







REVIEW

The development of posttraumatic stress disorder in individuals with visual impairment: a systematic search and review

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Abstract

Purpose: Posttraumatic stress disorder (PTSD) is a mental health problem with a negative impact on quality of life. Little is known about the relationship between PTSD and visual impairment. According to diagnostic criteria for PTSD, vision loss in itself is generally not considered as a traumatic event. PTSD in people with visual impairment is more likely to be the result of traumatic events, which are not directly related, or are only indirectly related to, visual impairment. The purpose of this systematic review was to describe and discuss the literature on the development of PTSD in people with visual impairment.

Methods: A literature search in PubMed, Embase, PsycINFO and Web of Science was performed up to 15 November 2019 in collaboration with a medical information specialist. Additional search strategies included hand searches of references of retrieved papers and free-text hand searches in Google Scholar. Thematic content analysis of the extracted data was carried out in order to identify main themes and subthemes.

Results: Findings from 13 articles are presented in a narrative manner along three main themes: (1) posttraumatic stress disorder; (2) traumatic events and (3) impact of traumatic events. People with visual impairments may be at higher risk of being exposed to certain potentially traumatic events. Limited/restricted access to situational information during events may contribute to the stressfulness of the experience. Furthermore, visual impairment may shape the impact of traumatic events.

Conclusions: The current evidence suggests some unique experiences and challenges for people who are visually impaired. PTSD was prevalent in this population, and prevalence rates ranged from 4% to 50%. Future research may focus on gaining insight into the extent and burden of PTSD, and exploring help-seeking behaviour and treatment needs among those with visual impairment and PTSD.

Introduction

Posttraumatic stress disorder (PTSD) is a mental disorder that may develop after exposure to exceptionally threatening or horrific events. PTSD can occur after a single event or from prolonged exposure to trauma. Based on the Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5), in order to qualify for a PTSD diagnosis, a person must display one or more symptoms from each of the following four clusters: avoidance of reminders of stressors, re-experiencing of the event, negative thoughts and emotions and hyperarousal.¹ In addition, these symptoms must persist for at least one month after the event, and cause significant functional impairment for those affected. The lifetime prevalence of PTSD in the general population is estimated to range from 1.9% to 8.8%.² Although it is difficult to predict who will develop PTSD after a traumatic event, evidence from past research shows that it depends on the nature of the trauma as well as intrapersonal factors (e.g., personal characteristics and coping) and interpersonal factors (e.g., social support and relationships).³ Some commonly identified risk factors include prior trauma, psychiatric history and reported childhood abuse.^{4,5} Moreover, several chronic physical conditions seem to be associated with trauma exposure and PTSD, such as cardiovascular diseases, respiratory diseases and chronic pain.^{3,6,7}

Despite the considerable research on PTSD in various types of chronic conditions, limited attention has been given to whether individuals with visual impairment are at high risk of trauma and PTSD. Visual impairment includes low vision and blindness.⁸ Low vision is defined as visual acuity of less than 6/18, but equal to or better than 3/60, or a corresponding visual field loss of less than 20 degrees in the better eye with best possible correction. Blindness is defined as visual acuity of less than 3/60, or a corresponding visual field loss of less than 10 degrees in the better eye with best possible correction. Worldwide, it is estimated that 217 million people have low vision, whereas 36 million people are blind.⁹ These numbers are expected to increase in the coming decades due to population growth and ageing. Past research found that the prevalence of major depression and anxiety disorders (in particular social phobia and agoraphobia), were higher among elderly adults with visual impairment than among their non-impaired peers.¹⁰ PTSD was not included in this research. Findings from a systematic review by Brunet *et al.* indicate that persons with visual impairment had a significantly higher risk of certain potentially traumatic events, such as falls, accidents, violence and abuse, compared to individuals without visual impairment.¹¹ The authors indicate that potentially traumatic events may lead to a variety of stress reactions, including depression, dysthymia, substance use and PTSD. However, as this study more broadly focused on mental

health adversities following potentially traumatic events, and only included one study on PTSD, it provides limited insight into specific interactions between visual impairment and PTSD.

