Intimate Partner Violence (IPV) - Associated Ophthalmologic Injuries among Women: A Systematic Review

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ABSTRACT

Objectives: This study aims to describe patterns of IPV-associated ophthalmic injuries among women: Specifically, it seeks to identify factors associated with ophthalmic injuries in women secondary to IPV, determine practices and/or protocols in identifying IPV-associated ophthalmic injuries, and to examine practices in referral to ancillary services for IPV survivors with such injuries.

Methods: A systematic literature search was conducted for observational studies published from 2009 to 2022 using PubMed, Google Scholar, HERDIN, and the Cochrane Library. Studies were screened and appraised using the Newcastle-Ottawa Quality Assessment Scale (NOS) for risk of bias. Relevant data on injury types, screening protocols, and referral practices were extracted and synthesized. Analysis of risk of bias (ROB) for each study utilizing the NOS scale indicated that four studies exhibited a good ROB.

Results: A total of 567 female patients with IPV-related facial injuries were included in the selected studies. Of these, 98 cases (17.28%) involved ophthalmic injuries, including orbital fractures, subconjunctival hemorrhages, and contusions. Factors associated with these injuries included delayed healthcare-seeking behavior, bilateral and recurrent trauma, and psychological distress. Current practices in IPV identification were found to be inconsistent, with a lack of standardized screening protocols, especially in ophthalmology settings. Referral to ancillary services was often suboptimal due to poor interdepartmental coordination and absence of formal pathways.

Conclusion: There is a significant gap in the recognition and management of IPV-associated ophthalmic injuries among women. Establishing standardized screening protocols and improving referral systems can enhance care outcomes and provide holistic support for survivors, particularly in low-resource settings.

Keywords: *Intimate Partner Violence, ophthalmic injuries, women's health, screening protocols, ancillary services*

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Intimate partner violence (IPV) or interpersonal violence continues to be underreported among women with IPV-related injuries. Studies indicate that 27.4% of women in India suffer from physical violence from their partners.[1] Between 2002 and 2015, there was an increase in emergency department (ED) visits for injuries related to IPV in the United States.[2] Lower levels of education and socioeconomic status correlate with increased prevalence of IPV and reduced reporting rates among women.[3,4] Women possessing higher education and greater wealth demonstrate an increased likelihood of seeking assistance and participating in health screenings.[4] Structural barriers, including restricted service availability and unfavorable attitudes from service providers, contribute to underreporting in rural areas.[5] Malawis-Ignacio identifies several cultural factors that hinder reporting.[6] The elements encompass the aspiration to address familial situations and the apprehension regarding the consequences for children. Interviewer characteristics may influence the disclosure of intimate partner violence in survey responses.[7] Furthermore, exposure to parental IPV heightens the probability of both experiencing and perpetrating IPV.[8] Women who are victims of IPV continue to be at risk for various reasons, despite having experienced abuse from their current or former partners.

IPV disproportionately impacts women aged 20-40, as evidenced by a higher frequency of ED visits for IPV-related injuries within this demographic.[2,9] Women subjected to IPV are susceptible to recurrent mild traumatic brain injuries and strangulation-related anoxic or hypoxic brain injuries.[10,11] Ophthalmic trauma frequently occurs as a significant outcome of IPV, with research showing that 45% of IPV cases are associated with ocular injury.[12,13] Injuries vary from contusions and subconjunctival hemorrhages to more severe complications, including orbital fractures, globe ruptures, and retinal detachments.[12,14] Ophthalmologists play a crucial role in the accurate identification and reporting of conditions. The goal of involving ophthalmologists in identifying IPV patients is to perform both vision- and life-saving management.

This study systematically analyzed ophthalmic injuries associated with IPV among women. It identified factors related to these injuries, evaluated current recognition practices, and assessed referral protocols for IPV survivors. Although there is an increasing amount of research on IPV and its physical effects, a notable gap persists in the literature concerning ophthalmic injuries as a distinct outcome of IPV. Existing studies predominantly examine general trauma patterns or facial injuries, lacking a thorough analysis of ocular manifestations.[15] Moreover, there is an absence of systematic reviews that consolidate existing evidence regarding the identification, management, and referral processes for these injuries.[16-18] Addressing this gap is essential for the development of standardized screening guidelines, enhancing clinical recognition, and promoting the integration of IPV-related ophthalmic injury management into public health policies. This study sought to synthesize existing data on ocular manifestations of IPV, assess gaps in current identification and referral systems, and offer evidence-based recommendations for enhancing healthcare interventions. The study aimed to improve the understanding of ophthalmic injuries associated with IPV and to promote policies that facilitate timely identification and adequate support for affected women.

