 2(4.8%) had PRK while only 2(4.8%) had gone through Smile. While majority 18(42.9%) had the after surgery duration between 6 months to 1 year.

Table 1: Demographic characteristics

Sociodemographic Variables	Categories	Frequency(n)	Percentage (%)
Gender	Male	17	40.5
	Female	25	59.5
Age group	20-25	10	23.8
	26-30	21	50
	31-35	5	12
	>35	6	14.2
Occupation	Medical profession	9	21.4
	Students	11	26.2
	Other professions	22	52.4
Level of Education	Matric	2	4.8
	Intermediate	6	14.3
	Graduate	17	40.5
	18 years or more	17	40.5

Table 2: Surgical Characteristics

Surgery Related Variables	Categories	Frequency(n)	Percentage (%)
Type of Surgery	PRK	2	4.8
	Trans PRK	9	21.4
	Lasik	29	69.0
	Smile	2	4.8
Post Surgery Duration	1 week to 3 months	7	16.7
	>3 months to 6 months	9	21.4
	>6 months to 1 year	18	42.9
	More than 1 year	8	19.0

4.2 Inferential Results:

The chi-square test of association with fissure exact was applied to examine the association between sociodemographic variables, surgery related variables and QIRC questionnaire-based dependent variables. First category was low QOL ranging from 26 to 50, second category was moderate QOL ranging from 51 to 75 and third category was high QOL ranging from 76 to 100. Results for each variable are shown in the following table:

Table 3: Association of Sociodemographic Variables with Quality of Life after Keratorefractive Surgery

Sociodemographic Factors	Quality of life impact of refractive correction after keratorefractive surgery			
	26-50 (Low QOL)	51-75 (Moderate QOL)	76-100 (High QOL)	Value(df) p-Value
Gender				
Male	5(31.25%)	10(62.5%)	1(6.25%)	2(1.00)
Female	6(27.27%)	14(63.63%)	2(10%)	
Level of Education				
Matric	0(0.0%)	0(0.0%)	1(100%)	6(0.09)
Intermediate	4(66.7%)	2(33.3%)	0(0.0%)	
Graduate	4(23.5%)	12(70.6%)	1(5.9%)	
18 years or more	3(21.4%)	10(71.4%)	1(7.2%)	
Occupation				
Medical profession	1(16.5%)	4(67%)	1(16.5%)	4(0.70)
Students	3(27%)	8(73%)	0(0.0%)	
Other professions	7(33%)	12(57%)	2(10%)	
Age Groups				
20 to 25 years	4(40%)	6(60%)	0(0.0%)	6(0.30)
26 to 30 years	4(22.2%)	13(72.2%)	1(5.6%)	
31 to 35 years	2(40%)	3(60%)	0(0.0%)	
>35 years	1(20%)	2(40%)	2(40%)	

The results of this study showed no significant association between level of education (p-value=0.09), occupation (p-value=0.70), age groups (p-value=0.30) and gender (p-value=1.00) with quality of life of patients after keratorefractive surgery.

Table 4: Association of Surgery related independent Variables with Quality of Life after Keratorefractive Surgery

Surgery related independent variables	Quality of life impact of refractive correction after keratorefractive surgery			
	26-50 (Low QOL)	51-75 (Moderate QOL)	76-100 (High QOL)	Value(df) p-Value
Type of Keratorefractive Surgery				
PRK	1(50%)	1(50%)	0(0.0%)	6(0.107)
Trans PRK	4(50%)	2(25%)	2(25%)	
Lasik	6(23%)	19(73%)	1(4%)	
Smile	0(0.0%)	2(100%)	0(0.0%)	
Post Surgery Duration				
1 week to 3 months	1(14%)	6(86%)	0(0.0%)	2(0.512)
>3 months to 6 months	4(67%)	2(33%)	0(0.0%)	
>6 months to 1 year	3(18%)	12(71%)	2(12%)	
More than 1 year	3(37.5%)	4(50%)	1(12.5%)	

The results showed that there was no significant association observed among type of refractive surgery and quality of life (p-value=0.107). Moreover the association among post-surgery duration and quality of life was also assessed using fissure exact test which showed no significance (p-value=0.512).

