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Review Article

Rewriting trauma: A systematic review of treatment effects of imagery rescripting for PTSD and complex PTSD

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ABSTRACT

Objective: Imagery Rescripting (ImRs) has emerged as a promising, evidence-based intervention to process traumatic experiences. No prior review has systematically examined its application for Post Traumatic Stress Disorder (PTSD) and Complex PTSD (C-PTSD). Furthermore, there still is not a clear understanding of mechanisms of change involved in ImRs, which are crucial for trauma-focused treatments. This review addresses this gap by summarizing the effectiveness and change processes of ImRs in PTSD and C-PTSD.
Method: A systematic search was conducted across PubMed, Scopus, Web of Science, and PsycINFO. Eligible studies were published in English or Italian, included clinical populations aged 18 or older, and used experimental or quasi-experimental designs.
Results: Twenty-four studies met inclusion criteria. Across randomized, clinical, and multiple-baseline studies, ImRs was associated with consistent reductions in trauma-related symptoms, showing treatment effects consistent with its targeting of core transdiagnostic processes—modifying aversive memory representations in PTSD and fostering integration and emotional safety in C-PTSD.
Conclusions: This review offers a focused synthesis of the evidence of ImRs for trauma-related disorders, highlighting its potential as a brief, powerful clinical intervention operating through distinct mechanisms of change across varying symptom profiles.

Introduction

Imaginative techniques are therapeutic approaches that use imagination to modify mental experiences and influence emotions, behaviors, and perceptions (Rudstam et al., 2022). These techniques are based on the idea that the mind and body are closely interconnected, and that mental reframing of events or situations can promote positive changes (Blackwell, 2021). They may include visualization exercises, rewriting traumatic memories, exposure to imaginary scenarios or creating safe mental environments, with the goal of reducing anxiety, stress, and trauma-related symptoms such as intrusive memories, emotional numbing, and hyperarousal, as well as other symptoms related to psychological disorders such as depression, insomnia or, phobias (Blackwell, 2021). Using imagination in a structured way, these techniques help patients reframe and "reset" negative emotions, improving their emotional and cognitive well-being (Saulsman et al., 2019).

The imagery rescripting technique

Definition and therapeutic context

Among imaginative techniques, ImRs has been gaining increasing attention in recent years, as an evidence-based therapeutic technique used in the context of Schema Therapy (ST; Schaich et al., 2020; Arntz & van Genderen, 2020; Jacob & Arntz, 2013) and Cognitive Behavioral

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Therapy (CBT; Holmes et al., 2007; Arntz, 2012). ImRs is designed to address aversive experiences, traumatic memories, distressing fantasies, and recurrent nightmares (Müller-Engelmann & Steil, 2017; Nilsson et al., 2019). The procedure typically focuses on the most distressing moment of the memory, referred to as the hotspot, and involves modifying the mental representation of the event to produce an alternative outcome in which the individual's unmet needs are more effectively addressed. Several variations of the method have been developed: (1) the therapist actively intervenes in the imagery by entering the scene, stopping the threat, and attending to the patient's unmet needs; (2) the patient, as their current adult self, takes on this role, confronting the threat and providing protection or comfort to the vulnerable self. This can be done with or without prior cognitive preparation. The purpose is to ameliorate negative emotions by rescripting the individual's negative memories and relative images. Rather than relying solely on cognitive reinterpretation, ImRs engages directly with the emotional and sensory components of distressing memories.

This experiential engagement provides a bridge to contemporary theoretical models of complex trauma, particularly within the European conceptualizations of complex trauma, which emphasize disturbances in self-organization—such as affect dysregulation, negative self-concept, and relational difficulties (ICD-11; Cloitre et al., 2013; Karatzias et al., 2017). These features are closely linked to dissociative processes and the structural fragmentation of the self, as described within the European trauma tradition (Nijenhuis & Van der Hart, 2011). Within this framework, ImRs can be understood as an integrative intervention that bridges dissociated self-states—for instance, between the vulnerable parts and the healthy adult self (Arntz, 2012; Morina et al., 2017). By enabling a compassionate re-engagement with the vulnerable part and its unmet relational needs, ImRs facilitates corrective emotional experiences that foster coherence in autobiographical memory and promote integration across dissociative parts. This conceptualization aligns with the European perspective on complex trauma and dissociation, which views recovery as a process of reconnecting fragmented aspects of the self (Nijenhuis & Van der Hart, 2011).

Building upon these European theoretical foundations, recent developments in the scientific understanding of post-traumatic disorders have increasingly integrated neurobiological and dissociative models, offering complementary perspectives on the mechanisms underlying trauma-related symptomatology. Neurobiological frameworks highlight alterations in brain circuits involved in emotion regulation and stress response—particularly within the amygdala, medial prefrontal cortex, and hippocampus—suggesting dysfunctions in cortico-limbic networks responsible for fear modulation and memory integration (van der Kolk, 2014; Rauch et al., 2006). In parallel, dissociative models, such as that proposed by Lanius et al. (2015), delineate two primary trauma-response subtypes: hyperactivation (marked by excessive limbic reactivity) and hypoactivation or "shutdown" (associated with cortical underactivity and perceptual detachment). These models conceptualize dissociation as a neurobiologically grounded defensive and regulatory mechanism that emerges in the face of overwhelming threat. Integrating these perspectives allows for a more comprehensive and nuanced understanding of trauma, bridging neurobiological correlates with subjective experience and dissociative phenomena.

In this context, ImRs has emerged as an intervention that directly targets the processing of adverse memories across these diagnostic categories.

Psychological mechanisms underlying ImRs

ImRs' therapeutic effectiveness is currently thought to derive from a set of core psychological mechanisms that support emotional processing and long-term change.

Fulfilling unmet needs. According to Koetsier and colleagues (2024), one of these mechanisms is fulfilling unmet needs. During rescripting, individuals are guided to imagine a new outcome to a painful memory—one in which their core emotional needs are finally met (Arntz, 2014). This process can help to repair the emotional wounds caused by the original traumatic and unsatisfactory experience.

Mastery. Another key mechanism is mastery (Quinton et al., 2018). Through active intervention in the imagined scene—either by the individual themselves or with the help of a supportive figure—patients gain a sense of control and empowerment. This contrasts with the helplessness and powerlessness often felt during the original trauma Arntz & Weertman, 1999; Brockman & Calvert, 2017.

Unconditioned stimulus revaluation. Unconditioned stimulus revaluation also plays a crucial role. Rescripting changes the emotional significance of the traumatic event itself, making it feel less threatening or overwhelming. As a result, the conditioned fear or distress responses linked to the memory tend to diminish (Rameckers et al., 2024).

Counterconditioning. Finally, counterconditioning occurs when the distressing memory is paired with new, positive emotional experiences during rescripting. This process helps to replace old, negative associations with more adaptive and soothing responses. Together, these mechanisms form the foundation of how ImRs promotes healing and emotional change across a variety of trauma-related conditions (Arntz, 2012; Rameckers et al., 2024).

The therapeutic impact of ImRs is maximized when the change occurs at the hotspot, that is, the most distressing and emotionally activating moment of the memory for the patient (Strohm et al., 2021).

Process-Level account of ImRs

The primary aim of ImRs is to alter the meaning attached to intensely aversive memories (Edwards, 2007). Research has also demonstrated that trauma recollections remain consistent before and after ImRs (Spinhoven et al., 2012) and that factual memory of traumatic details improves compared to a control condition (Hagenaars & Arntz, 2012). It is suggested that shifting the meaning and emotional tone of memories contributes to reducing negative self-beliefs (Mancini & Mancini, 2018) while fostering a greater sense of control and self-efficacy (Kunze et al., 2019). Aversive memories not only shape other recollections but also have a significant impact on present and future behavior (Lane et al., 2015). Moreover, they play a pivotal role in the onset and persistence of various mental disorders (Beckers & Kindt, 2017). Collectively, this evidence indicates that ImRs reduces psychopathology by updating the affective meaning and self-referential appraisals of traumatic memories while preserving their factual integrity, with downstream gains in control and behavior.

