

The Impact of Ocular Trauma on Psychological Distress and Quality of Life Amidst the 2023-2025 Gaza War

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Abstract

Introduction:

The Gaza war has resulted in substantial civilian ocular trauma resulting in psychological and functional consequences. The study aimed to quantify the severity of the ocular injury and examine its association with depression, anxiety, and vision-related quality of life (QoL) among the survivors between October 2023 and January 2025.

Methods

This cross-sectional study enrolled 375 ocular trauma patients across all five Gaza governorates. Visual acuity was recorded in logMAR and severity was classified by the Ocular Trauma Score (OTS). Depression and anxiety were assessed using the Hospital Anxiety and Depression Scale (HADS), and vision-related QoL using the NEI-VFQ-25.

Results

Participants were predominantly male (72.5%) with mean age 37 ± 15 years. Open-globe injuries predominated (73.3%), followed by retinal detachment (61.8%) and globe rupture (43.0%). Depression and anxiety met case criteria in 56.5% and 30.1% of the participants, respectively. Visual acuity differed significantly across depression ($p = 0.008$) and anxiety ($p = 0.002$) categories, and OTS distributions differed across both (both $p < 0.001$). Higher OTS scores correlated with lower depression ($\rho = -0.253$), lower anxiety ($\rho = -0.220$), and higher QoL ($\rho = 0.142$; all $p < 0.01$). In adjusted multivariable models, OTS independently predicted depression ($B = -0.924$), anxiety ($B = -0.983$), and QoL ($B = 1.763$; all $p < 0.001$).

Conclusion

Ocular trauma severity is independently associated with greater psychological distress and lower vision-related QoL among civilians injured during the Gaza war. Integrated ophthalmic and mental-health care should be prioritized in conflict-zone health responses.

INTRODUCTION

Armed conflicts pose extreme and sustained risks to civilian eye health. High-energy blast mechanisms, shrapnel, building collapse, and direct trauma in densely populated urban warfare environments produce ocular injuries with disproportionate consequences for vision and psychosocial functioning [1, 2]. Since October 2023, civilians in the Gaza Strip have been exposed to one of the most intense urban conflicts in recent history, with field reports describing a sharp rise in penetrating and perforating eye injuries among non-combatants [3].

Ocular trauma is recognized as a leading cause of blindness worldwide and is associated with prolonged rehabilitation, occupational disruption, and substantial reductions in vision-related quality of life [4, 5]. Beyond visual loss, the psychological burden of eye injuries is increasingly recognized; depression and anxiety are commonly reported and may be amplified by displacement, bereavement, and limited access to mental-health services in active conflict zones [6, 7].

Standardized instruments enable objective comparison across settings. The Ocular Trauma Score (OTS) provides a validated prognostic score for visual outcome based on initial visual acuity and ocular findings, including globe rupture, endophthalmitis, perforating injury, retinal detachment, and afferent pupillary defect [8, 9]. Originally derived from the United States Eye Injury Registry, the OTS has been used internationally to estimate prognosis, guide surgical decision-making, and benchmark outcomes after open- and closed-globe trauma [5, 10].

The Hospital Anxiety and Depression Scale (HADS) is widely used to detect clinically relevant emotional distress in medically ill populations and has demonstrated acceptable psychometric properties across diverse cultural and linguistic contexts [11, 12]. The 25-item National Eye Institute Visual Function Questionnaire (NEI-VFQ-25) has been validated for multiple ophthalmic conditions and provides a vision-specific quality-of-life measure that captures both functional impairment and the social and emotional consequences of impaired vision [13, 14].

Beyond the immediate clinical sequelae, eye injuries sustained in war zones frequently overlap with other forms of cumulative traumatic exposure. Repeated bombardment, displacement, witnessing of death and injury, and chronic insecurity have been independently associated with increased rates of post-traumatic stress, depression, and anxiety in conflict-affected populations [15–17]. Visual impairment may compound this burden by limiting mobility, reducing access to information, and threatening occupational and social roles, particularly in young working-age adults who form the demographic core of casualties in many contemporary urban conflicts [18, 19].

Despite extensive coverage of physical injuries from the Gaza war, primary data linking ocular trauma severity with mental-health outcomes and vision-related quality of life remain scarce. Most published evidence from Gaza has focused on broad injury epidemiology, surgical capacity, or mortality, with limited integration of validated mental-health and patient-reported vision outcomes [3, 20]. Yet the disability-adjusted impact of unilateral or bilateral visual impairment among working-age civilians is profound: it disrupts livelihoods, erodes household economic security, and intensifies the cumulative psychosocial trauma experienced by displaced and bereaved populations [21, 22]. Quantifying these relationships is therefore essential to inform humanitarian response, resource allocation, and post-conflict rehabilitation strategy.

The present study aimed to address this evidence gap by combining standardized injury grading with validated psychological and vision-related quality-of-life instruments to evaluate the impact of ocular injury on psychological distress and quality of life among ocular trauma survivors in Gaza.

METHODS

Study design and setting

This was a cross-sectional study of patients who sustained ocular trauma during the Gaza war between October 2023 and January 2025. Participants were recruited across all five governorates of the Gaza Strip (North Gaza, Gaza, Middle area, Khan Younis and Rafah), reflecting the geographic distribution of casualties during the period of observation. The study adhered to the tenets of the Declaration of Helsinki, and informed consent was obtained from all participants prior to commencement of the study. The experimental protocol was reviewed and approved by the Palestinian Health Research Council (PHRC/HC/1199/25), which served as the Research Ethics Committee (REC) of the European Gaza Hospital, Gaza Strip Gaza City 970, Ministry of Health, Palestine.