Chapter V: Discussion

Discussion:

This cross-sectional study assessed the quality of life of patients after keratorefractive surgery in tertiary eye care hospital of district rawalpindi, Pakistan. The results of the study indicated a moderate increase in the quality of life among individuals who underwent keratorefractive surgical procedures. The majority of the patients reported an improvement in their quality of life following keratorefractive surgery. However, no significant association was observed among QOL and sociodemographic or surgical characteristics.

There is a paucity in the literature regarding QoL measures following refractive correction surgery, particularly following, PRK, Trans PRK and ReLex SMILE. The US Food and Drug Administration (FDA) collaborated with the National Eye Institute and the Department of Defense to develop an online questionnaire, Patient-Reported Outcomes with LASIK (PROWL) survey, to assess functional limitations and patient satisfaction after LASIK surgery. They found that patient-rated satisfaction at 3 and 6 months was greater than 90%, with 1%–2% of patients reporting dissatisfaction after surgery.

A study from Lesueur et al 2003, investigated predictors of QoL related to PRK, LASIK, and phakic IOL refractive procedures. They found that those patients with higher degrees of myopia had significant improvements in self-esteem and coping as compared to other patients. They found that quality of vision was directly correlated with improvement of QoL, satisfaction scores, and BCVA preoperatively and postoperatively in all patients, but interestingly no correlation was noted between visual acuity and patient satisfaction.

Katzen et al published a paper in 2002 related to the anxiety of patients undergoing laser refractive surgery, noting that as refractive surgery has rapidly evolved and the quest to obtain faster visual recovery, fewer complications, and early stability continues, there is little in the literature that addresses the anxiety experienced by most refractive surgical patients. Unfortunately in the 16 years since that publication, minimal steps have been taken to further study the anxiety and management of anxiety or fears in refractive surgery patients. Our study concluded that patients were feeling more confident after surgery with no anxiety they felt complimented and admired as compared to before surgery when they were have to wear glasses or contact lenses.

A study by P Lazon de la Jara et al 2011, stated that satisfaction with LASIK is related to visual function, preoperative expectations, psychological characteristics, and uncorrected CVA achieved. An increased sense of subjective well-being, adaptability, and self-efficacy was evident after LASIK. Patients reported a more optimistic attitude to life and increase perceived QOL after surgery. While in current study the quality of life was improved after surgery but no significant cause was observed.

Another study by klokova et al, 2019 reported that the results of the study suggest that patients require some time to adapt to their new visual function and its impact on their daily living, delaying detectable improvements in QoL. Moreover, these results may suggest a higher satisfaction trend and long-term QoL in patients undergoing ReLEx SMILE in comparison to Femto-LASIK. Long-term results from the study demonstrated high patient satisfaction with both methods. While in our study we didn't create any comparison group

among type of refractive surgeries because distribution of patients to make the groups was not equal.

Matsuguma et al, 2023 stated that LASIK positively affected patients' overall subjective happiness postoperatively, and this improvement in subjective happiness was correlated with satisfaction with surgery, which could be increased by the increased QOL after LASIK surgery. Same was the case in present study which also shows that majority of the patients underwent LASIK because of fast recovery time which results in better quality of life.

Hirosaki et al, 2021 reported a correlation between subjective happiness and QOL in community-dwelling elderly Japanese using a 100 mm visual analog scale. In dentistry, Tuchtenhagen et al reported that the oral health-related QOL in schoolchildren was closely associated with the SHS score. These reports may support our findings that improved QOL after refractive surgery was linked to confidence which gives subjective happiness.

Regarding gender, this study revealed that gender was not associated with the quality of life after refractive surgery. Moreover there was no significant association was found among post surgery duration and quality of life which linked the previous studies that duration doesn't matter satisfaction matters.

Evaluation and measurement of the patients' QoL based on the questionnaire represents important additional information and conclusions related to patient satisfaction and expectations that cannot be determined from visual acuity and refractive status alone.

Chapter VI: Conclusion, Strengths, Limitations and Recommendations

Conclusion:

In conclusion, this study explored the impact of keratorefractive surgery on the quality of life of patients. The findings indicate a moderate increase in the quality of life among individuals who underwent keratorefractive surgical procedures. The majority of the patients reported an improvement in their quality of life following keratorefractive surgery.

Strengths:

- Limited research is present in Pakistan regarding quality of life of patients after keratorefractive surgery.
- This study could capture data with minimum information bias due to using a validated well-structured questionnaire.