REVIEW OF RELATED LITERATURE

Intimate Partner Violence and Ophthalmic Injuries

IPV often results in ophthalmic injuries, including contusions and abrasions, and more serious conditions such as retinal detachment, orbital fractures, and globe rupture. The COVID-19 pandemic has exacerbated this issue, potentially increasing IPV-related ocular injuries.[19] Improved screening and education initiatives in emergency departments (EDs) have shown promise in identifying and referring IPV victims with ocular injuries to appropriate services.[20] Ophthalmologists play a crucial role in recognizing and addressing these injuries, as they may be the first point of contact for victims.[21] Continued vigilance and awareness are essential for providing comprehensive care to IPV survivors with ophthalmic trauma.

Despite the prevalence of such injuries, hospitals often lack standardized screening mechanisms to identify IPV-related trauma in ophthalmic patients,

leading to underreporting and missed opportunities for intervention. Emergency and ophthalmology departments frequently focus on treating the physical injury without investigating the underlying cause, leaving many IPV survivors without the necessary support. Studies have shown that implementing standardized screening protocols in EDs and trauma centers can improve the identification of IPV-related ocular injuries.[20] However, many healthcare providers, including surgical residents, lack adequate training and knowledge about IPV screening and intervention.[22] The absence of IPV-focused screening in ophthalmic evaluations highlights the need for targeted research on IPV-related eye injuries.

Factors Associated with Ophthalmic Injuries in Women Secondary to IPV

IPV is associated with significant midface injuries, particularly fractures of the nasal bone, which are commonly observed among victims of such violence.[23,24] IPV-related traumatic brain injuries, such as mild traumatic brain injuries and strangulation-induced anoxic/hypoxic injuries, are common and are linked to adverse cognitive and psychological effects.[10] Ophthalmologists are essential in the identification and management of ocular trauma associated with intimate partner violence.[21]

The absence of thorough patient histories in hospitals during ophthalmic consultations leads to the underrecognition of injuries related to IPV.[22] Physicians may be reluctant to ask about IPV due to time limitations, concerns about offending patients, or insufficient training in managing IPV disclosures.[25] Research is needed to identify risk factors and emphasize the significance of IPV awareness among healthcare professionals to address these barriers.

Current Practices in the Identification of IPV-Associated Ophthalmic Injuries

Screening for IPV-related injuries remains inconsistent in many healthcare settings worldwide. Studies have shown that emergency room protocols and ophthalmic evaluations rarely include structured questions about IPV, and that only 2-50% of medical professionals routinely screen female patients for IPV, resulting in underdiagnosis.[26] In developed countries, the HITS (Hurt, Insult, Threaten, Scream) questionnaire is a validated tool for IPV screening, with adaptations like E-HITS showing improved sensitivity in military populations.[27] Implementation of HITS in clinical settings has increased screening rates and IPV disclosure.[28] However, modifying screening tools may affect their effectiveness, necessitating careful consideration of scoring systems.[29] The Persian version of HITS has demonstrated validity and reliability in Iranian women.[30] Successful implementation of IPV screening programs requires ongoing provider training, readily available referral sources, and institutional support.[31] Integration of screening tools into electronic medical records, combined with education, can improve healthcare providers' readiness to screen for IPV.[32] The absence of hospital-wide IPV protocols and limited staff training on IPV identification contribute to inadequate recognition and reporting. Further research is needed to assess current identification practices in hospitals and determine effective strategies for integrating IPV screening into ophthalmic care.[33]

Referral Practices for IPV Survivors with Ophthalmic Injuries

Timely referral to ancillary services, such as social work, mental health support, and legal aid, is critical for the well-being of IPV survivors. Research indicates that hospitals with established IPV response systems provide multidisciplinary care for patients with suspected IPV-related injuries. This care typically involves medical treatment, psychological support, and legal assistance.[34,35] EDs play a crucial role in identifying and responding to IPV cases, with staff emphasizing the importance of trauma-informed care and effective interprofessional teamwork.[36,37] Best practices include routine screening, forensic evidence collection, and emotional support for patients and healthcare workers.[38] However, challenges persist, such as professional uncertainty, stigma, and difficulties in coordinating care across agencies.[37,39] Studies suggest that IPV exposure increases hospitalization risk and worsens inpatient outcomes.[40] Implementation of IPV screening and response programs, like those in the Veterans Health Administration, can improve care, but requires consistent follow-up processes.[41] The lack of standardized referral protocols results in many survivors receiving only medical treatment for their

injuries without additional support for addressing the underlying IPV situation.[42,43] Research into existing referral systems can provide insights into gaps in service provision and highlight strategies for improving interdisciplinary collaboration in IPV cases.

Gaps Bridged by the Present Study

Existing research has examined injuries related to IPV; however, there is a notable deficiency in studies specifically addressing ophthalmic trauma as a separate outcome of IPV. Much of the existing literature addresses facial and head injuries as a unified category, neglecting to distinguish the specific patterns and consequences associated with ophthalmic trauma. Furthermore, research on IPV screening and referral practices in ophthalmic settings remains limited. In summary, IPV remains a critical but underrecognized contributor to ophthalmic injuries among women. Despite the prevalence of such injuries, hospitals lack standardized screening protocols and effective referral systems for IPV survivors.