Clinical applications of ImRs

Clinically, ImRs has been applied across a broad range of conditions, i.e. PTSD (e.g., Arntz et al., 2013; de Haan et al., 2020), PTSD related to childhood abuse (Raabe et al., 2015), personality disorders (Koppeschaar et al., 2023), major depressive disorder (Lee, 2020), phobias (Habeck & Sheikh, 2019), eating disorders (e.g., Kadriu et al., 2023), body dysmorphic disorder (e.g. ., Ritter & Stangier, 2016), obsessive compulsive disorder (e.g., Tenore et al., 2020), psychosis (Clarke et al., 2022), social anxiety disorder (Wild et al., 2008), voice hearing (Paulik et al., 2019), hoarding disorder (Sabel et al., 2024), nightmares (Kunze et al., 2017), voice hearers with PTSD (Paulik et al., 2022), generalized anxiety disorder (Seinsche et al., 2024), Pathological Affective Dependence and Intimate Partner Violence (Pugliese et al., 2025b). Taken together, these applications indicate the transdiagnostic applicability of ImRs.

Application methods

Two main application methods have been developed for ImRs. One involves cognitive preparation, where dysfunctional interpretations of the aversive memory are challenged before creating a new script to replace the aversive imagery. The other approach is experiential, where the patient directly engages with the distressing memory, and the rescripting emerges based on their spontaneous needs and action tendencies (Voncken et al., 2023). While the first method aligns with Beckian cognitive therapy (Beck, 2015), the second relies more on emotional processing (Arntz, 2012). In sum, ImRs can be delivered via a top-down, cognitively prepared script or a bottom-up, experiential rescripting, both aiming to update the meaning of traumatic memories, with selection guided by case formulation. According to Kip and colleagues (Kip et al., 2023), no studies have directly compared these two approaches.

The application of ImRs on PTSD and C-PTSD

Research on ImRs for conditions rooted in aversive memories has expanded considerably in recent years (Morina et al., 2017; Kip et al., 2023). PTSD and C-PTSD are particularly relevant targets, as both disorders are characterized by traumatic, non-integrated memories that drive pervasive emotional and behavioral disturbances (Iyadurai et al., 2019). The conceptual overlap between PTSD and C-PTSD has been increasingly investigated (Cloitre et al., 2013; Ford & Courtois, 2021). Since the initial definition of PTSD, it has become evident that trauma can manifest in more severe and complex ways when experienced chronically over extended periods (Gilbar et al., 2018). PTSD is typically associated with altered processing of traumatic memories, resulting in intrusive thoughts, flashbacks, and nightmares (Ehlers & Clark, 2000).

The conceptual overlap between PTSD and C-PTSD has been increasingly investigated in recent years (Cloitre et al., 2013; Ford & Courtois, 2021). Since the initial definition of PTSD, it has become evident that traumatic stress can manifest in more severe and complex ways when exposure is chronic or repeated over extended periods (Gilbar et al., 2018). PTSD is typically associated with the altered processing of traumatic memories, leading to intrusive thoughts, flashbacks, and nightmares (Ehlers & Clark, 2000). However, several studies have identified specific vulnerability factors that distinguish C-PTSD from PTSD. While PTSD generally follows single, time-limited, life--threatening events, C-PTSD more often arises from prolonged and interpersonal trauma that progressively undermines an individual's sense of safety, autonomy, and identity (Herman & van der Kolk, 2020; Cloitre et al., 2013; Ford & Courtois, 2021). Such experiences include torture, interpersonal violence, neglect, abuse, and genocide (Zerach et al., 2019), as well as traumatic bereavement, domestic or intimate partner violence (IPV) (Pugliese et al., 2023). Institutional maltreatment—such as abuse within foster care settings —and the cumulative traumatic experiences of war refugees (Knefel et al., 2015; Hyland et al., 2018) have also been recognized as significant contributors to vulnerability (Matheson & Weightman, 2021). Collectively, these findings underscore that C-PTSD is typically rooted in sustained relational and environmental adversity, reflecting a more pervasive disruption of self-organization and interpersonal functioning than that observed in PTSD.

C-PTSD, as defined by the ICD-11, includes the core PTSD symptoms alongside additional features such as emotional dysregulation, a negative self-concept, and interpersonal difficulties. These manifestations often arise from prolonged or repeated trauma, including chronic childhood abuse or long-term intimate partner violence, where escape is limited or impossible (WHO, 2018). This distinction represents a significant advance in trauma research, although debates persist regarding the precise definition and diagnostic boundaries of C-PTSD (Bryant et al., 2012; Herman et al., 2012; Resick et al., 2012).

The current study

This systematic review examines ImRs treatment effects in PTSD and C-PTSD, focusing on differences in response by clinical profile and study design. Outcomes of interest include symptom change, retention, and acceptability, with the goal of informing patient–treatment matching and optimizing trauma-focused care.

We hypothesize that: (1) ImRs reduces trauma-related symptoms across presentations; (2) Benefits are broadly comparable across delivery formats, with individual work favoring deeper emotional engagement and group work supporting interpersonal validation; (3) Therapeutic change is multi-determined, reflecting shifts in traumatic memories and in core meanings about self and others; (4) Memory-focused processes predominate in PTSD, whereas self/relationship-focused processes are more salient in C-PTSD; (5) Early emotional engagement facilitates subsequent cognitive–schema change, leading to symptom improvement.

By systematically synthesizing these effects, the review provides a nuanced understanding of ImRs' clinical efficacy and informs evidence-based implementation for trauma-related psychopathology.

Method

This search protocol was based on the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines (Page et al., 2021), according to the PECOS (Population, Exposure, Comparison, Outcome, Study Design) guidelines.

Search strategy

The research of the literature was conducted using the following electronic databases: PubMed, Scopus, Web of Science, and PsycInfo from February to April 2025. The databases were selected to contain the highest-quality empirical studies. The protocol has been registered at the International Prospective Register of Systematic Reviews (PROSPERO; registration number CRD420251021501). The research question was: ("imagery rescripting") AND ("trauma" OR "PTSD" OR "complex PTSD"). The keywords were selected after a preliminary literature search, which helped identify the most commonly used terms to describe the phenomenon and following the PECOS criteria (P- adult between 18 and 70 years with a psychological trauma diagnosis; E- psychological trauma; C- ImRs treatment versus other treatment; O- remission of symptoms; S- experimental studies). No restrictions were applied regarding the publication period; however, only articles written in English or Italian were included. Each paper was reviewed by the authors to identify additional relevant articles that were not retrieved through the initial search string, in accordance with publication standards (Horsley et al., 2011; Beynon et al., 2013), and authors were contacted via email where there was insufficient data.

Selection criteria

The inclusion criteria were as follows:

- Type of participants: adults aged 18 to 70 years with a psychological trauma-related diagnosis (PTSD, C-PTSD).
- Type of studies: clinical trial with or without randomization.
- Type of trauma: any trauma that is considered a predisposing factor for PTSD, as well as all types of abuse experienced in both childhood or adulthood.
- Type of comparison: at least one group must have received treatment with ImRs, and possibly one or more groups another type of treatment.
- Type of outcome: a comparison of symptoms between pre and post-treatment, and/or among different intervention groups.
- Study language: English or Italian.

The exclusion criteria were as follows:

- Any non-experimental studies (qualitative studies, observational studies, case reports/series/studies, research protocol, systematic review with or without meta-analysis).
- Studies not published in English or Italian languages.
- Studies that included participants of different ages than the group of interest.
- Studies that included healthy participants, and/or without a trauma-related diagnosis, and/or in which the focus is not the trauma.

Study selection and data extraction

Studies were selected through a three-step process. All citations identified through the initial search were imported into Zotero, where duplicates were removed. Next, two reviewers independently screened the titles and abstracts of the remaining articles. In case of disagreement, a third independent author (FM) was consulted. If the abstract did not provide sufficient clarity on the article's content, the study proceeded to the full-text analysis stage. The full texts of potentially eligible studies were obtained and assessed by two more reviewers. Disagreements regarding full-text inclusion were resolved by consulting another independent reviewer. In cases where extractable data was missing, authors were contacted by email. The summary table was constructed using the authors' names, country, year of publication, diagnosis, type of trauma, treatment's focus and specific protocol, results.