Visual impairment may interact with the development of PTSD in several ways. According to diagnostic criteria for PTSD, vision loss in itself is generally not considered as a traumatic event, unless it is directly related to threatened death, serious injury or sexual violence. PTSD in people with visual impairment is therefore more likely to be the result of traumatic events, which are not directly related, or are only indirectly related to visual impairment. Hypothetically, the impairment may alter the risk and type of events that people are exposed to, the emotional and physical experience of events, the manifestation of symptomatology and the assessment and diagnosis of PTSD. Visual impairment may also interact with the access and quality of social support as a protective factor for PTSD and other mental health adversities and with the likelihood of getting assistance or treatment in the mental health care system.¹² In order to be able to adequately diagnose and treat people with visual impairment suffering from PTSD, better insight is needed into the specific experiences and challenges that these people may have with respect to traumatic events and the development of PTSD. The purpose of this review is to describe and discuss the literature on the development of PTSD among people with visual impairment, as a first step towards building a sound evidence-base and to inform mental healthcare, eye care and rehabilitation professionals.

Methods

A systematic search was conducted to critically review literature on the development of PTSD in people with visual impairment. According to Grant and Booth,¹³ such an approach combines the strengths of a critical review with a comprehensive search process and is suitable for broad research questions and inclusion of multiple study types. In order to optimise methodological rigour and reduce bias, a review protocol was developed based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement.

Search strategy

A comprehensive search was performed in the bibliographic databases PubMed, Embase, PsycINFO and Web of Science, in collaboration with a medical librarian. Databases were searched from inception up to 15 November 2019. The following terms were used (including synonyms and closely related words) as index terms or free-text words: 'Posttraumatic stress', 'Visually Impaired Persons',

'Low vision'. Articles were included if they either directly addressed PTSD in people with visual impairment, or if they addressed PTSD indirectly by focusing on traumatic events in relation to PTSD-related complaints. The search was performed without date, language or publication status restrictions. Duplicate articles were excluded. The full search strategies for all databases can be found in the Supplementary Materials. Additional strategies included screening of the reference lists of identified studies (backwards search), screening citations of articles in Google Scholar and free-text hand searches in Google Scholar. Relevant research in grey literature (e.g., research reports, non-peer reviewed case reports) was included. The search was performed by the first and last authors (AH and RN). The third and fourth authors (TH and AB) peer reviewed the articles selected for inclusion to determine whether important articles were missed.

Search process

Figure 1 shows the results of our search process. After removal of duplicates and adding additional search strategies, 648 references were identified. 610 references were judged not to be relevant and excluded based on the title and abstract alone. The remaining 38 articles were read in

order to assess their relevance. From these, 13 articles were considered eligible and included in the analyses.

Quality assessment

The first and second authors performed a quality assessment. The authors assessed articles independently according to criteria of the Public Health Ontario Meta-tool for Quality Appraisal for Public Health Evidence (PHO Meta-QAT 1.0).¹⁴ This tool is particularly useful for the appraisal of public health evidence from diverse health contexts and different study designs. The MetaQAT assessment form includes questions on relevancy, reliability, validity and applicability. Written answers can be provided as well as 'good', 'sufficient', 'insufficient', 'unclear' and 'n/a' answers. When differences in answers arose, the authors discussed the answers until consensus was reached. In order to maintain a broad search and to be able to describe the quality of the available literature, the quality assessment was not used as an exclusion criterion.

Analysis

Data were extracted for the following elements: publication date and origin, study design, study population, assessment