This study sought to systematically review existing evidence on ophthalmic injuries associated with IPV, assess identification practices within hospitals, and analyze referral mechanisms for survivors. This review highlights the need for improved identification and management of IPV-related ophthalmic trauma, emphasizing the role of ophthalmologists in IPV detection. By addressing gaps in current research, this study aims to contribute to the development of hospital-based IPV screening and referral protocols, ultimately enhancing healthcare responses for women affected by IPV-related ophthalmic injuries.

The general objective of this study was to describe patterns of IPV-associated ophthalmic injuries among women. The specific objectives were: (1) to identify factors associated with ophthalmic injuries in women secondary to IPV; (2) to determine practices and/or protocols implemented in the identification of women who sustained IPV-associated ophthalmic injuries; and (3) to determine practices in the referral to ancillary services of IPV women survivors who sustained ophthalmic injuries.

METHODOLOGY

Research Design and Literature Search Strategy

This study is a systematic review of literature.

A search was conducted through PubMed, Google Scholar, HERDIN, and Cochrane Library for observational studies published from 2009 to 2022 which dealt with the magnitude of ophthalmic injuries among women affected by IPV.

The free text terms that were used through the advanced search strategy were "intimate partner violence" or "domestic violence", and "orbital injury" or "ophthalmic injury" or "maxillofacial injury". Secondary search strategy was done using the search terms "referral", "identification", and "diagnosis" with respect to women in an IPV setting. Non-English articles with no available full-text access and no available contact details of authors were excluded. In certain cases, the investigator contacted the authors of the studies to obtain full text articles. References from relevant original papers and review articles were also assessed to identify other eligible studies not covered by the original database searches. Conference abstracts and correspondences were manually searched for possible unpublished studies. Copies of these studies were obtained through the available contact details of the corresponding author/s.

A systematic review was done in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.[44]

Eligibility Criteria

Types of Studies: This review included observational studies (cross-sectional, case-control, and cohort studies), interventional studies (clinical trials), case series, and systematic reviews that investigated ophthalmic injuries in women secondary to IPV. Only peer-reviewed articles and gray literature from reputable sources were considered. Editorials, expert opinions, conference abstracts, non-peer-reviewed articles, and anecdotal reports were excluded. Studies focusing exclusively on general facial trauma without specific mention of ophthalmic injuries were also excluded.

Types of Participants: The review included studies on women of any age who had sustained

ophthalmic injuries due to IPV. Studies that specifically documented ophthalmic trauma in the context of domestic or intimate partner violence were prioritized. Studies involving male IPV survivors, pediatric cases where IPV was not explicitly documented, or general ocular trauma unrelated to IPV (e.g., occupational injuries, accidents, or non-IPV-related assaults) were excluded.

Types of Interventions/Exposures: The review considered studies that examined the identification, assessment, and management of ophthalmic injuries in IPV survivors. The examined procedures included screening and diagnostic approaches used in emergency, ophthalmology, and primary care settings, as well as referral protocols for ancillary services such as psychological support, social work, and legal aid. Research that did not assess IPV-specific screening, diagnosis, or referral practices for ophthalmic injuries were not included. Studies focusing on ophthalmic injuries in the context of non-IPV violence, such as community violence or self-inflicted injuries, were excluded.

Types of Outcome Measures: The primary outcomes were the prevalence, types, and severity of ophthalmic injuries sustained due to IPV, as well as the frequency of identification in medical settings. Secondary outcomes were the effectiveness of current screening and referral protocols in hospitals, the proportion of IPV survivors who received appropriate medical and psychosocial interventions, and the barriers to IPV-related injury recognition in ophthalmic practice. Studies that did not provide clear documentation of IPV-related ophthalmic injuries, or that reported only general trauma findings without differentiation from non-IPV cases, were excluded. Research that did not evaluate hospital-based IPV screening and referral systems or that lacked relevant data on healthcare responses to IPV-related ocular trauma were not considered.

The primary investigator (KF) and co-investigator (MS) independently examined all titles and abstracts and obtained full texts of potentially relevant papers. Independent review was done by the primary investigator and co-investigator to assess fulfilment of inclusion criteria. In case of discrepancies, another independent research associate (DV) not directly involved in the study was tapped to resolve the issue.

Variable Description/Operational Definition

Ophthalmic orbital injuries: This includes orbital floor fractures, zygomaticomaxillary complex (ZMC) fractures, and ruptured globes secondary to assault in IPV.

