



Original Article

## A Cross-Sectional Study of Psychological Distress, Dry Eye Symptoms, and Quality of Recovery after Ophthalmic Procedures

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### ABSTRACT

**Background:** Psychological distress and ocular surface discomfort are common around ophthalmic procedures and can influence the patient's early postoperative experience. However, their combined relationship with postoperative recovery in routine ophthalmic practice has not been adequately characterized.

**Objectives:** To assess psychological distress, dry eye symptoms, and quality of recovery among patients undergoing ophthalmic procedures, and to examine the association of psychological distress and dry eye symptom severity with postoperative recovery.

**Methods:** This hospital-based cross-sectional study included 100 consecutive adult patients undergoing ophthalmic procedures at a tertiary care teaching hospital over six months. Demographic and clinical details were recorded using a structured proforma. Psychological distress, dry eye symptoms, and postoperative recovery were evaluated using standardized patient-reported instruments and categorized into severity groups. Data were analyzed with descriptive statistics and chi-square testing, with statistical significance set at  $p < 0.05$ .

**Results:** The mean age of participants was  $49.6 \pm 15.2$  years, and 52% were female. Cataract surgery was the most common procedure. Psychological distress was present in 66% of patients, while 78% reported dry eye symptoms. Good quality of recovery was observed in 40% of participants, fair recovery in 37%, and poor recovery in 23%. Increasing psychological distress and greater dry eye symptom severity were both significantly associated with poorer postoperative recovery.

**Conclusion:** Psychological distress and dry eye symptoms were frequent after ophthalmic procedures and showed a clear inverse relationship with quality of recovery. Early identification of emotional distress and ocular surface symptoms could improve perioperative counseling, symptom control, and overall recovery experience in ophthalmic patients.

**Keywords:** psychological distress; dry eye symptoms; ophthalmic procedures; quality of recovery; cataract surgery; cross-sectional study.

### INTRODUCTION

Psychological well-being is increasingly recognized as an important determinant of surgical experience and postoperative outcomes. In ophthalmology, even relatively short and routinely performed procedures can evoke substantial emotional stress because vision is directly linked to independence, mobility, occupation, and quality of life. Surgery-related fear, uncertainty regarding visual outcome, anticipation of pain, and concern about intraoperative awareness can all contribute to psychological distress in patients scheduled for eye procedures [7-11]. These concerns are particularly relevant in

ophthalmic settings, where many patients are elderly, undergo surgery under local anesthesia, and remain aware of the perioperative environment.

Dry eye disease is another clinically important issue in the perioperative ophthalmic period. According to TFOS DEWS II, dry eye is a multifactorial disease of the ocular surface characterized by loss of tear film homeostasis and accompanied by ocular symptoms, in which tear film instability, hyperosmolarity, inflammation, and neurosensory abnormalities play central roles [4,6]. Epidemiological evidence indicates that dry eye symptoms affect a substantial proportion of adults, with prevalence estimates varying widely across populations and increasing with age and female sex [5]. In patients undergoing ophthalmic procedures, ocular surface symptoms can worsen because of corneal nerve disruption, exposure to microscope light, preservative-containing medications, perioperative stress, and postoperative inflammation.

Previous studies have shown meaningful links between visual disability, cataract-related functional limitation, and psychological distress [10,11]. Likewise, anxiety before cataract surgery has been associated with pain perception and poorer perioperative experience [7-9]. Beyond surgery-specific anxiety, dry eye itself has been linked to anxiety and depression in both clinic-based and population-based studies [12-14]. These findings suggest that psychological distress and ocular surface symptoms are not isolated constructs; instead, they often coexist and can adversely affect patient-reported outcomes after ophthalmic interventions.

Quality of recovery has emerged as a patient-centered outcome that extends beyond technical surgical success. Recovery assessment captures comfort, physical independence, emotional state, and the patient's perception of return to baseline function. The QoR-15 framework has provided a concise and reliable method for evaluating postoperative recovery and has helped shift perioperative assessment toward patient-reported endpoints [3]. In ophthalmology, this broader perspective is especially useful because visual outcomes alone do not fully explain why some patients report dissatisfaction, delayed adjustment, or persistent discomfort after otherwise uneventful procedures.

The present study was undertaken to assess the pattern of psychological distress, dry eye symptoms, and postoperative quality of recovery among patients undergoing ophthalmic procedures in a tertiary care center. The specific objectives were to describe the demographic and procedural profile of the study population; to determine the severity distribution of psychological distress and dry eye symptoms; to assess the quality of recovery after ophthalmic procedures; and to examine the association of psychological distress and dry eye symptom severity with postoperative recovery.

## **METHODOLOGY**

### **Study design and setting**

This hospital-based observational cross-sectional study was conducted at Azeezia Institute of Medical Sciences and Research, Meeyannoor, Kollam, a tertiary care teaching hospital. The study was carried out over a period of six months, from April 2025 to September 2025. The study population comprised adult patients attending the Department of Ophthalmology for elective ophthalmic procedures and presenting for postoperative assessment during the study period.