Assessment of study quality

Quality assessment was conducted using an existing checklist (Moola et al., 2015). Quality was defined as the confidence that bias in the estimation of the effect of treatment on the symptoms reduction was minimized through appropriate study designs methods and analysis. Two independent authors assessed the quality of the retrieved articles to identify any potential source of bias using predeterminated and validated criteria from The Joanna Briggs Institute appraisal checklist for randomized controlled trials (Moola et al., 2015). The appraisal criteria include the quality of the randomization, the similarity of the groups, the blindness of the participants, identical treatment regardless of the experimental one, quality of the follow-up, quality and appropriateness of the analysis, reliable measures, and appropriateness of the trial design. To ensure the quality of a study, each trial should be met at least 7 out of 13 criteria. Only studies that meet these standards will be considered high-quality and included in the results.

Results

Literature identification, study characteristics, and quality

The search yielded 601 articles. After removing duplicates, 399 articles remained. Following the title and abstract screening, 115 articles were retained but 10 of these have not been retrieved. Out of the 105 studies selected for full-text review, 81 were further excluded for various reasons, including: studies written in languages not known by the authors, studies that not focused on trauma, studies with healthy samples or with an non-experimental study design or studies that did not specifically target PTSD or C-PTSD. Ultimately, 24 articles were deemed relevant and included in the general overview of results (Alliger-Horn et al., 2016; Arntz et al., 2013, 2007; Assmann et al., 2021; De Haan et al., 2020; Davis et al., 2011; Grunert et al., 2007; Kindt et al., 2007; Langkaas et al., 2017; Long et al., 2011a, 2011b; Øktedalen et al., 2015; Pruiksma et al., 2020; Pruiksma et al., 2016; Raabe et al., 2022; Sandahl et al., 2021; Steel et al., 2023; Swanson et al., 2009; ten Napel-Schutz et al., 2022; Ulmer et al., 2011; van Kuik et al., 2023; Wagner et al., 2023; Wagner et al., 2024, 2022). All the studies met the required quality criteria, no articles were excluded based on these standards. Three studies met 7 out of 13 criteria (Swanson et al., 2009; Wagner et al., 2022; 023), four studies met 8 out of 13 (Alliger-Horn et al., 2016; Grunert et al., 2007; Kindt et al., 2007; Long et al., 2011b), and another four met 9 out of 13 criteria (Arntz et al., 2007; Pruiksma et al., 2016; Steel et al., 2023; Wagner et al., 2024). One study met 10 out of 13 criteria (Sandahl et al., 2021), five studies met 11 out of 13 (Assmann et al., 2021; Davis et al., 2011; Long et al., 2011a; Ten Napel-Schutz et al., 2022; Ulmer et al., 2011), and another five met all of them (Arntz et al., 2013; Langkaas et al., 2017; Øktedalen et al., 2015; Pruiksma et al., 2020; Raabe et al., 2022). Finally, two studies met 12 out of 13 criteria (de Haan et al., 2020; S. van Kuik et al., 2023) (for the specific criteria, see Table S1 in the Supplementary Materials). See the flowchart in Fig. 1.

The years of the study range from 2007 to 2024, 8 studies are clinical trials without randomization, and 15 are randomized. Studies from the USA or Australia are 45,83 %, 25 % are from The Netherlands, and 29,17 % are from other countries in Europe (Germany, UK, Norway, and Denmark). The sample size ranges from 8 to 219 ($M = 51.54$, SD = 54.2), both males and females, cases and controls, and its ages range from 26 to 63 ($M = 42.33$, SD = 8.92). In all selected articles the primary diagnosis was PTSD. The types of included trauma was: war, childhood abuse, sexual or non-sexual assault, accidents, serious injuries, natural disasters, witnessing death, torture, and imprisonment. The treatment focused not only on PTSD symptoms, but also on secondary issues such as guilt, shame, symptoms linked to Border Personality Disorder, depression, anxiety, anger/hostility, dissociation, nightmares and sleep quality. The protocol used was heterogeneous, although they can all be categorized into the following phases: assessment and baseline, intervention with a variable number of sessions and durations in individual and/or group settings, and follow-up. See Table 1 for studies characteristics.

Trauma types and diagnostic profiles

The studies included in this systematic review primarily focus on the efficacy of ImRs in the treatment of PTSD. However, the nature of the traumas experienced by participants varies considerably, resulting in distinct clusters of post-traumatic symptoms, including the emergence of disturbances in self-organization that are typically associated with C-PTSD. We acknowledge the potential bias in the selection of studies, as the formal diagnosis of C-PTSD was not possible prior to 2018, following the publication of the ICD-11. This limitation inevitably affects the generalizability of our findings. Nevertheless, our interpretation of the results—particularly regarding the distinction between PTSD and C-PTSD—was guided by both the nature of the traumatic experiences reported by the study participants and the symptom profiles described in the included studies. To address this, we categorized the selected studies according to the type of trauma experienced by participants, which enabled a clearer distinction between investigations focusing on PTSD and those addressing C-PTSD. Some studies examined populations that had experienced specific traumas, such as war trauma (Alliger-Horn et al., 2016; Arntz et al., 2013; Long et al., 2011b; Pruiksma et al., 2020; Sandahl et al., 2021; Swanson et al., 2009; Ulmer et al., 2011; Wagner et al., 2023), while others included individuals with a history of childhood abuse (Assmann et al., 2021; De Haan et al., 2020; Raabe et al., 2022; Wagner et al., 2024, 2022), assaults (both sexual and non-sexual) (Arntz et al., 2007; Langkaas et al., 2017; Øktedalen et al., 2015), or accidents (Davis et al., 2011; Pruiksma et al., 2016). Furthermore, many participants presented with comorbidities associated with PTSD, including depression (Arntz et al., 2013; Davis et al., 2011; Langkaas et al., 2017; Pruiksma et al., 2016; Raabe et al., 2022; Steel et al., 2023; Ulmer et al., 2011; van Kuik et al., 2023; Wagner et al., 2024; Wagner et al. 2022), anxiety (Assmann et al., 2021; Grunert et al., 2007; Kindt et al., 2007; Raabe et al., 2022; van Kuik et al., 2023; Wagner et al., 2024; Wagner et al. 2022), sleep disturbances/nightmares (Davis et al., 2011; Pruiksma et al., 2016, 2020; Swanson et al., 2009; Ulmer et al.,