Intimate Partner Violence (IPV): This refers to any behavior within an intimate relationship that causes physical, psychological, or sexual harm to those in the relationship. It includes acts of physical aggression (such as hitting, slapping, punching, or inflicting injury), sexual coercion, psychological abuse (including threats, intimidation, humiliation, or controlling behaviors), and other forms of violence perpetrated by a current or former partner or spouse. For the purposes of this systematic review, IPV is specifically operationalized as violence inflicted by a male intimate partner on a female victim resulting in identifiable ophthalmic injuries, including, but not limited to, blunt eye trauma, orbital fractures, subconjunctival hemorrhage, retinal detachment, and vision loss. This definition encompasses both reported and clinically suspected IPV-related incidents documented in healthcare settings, particularly those resulting in ocular or periorbital injury that warranted medical evaluation or intervention.

Risk of Bias Assessment

Quality assessment for eligible observational studies was done by the primary investigator using the Newcastle-Ottawa Quality Assessment Scale (NOS). A version of the NOS scale adapted specifically for cross-sectional studies was used (Appendix A). The NOS scale uses points or "stars" to assess the quality of a study in the three domains of patient selection, comparability of groups, and outcome/exposure: maximum of five stars for selection, two stars for comparability, and three stars for outcome/exposure. Studies were assessed as Good, Fair, or Poor, based on the following parameters: (1) Good: 3 or 4 stars in selection domain AND 1 or 2 stars in comparability domain AND 2 or 3 stars in outcome/exposure domain; (2) Fair: 2 stars in selection domain AND 1 or 2 stars in comparability domain AND 2 or 3 stars in outcome/exposure domain; and (3) Poor: 0 or 1 star in selection domain OR 0 star in comparability domain OR 0 or 1 star in outcome/exposure domain. Both the primary investigator and co-investigator carried out the risk of bias assessment

based on the predefined search terms included in the titles and abstracts and the eligibility criteria.

Data extraction and quality assessment

For all studies that met the inclusion criteria, the following data were extracted: study country, study size, and patients' characteristics including pertinent demographics and percentage of women with ophthalmic orbital injuries. The total number of female IPV victims and the magnitude of different types of ophthalmic orbital injuries were also extracted. Both the primary investigator and co-investigator carried out the data extraction.

Ethical Considerations

The ethics review committee of the institution reviewed and approved the study protocol, which involved electronic database search, systematic review, and appraisal of journal articles. As no interventions were done on any human subjects, no adverse effects or harm were observed in the implementation of this study.

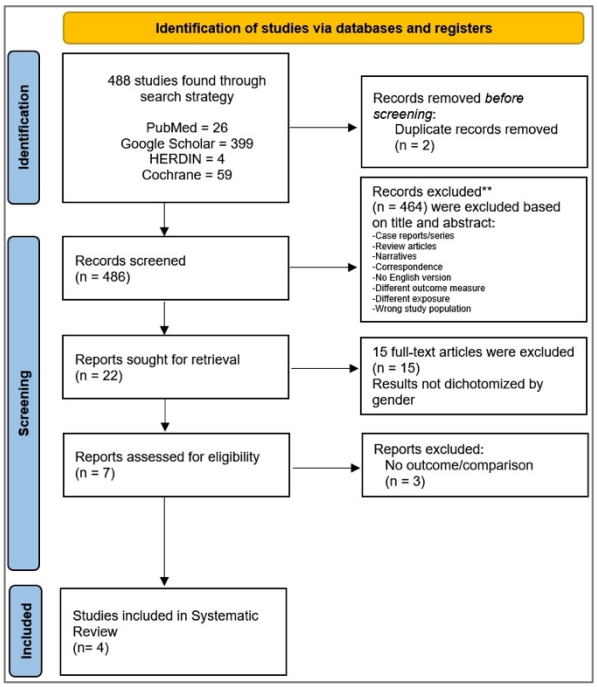
All identified studies based on the literature search using search engines and keywords were assessed for inclusion in the preliminary review. All studies that met the eligibility criteria were included in the final review. No studies were used or downloaded in any illegal way or through any illegal online platforms. The authors of non-open access articles were contacted to request for the full text copy of their researches.

RESULTS

Search results

The primary and secondary search strategies yielded an initial 488 articles from different databases. After removal of duplicates, 486 articles were then screened based on the titles and abstracts. Among the screened articles, 22 full-text articles were assessed, and out of these, 15 articles were removed due to the lack of dichotomous classification of injuries among their study population based on gender. Three reports were excluded due to the lack of assessed comparability, as either no association analysis or comparison between outcome groups was conducted, or there were no defined outcome or comparison groups. Finally, four studies were included in this review (Figure 1).