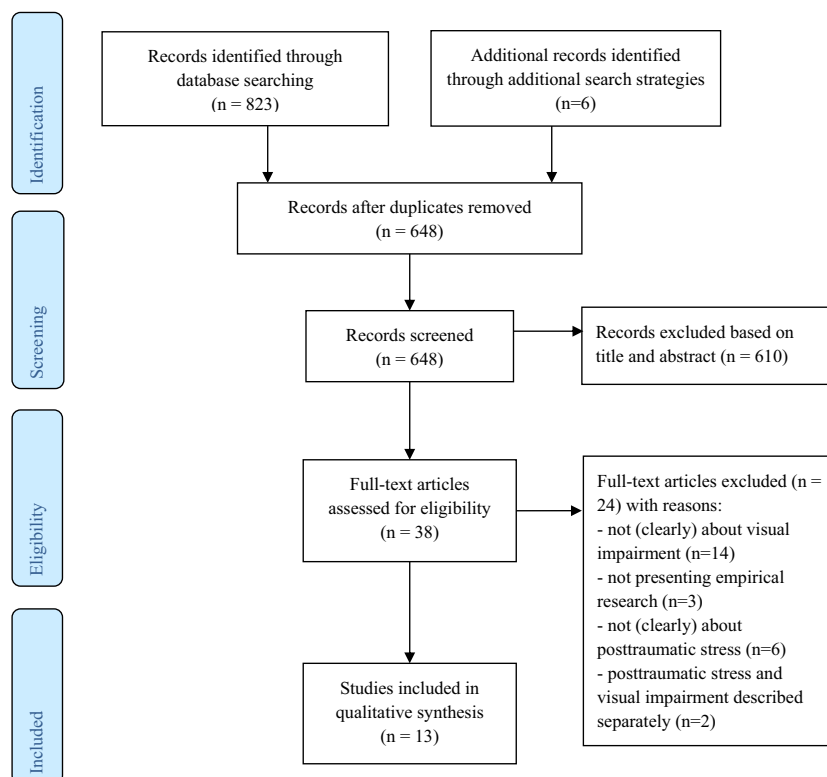


Figure 1. PRISMA flow diagram of the search process

of visual impairment, type of traumatic event, assessment of PTSD and the study's key findings and conclusions. Synthesis of the data was done manually using thematic analysis.¹⁵ First, articles were read and re-read, and patterns in the descriptions of trauma and PTSD in people with visual impairment were identified by the first author (LH). Second, initial codes were assigned to reoccurring patterns in the data and clustered into overarching themes and sub-themes by the same author. Lastly, themes and subthemes were reviewed and refined after critical reappraisal of the data set by multiple researchers (AH, HA and RN).

Results

Thirteen articles were included which all involved empirical research (Table 1). Five studies had a quantitative design, four had a qualitative design, three studies presented case studies and one study applied mixed-methods. Four of the articles originated from the United Kingdom, three from Norway and two from Israel. The remaining four articles were from Lebanon, New Zealand, Australia and Canada.

Of the 13 articles, seven included an assessment of PTSD, while six of them focused on traumatic events in relation to PTSD-related complaint without an assessment of PTSD. The extent and type of visual impairment was often only described in general terms in the included articles. Articles addressing PTSD often mentioned that diagnosis was established according to DSM criteria. Some also reported the specific assessment instruments used. With respect to traumatic events, most articles did not use formal definitions to qualify an event as being traumatic. Approximately one third of the articles focused on war-related events and populations, while other articles addressed occurrences such as traffic accidents, abuse, vision loss or discussed traumatic events more generally.

The studies included in the review varied considerably in quality (see Supplementary Materials). None of the reviewed articles were assessed as 'good' on all items for relevance, reliability, validity and applicability in the quality assessment. Five of the articles were rated as 'sufficient' or 'good' on all items. The methodological quality of the other articles was poorer as these obtained 'insufficient' or 'unclear' scoring on at least two of the nine items. The most important reasons for not obtaining a maximum score on 'relevance' was the lack of an assessment of PTSD or the focus on a specific subpopulation or one type of trauma. The most important issues with respect to reliability included a lack of detail about the methodology and ethics procedures. Regarding validity, concerns arose because of the lack of attention in the article towards potential bias and overly strong conclusions. The most important issue leading to lower assessment of 'applicability' concerned the

lack of attention towards implications of the study findings.

Results are structured according to the themes that emerged from the content analysis: (1) posttraumatic stress disorder; (2) traumatic events; (3) impact of traumatic events.

Posttraumatic stress disorder

Assessment of PTSD

Eight articles^{16–23} included a study population that had been subjected to screening or diagnosis of PTSD according to diagnostic criteria of various editions of the Diagnostic Statistical Manual (DSM) (Table 1). Three of these studies^{20,21,23} based their diagnosis on the DSM-III, three others^{17,18,22} on the DSM-IV or DSM-IV-TR and one the DSM-5.¹⁶ While half of these studies generally stated to have based the diagnosis of PTSD on the DSM, others mentioned specific assessment instruments. The Post-Traumatic Stress Disorder Checklist—Civilian was used in two studies in order to identify symptoms of PTSD among ex-service personnel.^{17,18} Au-Yong and Firth²² applied the Clinician Administered PTSD scale (CAPS) in their case study, and Shaar²⁰ used the Post Traumatic Stress Reaction Checklist for Children (PTSRC) to assess PTSD among adolescents.