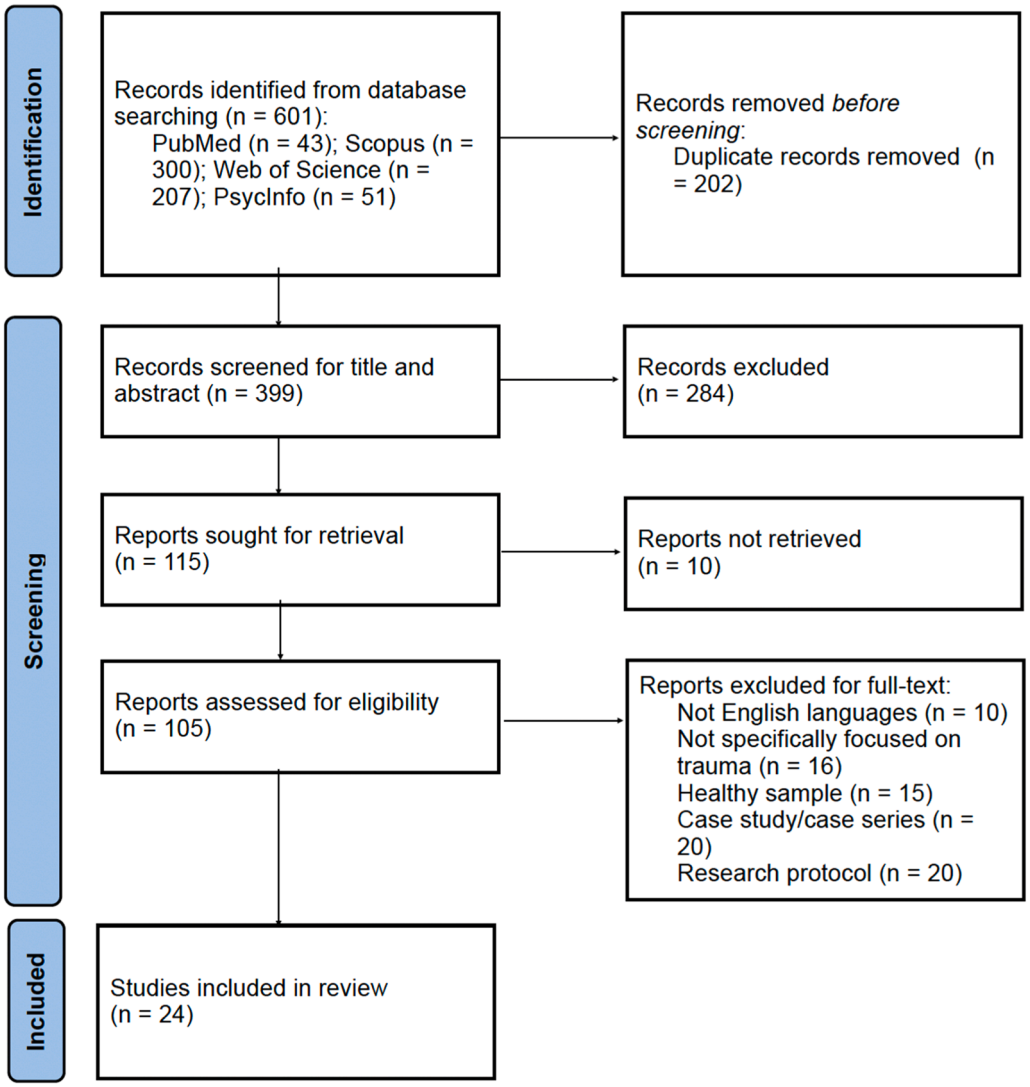

Fig. 1. Prisma flowchart (Page et al., 2021).

2011; Wagner et al., 2023), and, in one case, eating disorders (Ten Napel-Schutz et al., 2022).

Study designs and comparisons

The review encompasses a variety of study designs, including RCTs, clinical trials, and multiple baseline design studies. RCTs represent the most common research design, reflecting a strong interest in comparing ImRs with other treatments or control groups. Specifically, some RCTs compared ImRs with Eye Movement Desensitization and Reprocessing (EMDR) (Assmann et al., 2021; De Haan et al., 2020), Prolonged Exposure (PE) (Langkaas et al., 2017), Skills Training in Affective and Interpersonal Regulation (STAIR) (Raabe et al., 2022), Exposure, Relaxation, and Rescripting (EX) with a minimal contact control (MCC) or Relaxation (NEX) control group (Pruiksma et al., 2016, 2020), Sleep Intervention for PTSD (SIP) (Ulmer et al., 2011), and treatment as usual (TAU) (Sandahl et al., 2021), as well as waitlist control groups (Davis et al., 2011; Wagner et al., 2024). Other RCTs compared ImRs with Imagery Exposure (IE) (Øktedalen et al., 2015), or with Imaginal exposure with imagery rescripting (IE+IR) (Arntz et al. 2007). Clinical trials, on the other hand, evaluate the efficacy of ImRs in the absence of a control group (Alliger-Horn et al., 2016; Grunert et al., 2007; Kindt et al., 2007; Long et al., 2011b; Swanson et al., 2009; Wagner et al., 2023; Wagner et al., 2022), while multiple baseline design studies examine treatment efficacy in small samples, with a focus on individual variation in treatment response (Arntz et al., 2013; Steel et al., 2023; Ten Napel-Schutz et al., 2022; van Kuik et al., 2023).

Treatment protocols and techniques

The primary intervention across all studies is ImRs, however, treatment protocols vary significantly in terms of session duration, frequency, and the specific integration of ImRs with other therapeutic techniques. Some studies implemented weekly sessions, allowing for a consistent and structured approach (e.g., Long et al., 2011a), while others utilized bi-weekly sessions, potentially aiming for a more intensive intervention period (e.g., Assmann et al., 2021; De Haan et al., 2020). Session durations also varied, ranging from shorter sessions of 40–60 min (Øktedalen et al., 2015), which might have been suitable for populations with limited attention spans or higher distress levels, to longer sessions of 90–120 min (Langkaas et al., 2017), potentially allowing for more in-depth processing of traumatic memories. Furthermore, ImRs was frequently combined with other therapeutic modalities to enhance treatment efficacy. For instance, IE was often integrated to directly confront and process traumatic memories (Arntz et al., 2007; Grunert et al., 2007; Long et al., 2011a, 2011a; Øktedalen et al., 2015; Pruiksma et al., 2016; Swanson et al., 2009), while CBT was used to address maladaptive thought patterns and behaviors associated with

Table 1
Characteristics of the included studies.

Authors	Sample	Study design	Diagnosis	Type of trauma	Treatment (focus on)	Protocol	Effectiveness
Alliger-Horn et al., 2016 Germany	24 M soldiers 39.3 y/o	Clinical Trial	PTSD	War	PTSD symptoms, guilt and shame	−1 week of assessment and baseline −3/4 weeks of muscle relaxation and safe-place imagery −3 weekly individual session of 50–100 min IRRT over a period of 6 weeks -A 3-month follow-up	Pre-treatment score: PTSD = 32.25; Guilt = 0.79; Shame = 1.29 Post-treatment score: PTSD = 25.88 (p<.001; d = 0.98) Follow-up score: PTSD = 21.83 (p<.001; d = 0.99); Guilt = 0.70 (p<.01); Shame = 1.16 (p<.001)
Arntz et al., 2013 the Netherlands	10 (2 F, 8 M) 39.9 y/o	Concurrent multiple baseline	PTSD	War	PTSD symptoms, depression	−6/10 weeks baseline −5 weeks exploration of trauma −10 weeks ImRs treatment −5 weeks follow-up −3 months follow-up	PTSD score: 9/10 patients = <14 (remitted), 1/10 = 36.4 (non-remitted); intervention: d = 1.57, p<.001; follow-up: d = 2.86, p<.001 BDI score: 6/10 patients = minimal, 3/10 = mild, 1/10 = severe; intervention: d = 0.89, p<.001; follow-up: d = 1.28, p<.001
Arntz et al., 2007 the Netherlands	67 (44 F, 23 M) 35 y/o	RCT: -Imaginal exposure (IE = 39) -Imaginal exposure with imagery rescripting (IE+IR = 28)	PTSD	−23: non-sexual assault (e.g., physical abuse) −20: sexual assault (rape or attempted) −24: other traumatic experiences	PTSD symptoms, anger, hostility, guilt, shame	−1 60-min introductory session −9 weekly 90-min sessions of IE, 5 days of the week listen the audiotaped session, rate the level of emotions before, during and after each exposure at home (IE group) −3 weekly 90-min sessions of IE + 1 session to discover any wished reactions + 5 sessions of IR −1 month follow-up −6 months follow-up	PTSD score: -IE: d = 0.56 - 0.51 - 0.65 post-treatment, 1 an 6 months follow-up -IE+IR: d = 0.73- 0.63 - 0.60 Anger: -IE: d = 0.64, - 0.71, - 0.46 -IE+IR: d = 0.69 - 0.71 - 0.52 Hostility: -IE: d = 0.15 - −0.01 - 0.21 -IE+IR: d = 0.31 - 0.26 - 0.40 Guilt: -IE: d = −0.12 - −0.15 - −0.17 -IE+IR: d = 0.59 - 0.32 - 0.44 Shame: -IE: d = −0.02 - −0.07 - 0.03 -IE+IR: d = 0.19 - 0.11 - −0.04
Assmann et al., 2021 Germany	155 (119 F, 36 M) 38.54 y/o	RCT: -Eye Movement Desensitization and Reprocessing (EMDR = 81) -ImRs = 74	PTSD	Childhood trauma	PTSD symptoms with depressive or anxiety comorbidities	−12 90-min sessions ImRs or EMDR twice a week −8 weeks follow-up −1 year follow-up	PTSD and depression: -EMDR: 39.55–21.36, d = 1.51 -ImRs: 40.41–13.33, d = 2.72 (p = .001) PTSD without depression: -EMDR: 38.24–11.26, d = 2.98 -ImRs: 40.13–21.09, d = 1.64 (p = .001) PTSD and anxiety: -EMDR: 38.26–16.88, d = 2.14 -ImRs: 41.27–17.12, d = 2.22 (p = .50) PTSD without anxiety: -EMDR: 40.88–19.46, d = 1.63 -ImRs: 38.93–15.83, d = 2.22 (p = .5)