Figure 1. Diagram of the literature search



Study characteristics

The seven studies included in the risk of bias (ROB) analysis were published from 2009 to 2022. They were all retrospective and done outside the Philippines.[45-51] Analysis of ROB on each study using the NOS scale revealed three studies with poor ROB,[45,49,51] while four studies had good ROB[46,47,48,50]. The three cited studies had poor ROB because comparability was not assessed since there was either no association analysis/comparison done between outcome groups or there were no outcome/comparison groups. All studies utilized institution-based databases wherein all eligible patients were included in their studies. Since all studies were done using retrospective chart review strategy, the non-respondents/non-response rate cannot be assessed. Outcome information of all included patients in the studies were based on record linkages as well as records from databases (Table 1).

Table 1. Summary of NOS scale or risk of bias

Author/s, Year Published, Country	Study design	A				B	C		Total	Risk of bias
		1	2	3	4	1	1	2		
Arosarena *et al.*, 2009, USA	Retrospective	*	*	c	**	-	**	b	6	Poor
Clark *et al.*, 2014, USA	Retrospective	*	*	c	**	*	**	b	7	Good
Cohen *et al.*, 2019, USA	Retrospective	*	*	c	**	*	**	b	7	Good
Dawoud *et al.*, 2021, USA	Retrospective	*	*	c	**	*	**	*	8	Good
Gujrathi *et al.*, 2022, USA	Retrospective	*	*	c	**	-	**	*	7	Poor
Roccia *et al.*, 2021, Italy	Retrospective	*	*	c	**	*	**	*	8	Good
Saddki *et al.*, 2010, Malaysia	Retrospective	*	*	c	**	-	**	*	7	Poor

A: selection, B: comparability, C: exposure/outcome
Note: small letters denote the appropriate assessment per item based on the NOS scale (Appendix A).

Four studies[46,47,48,50] were included in the systematic review. All studies included in their report the patterns of injuries and factors associated with these injuries, method of case identification, and referral system or recommendations (Tables 2A and 2B).

Of these studies, only three were able to tackle identification/screening modalities/protocol,[46-48] while only two elaborated on the referral of females with IPV-related ophthalmic injuries[46,47] (Table 3).

Study population

The four studies included in the review revealed that that 98 out of 567 (17.28%) IPV-related facial injuries in female patients affected the eyes, with or without concurrent injuries to other facial areas.

Table 2A. Summary of articles included in review

Author, Year, Country	Study design (proportion of injury)	Population characteristics	Patterns of ophthalmic injury/ies
Clark *et al.*[46], 2014, USA	Retrospective (31/405)	Female patients with mean age of 32.1 years examined at the University of Iowa Hospitals and Clinics with orbital floor fractures secondary to assault from 1995 to 2013	- Isolated orbital fracture: 38.7% - ZMC fracture: 35.5% - Orbital with medial wall fracture: 16.1% - ZMC with medial wall fracture: 6.5% - ZMC with medial wall and orbital roof fracture: 3.2%
Cohen *et al.*[47], 2019, USA	Retrospective (5/13)	Female patients with median age of 28 years with traumatic ocular injuries at the University of Iowa Hospitals and Clinics from 1995 to 2015	- Scleral laceration/rupture: 100% - Uveal prolapse: 80% - Corneal laceration: 60% - Total retinal detachment: 40% - Posterior vitreous detachment: 20% - Traumatic cataract: 20%
Dawoud *et al.*[48], 2021, USA	Retrospective (13/73)	Female patients with orbital floor fractures, ZMC fractures, or ruptured globes with mean age of 55 years seen at the emergency department of University of Iowa	- ZMC fractures (8/22): 36% - Ruptured globes (5/51): 10%
Roccia *et al.*[50], 2021, Italy	Retrospective (49/76)	Hospitalized patients with mean age of 32.7 years presenting with maxillofacial fractures presented with "violence" with subtype of "interpersonal violence" as etiology	- Maxillo-ZMC-orbital complex fractures: - Floor: 68.57% - Medial wall: 28.57% - Roof: 2.86% *Note: The separate proportions presented may be an overestimate of fractures, as more than one fracture may be seen in a single patient.*

Table 2B. Summary of articles included in review

Author, Year, Country	Associated factors	Case identification	Referral
Clark *et al.*[46], 2014, USA	- Most injuries (70%) were left sided - 7.6% prevalence rate of IPV-associated assault leading to orbital floor fractures	- Due to the high prevalence of IPV among females with orbital floor fractures, ophthalmologists must do proper screening for IPV should be done privately, in a quiet location, and patient unaccompanied: BE AWARE	- Only 8.3% were referred accordingly - Other services to tap for referral: social work, law enforcement, counseling services, local agencies, psychiatry, psychology, and appropriate national task force
Cohen *et al.*[47], 2019, USA	- ZMC fractures were more associated with greater force of impact compared to isolated blowout fractures - Increased incidence of ZMC fractures translates to the severity of IPV-related trauma - IPV-related traumas are associated with intracranial injuries	- Three simple components of screening ophthalmologists may include in their assessment among females with IPV-related injuries: Ask, Assess, Refer - Emphasized routine screening of all females with significant ocular and/or orbital injury with unclear etiology	- Before referring patients to appropriate services, disclosure of physician's legal obligation must be done first
Dawoud *et al.*[48], 2021, USA	- 10.2% (22 out of 216) of all orbital fractures were due to IPV - 10% (5 out of 51) of patients with ruptured globes were due to IPV	- Emergency department-based electronic screening protocols increased the likelihood of discussion and disclosure of IPV	
Roccia *et al.*[50], 2021, Italy	- 27.7% (711 out of 2567) of injuries among patients were due to IPV in which 8.3% (59 out of 711) were female - 7.97% (76 out of 953) cases of IPV-related injuries were female - 64.47% (49 out of 76) cases of orbital involvement out of all the facial injuries among women		