Prevalence estimates of PTSD in included studies

Five articles^{16–18,20,23} included prevalence estimates of PTSD in people with visual impairments. Prevalence rates reported in these studies ranged from approximately 4% to 50%. However, these studies focused on different study populations. One included adults with visual impairment in general and found a prevalence of current PTSD of 12%.¹⁶ The prevalence was higher for women than for men (14% and 9% respectively) and higher for younger than older age groups. The most common traumatic events leading to PTSD included illness or injury causing vision loss, sexual and physical assault.

However, other studies focused on specific populations who were by definition exposed to stressful situations, including veterans or civilians who were affected by war or conflict situations and had visual impairment. The highest prevalence in these studies was reported by Khamis²³ who found that 50% of people with intifada-related injuries in their study fulfilled DSM criteria for PTSD. No differences were found between people with visual or other types of impairment. Stevelink *et al.*¹⁷ studied the mental health of male veterans ($n = 74$) with combat-related visual impairment as well as veterans with visual impairment unrelated to combat. The authors reported prevalence rates ranging from 10% (among those with combat-related visual impairment) to almost 17% (for those with non-combat

Table 1. Overview of included studies about posttraumatic stress in people with visual impairment

| Author (year, country) | Study design | Sample; sample size and characteristics, recruitment | Traumatic event definition / type | PTSD assessment |
|--|--|---|---|--|
| Au-Yong and Firth (2006, UK) | Case study | A young blind male (24 years) with chronic PTSD | Transportation accident | Diagnostic and Statistical Manual of Mental Disorders (DSM IV) and Clinician Administered PTSD scale |
| Brunes and Heir (2018, Norway) | Cross-sectional: structured interviews | 736 adults with a diagnosis of visual impairment, recruited through the Norwegian Association of the Blind and Partially Sighted, using random sampling for four age strata (18-35, 36-50, 51-65, ≥66) | Sexual (rape, attempted rape, made to perform any type of sexual act through force or threat of harm) | Not applicable |
| Good <i>et al.</i> (2016, New Zealand) | Qualitative: semi-structured interviews | 12 Christchurch residents with visual impairment who experienced more than 12 000 earthquake aftershocks throughout 2010 and 2011; recruited through The Association of Blind Citizens | Natural disaster (earthquake and aftershocks) | Not applicable |
| Heir <i>et al.</i> (2017, Norway) | Cross-sectional: structured telephone interviews | 736 adults with a diagnosis of visual impairment, recruited through the Norwegian Association of the Blind and Partially Sighted, using random sampling for four age strata (18-35, 36-50, 51-65, ≥66) | Adverse life events specified from a list of 18 potentially traumatic events | Diagnostic and Statistical Manual of Mental Disorders (DSM-5) |
| Khamis (1993, Israel) | Cross-sectional: questionnaire | 140 persons with intifada-related injuries of a physical or sensory nature who were receiving services in hospitals or other institutions | Exposure to a war zone (intifada-related injuries) | Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R) |
| Marques-Brocksopp (2015, UK) | Qualitative: semi-structured interviews | 20 guide dog owners whose dogs had been the victim of a dog attack, recruited through Guide Dogs for the Blind Association | Attack on owner's guide dog | Not applicable |
| McFarlane (1988, Australia) | Multiple case study | 4 cases of posttraumatic stress disorder in blind adults | Transportation accidents, sexual assault, physical assault | Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R) |
| Saur <i>et al.</i> (2017, Norway) | Qualitative: focus groups and semi-structured interviews | 17 adults, having any form of visual impairment and having experienced a potentially traumatic event; recruited through the Norwegian Association of the Blind and Partially Sighted | Various (transportation accidents, fires, serious accidents at work, home or during recreational activity and other very stressful events or experiences) | Not applicable |
| Shaar (2013, Lebanon) | Cross-sectional: questionnaire | 332 adolescents with ($n = 166$) and without sensory impairments ($n = 166$), of which 49.7% had VI; all adolescents aged 10-20 years enrolled in educational institutions for individuals with sensory impairments were invited to participate | Exposure to a war-zone | Post Traumatic Stress Reaction Checklist for Children (PTSRC), based on DSM-III-R |