(*continued on next page*)

Table 1 (*continued*)

Authors	Sample	Study design	Diagnosis	Type of trauma	Treatment (focus on)	Protocol	Effectiveness
de Haan et al., 2020 Australia	155 (119 F, 36 M) 38.54 y/o	RCT: -EMDR = 81 -ImRs = 74	PTSD	Childhood trauma	PTSD symptoms	−12 90-min sessions ImRs or EMDR twice a week −8 weeks follow-up −1 year follow-up	PTSD score: -EMDR: 38.14–17.96 $d = 1.88$ ImRs: 40.39–16.18 $d = 2.26$ ($p = .3$)
Davis et al., 2011 USA	47 47 y/o	RCT: -Waiting list control = 23 -ERRT = 24	PTSD	-Unwanted sexual contact = 59.6 % -Serious accidents = 57.4 % -Physical assault = 57.4 % -Combat exposure = 13 %	Nightmares, sleep disturbance, health symptoms, depression, anger, dissociation, PTSD symptoms	-Initial assessment (control group stops here) −3 week intervention, 180-min once a week −3 months follow-up −6 months follow-up	NM per week: - Control: 3.50–3.63 -ERRT: 3.19–2.85, $d = 0.21$ (follow-up: 1.36, $d = 0.76$) NM severity: - Control: 3.07–3.04 ERRT: 3.17–2.23, $d = 0.87$ (follow-up: 1.21, $d = 2$) Sleep quality: - Control: 11.81–11.49 -ERRT: 13.55–9.03, $d = 0.92$ (follow-up: 7.45, $d = 0.96$) Health symptoms: -Control: 75.84–76.49 -ERRT: 74.31–67.38, $d = 0.22$ (follow-up: 59.53, $d = 0.48$) Depression: -Control: 10.52–10.21 -ERRT: 12–9.17, $d = 0.37$ (follow-up: 7.47, $d = 0.52$) Anger: -Control: 12.41–10.98 -ERRT: 13.56–11.02, $d = 0.16$ (follow-up: 7.93, $d = 0.83$) Dissociation: -Control: 9.34–8.29 -ERRT: 10.30–8.51, $d = 0.11$ (follow-up: 6.36, $d = 0.72$) PTSD: -Control: 55.36–51.80 -ERRT: 59.11–43.57, $d = 0.39$ (follow-up: 24.93, $d = 1.18$)
Grunert et al., 2007 USA	23 (7 F, 16 M) 20–47 y/o	Clinical Trial	PTSD	Industrial injury (amputations/ burns/crush injuries)	PTSD symptoms (concentration, avoidance, intrusion), depression, anxiety	−6 to 15 60/90 min prolonged imaginal exposure sessions with ImRs −6 months follow-up	-Concentration: mean difference = −2.78 ($d = 1.15$, $p = .001$) -Avoidance: mean difference = 11.17 ($d = -1.97$, $p<.001$) -Intrusion: mean difference = 13.87 ($d = -2.73$, $p<.001$) -Depression: mean difference 13.74 ($d = -2.29$, $p<.001$) -Anxiety: 25.44 ($d = -1.26$, $p<.001$)
Kindt et al., 2007 the Netherlands	25 (20 F, 5 M) 33 y/o	Clinical Trial	PTSD	-Sexual abuse = 12 -Sever violence = 9 -Car accidents = 2 -Witness of severe assault by dogs = 1 -Life-threatening illness of child = 1	PTSD symptoms, depression, anxiety	−10 weekly 90-min ImRs sessions -Twice a week listen to the tape of the session at home −1 month follow-up	-PTSD score: 26–14.8 ($d = 1$) -Depression: 47.6–37.1 ($d = 0.7$) -Anxiety: 53.2–44.2 ($d = 0.6$)
Langkaas et al., 2017 Norway	65 (38 F, 27 M) 45.2 y/o	RCT -ImRs = 34 -Prolonged Exposure (PE) = 31	PTSD	-Nonsexual assault by a familiar person = 30 -Sexual assault by a familiar person = 15 -Sexual assault by	PTSD symptoms, depression, anger, guilt	−2 90/120 min psychoeducation sessions −10 90/120 min weekly sessions of prolonged exposure or ImRs −1 year follow-up	PTSD score: -ImRs: 33.2–21.9 ($g = 0.90$) -PE: 34.9–19.7 ($g = 1.24$) Depression: -ImRs: 23.6–16.4 ($g =$

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Table 1 (*continued*)

Authors	Sample	Study design	Diagnosis	Type of trauma	Treatment (focus on)	Protocol	Effectiveness
				a stranger = 8 -War = 8 -Accidents = 4			*0*.69) -PE: 25.6–13 (g = 1.28) Anger: -ImRs: 6.1–4.8 (g = *0*.47) -PE: 5.2–4.2 (g = *0*.29) Guilt: -ImRs: 1.92–1.43 (g = *0*.40) -PE: 2.04–1.28 (g = *0*.58)
Long et al., 2011a USA	19 (14 F, 5 M) 39.8 y/o	Clinical Trial	PTSD		PTSD symptoms, self-blame	-Psychoeducation -Modification of sleep hygiene -Relaxation exercises -Imaginal exposure + ImRs (weekly sessions) −3 month follow-up −6 month follow-up	PTSD score: decreased of 1.48 point (p<.001) Self-blame: decreased of 0.64 (p = .004)
Long et al., 2011b USA	37 M 62.1 y/o	Clinical Trial	PTSD	War	PTSD symptoms, nightmares, quality of sleep	−6 weekly psychotherapy sessions + homework −6 sessions of sleep management, imaginal exposure + ImRs	PTSD score: 68.7–55.7 (d = 1) Nightmares: 4.61–2.37 (d = 1.37) Sleep quantity: 4.06–5.01 (d = 1.22)
Øktedalen et al., 2015 Norway	65 (37 F, 28 M) 45.18 y/o	RCT -Imagery Exposure (IE) = 32 -ImRs = 33	PTSD	-Assaults by a familiar person = 26 -Assaults by a stranger = 29 -Accidents = 3 -Natural disasters = 9 -War = 13	PTSD symptoms, shame and guilt	−2 psychoeducation sessions −10 weekly 40–60 min sessions of IE or ImRs	PTSD score: -IE: 34.96–16.65 (p<.001) -ImRs: 33.18–21.90 (p<.001) Shame: -IE: 49.71–26.14 (p<.001) -ImRs: 40.20–22 (p<.001) Guilt: -IE: 47.51–28.7 (p<.001) -ImRs: 38.61–25.41 (p<.001)
Pruiksma et al., 2016 USA	70 (50 F, 20 M) 42.57 y/o	RCT -Exposure, relaxation, and rescripting (EX) = 37 -Relaxation (NEX) = 33	PTSD	-Accident = 43 -Witnessing death = 35 -Sexual assault = 33 -Childhood abuse = 30 -Physical assault = 27 -Fear being killed/injured = 27	PTSD symptoms, nightmares, sleep quality, depression	−3 90 min sessions weekly −1 week follow-up −3 months follow-up −6 months follow-up	PTSD score: -EX: 45.05–29.33 (d = *0*.65) -NEX: 51.61–25.8 (d = 1.01) Nightmares: -EX: 3.84–3 (d = *0*.95) -NEX: 4.24–2.89 (d = 1.45) Sleep quality: -EX:12.65–8 (d = 1.25) -NEX: 14.08–6.75 (d = 1.75) Depression: -EX: 22.43–11.27 (d = *0*.82) -NEX: 25.39–16.30 (d = *0*.65)
Pruiksma et al., 2020 USA	40 (6 F, 34 M) 33.03	RCT -EX = 20 -Minimal contact control (MCC) = 20	PTSD	War	PTSD symptoms, nightmares, sleep quality, depression	−5 90 min sessions weekly −1 week follow-up −1 month follow-up	PTSD score: -EX: 39.61–33.44 MCC: 40.55–36.80 (d = *0*.12) Nightmares: -EX: 3.70–2.72 -MCC: 3.65–3.33 (d = *0*.60) Sleep quality: -EX: 18.40–11.79 -MCC: 18.65–15.83 (d = *0*.52) Depression: -EX: 12.85–8.86 -MCC: 12.65–11.56 (d = *0*.51)
Raabe et al., 2022	61 (54 F, 7 M) 35.9 y/o	RCT -ImRs = 21 -Skills Training in	PTSD	Childhood abuse (physical and/or sexual)	PTSD symptoms, guilt, shame, anger, depression	STAIR: −4 sessions of skills training −4 sessions on changing the	PTSD score: -ImRs: 78.2–45.6 (d = 2.07)