### **Study population and sampling**

A consecutive sampling technique was used. All eligible patients aged 18 years and above who underwent an ophthalmic procedure during the study period and consented to participate were enrolled until the target sample size of 100 was achieved. Patients with severe cognitive impairment, inability to respond to the questionnaire, active ocular infection requiring emergency intervention, or incomplete clinical records were excluded from the analysis.

### **Data collection procedure**

Data were collected using a structured case-record proforma and patient interview schedule. Baseline demographic details including age, sex, and type of ophthalmic procedure were recorded from the clinical record and verified with the patient. The study included cataract surgery, pterygium excision, glaucoma procedures, vitreoretinal surgery, and other minor ophthalmic interventions. Patients were assessed at the early postoperative period during their scheduled review visit, and all interviews were conducted in a quiet clinical setting by the study investigator.

### **Assessment of study variables**

Psychological distress was assessed using the Kessler Psychological Distress Scale (K10), a brief and widely used screening tool for nonspecific psychological distress, and scores were categorized as no distress, mild distress, moderate distress, and severe distress according to standard interpretive ranges [1]. Dry eye symptoms were evaluated using the Ocular Surface Disease Index, a validated symptom-based questionnaire for ocular irritation, vision-related difficulty, and environmental triggers, and severity was classified as none, mild, moderate, or severe [2]. Quality of recovery was assessed using a structured patient-reported recovery instrument based on the QoR-15 framework, which captures emotional well-being, physical comfort, and functional recovery after surgery [3]. For the present analysis, recovery scores were categorized as good, fair, or poor based on predefined score bands.

### Statistical analysis

The collected data were entered into Microsoft Excel and analyzed using Statistical Package for the Social Sciences (SPSS) software, version 25.0. Categorical variables were summarized as frequency and percentage, whereas continuous variables were expressed as mean and standard deviation. Associations between severity of psychological distress and quality of recovery, and between dry eye symptoms and quality of recovery, were analyzed using the chi-square test. A p value of less than 0.05 was considered statistically significant.

### Ethical considerations

The study was conducted in accordance with the ethical principles of biomedical research involving human participants. Institutional ethics committee approval was obtained before commencement of the study. Written informed consent was obtained from all participants after explaining the purpose of the study, and confidentiality of participant information was maintained throughout the investigation.

### RESULTS

A total of 100 patients who underwent various ophthalmic procedures were included in this cross-sectional study. The demographic and clinical profile of the study population is summarized in Table 1. The age of the participants ranged from 18 to 78 years with a mean age of  $49.6 \pm 15.2$  years. The largest proportion belonged to the 46–60 years age group (32%), and females constituted a slight majority (52%). Cataract surgery was the most common ophthalmic procedure performed, accounting for 46% of the cohort.

**Table 1. Demographic and clinical characteristics of study participants (n = 100)**

Variable	Number	Percentage
Age group (years)		
18–30	18	18.0
31–45	24	24.0
46–60	32	32.0
>60	26	26.0
Sex		
Male	48	48.0
Female	52	52.0
Type of ophthalmic procedure		
Cataract surgery	46	46.0
Pterygium excision	18	18.0
Glaucoma procedure	14	14.0
Vitreoretinal surgery	12	12.0
Other minor procedures	10	10.0

The distribution of psychological distress and dry eye symptom severity is presented in Table 2. Psychological distress was identified in 66% of the participants, with mild distress being the most frequent category (38%). Moderate and severe distress were observed in 20% and 8% of patients, respectively. Dry eye symptoms were reported by 78% of patients, with mild and moderate symptoms accounting for 36% and 28% of the sample. Severe dry eye symptoms were present in 14% of participants.

**Table 2. Distribution of psychological distress and dry eye symptoms among study participants**

Variable	Category	Number	Percentage
Psychological distress	None	34	34.0
	Mild	38	38.0

Variable	Category	Number	Percentage
	Moderate	20	20.0
	Severe	8	8.0
Dry eye symptoms	None	22	22.0
	Mild	36	36.0
	Moderate	28	28.0
	Severe	14	14.0

The quality of postoperative recovery is shown in Table 3. Good recovery was documented in 40% of the patients, whereas 37% had fair recovery. Poor recovery was noted in 23% of the study population, indicating that almost one in four patients experienced a suboptimal recovery profile in the early postoperative period.

**Table 3. Quality of recovery following ophthalmic procedures**

Quality of recovery category	Number	Percentage
Good recovery	40	40.0
Fair recovery	37	37.0
Poor recovery	23	23.0

The association of psychological distress and dry eye symptom severity with postoperative recovery is shown in Table 4. Patients without psychological distress demonstrated better recovery, with 22 of 34 individuals showing good recovery, whereas poor recovery predominated among those with severe distress. Similarly, increasing severity of dry eye symptoms was associated with a progressive decline in recovery quality, and poor recovery was most frequent among patients with severe dry eye symptoms. These associations were statistically significant for both psychological distress and quality of recovery ( $\chi^2 = 31.25$ ,  $p < 0.001$ ) and for dry eye symptoms and quality of recovery ( $\chi^2 = 28.36$ ,  $p < 0.001$ ).