Participants

Patients who sustained ocular trauma were recruited for the study. Eligible patients were provided with a detailed explanation of the study objectives, procedures, potential risks, and benefits. Those who agreed to participate were required to provide written informed consent by signing and dating a consent form before any study-related procedures or assessments were conducted.

Sociodemographic characteristics (age, sex, marital status, education, employment, residence, household income, family size), baseline health (smoking, pre-existing eye disease, diabetes mellitus, hypertension), and ocular injury characteristics (laterality, mechanism, type of injury, clinical findings, and management) were recorded through a structured interview and medical-record review. Eligible participants were patients with documented ocular injuries sustained in response to the war, during the period of observation who consented to participate. Those who suffered from any form of ocular diseases, or had suffered ocular injury prior to the war, were excluded from the study.

Outcome Measures

Injury severity was graded using the Ocular Trauma Score (OTS), a validated prognostic system that combines initial visual acuity with the presence of adverse clinical findings (e.g., globe rupture, perforating injury, retinal detachment, endophthalmitis, and afferent pupillary defect) to stratify cases into severity categories with known associations to long-term visual outcome. Higher raw OTS scores (derived from better initial visual acuity and fewer adverse signs) indicate less severe injury and better visual prognosis, whereas lower scores indicate greater severity [8]. Visual acuity was measured using a logMAR chart under standardized conditions, both aided and unaided conditions or with the habitual correction. The findings were recorded in logMAR units to permit parametric or non-parametric analyses on a continuous scale. The remaining OTS components—globe rupture, endophthalmitis, perforating injury, retinal detachment, and relative afferent pupillary defect (RAPD)—were assessed using slit-lamp

biomicroscopy / dilated fundus examination / B-scan ultrasonography when media opacity precluded direct visualization and extracted from the initial clinical examination and operative records. The OTS was chosen as it remains the most cited prognostic score for ocular trauma and is feasible to apply at the bedside even in low-resource conflict settings. The raw OTS is built up by first assigning a value based on initial visual acuity (NLP = 60, LP/HM = 70, 1/200–19/200 = 80, 20/200–20/50 = 90, $\geq 20/40$ = 100) and then subtracting fixed point penalties for each adverse clinical sign (globe rupture – 23, endophthalmitis – 17, perforating injury – 14, retinal detachment – 11, RAPD – 10). The final raw score is then placed into one of the five OTS categories (1 to 5), each linked to a published probability distribution of final visual outcomes.

Symptoms of depression and anxiety were assessed using the Hospital Anxiety and Depression Scale (HADS), a 14-item screening instrument designed for use in non-psychiatric medical settings. The HADS was selected over PHQ-9/GAD-7 because the Arabic version has been validated in regional populations and, importantly, omits the somatic items that would otherwise overlap with injury-related symptoms such as fatigue or sleep disturbance. The depression and anxiety subscales were summed independently, and total subscale scores of 0–7 were classified as 'normal range' (no clinically meaningful symptoms), 8–10 as 'borderline' (sub-threshold symptoms that nevertheless warrant clinical attention), and 11–21 as 'case' (probable depressive or anxiety disorder) [11, 12].

Vision-related quality of life was assessed using the 25-item National Eye Institute Visual Function Questionnaire (NEI-VFQ-25) [13]. The NEI-VFQ-25 was used because it captures both functional and emotional dimensions of vision loss and has been applied previously in trauma-related cohorts. Subscale scores were computed using the standard NEI scoring algorithm and averaged into a composite score on a 0–100 scale. A higher number reflects better visual functioning across general health, general vision, ocular pain, near and distance activities, social functioning, mental health, role difficulties, dependency, driving, color vision, and peripheral vision domains.

All three tools (OTS, HADS and NEI-VFQ-25) were administered face-to-face by resident optometrists, ophthalmology residents and trained study nurses who attended a one-day standardization workshop before recruitment began.

Statistical analysis

Descriptive statistics was used to summarize participant characteristics using means $\pm$ SD for continuous variables and frequencies (%) for categorical variables. As the principal continuous outcomes (visual acuity and NEI-VFQ-25 score) were not normally distributed across grouping variables, non-parametric tests were used for between-group comparisons. The grouping variables for between-group comparisons were the HADS depression categories (normal range, borderline, case), the HADS anxiety categories (normal range, borderline, case), and the OTS severity categories (1 to 5). Differences in continuous outcomes (visual acuity and NEI-VFQ-25 score) across depression/anxiety severity categories and across OTS groups were analyzed using the Kruskal–Wallis test, while the chi-square test

was used to examine the association between categorical OTS groups (1 to 5) and the HADS-defined depression and anxiety categories (normal range, borderline, case).

Associations between OTS, visual acuity, NEI-VFQ-25 score and level of depression and anxiety were examined using Spearman's rank correlation coefficients. To evaluate independent predictors of mental health and QoL outcomes, multivariable linear regression models were fitted with OTS score as the primary predictor and adjusted for age and sex, which were specified as potential confounders. Standardized (β) and unstandardized (B) regression coefficients with standard errors and 95% confidence intervals are reported. Statistical significance was determined using two-sided tests with $\alpha = 0.05$. All analyses were conducted using IBM SPSS Statistics version 28.