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Table 1 (*continued*)

Authors	Sample	Study design	Diagnosis	Type of trauma	Treatment (focus on)	Protocol	Effectiveness
The Netherlands		Affective and Interpersonal Regulation (STAIR) = 20 -Waitlist = 20				trauma-related schema ImRs: −1 session focused on traumatic situations −15 sessions of ImRs −36 weeks follow-up	-STAIR: 75.6–64.1 (*d* = *0.*75) -Waitlist: 70.5–63.7 (*d* = *0.*43) Depression: -ImRs: 34.7–18.9 (*d* = 1.08) -STAIR: 34.4–24.7 (*d* = *0.*71) -Waitlist: 31.1–25.8 (*d* = *0.*40) Anger: -ImRs: 110.7–88.5 (*d* = 1.48) -STAIR: 109.7–100.2 (*d* = *0.*40) -Waitlist: 102.2–97.4 (*d* = *0.*03) Guilt: -ImRs: *d* = 1.90 -STAIR: *d* = *0.*29 -Waitlist: *d* = *0.*25 Shame: -ImRs: *d* = 1.63 -STAIR: *d* = *0.*40 -Waitlist: *d* = *0.*29
Sandahl et al., 2021 Denmark	219 (109 F, 110 M) 44.4 y/o	RCT -TAU = 55 -TAU + mianserin = 54 -TAU + ImRs = 54 -TAU + ImRs + mianserin = 54	PTSD	-War = 210 -Torture = 189 -Imprisonment = 195 -Soldier = 189 -Sexual violence = 147 -Violence from relatives = 164	PTSD symptoms, sleep quality, depression, anxiety	-TAU: 8–12 months of pharmacotherapy, physiotherapy, psychoeducation and CBT -ImRs: 6 sessions −8 weeks follow-up −1 year follow-up	PTSD score: -TAU: 3.11–3.00 -TAU + ImRs: 3.12–2.87 (*d* = *0.*33) -Mianserin: 3.13–3.02 -Non Mianserin: 3.10–2.85 (*d* = *0.*33) Sleep quality: -TAU: 16.01–14.41 -TAU + ImRs: 16.50–14.52 (*d* = *0.*13) -Mianserin: 16.43–15.25 -Non-Mianserin: 16.10–13.66 (*d* = *0.*42) Depression: -TAU: 22.42–22.47 -TAU + ImRs: 21.77–21.06 (*d* = *0.*14) -Mianserin: 22.53–22.88 -Non-mianserin: 21.65–20.61 (*d* = *0.*25) Anxiety: -TAU: 26.06–26.62 -TAU + ImRs: 26.35–26.59 (*d* = *0.*04) -Mianserin: 26.62–27.81 -Non-Mianserin: 25.79–25.38 (*d* = *0.*22)
Steel et al., 2023 UK	10 (5 F, 5 M) 40.1 y/o	Multiple baseline	PTSD	Refugee and asylum seekers	PTSD symptoms, depression	−5/6/7/8/9 weeks baseline −5 psychoeducation sessions −10 ImRs sessions −5 weeks follow-up −1 year follow-up	PTSD score: 45.92–26.88 (*d* = 2.72) Depression: 21–15 (*d* = 1.55)
Swanson et al., 2009 USA	10 M 59 y/o	Clinical Trial	PTSD	War	PTSD symptoms, sleep quality, nightmares	−10 90-min group sessions of psychoeducation, exposure, relaxation, ImRs	PTSD score: 36–31.7 (*d* = *0.*42) Sleep quality: 15.1–11.6 (*d* = *0.*73) Nightmares: 39.2–17.9 (*d* = 1.14)
Ten Napel-Schutz et al., 2022 The Netherlands	10 F 26.4 y/o	Multiple baseline	PTSD + anorexia		PTSD symptoms, emotional regulation, eating problems	−6 to 10 weeks baseline −12 90-min sessions of ImRs	PTSD score: *d* = 1.53 Emotional regulation: *d* = 2.41 Eating problems: *d* = 1.45
Ulmer et al., 2011 USA	22 (7 F, 15 M) 45.96 y/o	RCT -Sleep Intervention for PTSD (SIP) -Control	PTSD	War	PTSD symptoms, sleep quality, nightmares, depression	−6 biweekly 60-min individual sessions of CBT for insomnia and ImRs	PTSD score: -SIP: 63.23–45.25 -Control: 63.23–66.08 (*d* = 1.76) Sleep quality:

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Table 1 (*continued*)

Authors	Sample	Study design	Diagnosis	Type of trauma	Treatment (focus on)	Protocol	Effectiveness
							-SIP: 14.24–9.31 -Control: 14.24–14.47 ($d = 1.60$) Insomnia: -SIP: 22.46–12.45 -Control: 22.46–21.58 ($d = 2.15$) Nightmares: -SIP: 0.67–0.51 -Control: 0.67–0.83 ($d = 0.60$) Depression: -SIP: 3.81–3.45 -Control: 3.81–4.06 ($d = 0.34$)
van Kuik et al., 2023 The Netherlands	8 (5 F, 3 M) 38 y/o	Multiple baseline -Virtual Reality Imagery Rescripting (VR-ImRs) -ImRs	PTSD	Childhood sexual abuse	PTSD symptoms, anxiety, depression	−5/6/7 weeks baseline −5 twice-weekly psychoeducation and exploration sessions −6 VR-ImRs + 6 ImRs twice-weekly sessions −5 weeks follow-up	PTSD score: -ImRs: $d = 0.90$ -VR-ImRs: $d = 0.67$ -Follow-up: $d = 0.96$ Anxiety: -ImRs: $d = 0.62$ -VR-ImRs: $d = 0.78$ -Follow-up: $d = 0.90$ Depression: -ImRs: $d = 0.37$ -VR-ImRs: $d = 0.65$ -Follow-up: $d = 0.48$
Wagner et al., 2023 USA	8 (2 F, 6 M) 46.5 y/o	Clinical Trial	PTSD	War	PTSD symptoms, nightmares, sleep quality	-Psychoeducation -ImRs sessions + homework −4 weeks follow-up	PTSD score: 66.1–50.89 ($d = 1.91$) Nightmares: 79.4–41.5 ($d = 1.82$) Sleep quality: 61.3–78 ($d = 1.80$)
Wagner et al., 2024 USA	72 (49 F, 23 M) 54.52 y/o	RCT -Internet-based intervention = 38 -Waitlist = 34	PTSD	Childhood abuse: Emotional abuse = 38 Physical abuse = 29 Sexual abuse = 22 Emotional neglect = 64 Physical neglect = 66	PTSD symptoms, anxiety, depression	−1 psychoeducation session −10 twice-weekly ImRs sessions −3 months follow-up −6 months follow-up	PTSD score: -Intervention: 11.50–6.13 ($d = 0.90$) -Waitlist: 11.38–9 ($d = 0.39$) Depression: -Intervention: 10.76–5.97 ($d = 1.08$) -Waitlist: 8.76–8.03 ($d = 0.14$) Anxiety: -Intervention: 8.39–4.93 ($d = 0.85$) -Waitlist: 7.74–6.87 ($d = 0.18$)
Wagner et al., 2022 Germany	15 (10 F, 5 M) 56.2 y/o	Clinical Trial (internet-based ImRs)	PTSD	Childhood abuse (emotional, physical and/or sexual)	PTSD symptoms, anxiety, depression	−1 psychoeducation session −10 twice-weekly ImRs sessions −3 months follow-up −6 months follow-up	PTSD score: 11.27–4 ($d = 1.26$) Depression: 8.27–4 ($d = 1.08$) Anxiety: 8.13–3.20 ($d = 1.20$)