Table 3. Summary of themes in included articles

Author/s, Year, Country	Patterns of injury/ies	Associated factors	Identification/ screening	Referral
Clark *et al.,* 2014, USA	√	√	√	√
Cohen *et al.,* 2019, USA	√	√	√	√
Dawoud *et al.,* 2021, USA	√	√	√	
Roccia *et al.,* 2021, Italy	√	√		

DISCUSSION

Patterns of Ophthalmic Injuries

All patients analyzed in the included studies were IPV victims. However, their emergency department (ED) presentations varied. IPV-related ophthalmologic injuries were heterogeneous, ranging from subtle subconjunctival hemorrhages, periorbital edema, and ecchymosis, to sight-threatening conditions such as scleral lacerations, uveal prolapse, corneal laceration, retinal detachment, traumatic cataract, and ruptured globes. These injuries may occur in isolation or with midfacial trauma. While orbital fractures were common, with some studies reporting detailed distributions (e.g., floor, medial wall, lateral wall, and roof fractures), current evidence does not support a consistent pattern of fracture localization unique to IPV; nevertheless, the middle third of the face is still the most affected part secondary to IPV.[50] Roccia et al. noted varied fracture involvement across orbital walls, suggesting that no single orbital wall predilection can definitively indicate IPV.[50] The clinical suspicion of IPV arises from a combination of factors, including bilaterality of injuries, delayed presentation, inconsistencies in history, repeated trauma, and injury severity disproportionate to the reported mechanism. Thus, while ophthalmologic injuries from IPV can be diverse in presentation, clinicians should maintain a high index of suspicion and apply IPV-screening protocols for trauma cases with obscure etiology. Cohen et al. stated that IPV targets the eye owing to its visibility and fragility, making ocular injuries a possible sign of abuse.[47] In the included studies, there were also reports of patients with near-sight-losing to sight-losing outcomes such as corneal/scleral laceration/rupture, uveal prolapse, retinal

detachment, traumatic cataract, and rupture of globes which may later necessitate enucleation. Vision alterations, corneal abrasions, and psychological aversion to eye contact and brightness might go unreported without a strong index of suspicion. Eye doctors and emergency room doctors should be more aware of IPV when diagnosing unexplained or recurring ocular injuries. Clark et al. noted that outpatient screening techniques vary, missing opportunities to identify injury trends.[46] Many IPV-related ocular trauma victims may not be identified or referred for help with conventional methods.

The damage patterns show that IPV-related ocular trauma is common and underrecognized. Preventing long-term vision impairment and protecting at-risk women requires early detection and management.[52] Ophthalmologists and ED clinicians must be taught to recognize IPV damage and use standardized screening methods.[16] Such efforts are essential for a multidisciplinary, trauma-informed approach that treats physical injuries and opens psychological and legal channels. IPV screening in trauma hospitals and EDs is supported, although therapeutic options need more investigation.[53]