RESULTS

A total of 375 ocular trauma patients were included in the study. Participants were recruited across all Gaza governorates, with the highest proportions were from North Gaza (n = 103, 27.5%) and Gaza (n = 93, 24.8%). Participants were predominantly male (n = 272, 72.5%) with a mean age of 37 ± 15 years old. Most were married (n = 218, 58.1%) and reported associate-level education (n = 220, 58.7%). Unemployment affected 302 participants (80.5%), and the pre-war household income was $\$1439 \pm 129$. Detailed sociodemographic and baseline health characteristics are presented in Table 1, and ocular injury characteristics and management are presented in Table 2.

Table 1
Sociodemographic and baseline health characteristics of the study participants.

Domain	Category	n (%)
Gender	Female	103 (27.5)
	Male	272 (72.5)
Age (years)	—	37 ± 15*
Residence	Gaza	93 (24.8)
	Khan Younis	72 (19.2)
	Middle area	61 (16.3)
	North Gaza	103 (27.5)
	Rafah	46 (12.3)
Marital status	Divorced	3 (0.8)
	Married	218 (58.1)
	Single	130 (34.7)
	Widow	24 (6.4)
Education	Associate	220 (58.7)
	Bachelor	108 (28.8)
	Master or higher	14 (3.7)
	Never been to school	33 (8.8)
Household income (USD)	—	1439 ± 129*
Family members	—	6 ± 4*
Employment	No	302 (80.5)
	Yes	73 (19.5)
Smoking status	Never smoker	194 (51.7)
	Past smoker	99 (26.4)
	Current smoker	82 (21.9)
Eye problem prior to the war	No	363 (96.8)
	Yes	12 (3.2)
*Data is displayed as mean ± SD		

Domain	Category	n (%)
Diabetes mellitus	No	343 (91.5)
	Yes	32 (8.5)
Hypertension	No	325 (86.7)
	Yes	50 (13.3)
*Data is displayed as mean $\pm$ SD		

Table 2
Ocular injury characteristics and management.

Characteristic	Category	n (%)
Side	Both eyes	17 (4.5)
	Left	173 (46.1)
	Right	185 (49.3)
Received treatment	No	61 (16.3)
	Yes	314 (83.7)
Type of treatment	No treatment	61 (16.3)
	Evisceration	11 (2.9)
	IOFB removal/surgery	8 (2.1)
	Eyelid repair	6 (1.6)
	Medical treatment/drops	98 (26.1)
	Retinal detachment repair/surgery	26 (6.9)
	Rupture globe repair/surgery	165 (44.0)
Type of injury	Closed globe	100 (26.7)
	Open globe	275 (73.3)
Type of open/ closed globe	Contusions	100 (26.7)
	Penetrating laceration + IOFB	45 (12.0)
	Perforating injury	72 (19.2)
	Rupture globe	158 (42.1)

Ocular signs, symptoms, and clinical findings

Figure 1 recorded the ocular signs and symptoms were dominated by trouble seeing ($n = 370$ cases, 98.9%) and pain ($n = 358$ cases, 95.7%), followed by eyelid laceration ($n = 78$ cases, 20.9%), blood in the eye ($n = 45$ cases, 12.0%), and abnormal pupil size or shape ($n = 33$ cases, 8.8%). On the other hand, Fig. 2 presented the key clinical findings of the ocular trauma which were retinal detachment in 225 cases (61.8%), globe rupture in 157 cases (43.0%), evidence of perforating injury in 104 cases (28.6%), relative afferent pupillary defect (RAPD) in 92 cases (25.3%), and endophthalmitis in 59 cases (16.2%).

Depression and anxiety symptom distributions

Item-level response for depression (D1–D7) and anxiety (A1–A7) on the HADS are presented in Fig. 3 and Fig. 4, respectively. Overall, 56.5% ($n = 212$) met the criteria for depression case, 37.9% ($n = 142$) were borderline, and 5.6% ($n = 21$) were normal. For anxiety, 30.1% ($n = 113$) met case criteria, 63.5% ($n = 238$) were borderline, and 6.4% ($n = 24$) were normal.

Vision-related quality of life

The mean composite of NEI-VFQ-25 score for the cohort was 38.6 ± 12.4 , with the lowest subscale means observed for general vision (32.1), role difficulties (30.7), and dependency (29.4), and the highest for color vision (51.8) and peripheral vision (47.2). Items related to driving were treated as missing for participants who reported never having driven and were excluded from that subscale calculation, in line with the standard NEI-VFQ-25 scoring rules.

Visual acuity, OTS, and mental-health categories

Visual acuity (logMAR) differed across depression categories ($p = 0.008$), with worse acuity observed in the borderline group (1.6 ± 1.3) and case group (1.5 ± 1.4) than in participants in the normal range (0.7 ± 1.1). Visual acuity also differed across anxiety categories ($p = 0.002$), with worse acuity in case (1.7 ± 1.4) and borderline (1.4 ± 1.3) groups than in HADS-normal-range trauma survivors (0.9 ± 1.1).