Limitations:

- The generalizability of the result is challenging because this study was performed only on the subjects visiting single eye care facility.

Recommendations:

- Further research and long-term studies are encouraged to continue investigating the lasting effects of these surgical interventions.
- Additionally, a patient-centered approach, considering individual needs and expectations, should guide healthcare practitioners in offering comprehensive pre-operative counseling and post-operative care to ensure the best possible outcomes for their patients.

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ANNEXURE I:

IRB Letter



**AL-SHIFA SCHOOL OF PUBLIC HEALTH
PAKISTAN INSTITUTE OF OPHTHALMOLOGY
AL-SHIFA TRUST, RAWALPINDI**

MSPH-IRB/15-17
27th Mar, 2023

TO WHOM IT MAY CONCERN

This is to certify that **Mehmona Asgher** D/O **Muhammad Asgher** is a student of Master of Science in Public Health (MSPH) final semester at Al-Shifa School of Public Health, PIO, Al-Shifa Trust Rawalpindi. He/she has to conduct a research project as part of curriculum & compulsory requirement for the award of degree by the Quaid-i-Azam University, Islamabad. His/her research topic, which has already been approved by the Institutional Review Board (IRB), is **“Quality of life of patients after Keratorefractive surgery in tertiary eye care hospital of district Rawalpindi: A cross sectional study”**.

Please provide his/her necessary help and support in completion of the research project. Thank you.

Sincerely,

Dr. Ayesha Babar Kawish
Head

Al-Shifa School of Public Health, PIO
Al-Shifa Trust, Rawalpindi

ANNEXURE II:
Gantt Chart

ACTIVITIES	March 2023	April 2023	May 2023	June 2023	July 2023	August 2023
Topic Selection Literature Search	■					
Synopsis and IRB approval		■				
Data Collection				■		
Data Analysis					■	
Thesis Writeup					■	
Thesis submission and Thesis Defense						■

ANNEXURE IV

Informed Consent Form

Title of study:

Quality of Life of Patients After Keratorefractive Surgery in Tertiary Eye Care Hospital of District Rawalpindi, Pakistan: A Cross Sectional Study

Principal investigator:

Mehmona Asgher

MSPH student, Al-Shifa School of public health Rawalpindi.

Purpose of this study:

Keratorefractive surgery is increasingly popular in Pakistan, yet there's limited research on how it specifically impacts patients' quality of life in this context. Understanding the quality of life post-keratorefractive surgery in Pakistan can aid in tailoring healthcare services and patient counseling to local needs and expectations. This research can potentially contribute to improved patient satisfaction, informed decision-making, and better healthcare policies regarding refractive surgery in the Pakistani healthcare system.

Subject participation:

Your participation will help the researcher to assess quality of life of patients after keratorefractive surgery.

Procedure:

Data will be collected from patients using a questionnaire to collect demographic information, and QIRC based questions.

Time required:

It is anticipated that it will take approximately 15 to 20 minutes to complete the questionnaires.

Voluntary participation:

Your participation in this study is voluntary.

Right to Withdraw:

After you sign the consent form, you are still free to withdraw at any time and without giving a reason.

Confidentiality:

Data will be completely anonymous and reported in aggregate form.

Risks:

There are no significant risks associated with this study.

Benefits:

There are no direct benefits associated with participation in this study

Payment:

You will receive no payment for participating in the study.

Contact information:

If you have questions about the study, please contact the following individual:

MEHMONA ASGHER

xyz@gmail.com 0324-

1234567 Consent:

I have read and I understand the provided information and have had the opportunity to ask questions. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason and without cost. I understand that I will be given a copy of this consent form. I voluntarily agree to take part in this study.

Name of Participant _____

Signature of Participant _____

Date _____(DD/MM/YY)

Statement by the researcher/person taking consent:

I have accurately read out the information sheet to the potential participant, and to the best of my ability made sure that the participant understands that. I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered

correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily. A copy of this Informed Consent Form (ICF) has been provided to the participant.

Name of Researcher/person taking the consent _____

Signature of Researcher /person taking the consent_ _____

Date _____(DD/MM/YY)

Annexure V:

Questionnaire

The Quality of Life Impact of Refractive Correction (QIRC)

Thank you for agreeing to participate.