**Table 4. Association of psychological distress and dry eye symptoms with quality of recovery**

Variable	Good recovery	Fair recovery	Poor recovery	Total
Psychological distress: None	22	10	2	34
Psychological distress: Mild	14	18	6	38
Psychological distress: Moderate	4	7	9	20
Psychological distress: Severe	0	2	6	8
Dry eye symptoms: None	15	6	1	22
Dry eye symptoms: Mild	17	15	4	36
Dry eye symptoms: Moderate	7	12	9	28
Dry eye symptoms: Severe	1	4	9	14

## DISCUSSION

The present study examined the interrelationship between psychological distress, dry eye symptoms, and quality of recovery after ophthalmic procedures in a tertiary care setting. Three findings stand out. First, psychological distress was common in the perioperative period, affecting two-thirds of participants. Second, dry eye symptoms were highly prevalent, with more than three-quarters of patients reporting at least some degree of ocular surface discomfort. Third, both higher psychological distress and greater dry eye symptom severity were significantly associated with poorer postoperative recovery. These observations support the growing view that outcomes after eye surgery are shaped not only by technical success but also by emotional state and ocular surface comfort.

Our findings regarding psychological distress are consistent with prior ophthalmic literature demonstrating that eye surgery commonly provokes anxiety and related emotional strain [7-11]. Nijkamp et al. identified several determinants of surgery-related anxiety in cataract patients, while Ramirez et al. and Socea et al. reported that preoperative anxiety remains frequent and is linked to poorer procedural experience and higher pain perception [7-9]. Walker and colleagues further showed that visual disability in cataract patients is closely linked with psychological distress and that surgery can reduce distress when functional limitations improve [10,11]. In the present study, the high proportion of patients with mild to severe distress likely reflects concern about vision, fear of complications, and uncertainty regarding the pace of visual recovery.

The burden of dry eye symptoms observed in this study also aligns with existing concepts of ocular surface disease after ophthalmic intervention. TFOS DEWS II emphasizes that dry eye is a multifactorial disorder involving tear film instability, inflammation, and neurosensory abnormalities [4,6]. The OSDI has been shown to be a reliable and valid patient-reported instrument for measuring symptom severity [2]. In the perioperative context, surgical incision, ocular surface exposure, microscope light, postoperative medications, and transient corneal nerve disturbance can worsen dryness-related symptoms. The substantial proportion of patients with mild-to-severe dry eye symptoms in our series therefore appears clinically plausible and highlights the need for routine ocular surface assessment around ophthalmic procedures.

An important finding in the present study is the strong association between symptom burden and postoperative recovery. Patients without psychological distress or dry eye symptoms were much more likely to report good recovery, whereas poor recovery clustered in those with severe distress and severe ocular surface symptoms. This pattern is biologically and clinically coherent. Emotional distress can reduce coping capacity, heighten symptom vigilance, impair sleep, and worsen satisfaction with care. Likewise, burning, foreign-body sensation, photophobia, and fluctuating vision can diminish comfort and confidence during early postoperative recovery. Previous studies have demonstrated close links between dry eye and anxiety or depression, both in clinic populations and in large epidemiological datasets [12-14]. Thus, the coexistence of distress and dry eye symptoms can plausibly amplify the negative recovery experience.

The study has practical implications for perioperative ophthalmic care. Preoperative counselling should not focus solely on the technical aspects of surgery but should also address fear, expectations, and reassurance. Brief screening for psychological distress and dry eye symptoms can identify patients at risk of suboptimal recovery. Attention to ocular surface optimization, lubricant support, and clear postoperative guidance could reduce symptom burden. In parallel, patient-reported recovery assessment provides a more comprehensive picture of success than visual acuity alone. Incorporating these dimensions into routine ophthalmic practice could improve patient satisfaction, enhance recovery, and support more patient-centered care.

### Limitations

This study was conducted at a single tertiary care center over six months and involved a moderate sample size, which restricts broad generalizability. The cross-sectional design captured symptoms and recovery at one postoperative time point and did not evaluate changes over time. The procedure spectrum was heterogeneous, and objective tear film investigations were not incorporated into the analytical model alongside symptom-based assessments. Residual confounding from baseline ocular surface status and pre-existing emotional morbidity could not be fully excluded.

### CONCLUSION

This cross-sectional study demonstrates that psychological distress and dry eye symptoms are common among patients undergoing ophthalmic procedures and are closely linked to the quality of postoperative recovery. While a substantial proportion of patients reported good recovery, poorer outcomes were concentrated among those with greater emotional distress and more severe ocular surface symptoms. These findings underscore the importance of adopting a broader perioperative approach in ophthalmology that includes psychological assessment, dry eye symptom screening, patient counselling, and early symptomatic management. Integrating patient-reported recovery measures into routine postoperative care can help clinicians identify vulnerable patients, improve comfort and satisfaction, and optimize overall recovery after ophthalmic interventions.

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