The present study recorded the OTS category of the participants were mainly populated in OTS 1 ($n = 198$, 52.8%) which indicate severe injury and worse prognosis. This then followed by OTS 2 ($n = 144$, 38.4%) and OTS 3 ($n = 33$, 8.8%). None of the participants was categorized in OTS 4 and OTS 5, where both usually correspond to less severe injury and better prognosis. Thus, the less severe category in this cohort was OTS 3.

The OTS distributions differed significantly by depression status ($\chi^2(4) = 51.76$, $p < 0.001$), with OTS 3 more frequent among participants in the normal range (47.6%) than among borderline (7.0%) or case participants (6.1%). By contrast, OTS 1 was more frequent in borderline (46.5%) and case participants (60.8%) than in participants in the normal range (14.3%) as shown in Table 3.

Table 3
Association between ocular trauma score (OTS) and depression category.

Variable	Normal n (%)	Borderline n (%)	Case/Depression n (%)	p-value
OTS 1	3 (14.3)	66 (46.5)	129 (60.8)	
OTS 2	8 (38.1)	66 (46.5)	70 (33.0)	< 0.001*
OTS 3	10 (47.6)	10 (7.0)	13 (6.1)	
p values were derived from Chi Square test, *: Statistically significant				

OTS distributions also differed across anxiety categories ($\chi^2(4) = 42.27$, $p < 0.001$), with OTS 3 more frequent among HADS-normal-range trauma survivors (41.7%) than among borderline (8.0%) or anxiety-case participants (3.5%). Conversely, OTS 1 was most frequent in anxiety-case participants (64.6%), followed by borderline participants (50.0%) and those in the normal range (25.0%) as shown in Table 4.

Table 4
Association between ocular trauma score (OTS) and anxiety category.

Variable	Normal n (%)	Borderline n (%)	Case/Anxiety n (%)	p-value
OTS 1	6 (25.0)	119 (50.0)	73 (64.6)	
OTS 2	8 (33.3)	100 (42.0)	36 (31.9)	< 0.001*
OTS 3	10 (41.7)	19 (8.0)	4 (3.5)	
p values were derived from Chi Square test, *: Statistically significant				

Correlation analyses

Spearman correlation analyses showed that higher OTS scores (i.e., less severe injury / better prognosis) were associated with lower depression ($\rho = -0.253$, $p < 0.001$), lower anxiety ($\rho = -0.220$, $p < 0.001$), and higher QoL ($\rho = 0.142$, $p = 0.006$). Worse visual acuity (higher logMAR) correlated with higher anxiety ($\rho = 0.204$, $p < 0.001$) and lower QoL ($\rho = -0.164$, $p = 0.001$), while the correlation between logMAR and depression was not significant ($\rho = 0.064$, $p = 0.216$).

Multivariable linear regression

Table 5 presents the multivariable linear regression models adjusted for sex and age, while the OTS score was the independent predictor of all three outcomes. Specifically, a higher OTS score was associated with lower depression scores ($B = -0.924$, $SE = 0.158$, $\beta = -0.300$, 95% CI: -1.235 to -0.613 , $p < 0.001$), lower anxiety scores ($B = -0.983$, $SE = 0.230$, $\beta = -0.224$, 95% CI: -1.434 to -0.531 , $p < 0.001$), and higher QoL scores ($B = 1.763$, $SE = 0.457$, $\beta = 0.204$, 95% CI: 0.864 to 2.662 , $p < 0.001$). In contrast,

sex and age were not significantly associated with depression, anxiety, or QoL in the adjusted models (all $p > 0.05$).

Table 5
Multivariable linear regression models (adjusted for age and sex).

Outcome	Predictor	B	SE	β	95% CI	p-value
Depression	OTS score	-0.924	0.158	-0.300	-1.235, -0.613	< 0.001*
	Gender	0.053	0.222	0.012	-0.384, 0.490	0.811
	Age	0.000	0.007	0.003	-0.013, 0.014	0.946
Anxiety	OTS score	-0.983	0.230	-0.224	-1.434, -0.531	< 0.001*
	Gender	-0.466	0.323	-0.073	-1.100, 0.169	0.150
	Age	-0.001	0.01	-0.003	-0.02, 0.018	0.954
Quality of life	OTS score	1.763	0.457	0.204	0.864, 2.662	< 0.001*
	Gender	0.510	0.642	0.040	-0.753, 1.773	0.428
	Age	-0.005	0.019	-0.013	-0.043, 0.033	0.804

DISCUSSION

In this cross-sectional study of 375 civilians with ocular trauma sustained during the Gaza war between October 2023 and January 2025, we observed a marked psychological burden alongside severe ocular injuries. More than half of participants (56.5%) met case criteria for depression on the HADS and nearly one-third (30.1%) met case criteria for anxiety, with only 5.6% and 6.4% respectively classified as normal. These markedly exceed those typically reported in general ophthalmology populations and are consistent with the broader pattern of elevated mental-health morbidity documented in conflict-exposed civilians [22, 23]. The combined prevalence of borderline plus case-level distress exceeded 94% for depression and 93% for anxiety, indicating that virtually all participants in this cohort exhibited some degree of clinically meaningful psychological symptoms in the aftermath of their ocular injury.