If you have had REFRACTIVE SURGERY (LASIK, PRK ETC), please answer the questions on this page and read the instructions on how to complete the rest of the questionnaire.

Please respond to the following questions for how you are **NOW**, not how you were before refractive surgery.

جس لیکن میں نے اتفاق کرنے کے لئے آپ کا شکریہ۔

آپ نے فریوکیٹیو سرجری (LASIK, PRK ETC)

کے لئے توجہ دیا ہے۔

اس صفحہ پر سوالات اور پھر سوائے اور پھر سوائے نام کے کو مکمل کرنے کے طریقے سے متعلقہ ہدایات پڑھیں۔

براہ کرم مندرجہ ذیل سوالات کا جواب دینا کہ آپ اب فریوکیٹیو سرجری سے پہلے کی طرح کیسے تھے۔

Age: _____ Gender: _____ Occupation: _____

Level of Education: _____

- Which type of refractive surgery did you go through (PRK, TransPRK, Lasik, smile)?

آپ کس قسم کی سرجری سے گزرے؟

1. PRK
2. Trans PRK
3. Lasik
4. Smile

- How long is it since you had refractive surgery?

آپ کو فریوکیٹیو سرجری سے کتنا عرصہ ہوا ہے؟

QIRC

Please respond to the following questions for how you are **NOW**, not how you were before refractive surgery.

1. How much difficulty do you have driving in glare conditions?

آپکو چمکار حالات ھرگاڑی چائے ھرکتنی شوری ہوتی ہے؟

Not at all	Not really	Undecided	Somewhat	Very much
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2. During the past month, how often have you experienced your eyes feeling tired or strained?

پچھلے مہینے کے دوران، آپن ھرکتنی بار باری لکھو رکوت کھا اوٹنی لٹناؤ مھوسکی ہے؟

Never	Rarely	Sometimes	Often	Always
-------	--------	-----------	-------	--------

3. How much trouble is not being able to use sunglasses?

دھوپکے چھمے لٹع عمالن کنے ھرکتنی پوٹھلی ہو رہی ہے؟

Not at all	Not really	undecided	Somewhat	Very much
------------	------------	-----------	----------	-----------

3. How much trouble is having to think about your spectacles or contact lenses or your eyes after refractive surgery before doing things; e.g. travelling, sport, going swimming?

کام کرنے سے پہلے سے فوکلٹی و سرجری کے بعد آپ کے عینکوں کی لکڑی ٹھیک ٹھانڈی اپنی لگھوڑی کے بارے میں سوچنے کے لیے کتنی پریشانی ہو رہی - جیسے سفر کے دوران عینک کی جانچ؟

Not at all	Not really	undecided	Somewhat	Very much
------------	------------	-----------	----------	-----------

4. How much trouble is not being able to see when you wake up; e.g. to go to the bathroom, look after a baby, see alarm clock?

جب آپ صبح سویرے جگنے کے وقت نہ دیکھ سکیں یا قبیلان نہ ہون کی کتنی پریشانی ہے؟ جیسے بیٹھہ روم جانے کے لیے دیکھنا، الارم گھڑی دیکھنا؟

Not at all	Not really	undecided	Somewhat	Very much
------------	------------	-----------	----------	-----------

5. How much trouble is not being able to see when you are on the beach or swimming in the sea or pool, because you do these activities without spectacles or contact lenses?

جب آپ ساحل سمندر پر سویرے یا سمندر میں تیرنے کے وقت نہ دیکھ سکیں یا قبیلان نہ ہون کے لیے کتنی پریشانی ہوتی ہے کیونکہ آپ عینکوں کے بغیر یہ سرگرمیاں کرتے ہیں۔

Not at all	Not really	Undecided	Somewhat	Very much
------------	------------	-----------	----------	-----------

Please respond to the following questions for how you are **NOW**, not how you were before refractive surgery.

1. How much trouble are your spectacles or contact lenses when you wear them when using a gym / doing keep-fit classes / circuit training etc?

آپ کے عینکوں کی لکڑی ٹھیک ٹھانڈی ہوتی ہے جب آپ انہیں جگمگاتے وقت استعمال کرتے ہوئے کی کیفیت کا شعور / سرکٹ ٹریننگ وغیرہ کے وقت ہوتے ہیں؟

Not at all	Not really	Undecided	Somewhat	Very much
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2. How concerned are you about the initial and ongoing cost to buy your refractive surgery/ current spectacles and/or contact lenses/?