(continued)

Table 1. (continued)

| Author (year, country) | Study design | Sample; sample size and characteristics, recruitment | Traumatic event definition / type | PTSD assessment |
|---------------------------------------|---|--|-----------------------------------|---|
| Shpigelman and Gelkopf (2017, Israel) | Qualitative: focus groups | 18 adults with lifelong disabilities, including 5 persons with visual impairment; recruited through disability communities based on criteria of: having a physical or sensory impairment (a lifelong disability), being 18 years or older and being intensively exposed to terror and war-related events in Israel | Exposure to a war-zone | Not applicable |
| Stevellink <i>et al.</i> (2015, UK) | Cross-sectional: structured interview | 77 ex-servicemen with a visual impairment; potential participants were included if they were members of Blind Veterans UK, male and under the age of 55 years | Vision loss | Probable PTSD: Post-Traumatic Stress Disorder Checklist—Civilian, based on DSM-IV |
| Stevellink and Fear (2016, UK) | Mixed methods: cross-sectional (questionnaire) and qualitative (semi-structured interviews) | 9 female ex-service personnel, below 55 years of age; All female members of the charity organization Blind Veterans UK who were below 55 years of age were invited to participate | Vision loss | Probable PTSD: Post-Traumatic Stress Disorder Checklist—Civilian, based on DSM-IV |
| Ulster and Antle (2005, Canada) | Case study | 6 year old boy with a clinical history of retinoblastoma, and parents | (illness causing) vision loss | Not applicable |

PTSD, Posttraumatic Stress Disorder.

related visual impairment). Stevellink and Fear¹⁸ investigated the psychosocial wellbeing of female veterans. One of the nine women included in the study (approximately 11%) screened positive for probable PTSD. Shaar *et al.*²⁰ examined trauma exposure and PTSD among adolescents with vision and hearing impairments living in a war-affected region. Among adults with sensory impairment, the prevalence of PTSD was over 4%. However, when only focusing on adults who had been exposed to one or more traumatic events, the prevalence of PTSD was approximately 18%. The authors also compared adults with vision or hearing impairment with adults without these sensory impairments, but did not find any differences.

Traumatic events

Exposure to traumatic events

Eight articles reported on exposure to traumatic events in people with visual impairment.^{16,19,20,24–26} This provided some insight into the prevalence of exposure to traumatic events, related risk factors and possible protective factors.

With respect to the prevalence of traumatic events, Heir *et al.*¹⁶ found that about 80% of the adult population included in their study had experienced at least one traumatic event. The most frequent occurrences were injuries

or illness, causing vision loss, life threatening injury or illness and traffic accidents.

People with visual impairment may be at risk of certain types of traumatic events. Saur *et al.*²⁴ points out that visual impairment plays a crucial role in the emergence of accidents. In their qualitative study, they describe several cases in which (falls) accidents were attributed to the lack of crucial visual information regarding (potentially) hazardous situations. Second, a higher risk of sexual assaults was identified in a cross-sectional study by Brunet and Heir²⁵ examining the prevalence of sexual assaults among individuals with visual impairment compared with the general population. Third, vision loss, or phenomena causing vision loss, was described as a traumatic experience in several publications.^{16,19} Heir *et al.*¹⁶ included injuries or illness causing vision loss as a type of traumatic event which is specific for people with visual impairment. Ulster and Antle¹⁹ described the diagnosis and treatment of retinoblastoma, a rare form of childhood ocular cancer, and the resulting blindness, as a psychological trauma. A third example of a traumatic event which may be specifically associated with people with visual impairment was an attack on a guide dog, which Marquès-Brocksopp²⁶ identified as an emotional trauma in a qualitative study among guide dog owners whose dogs had been the victim of an attack.

The study by Shaar *et al.*²⁰ was the only one suggesting that some traumatic events may be less common in people with visual impairment compared to the general population. Adolescents with sensory impairment, including those with visual impairment, reported a lower exposure to severe war-related traumatic events compared to their able-bodied peers. The authors speculated that this might be due to the sheltered life that they lead.