Open-globe injuries predominated (73.3%) and rupture globe was the single most common injury subtype (42.1%), with rupture globe repair the most frequently performed procedure (44.0%). These patterns are consistent with high-energy, blast-related mechanisms reported in other contemporary urban conflicts [2, 24]. The high frequencies of retinal detachment (61.8%), globe rupture (43.0%), and endophthalmitis (16.2%) underscore the severity of injuries and the limited capacity for timely vitreoretinal and infection-control care in a health system under siege [3]. Notably, 16.3% of the participants received no treatment, and only a small minority underwent intraocular foreign body removal (2.1%) or retinal detachment repair (6.9%), reflecting the constrained surgical infrastructure and supply chains during the period of observation [20, 25].

The central finding of the present study demonstrated that ocular trauma severity, as measured by the OTS, is independently associated with worse psychological outcomes and lower vision-related quality of life. Higher OTS scores (indicating less severe injury and better prognosis) moderately correlated with lower depression and anxiety, and with higher QoL. These associations persisted in multivariable regression models adjusted for age and sex. Specifically, each 1-unit increase in OTS score was associated with a 0.924-point decrease in depression score, a 0.983-point decrease in anxiety score and a 1.763-point increase in quality-of-life score. Sex and age, by contrast, were not significant predictors of any outcome, suggesting that injury-specific clinical factors, rather than demographics are the dominant determinants of psychological distress and visual functioning in this cohort.

These results align with the conceptual model that visual loss is a powerful and proximal stressor, linked to occupational disruption, dependency, and reduced participation in social and economic life [6, 7]. Worse visual acuity (higher logMAR) was specifically associated with greater anxiety and lower QoL, consistent with prior evidence that anxiety is acutely reactive to functional uncertainty about the eye, whereas depression in this cohort tracked more closely with overall injury severity than with logMAR [12, 13]. Taken together, these categorical findings demonstrate that less severe ocular trauma confers a graded protective effect against psychological distress and functional impairment. These findings provide convergent evidence that injury severity is a clinically meaningful axis of psychosocial vulnerability that should be incorporated into post-trauma triage and rehabilitation pathways [6, 23].

From a public-health perspective, the disproportionate burden among working-age men (72.5% male;), of whom 80.5% were unemployed, has implications beyond clinical rehabilitation. Vision impairment in this group threatens household livelihoods in a context already characterized by humanitarian emergency, food insecurity, and disrupted services [3, 20]. Multidisciplinary models that integrate ophthalmic surgical care, low-vision rehabilitation, and culturally adapted mental-health services, delivered by trained primary-care and community workers where specialists are scarce, are essential components of any sustainable response [21, 25].

Findings from the present study are broadly consistent with prior conflict-zone literature reporting elevated rates of ocular trauma during urban warfare and high rates of post-injury psychological distress [1, 2, 24]. They extend that literature by providing primary, contemporaneous data from Gaza and by quantifying the independent association between OTS and validated mental-health and vision-related QoL measures. To the best of our knowledge, this is among the first studies to apply the OTS, HADS, and NEI-VFQ-25 in concert within an active conflict cohort, providing a methodological template for future investigations in comparable humanitarian settings [26, 27].

Several mechanisms may underlie the observed association between injury severity and psychological distress. Severe ocular trauma frequently entails irreversible structural damage and an uncertain visual prognosis; this uncertainty has been linked, in non-conflict ophthalmic populations, to anticipatory anxiety, demoralization, and depressive symptoms [14, 28]. In the Gaza setting, these intrinsic injury-related stressors are compounded by extrinsic factors including displacement, loss of family members,

exposure to repeated traumatic events, food insecurity, and severely limited access to specialty care [20, 21, 23]. The fact that age and sex were not significant predictors in our adjusted models supports the interpretation that the dominant determinants of distress in this cohort are clinical and contextual rather than demographic, with implications for triaging psychosocial care according to objective injury severity rather than demographic profile.

The differential pattern observed for visual acuity is also clinically informative. Worse logMAR score correlated with higher anxiety and lower QoL, but not with depression after the influence of OTS was considered. Taken together, these findings indicate that injury severity is associated with all three patient-centered outcomes, whereas visual acuity shows a more selective association with anxiety and QoL. This dissociation may reflect the distinct phenomenology of anxiety, which is reactive to perceived threat and uncertainty about the eye, versus depression, which may track more closely with cumulative loss, dependency, and the broader severity of injury and disability. The construct overlaps between anxiety, and the situational stressor of acute visual loss is well recognized [12, 28], and supports the use of subscale-level interpretation when planning interventions.

Operationally, the present findings suggest that integrating brief HADS screening into post-injury ophthalmic follow-up could identify the substantial proportion of patients (more than 90% in our sample fell into borderline or case categories for at least one HADS subscale) who would benefit from focused psychosocial support. Equally, NEI-VFQ-25-based outcome monitoring could provide a patient-centered metric of recovery that complements traditional acuity- and structure-based measures. In low-resource conflict settings, scalable models of care such as task-shifted counseling delivered by community health workers using the WHO Mental Health Gap Action Programme (mhGAP) framework may offer a feasible pathway to address the psychological burden documented here [20, 21, 25].

The strengths of the present study include its substantial sample size recruited from all five Gaza governorates during an active armed conflict, the use of internationally validated instruments (OTS, HADS, NEI-VFQ-25), and a coherent analytic framework that combined non-parametric group comparisons, correlation analyses, and multivariable regression adjusted for age and sex. The geographic spread of recruitment across Gaza, Khan Younis, North Gaza, the Middle area, and Rafah supports the external validity of the findings within the affected population, and the focus on patient-reported outcomes captures the lived experience of survivors that is often invisible in mortality- or surgery-focused reporting [19, 29].