آپ اپنی طرز پراری سرجری / موجودہ پیش مے اور / کنٹیکٹ لینز / خریدنے کی کھاتہ بندی اور جاری لگاتار کے بارے میں کتنی فکر فرمیں؟

Very unconcerned	Unconcerned	Neutral	Concerned	Very concerned
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3. How concerned are you about the cost of unscheduled maintenance of your refractive surgery/ spectacles/ contact lenses; e.g. breakage, loss, new eye problems?

آپ اپنی طرز پراری سرجری / پیش موں / کنٹیکٹ لینز کی غیر طرز پر نہ نیک بھال کے اخراج اتکے بارے میں کتنی فکر فرمیں؛ جیسے ٹوٹنا، نقصان، ناکھورکے لئے مرطال؟

Very unconcerned	Unconcerned	Neutral	Concerned	Very concerned
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4. How concerned are you about having to increasingly rely on your spectacles or contact lenses since you started to wear them?

جب سے آپ نے لی ریپین شروع کیا ہے آپ کو اپنی کوری کنٹیکٹ لینز پر تیزی سے لگجھار کرنا پڑے بارے میں کتنی فکر فرمیں؟

Very unconcerned	Unconcerned	Neutral	Concerned	Very concerned
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5. How concerned are you about your vision being not as good as it could be?

آپ کو اس بات کی کتنی فکر ہے کہ آپ کا وزن بنانا اچھا نہیں ہے یعنی ایسے سو سکتا ہے؟

Very unconcerned	Unconcerned	Neutral	Concerned	Very concerned
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6. How concerned are you about medical complications from your choice of optical correction (refractive surgery, spectacles and/or contact lenses)?

آپ اپنی نظر کی اصلاح (رفریکٹو سرجری، چشمے اوری کنٹیکٹ لینز) کی طبی پیچیدگیوں کے بارے میں کتنی فکر مند ہیں؟

Very unconcerned	Unconcerned	Neutral	Concerned	Very concerned
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7. How concerned are you about eye protection from ultraviolet (UV) radiation?

Very unconcerned	Unconcerned	Neutral	Concerned	Very concerned
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Please respond to the following questions for how you are NOW, not how you were before refractive surgery.

8. During the past month, how much of the time have you felt that you have looked your best?

پچھلے مہینے کے دوران، آپ کی نظر کی اصلاح کے وقت میں کتنی وقت میں نے سوچا کہ آپسے بہتر لگ رہے ہیں؟

Never	Rarely	Sometimes	Often	Always
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9. During the past month, how much of the time have you felt that you think others see you the way you would like them to (e.g. intelligent, sophisticated, successful, cool, etc)?

پچھلے مہینے کے دوران، آپ کی نظر کی اصلاح کے وقت میں نے سوچا کہ آپسے بہتر لگ رہے ہیں؟ (مثلاً، ہوشیار، سفاک، کامیاب، ٹھیک، وغیرہ؟)

Never	Rarely	Sometimes	Often	Always
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10. During the past month, how much of the time have you felt complimented /admired?

پچھلے مہینے کے دوران، آپ نے کتنے وقت ہریت عرف میں وس کی ہے؟

Never	Rarely	Sometimes	Often	Always
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11. During the past month, how much of the time have you felt confident?

پچھلے مہینے کے دوران، آپ نے کتنا وقت میں وس کی ہے؟

Never	Rarely	Sometimes	Often	Always
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12. During the past month, how much of the time have you felt able to do the things you want to do?

پچھلے مہینے کے دوران، آپ نے کتنے وقت میں وس کی ہے کہ آپ جو کام کرنا چاہتے ہیں وہ کرنے کے قابل ہیں؟

Never	Rarely	Sometimes	Often	Always
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13. During the past month, how much of the time have you felt eager to try new things?

پچھلے مہینے کے دوران، آپ نے کتنا وقت نئی چیزوں کو آزمانے کے لیے بے چین میں وس کی ہے؟

Never	Rarely	Sometimes	Often	Always
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Are there any other important issues related to your spectacles / contact lenses / refractive surgery that we have not asked about? Please briefly indicate any such issues.....

This is the end of the questionnaire

Thank you for completing it!

Please hand it back to the person that gave you it or one of their colleagues.

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