Experience of a traumatic event

The experience of a traumatic event was described in five publications^{21,24,26-28} that all highlighted the importance of the lack of visual sensory information during (potentially) traumatic events. Based on these articles, visual impairment appeared to affect the experience of potentially traumatic events in two different ways: it acted as a barrier for obtaining situational information and for responding to the situation.

First, the visual impairment posed a barrier in obtaining information about a potentially traumatic event. For example, in a qualitative study about experiences related to recurrent political violence in Israel, focus group participants indicated that during emergency situations, technological equipment did not work well, or was difficult to access and that adequate information and communication technologies were not available to them.²⁸ Similarly, Good *et al.*²⁷ found that during and right after earthquakes it was difficult for people with visual impairment to figure out what was going on and hard to access helpful information. Their findings were based on semi-structured interviews with visually-impaired people who had experienced the Christchurch, New Zealand, 2010 and 2011 earthquakes. Furthermore, Marquès-Brocksopp²⁶ described how the fact that guide dog owners were not able to see what was happening during an attack on their dog increased the fear and panic. Saur *et al.*²⁴ conducted a qualitative study in which they explored how reactions to traumatic events are manifested and coped with by persons with visual impairment. They found that having a visual impairment poses a barrier in obtaining essential visual information about traumatic events and thereby limits the coping ability during events. Other insights were provided by McFarlane,²¹ who presented four cases of PTSD in blind patients. One case involved a congenitally blind woman who had been raped. The fact that she did not have any suspicion about the perpetrators intent before she was assaulted was especially troublesome for her.

Second, impairment may affect people's ability to respond appropriately during and after serious life events or disasters. Due to the lack of visual information, guide dog owners in the study by Marquès-Brocksopp²⁶ were

unable to help themselves or their dog. One of the interviewees in the study by Saur *et al.*²⁴ explained how her visual impairment formed an obstacle for bringing herself to safety during a bonfire accident. Shpigelman and Gelkopf²⁷ reported that participants in their qualitative study on recurrent political violence in Israel experienced difficulty in accessing the physical environment, for example in finding shelter or protective equipment during a rocket alarm. Likewise, participants in the study by Good *et al.*²⁸ reported having trouble accessing their environment after the earthquakes in New Zealand took place. They explained that their GPS, which they normally used for mobility, became unreliable as the earthquakes had changed and damaged the environment.

In each of the studies which described the experiences during traumatic events,^{24,25,28} the perceived barriers in interpreting and responding to a situation were shown to be accompanied by feelings of helplessness, lack of control and loss of security, which added to the stressfulness of the experience.

Impact of traumatic events

Posttraumatic stress manifestations

Five articles dealt with the way people process and cope with traumatic events.^{21,22,24,26,28} Visual impairment seemed to influence manifestations of stress after traumatic events in several ways.

First, the visual impairment may affect the type of intrusions that people experience. The dominant role of auditory intrusions in people with visual impairment was described in the qualitative study by Saur *et al.*²⁴ and the case study presented by Au-Young and Firth.²² Saur *et al.*²⁴ specified this by explaining that two participants with residual vision reported visual flashbacks, while other participants described flashbacks involving auditory or bodily experiences.

Second, avoidance symptoms may be more prominent among people with visual impairment. Avoidance of situations related to the traumatic experience was mentioned as a common coping response in several articles.^{21,22,24,26,28} Shpigelman and Gelkopf²⁸ found that avoidance patterns were more evident among focus group participants with sensory impairments compared to participants with a physical impairment.