Factors Associated with Ophthalmic Injuries in Women Secondary to IPV

This study revealed key factors associated with ophthalmic injuries in women who were victims of IPV. These factors span clinical, demographic, and systemic domains and are crucial in both recognizing IPV and improving outcomes for affected women. Due to their visibility and the psychological effect of injury, the face and periorbital area the most common anatomical targets in IPV.[48] After direct facial strikes, blunt trauma, periorbital ecchymosis, orbital fractures, and subconjunctival hemorrhages were common. Cohen et al. noted that unilateral, repetitive, unexplained injury strongly suggests IPV, especially when the presentation contradicts the patient's claimed mechanism of injury.[47] Lack of systematic screening and provider difficulty in addressing IPV were key hurdles to diagnosing partner violence-related ocular injuries.[46] Several authors emphasized that many outpatient settings underreported IPV due to patient-related factors such as fear, shame, emotional or financial dependence, and lack of privacy during consultations.[46] Also, ophthalmic injuries may often be reported without being attributed to IPV unless clinicians proactively implemented targeted screening protocols.[47] Young adult women (aged 20-40) from low-income families were disproportionately impacted.[50] These women also had greater face and ocular injuries, demonstrating that young age, female gender, and economic vulnerability are risk factors. In the study by Dawoud et al., the implementation of structured IPV screening techniques along with targeted ED staff education significantly improved the identification, documentation, and referral of IPV-related ocular injuries.[48] The recording and referral rates for suspected IPV cases with eye injuries increased significantly after such an endeavor, demonstrating that institutional protocols are crucial to IPV detection and care. Cohen et al. advocated for global awareness of ophthalmologists' unique role in IPV detection.[47] Because many trauma patients visit eye clinics, ophthalmologists may be their first and only medical contacts. This highlights the need for IPV awareness and training in ophthalmology residency and clinical practice. The findings imply that ophthalmologists and emergency care professionals treating women with unexplained or recurring eye injuries should suspect IPV. Trauma-informed treatment and combining medical demands with emotional well-being and advocacy require coordination among emergency medicine, ophthalmology, and social services.[36] Addressing socioeconomic determinants of health and raising ophthalmologists' IPV awareness can help identify and support survivors.[13] Enhancing healthcare providers' screening, documentation, and referral practices improves patient care and may help prevent continued violence against women. The study by Davis and Padilla-Medina promotes IPV education, screening, and referral procedures in ophthalmology and emergency medicine by identifying these characteristics.[33]

Practices and/or Protocols in the Identification of Women Who Sustained IPV-Associated Ophthalmic Injuries

Identification of women with IPV-associated ophthalmic injuries is difficult due to the subtle appearance of injuries, the victim's unwillingness to reveal abuse, and institutional gaps in routine IPV screening. Emerging guidelines and practices from many healthcare contexts help identify and manage such instances. Clark et al. found that outpatient

IPV screening measures including self-administered questionnaires and face-to-face interviews increased IPV detection rates.[46] Clinics that included routine, universal screening methods in patient intake workflows identified victims better than those that relied on physician judgment. Unfortunately, time restrictions and lack of training cause these techniques to be underutilized in ophthalmology clinics. An ED educational campaign that included staff training, IPV detection criteria, and referral algorithms was studied by Dawoud et al.[48] IPV-related ocular injuries were detected and documented more after the intervention. The study stressed the necessity of educating clinical personnel to notice IPV red flags such as orbital fractures, subconjunctival bleeding, and periorbital ecchymosis. The strategy improved victim care beyond professional treatment by providing explicit social service referral paths. Roccia et al. revealed that clinical pattern recognition helped identify IPV-related injuries.[50] Their facial trauma review found that many injuries were limited to the midface and periorbital area, suggesting IPV targeting. The study stressed the necessity of extensive injury recording and photographic data for diagnostic and medicolegal purposes. Cohen et al. proposed a global call to action in ophthalmology to include IPV education in training.[47] Due to the possibility of ocular injuries being the only harm, ophthalmologists are well-suited to identify IPV.

These studies demonstrate the need for IPV screening and referral policies in ophthalmology and emergency care. Ophthalmology departments lack uniform IPV policies, which leads to underreporting and insufficient care for survivors.[33] Identification is improved by routine IPV screening methods,[32] healthcare provider education,[25] and interprofessional collaboration.[31] These techniques identify IPV-related ocular injuries quickly and connect victims to psychological, legal, and protective resources. Addressing the hidden burden of IPV in healthcare, particularly those presenting ostensibly as eye-related injuries, requires hospital-wide policy and provider sensitization.

Practices in the Referral to Ancillary Services of IPV Women Survivors Who Sustained Ophthalmic Injuries

Referral to auxiliary services is essential for IPV survivors with ocular damage. Ancillary services include psychiatric counselling, social work, legal aid, crisis intervention, and safe housing support.[54] Reference practices vary considerably among institutions, and gaps exist, especially in ophthalmology and resource-limited healthcare systems. Dawoud et al. found that an educational and screening campaign in an ED increased social work and counseling referrals for IPV-related orbital and ocular trauma patients.[48] The approach stressed fast hand-offs to trained professionals following identification of IPV to prevent patient loss on follow-up. (The term "fast hand-offs" refers to the immediate referral or prompt transfer of care from the initial provider, such as an emergency physician or ophthalmologist, to a trained professional, such as a social worker, mental health professional, or IPV coordinator, once IPV is identified.) The program integrated a formal referral pathway into the clinical workflow, which standardized how patients with suspected IPV-related ophthalmologic injuries were identified and how they were connected to support services such as social work, counseling, or IPV advocacy programs. Clark et al. noted that absence of structured referral mechanisms, scheduling restrictions, provider discomfort, and poor training hindered outpatient referral.[46] Even when IPV was recognized, supplementary care referrals were uneven and often undocumented. These discrepancies were greater in ophthalmology clinics, which focus on physical injury management. The study suggested adding referral prompts to electronic medical records and educating doctors to spot psychological needs beyond physical trauma. Multidisciplinary care for IPV survivors was stressed by Cohen et al.[47] They wanted ophthalmologists to send patients directly to social workers, mental health specialists, and women's shelters. According to Cohen et al., patients may obtain care for their physical injury, but they remain susceptible to exploitation without such teamwork. The report also suggested professional association norms for ophthalmology referral protocols. Despite IPV-related injury patterns being common, Roccia et al. observed little official referrals to auxiliary services.[50] This demonstrates the lack of IPV knowledge and participation in surgical specialties, where acute treatment generally trumps psychological assistance.