trauma (Sandahl et al., 2021; Ulmer et al., 2011). Relaxation techniques were employed to manage anxiety and hyperarousal (Alliger-Horn et al., 2016; Pruiksma et al., 2016), and psychoeducation was provided to enhance participants' understanding of PTSD and its symptoms (Langkaas et al., 2017; Long et al., 2011a; Øktedalen et al., 2015; Wagner et al., 2023; Wagner et al., 2022). Additionally, one study incorporated group therapy to foster peer support and facilitate shared learning experiences (Swanson et al., 2009). The variability in these protocols highlights the adaptability of ImRs to different clinical needs and settings.

Treatment delivery formats

Across the reviewed studies, ImRs has been predominantly delivered in individual face-to-face settings. This modality was employed in the majority of interventions, including those by Alliger-Horn et al. (2016), Arntz et al. (2007, 2013), De Haan et al. (2020), Davis et al. (2011), Grunert et al. (2007), Kindt et al. (2007), Langkaas et al. (2017), Øktedalen et al. (2015), Pruiksma et al. (2020), Raabe et al. (2022), Sandahl et al. (2021), Steel et al. (2023), ten Napel-Schutz et al. (2022), Ulmer et al. (2011), and Wagner et al. (2023). A smaller number of studies explored group-based interventions, either exclusively or alongside individual treatment. For instance, Swanson et al. (2009) tested group formats, while Long et al. (2011a) and Pruiksma et al. (2016) combined both individual and group approaches, and Long et al. (2011b) focused solely on the group modality. More recently, online and technology-assisted modalities have emerged. Wagner et al. (2022, 2024) investigated internet-based individual ImRs, while van Kuik and colleagues (2023) employed a virtual reality-assisted individual format, reflecting ongoing innovation in delivery methods. These variations in delivery formats underline the flexibility of ImRs and its adaptability to different therapeutic contexts and populations.

Follow-up durations and assessments

Many studies incorporated a follow-up period to evaluate the long-term persistence of treatment effects, a crucial aspect in assessing the clinical significance of ImRs. The duration of these follow-up assessments varied considerably, reflecting different research objectives and logistical considerations. Some studies conducted short-term follow-ups, as brief as one week post-treatment (Pruiksma et al., 2016, 2020), likely aimed at capturing immediate post-intervention changes and ensuring participant safety. However, the majority of studies extended the follow-up period to several months or years, allowing for a more robust evaluation of sustained treatment benefits. Follow-up durations ranging from several months to one or two years (Assmann et al., 2021; De Haan et al., 2020; Langkaas et al., 2017; Steel et al., 2023) provided valuable insights into the durability of ImRs effects and the potential for long-term symptom reduction and functional improvement. This variability in follow-up duration underscores the importance of considering both short-term and long-term outcomes when evaluating the efficacy of ImRs in trauma-related disorders.

Clinical effectiveness and long-term outcomes

The collective findings of the included studies provide compelling evidence that ImRs is an effective therapeutic intervention for PTSD and its associated comorbidities. Across numerous studies, a consistent and significant reduction in PTSD symptom severity was observed following ImRs treatment (e.g. Assmann et al., 2021; De Haan et al., 2020; Grunert et al., 2007; Kindt et al., 2007; Steel et al., 2023; Wagner et al., 2023). This reduction was not limited to core PTSD symptoms but extended to associated distress, including improvements in depression, anxiety, sleep disturbances, and nightmares, indicating the broad applicability of ImRs in addressing the multifaceted nature of trauma-related distress. In several comparative studies, ImRs demonstrated superiority or non-inferiority to other established treatments. For example, ImRs was found to be more effective than EMDR in some trials (Assmann et al., 2021; De Haan et al., 2020) and achieved comparable or superior outcomes to PE (Langkaas et al., 2017). These findings suggest that ImRs offers a viable and potentially more effective alternative for specific patient populations or clinical presentations. Moreover, the long-term effectiveness of ImRs was supported by studies that included follow-up assessments. These studies indicated that the therapeutic gains achieved during ImRs treatment were sustained over time, with significant symptom reduction maintained for periods ranging from several months to years (e.g., Langkaas et al., 2017; Steel et al., 2023). This persistence of treatment effects underscores the potential of ImRs to induce lasting changes in trauma-related psychopathology and improve long-term functional outcomes.

Discussion

This systematic review aimed to comprehensively examine the therapeutic effectiveness and underlying mechanisms of change of ImRs, in the treatment of PTSD and C-PTSD, thereby filling a critical gap in the existing literature.

Across the 24 included studies, ImRs consistently demonstrated substantial clinical efficacy in reducing core trauma symptoms and associated distress, including depression, anxiety, guilt, shame, nightmares, and emotional dysregulation. The consistent efficacy is observed across diverse trauma populations—ranging from survivors of childhood abuse, war veterans, and refugees, to individuals with comorbid conditions. Accordingly ImRs can be considered as an evidence based treatment for the condition of PTSD and C-PTSD and its broad applicability with various traumatic clients.

Mechanisms of change

The observed improvements in symptom clusters align with several key theoretical mechanisms proposed to underlie the efficacy of ImRs (Koetsier et al., 2024). These mechanisms include the fulfillment of unmet emotional needs, revaluation of unconditioned stimuli, the experience of mastery, and counterconditioning. Findings suggest that ImRs facilitates symptom reduction through core mechanisms such as emotional processing, trauma memory restructuring, and enhanced sense of agency, while flexibly adapting these processes to the specific features of different post-traumatic conditions. In PTSD, ImRs primarily targets fear-based intrusions and hyperarousal (Long et al., 2011a). It achieves this by reducing avoidance, enabling safe confrontation with traumatic content, and facilitating habituation to distressing imagery (Grunert et al., 2007; Kindt et al., 2007; Øktedalen et al., 2015). Corrective imagery empowers patients to symbolically regain control (Davis et al., 2011; Pruiksma et al., 2016), diminishing feelings of helplessness and reshaping maladaptive beliefs (Steel et al., 2023; ten Napel-Schutz et al., 2022). In C-PTSD and war-related trauma, ImRs further emphasizes the restructuring of self-beliefs and the cultivation of self-compassion through imaginal dialogues between self-states (Alliger-Horn et al., 2016)—a process particularly relevant for veterans and individuals struggling with guilt or moral injury. In trauma rooted in childhood abuse, ImRs addresses deep-seated emotional schemas and chronic self-blame (De Haan et al., 2020) through techniques such as reparenting the younger self, letter writing, and repeated corrective imagery, which help meet unmet needs and integrate fragmented self-narratives (Wagner et al., 2022, 2024; van Kuik et al., 2023).

Here, the therapeutic alliance, defined as the collaborative patient–therapist relationship organized around shared goals, tasks, and a working bond (Bordin, 1979), plays a crucial facilitating role. It provides the safety necessary for schema modification and emotional transformation.

Overall, while ImRs is unified by its focus on trauma memory restructuring and empowerment, its mechanisms of change are selectively emphasized and adapted to the unique psychopathological and emotional challenges of each disorder.