Third, visual impairment may interact with symptoms of hyperarousal. Two articles described how participants experienced disturbed concentration, auditory hyperalertness and problems distinguishing between different sounds. Because of the visual impairment, people were mostly reliant on their hearing and the disturbances in processing auditory information appeared to be particularly debilitating.^{21,28}

Reconstructing traumatic events

Forming a mental image may be crucial for being able to process a traumatic event. Situational lack of information may make people vulnerable to cognitive failures about an actual event, or their role in the event. This was described in three studies.^{21,22,24} Reconstructing the traumatic event appeared to be difficult for the three congenitally blind patients with PTSD portrayed in the case studies by McFarlane²¹ and the blind patient with PTSD described in a case study by Au-Young and Firth.²² The events presented in these case studies included rape, assaults and accidents and in all cases, patients had trouble creating a mental picture of the event. They wondered what exactly had happened, and two of them were especially concerned about how their own behaviour had possibly contributed to the event. McFarlane²¹ noticed that in the case studies, the inability to reconstruct a traumatic event hampered the ability of patients to process and overcome the events. Obtaining information in the aftermath of traumatic events was shown to be helpful in reconstructing the event. One of the interviewees in the study by Saur *et al.*²⁴ explained how she got assistance from a friend and went back to the place where she had experienced a fall. At the time of the event, she had difficulty understanding what was going on due to her impaired vision and the shock of the fall. She thought it was important to go back in order to analyze what had happened to her, so that she could more easily process the traumatic experience.

Impact on functioning

The impact of traumatic events and posttraumatic stress manifestations on the social and environmental functioning of people with visual impairment was addressed in seven articles.^{18,21,22,24,26–28}

Social functioning may be affected in various ways.^{18,22,24,26–28} Social withdrawal and a decrease in social activities were common and often attributed to avoidance symptoms. However, social relations were also found to be altered due to feeling less connected, increased dependence on others or because other people may become (over)protective towards the person.^{18,26,27} Good *et al.*²⁷ noticed that after experiencing an earthquake, study participants who had a large social network recovered more quickly than people with limited social support.

With respect to environmental functioning, several articles mentioned a decline in mobility due to the combined impact of the traumatic event and the visual impairment.^{18,21,26} This involved both the physical as well as the mental ability to move around easily. For example, McFarlane²¹ presented several cases in which symptoms of hyperarousal hindered focusing on their environment, thereby limiting the ability to walk around safely. On the other hand, Stevelink and Fear¹⁸ described a reluctance among

female ex-service personnel to go out alone or to use public transport.

Discussion

This review provides insights into the literature on the development of PTSD among people with visual impairment. The results showed high rates of PTSD in this population and highlighted a few important and unique factors that may affect the risk of developing PTSD, including increased risk of experiencing certain types of traumatic events, as well as differences in experiencing and processing trauma.

Development of PTSD

Findings from this review suggest that people with visual impairment might be more prone to certain potentially traumatic events. Both these findings and the supplementary data presented in a systematic review from Brunet *et al.*¹¹ point to a vulnerability for experiencing adverse events such as serious accidents and sexual abuse in individuals with visual impairments, whereas less is known about other types of events such as physical violence, war exposure and disasters. Many scholars have established and discussed a relationship between abuse and disability.^{29–31} Factors that are thought to influence this relationship include the increased risk of dependency as a result of the disability, increased risk of isolation and reduced mobility. Brunet and Heir²⁵ emphasise the important role of power and control in sexual abuse among people with vision impairment, as dependency and social isolation may contribute to their vulnerability for potential perpetrators. Dependency and low self-esteem may play a role in the persistence of abusive relationships.

Another key point of the reviewed studies was related to the lack of sensory information and how this affected experiences and appraisal of a negative event. This idea finds support in literature on trauma in people with auditory impairment. Schild and Dalenberg³² introduced the concept Information Deprivation Trauma, meaning that ‘an event that is experienced as traumatic or more traumatic because information or knowledge about the event is limited or not available’. The lack of sensory information is thought to contribute to factors such as suddenness, uncontrollability and unpredictability, which have been linked to the development of PTSD.^{33,34} Findings from our review support the idea that such a concept might also play a role in the traumatic experiences of people with visual impairment.

Findings from the reviewed studies suggest that the posttraumatic stress symptoms reported by people with visual impairment are consistent with PTSD-criteria as described

in the DSM-5.¹ However, some symptoms manifest in a different way due to the lack of visual information. For example, flashbacks may lack visual content among people who are completely blind, and symptoms of avoidance and hyperarousal due to auditory stimuli may be more pronounced. More importantly, findings from the included studies pointed out that visual impairment may affect social support. This idea is supported by other studies who found that loneliness is common among people with visual impairment.^{35,36} Loneliness was shown to be related to previous experiences of abuse³⁶ and to less social support.³⁵ This is an important notion as a lack of post-trauma social support has been identified as a risk factor for development of PTSD.^{5,34} Subsequently, the general lack of social support among people with visual impairment, and especially those who experienced abuse, is likely to play a considerable role in the development of PTSD in this population. However, the specific role of social support in the development of PTSD in people with visual impairment requires further investigation.