These findings highlight the need for established, systematized emergency and outpatient ophthalmology referral routes. Clinical care of IPV-related ophthalmic injuries should continue after

initial treatment of injuries. Healthcare professionals should use trauma-informed methods to link patients with community-based IPV programs and ensure privacy and follow-up.[41] Ophthalmology clinics may not have social workers or IPV response methods, leaving a care gap. Addressing healthcare disparities requires institutional commitment, provider training, and standard operating procedures for referral.[55] Rights-based, trauma- and violence-informed, safe disclosure, and community collaborations are needed.[56] Healthcare systems can help stop the cycle of abuse and improve the long-term outcomes and safety of women who sustain IPV-related ophthalmic injuries by enhancing referral procedures.

This systematic review sought to address the multifaceted nature of IPV-associated ophthalmic injuries in women by exploring patterns, contributory factors, identification protocols, and referral practices to ancillary services. Based on the evidence reviewed, several key conclusions can be drawn for each specific objective.

First, IPV-related periorbital and face damage, including orbital fractures, subconjunctival hemorrhages, and contusions, is common in women. These bilateral, repeated injuries are often neglected or misattributed to non-violent sources. Clinicians must learn to identify psychological distress, delays in care, and discrepancies in injury history as serious issues. To quickly and accurately identify IPV in ophthalmic contexts, these injury patterns and context must be understood.

Second, standardized screening methods and formal guidelines for diagnosing IPV-related eye injuries, particularly in ophthalmology departments, are lacking. Emergency settings make improvements via teaching and screening, while outpatient clinics seldom examine IPV. Ophthalmologists underreport due to lack of training and fears of misdiagnosis. Many hospitals are resource-constrained, thus context-specific IPV screening techniques are needed.

Finally, referral practices to ancillary services show a continuum of care gap. Due to institutional impediments, limited training, and the lack of established referral mechanisms, many women with IPV do not receive timely referrals to social work, psychiatric assistance, or shelter services. Physicians have a clinical and ethical obligation to ensure that survivors of IPV receive comprehensive physical and emotional care. Improved care outcomes for intimate partner abuse survivors require streamlined referral channels, interdepartmental coordination, and healthcare professional education.

This study confirms the critical need for IPV knowledge, established procedures, and coordinated treatment models in ophthalmology and allied fields. Healthcare systems, especially in low-resource countries, can enhance the diagnosis, protection, and rehabilitation of women with IPV-associated ocular injuries by closing information gaps and encouraging interdisciplinary approaches.

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APPENDIX A
NEWCASTLE - OTTAWA QUALITY ASSESSMENT SCALE (adopted for cross sectional studies)

Selection: (Maximum 5 stars)

1. Representativeness of the sample:
   a. Truly representative of the average in the target population. * (all subjects or random sampling)
   b. Somewhat representative of the average in the target population. * (non- random sampling)
   c. Selected group of users.
   d. No description of the sampling strategy.
2. Sample size:
   a. Justified and satisfactory. *
   b. Not justified.
3. Non-respondents:
   a. Comparability between respondents' and non-respondents' characteristics is established, and the response rate is satisfactory. *
   b. The response rate is unsatisfactory, or the comparability between respondents and non-respondents is unsatisfactory.
   c. No description of the response rate or no description of the characteristics of the responders and the non-responders.
4. Ascertainment of the exposure (risk factor):
   a. Validated measurement tool. **
   b. Non-validated measurement tool, but the tool is available or described.*
   c. No description of the measurement tool.

Comparability: (Maximum 2 stars)

1. The subjects in different outcome groups are comparable, based on the study design or analysis. Confounding factors are controlled.
   a. The study controls for the most important factor (select one). *
   b. The study controls for any additional factor. *

Outcome: (Maximum 3 stars)

1. Assessment of the outcome:
   a. Independent blind assessment. **
   b. Record linkage. **

c. Self report. *
d. No description.

2. Statistical test:
   a. The statistical test used to analyze the data is clearly described and appropriate, and the measurement of the association is presented, including confidence intervals and the probability level (*p*-value). *
   b. The statistical test is not appropriate, not described, or incomplete.

(The number of * symbols after each criterion is the number of stars awarded for satisfying the said criterion.)