Several limitations should be acknowledged. First, the cross-sectional design precludes causal inference between ocular trauma severity and mental-health or QoL outcomes; longitudinal follow-up will be necessary to characterize the trajectory of recovery and the temporal ordering of distress and visual outcome. Second, the total trauma denominator was not reported in the analyzed results, so the precise incidence proportion of ocular trauma cannot be quantified here. Third, mental-health and quality-of-life outcomes were self-reported, which may be subject to recall and reporting biases in a setting of acute humanitarian crisis; pre-existing psychiatric morbidity was not captured, which limits inference about the

incremental contribution of the ocular injury itself. Fourth, only OTS categories 1 to 3 were observed in the sample; OTS 4–5 frequencies were not reported, limiting inference at the least-severe end of the OTS spectrum. Fifth, additional covariates such as time since injury, displacement status, and exposure to other traumatic events could not be modeled. Finally, residual confounding by displacement, bereavement, previous trauma exposure, and access to care cannot be excluded [15, 16].

CONCLUSION

In conclusion, among Gaza civilians who sustained ocular trauma during the 2023–2025 war, the burden of depression and anxiety was substantial, and ocular trauma severity (OTS) was independently associated with greater psychological distress and lower vision-related quality of life, even after adjustment for age and sex. These findings support the integration of mental-health screening and structured psychosocial support into ophthalmic-trauma pathways in conflict and post-conflict settings, and thus highlight the urgent need to strengthen ocular surgical, vitreoretinal, and rehabilitation capacity for the affected population.

Declarations

Ethics approval and consent to participate

The study adhered to the tenets of the Declaration of Helsinki, and informed consent was obtained from all participants prior to commencement of the study. The experimental protocol was reviewed and approved by the Palestinian Health Research Council (PHRC/HC/1199/25), which served as the Research Ethics Committee (REC) of the European Gaza Hospital, Gaza Strip Gaza City 970, Ministry of Health, Palestine.

Consent for publication

Not applicable

Availability of data and materials

The data that support the findings of this study are not openly available due to reasons of sensitivity and are available from the corresponding author upon reasonable request.