Prevalence of PTSD

It is clear that people with visual impairment can suffer from PTSD. However, the extent and burden of PTSD in this population remain unclear, as the included studies lacked comparison groups, had small sample sizes and were highly heterogeneous. Further investigation is needed in order to advance knowledge regarding the burden of PTSD in people with visual impairment. This would involve larger comparative studies, using reliable methods and the use of valid assessment tools. Current diagnostic instruments for traumatic events and PTSD need to be validated, and if necessary, adapted for people with visual impairment. When considering the diagnostic validity of instruments, several issues regarding the establishment of PTSD diagnosis need to be addressed. First, the influence of visual impairment in the manifestation of PTSD symptoms, and specifically intrusions, avoidance and hyperarousal, should be considered. Second, PTSD and traumatic brain injury often occur together, especially in ex-service personnel, and Traumatic Brain Injury (TBI) could result in vision loss. Consequently, it may become difficult to attribute a symptom to a specific diagnosis. Third, having a PTSD diagnosis may be associated with an increase in vision problems due to increased awareness and reporting of vision problems, neurophysiologic manifestations and side effects of medication.^{37,38} Professionals in mental health services, vision rehabilitation and eye care should become familiar with these factors to improve the identification and treatment of PTSD in this population.

An underlying question to assessing PTSD in persons who are visually impaired is whether vision loss should be

considered as a traumatic event in terms of diagnostic criteria for PTSD. The adverse impact of vision loss on mental health and stress levels has gained considerable attention in the literature.^{39,40} The traumatic character of vision loss, or phenomena causing vision loss, was highlighted in several articles included in the current review. To investigate the prevalence of PTSD, Heir *et al.*¹⁶ included a separate category with injuries or illness causing vision loss as a potential cause of PTSD. Despite the evident distress caused by vision loss, the current diagnostic criteria leave little room to consider vision loss as a possible stressor for PTSD. According to the DSM-V, stressors underlying PTSD should involve actual or threatened death, serious injury or sexual violence.⁴¹ Medical incidents involving natural causes, and thus most causes of vision loss, would currently not qualify as a traumatic event. While such a narrow definition may contribute to conceptual clarity, it also excludes some potentially severe trauma-related problems as may be the case for certain experiences of vision loss. It should be considered whether PTSD diagnosis could be applied more flexibly to people with visual impairment to acknowledge their vulnerability to traumatic events and unique features in experiencing and processing trauma.

Strengths and limitations

One of the main strengths of this review was the comprehensive and broad search strategy including both published articles and grey literature, which made it possible to detect and incorporate a number of relevant articles, and this was particularly useful given the scarcity of evidence of this research topic. Following guidelines of the PRISMA statement and involving two researchers to extract and analyse data made it possible to assess the quality of the evidence in an accurate and objective manner. The main limitation of this review involves the broadness of the search, which led to the inclusion of studies of considerable heterogeneity in terms of study population, methodology and quality. In addition, all studies were conducted in upper-income or high-income countries. These factors limit the interpretability and generalisability of findings.

Conclusion

In this systematic review of 13 studies, we identified some unique experiences and challenges for people who are visually impaired, and high rates of PTSD. Insights from this review may help professionals in their efforts to successfully identify and treat PTSD in this population. However, given the dearth of evidence, these findings need to be interpreted with caution. The epidemiology and burden of PTSD in people with visual impairments merits further

investigation, preferably by including a comparison group of people from the general population. Research may also focus on exploring help-seeking behaviours and treatment needs of those who already have developed PTSD.

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Conflict of interest

The authors report no conflicts of interest and have no proprietary interest in any of the materials mentioned in this article.

Author contributions

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Supporting Information

Additional Supporting Information may be found in the online version of this article:

Supplementary Material 1. Quality assessment of the included studies.

Supplementary Material 2. Search strategy.