At the same time, a critical engagement with memory reconsolidation is warranted. Analogue data indicate that post-consolidation ImRs is less distressing than exposure imagery. It may hasten intrusion decline versus no-intervention, yet it does not reduce total weekly intrusions relative to controls (Siegesleitner et al., 2019). Explicit declarative recall of the aversive material appears largely unchanged across conditions, suggesting that ImRs may primarily modify affective meaning and retrieval competition rather than overwriting event content per se. This aligns with proposals that ImRs may either alter the meaning of the original representation or create an alternative memory that competes at retrieval (Arntz, 2012), and indicates that affective endpoints (distress, non-fear emotions) may be more sensitive to change than factual recall. Importantly, reconsolidation requires prediction-error–based reactivation, yet few ImRs studies verify this with proper controls (Exton-McGuinness et al., 2015). Future work should manipulate reactivation/prediction error and track mechanistic intermediates and boundary conditions to distinguish true reconsolidation from new-learning/meaning-change accounts.

Future developments

Future research should clarify the mechanisms of ImRs across trauma types, client populations, and treatment conditions. For example, it is critical to extend the application of ImRs to survivors of IPV who are unable to leave abusive relationships or tend to return (Pugliese et al., 2023, 2025a), as well as to perpetrators with traumatic profiles. Addressing this gap would clarify the efficacy of the treatment across these populations. Furthermore, direct comparative studies of ImRs in

PTSD versus C-PTSD populations using ICD-11 criteria are needed to determine whether treatment pathways differ by diagnostic profile.

Further studies should investigate the moderating role of dissociation and memory fragmentation, and examine the differential outcomes of cognitive versus experiential ImRs modalities. The potential of group-based ImRs should also be explored, particularly for its benefits in peer support, interpersonal validation, and delivery in low-resource settings such as in refugee or war-related contexts, as well as to assess whether outcomes differ from individual formats.

Finally, research should standardize follow-up durations, evaluate long-term maintenance of treatment effects and relapse rates, and include culturally diverse samples to improve generalizability and guide patient–treatment matching and clinical guidelines.

Limitations

While the findings are promising, several methodological limitations across the studies warrant caution. One important limitation concerns the limited number of studies explicitly diagnosing C-PTSD. This gap largely stems from the recent formal inclusion of C-PTSD as a distinct diagnosis in the ICD-11 (WHO, 2018). As a result, the substantial body of trauma research conducted prior to this classification could not employ standardized diagnostic criteria specific to C-PTSD. Instead, earlier studies were often required to infer the presence of complex trauma presentations based on the nature of the traumatic exposure—typically chronic, prolonged, and interpersonal forms of trauma—and on symptom profiles characterized by emotional dysregulation, negative self-concept, and interpersonal difficulties (Cloitre et al., 2013; Karatzias et al., 2017). This lack of diagnostic precision limits direct comparisons across studies and hinders the accumulation of consistent evidence specific to C-PTSD.

A further limitation relates to the small sample sizes that characterize many studies in this area. Recruitment of trauma-exposed individuals, particularly those with complex trauma histories, is inherently challenging due to issues of accessibility, participant burden, and the emotional demands of research participation (Brewin, 2015). Small sample sizes reduce statistical power and may contribute to inconsistencies in reported findings.

Additionally, the absence of long-term follow-up in several trials constrains our understanding of the maintenance and trajectory of C-PTSD symptoms over time. Longitudinal research remains limited, often due to high attrition rates and the ethical and logistical complexities of following highly vulnerable populations across extended periods.

Another limitation concerns the exclusion of 10 studies whose full texts could not be retrieved, despite extensive efforts through institutional databases, interlibrary loans, and direct contact with the authors. A preliminary screening of their titles and abstracts indicated that most were only marginally relevant to the review's objectives or did not meet the inclusion criteria. Therefore, although the inability to access these studies slightly narrowed the scope of the literature reviewed, it is unlikely to have affected the main results or the thematic synthesis.

In addition, many trials lacked active control groups, or failed to report on treatment fidelity and adherence. Additionally, there was heterogeneity in the intervention protocols, outcome measures, and follow-up periods, which complicates cross-study comparisons. While multiple RCTs have confirmed ImRs' superiority or equivalence to established trauma treatments like EMDR and prolonged exposure (Assmann et al., 2021; Langkaas et al., 2017; Daniëls et al., 2025), larger-scale, standardized trials are necessary to consolidate the evidence base and refine clinical guidelines. One of the strengths of ImRs lies in its flexible delivery formats. The studies reviewed show that ImRs can be effectively implemented in individual, group, and internet-based formats, with emerging innovations such as virtual reality-enhanced ImRs offering new possibilities. Internet-delivered ImRs (Wagner et al., 2022, 2024) demonstrated efficacy comparable to traditional in-person interventions, highlighting its potential as a scalable solution in settings with limited clinical resources, such as reception centers for refugees and asylum seekers. However, acceptability, dropout rates, and long-term engagement remain underexplored, especially in digital modalities. Initial data on VR-ImRs (van Kuik et al., 2023) suggest that immersive environments may intensify therapeutic emotional experiences, potentially enhancing outcomes. Future research should explore the role of trauma type, severity, and client readiness as moderators to guide personalized implementation strategies for different delivery formats. Furthermore, it should prioritize rigorous RCTs with clearly defined ImRs protocols, consistent outcome measures, and long-term follow-up to consolidate current findings and inform clinical guidelines. Integrating ImRs into stepped-care models may also enhance accessibility, particularly for complex clinical presentations. Investigating its neurobiological underpinnings could further inform treatment personalization. To date, ImRs has not been systematically applied to victims or perpetrators of IPV—a context marked by chronic trauma exposure and complex psychopathology. Given that PTSD and C-PTSD may present differently in these populations (Pugliese et al., 2024), examining ImRs' effects across these profiles is an important next step. In conclusion, the available evidence supports ImRs as a brief, flexible, and effective trauma-focused evidence-based intervention. Its clinical utility across PTSD and C-PTSD is well established, and expanding research into other trauma-related conditions—including IPV-related profiles—may further consolidate its role in evidence-based care. Clarifying differential mechanisms of action across symptom profiles will be key to optimizing its therapeutic impact.

Clinical implications

From a clinical perspective, ImRs emerges as a versatile evidence-based intervention particularly well-suited for individuals who struggle with emotional avoidance, interpersonal shame, or self-blame—common features in PTSD and C-PTSD. Vulnerable populations include survivors of violence who cannot leave abusive relationships or tend to return to them, perpetrators of violence with traumatic profiles (Pugliese et al., 2023, 2025a), and individuals with comorbid disorders or refugees, especially when traditional exposure-based methods are less tolerated (Visco-Comandini et al., 2025). The corrective emotional experience inherent to ImRs allows clients to safely revisit traumatic events and re-script them in ways that promote well-being, resilience, and reduce dysfunctional behaviors.

ImRs can be delivered in individual or group formats, with group sessions offering interpersonal validation, shared experiences, and peer support. Group delivery may also serve as an effective adaptation in low-resource settings (Davis et al., 2023), optimizing access to care while maintaining therapeutic efficacy.

Potential contraindications include clients with severe dissociation, acute psychosis, or unstable psychiatric conditions, for whom stabilization may be required before treatment. Therapist training is critical to ensure proper delivery, particularly for imagery-based techniques, and resource constraints may necessitate adaptations such as group formats.

Preliminary clinical guidelines can support patient selection, session structure, and treatment format, though further research is needed to refine recommendations and optimize intervention matching for different patient profiles.

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Data availability

The datasets generated and/or analysed during the current study are available from the corresponding author on reasonable request.

Systematic review registration

This review was prospectively registered in the PROSPERO database (registration number: CRD420251021501).

Ethics approval

Not applicable.

Consent to participate

Not applicable.

Declaration of generative AI and AI-assisted technologies in the writing process

I confirm that ChatGPT (version 5) was used solely for the purpose of reviewing and enhancing the English language in this manuscript, specifically to improve the clarity of the text. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

CRediT authorship contribution statement

Federica Visco-Comandini: Writing – review & editing, Writing – original draft, Visualization, Supervision, Methodology, Conceptualization. **Carolina Papa:** Writing – review & editing, Writing – original draft, Methodology, Conceptualization. **Allison Uvelli:** Writing – review & editing, Writing – original draft, Methodology, Data curation, Formal analysis. **Francesco Mancini:** Supervision. **Erica Pugliese:** Writing – review & editing, Writing – original draft, Supervision, Methodology, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.ejtd.2025.100609.

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