Competing interests

All authors have no conflict of interest to declare

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Authors' contributions

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Figures

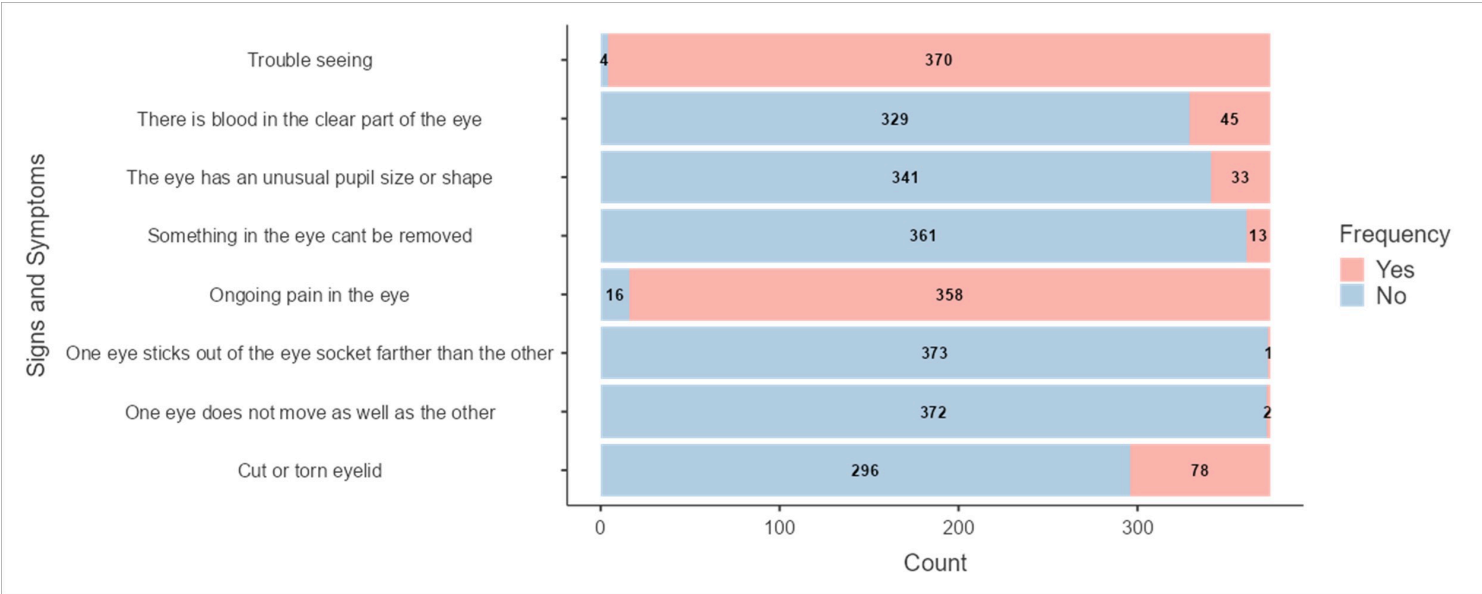


Figure 1

Frequency of reported ocular signs and symptoms among participants

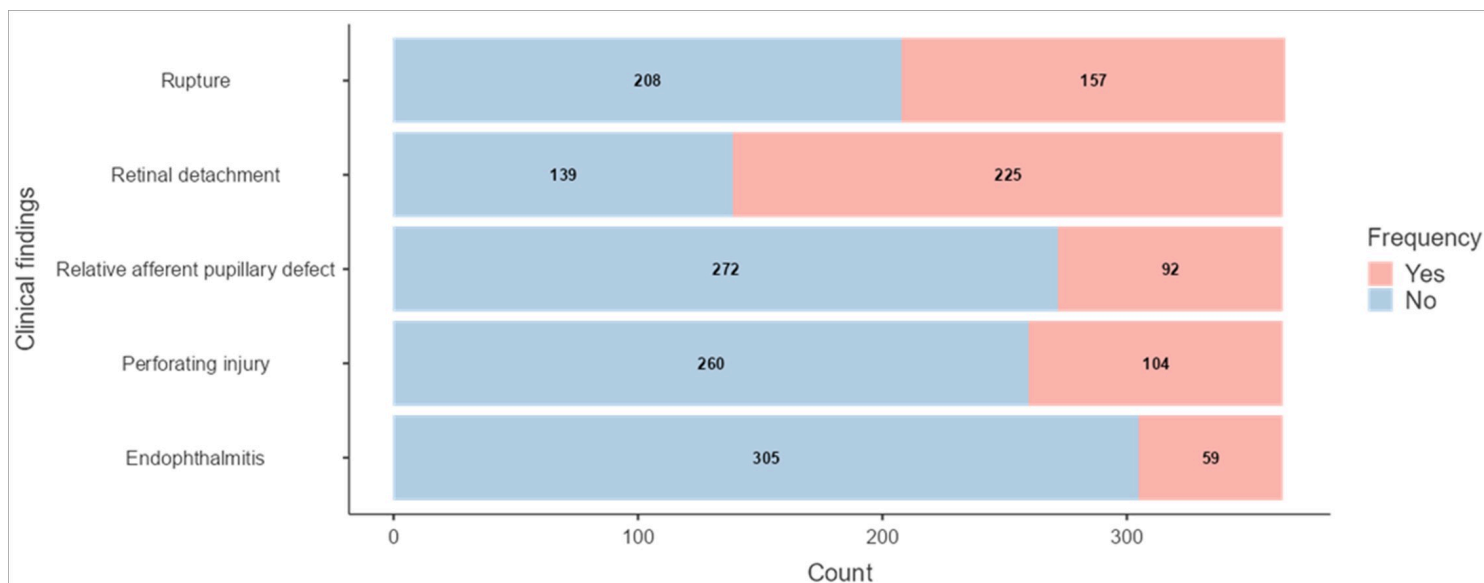


Figure 2

Frequency of key clinical findings in ocular trauma cases

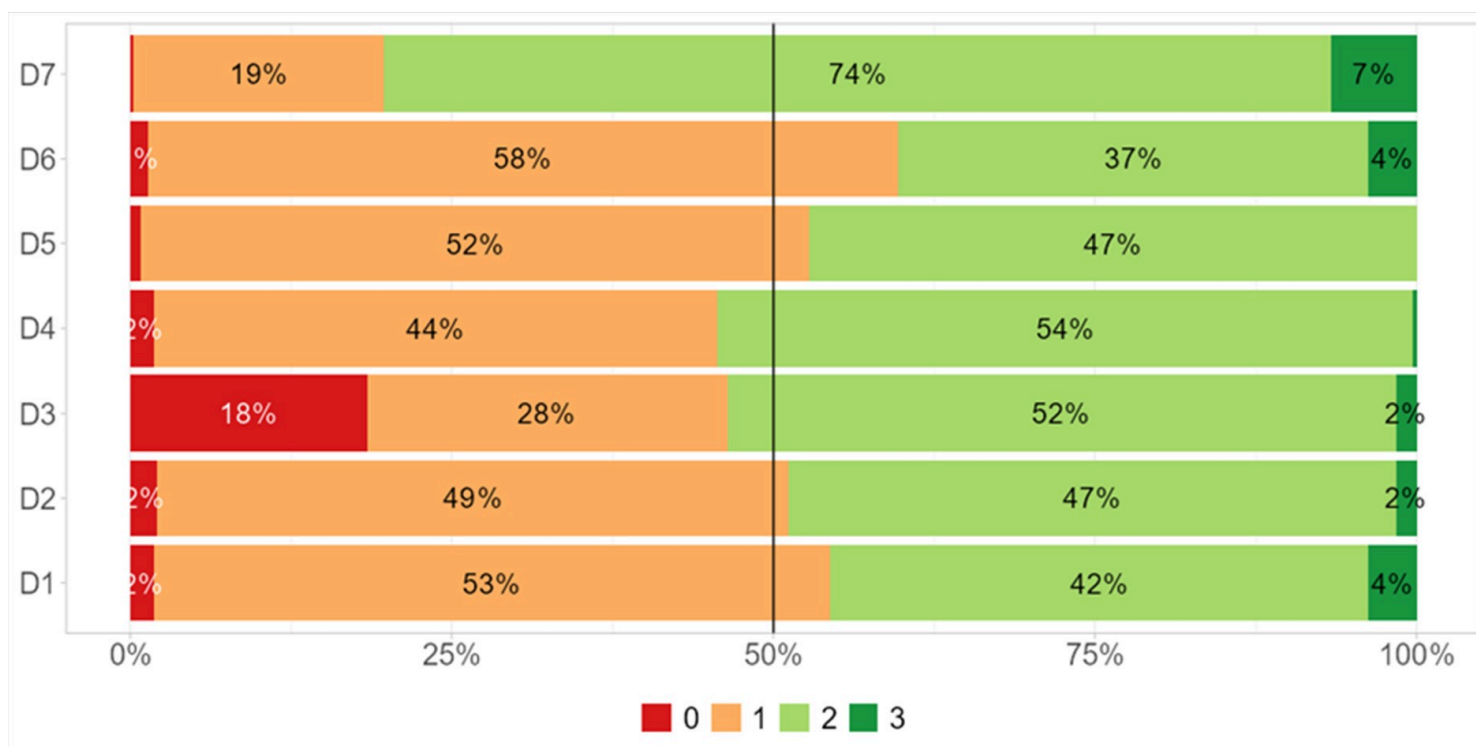


Figure 3

Distribution of responses to the seven HADS depression items (D1–D7). X-axis: percentage of participants. Y-axis: HADS depression items. Colors indicate response categories on the 4-point scale (0–3), where 0 = absence of the symptom, 1 = mild or occasional presence, 2 = moderate or frequent presence, and 3 = severe or constant presence.

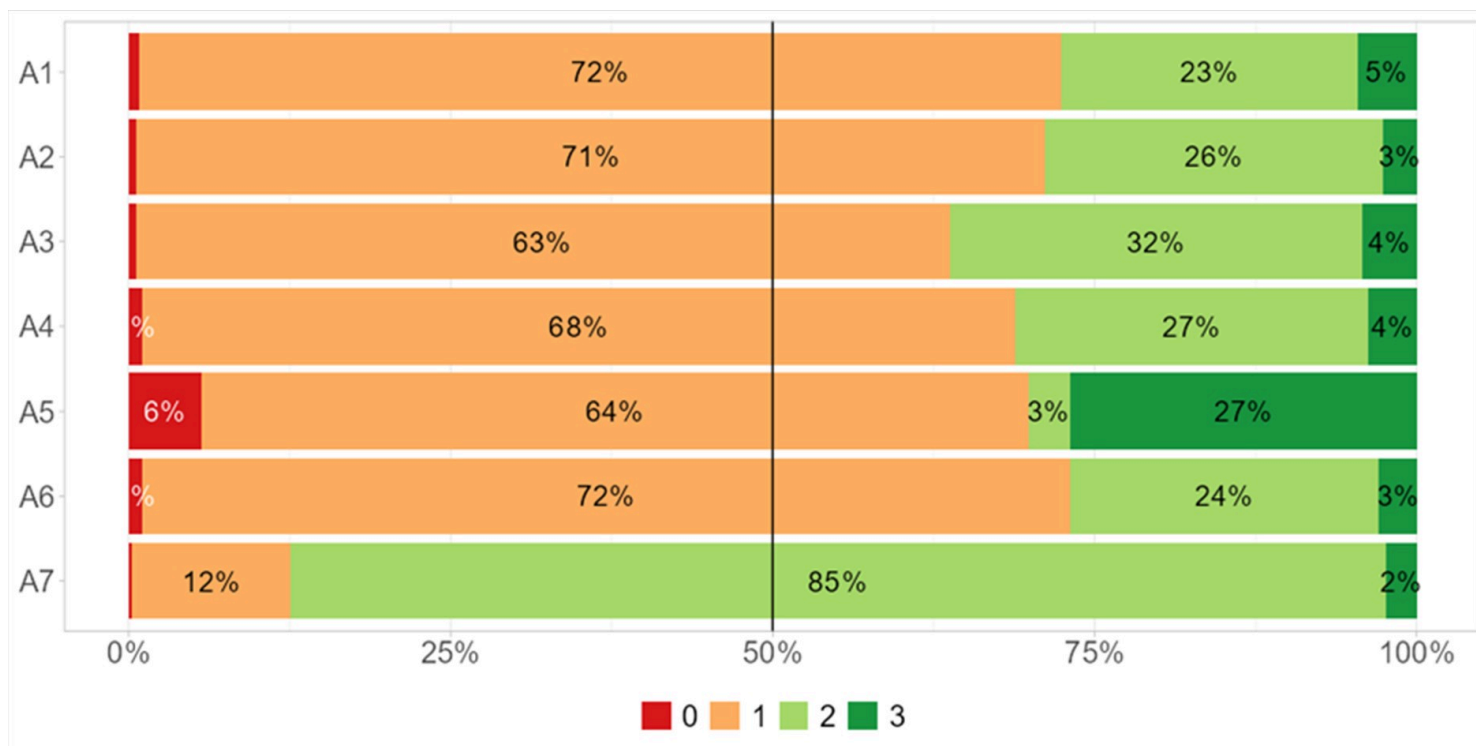


Figure 4

Distribution of responses to the seven HADS anxiety items (A1–A7). X-axis: percentage of participants. Y-axis: HADS anxiety items. Colors indicate response categories on the 4-point scale (0–3), where 0 = absence of the symptom, 1 = mild or occasional presence, 2 = moderate or frequent presence, and 3 = severe or constant presence.