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Review

Regulating Trauma Through the Body: A Narrative Review of Somatic-Based Interventions

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Abstract

Trauma is a condition that overwhelms an individual's capacity to cope, disrupting emotional regulation, cognitive functioning, and the sense of safety. Complex trauma, characterized by prolonged and interpersonal adverse experiences, is associated with significant psychological distress, including anxiety, dissociation, and difficulties in self-regulation. Neurobiological research highlights how trauma is encoded not only cognitively but also within the body, through autonomic nervous system dysregulation and procedural memory processes, often resulting in states of hyperarousal or hypoarousal and a narrowed window of tolerance. The aim of this narrative review is to synthesize and critically examine the current literature on somatic-based interventions for the treatment of trauma, with a particular focus on Sensorimotor Psychotherapy, Somatic Experiencing, and related body-oriented approaches. In this context, somatic-based interventions offer a bottom–up approach that directly targets physiological and sensorimotor processes. Modalities such as Sensorimotor Psychotherapy and Somatic Experiencing aim to restore autonomic balance, enhance body awareness, and support the integration of traumatic experiences. This narrative review synthesizes current evidence, suggesting that these approaches can improve emotional regulation, dissociation, and overall trauma-related symptoms, particularly in individuals with complex trauma. Despite promising findings, the literature is limited by methodological variability and a lack of rigorous trials. Further research is needed to strengthen the evidence base and clarify mechanisms of change. Overall, somatic interventions represent a valuable complement to traditional trauma therapies, supporting a more integrated and embodied approach to treatment.

Keywords: trauma; complex trauma; sensorimotor psychotherapy; somatic experiencing; somatic interventions; PTSD; dissociation; body-oriented psychotherapy

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1. Introduction

Trauma, from the Greek τραῦμα (-ατος) "wound, defeat," represents an experience perceived as extremely threatening and painful, which violates the basic assumptions of survival or an individual's sense of safety, leading them to feel vulnerable and powerless, unable to control events [1]. The traumatic experience, often non-integrable and incomprehensible, overwhelms the psychic apparatus, generating an emotional rupture and a fragmentation of cognitive functions. It not only exceeds the individual's coping capacities but also disrupts fundamental assumptions about the self and the world [2]. The term "complex trauma" refers to prolonged, repeated, and ongoing traumatic experiences, of an interpersonal nature and with early onset, usually occurring within the primary caregiving system [2].

The psychological suffering of individuals with a traumatic history is usually very high, accompanied by difficulties in self-regulation and interpersonal relationships, as well as by significantly higher scores on indices of anxiety, depression, psychoticism, somatization, dissociation, suicidal and self-harming tendencies, anger, insomnia, substance abuse, and alcoholism [3]. Such psychological vulnerability makes them more susceptible to the risk of further trauma (secondary retraumatization) [4].

Van der Kolk [5] uses the expression "the body keeps the score" to highlight how traumas are imprinted in bodily memory; when these events are early, relational, and chronic, their impact is even more pervasive. It is well known [5,6] that exposure to threatening situations activates archaic defense mechanisms regulated by the autonomic nervous system: fight-or-flight responses are mediated by the sympathetic system through the release of norepinephrine, while the parasympathetic system, and in particular the dorsal vagal complex, contributes to states of immobilization and detachment in situations of extreme terror [6]. This is considered an extreme survival strategy, aimed at passively disengaging, conserving energy, and simulating death [7]; it is thought that this mechanism constitutes one of the precursors of dissociation [7].

Intense activation of both the sympathetic and parasympathetic nervous systems has been associated with transient reductions in higher-order cortical functioning, facilitating rapid, reflexive defensive responses [8]. This predominantly bottom–up activation may compromise sustained awareness and reflective processing and has been linked to alterations in hippocampal functioning that can interfere with the encoding and contextualization of memories [9]. Procedural memory processes involved in traumatic experiences are thought to include conditioned sensorimotor patterns that operate largely outside of conscious awareness, tend to persist over time, and can be readily reactivated by internal and external cues [10].

Moreover, emotional and sensorimotor processes appear to interact bidirectionally, such that recurrent bodily and affective activation may reinforce trauma-related procedural memories. When these patterns are reactivated, individuals may experience the traumatic event as if it were occurring in the present and automatically engage defensive responses that were once adaptive but are no longer appropriate, thereby contributing to persistent functional impairment [11].

Within this framework, the concept of the window of tolerance [12] has been proposed to describe the optimal range of autonomic arousal within which an individual is able to remain emotionally regulated, cognitively flexible, and socially engaged. When arousal remains within this window, individuals can process internal and external stimuli without becoming overwhelmed or shutting down. In trauma-exposed individuals, this window is often narrowed, increasing vulnerability to dysregulation [11,13].

Hyperactivation (hyperarousal) refers to a state of excessive sympathetic nervous system activation, characterized somatically by increased heart rate, muscle tension, shal-

low or rapid breathing, sweating, tremors, and heightened startle responses. Emotionally, it is associated with intense anxiety, fear, anger, panic, and irritability. Cognitively, it often involves hypervigilance, intrusive thoughts or memories, attentional narrowing, and catastrophic appraisals of threat [5,12].

Hypoactivation (hypoarousal), in contrast, reflects a dominance of parasympathetic shutdown responses and is characterized somatically by reduced muscle tone, fatigue, numbness, slowed breathing, dizziness, and a sense of physical heaviness or collapse. At the emotional level, it is associated with feelings of emptiness, detachment, shame, hopelessness, or emotional blunting, whereas cognitively it may manifest as dissociation, depersonalization, derealization, reduced concentration, and fragmentation of memory and narrative continuity [6,11,13].

Therapeutic approaches grounded in somatic and sensorimotor principles aim to expand the individual's window of tolerance by fostering awareness of these states and supporting the gradual restoration of autonomic flexibility and self-regulatory capacity.

Traditional psychotherapeutic approaches (e.g., psychodynamic psychotherapy, psychoanalysis, and cognitive–behavioral therapy) have demonstrated substantial efficacy in the treatment of trauma-related disorders; however, they may show limitations in directly addressing the autonomic and somatic dysregulation that perpetuates psychophysiological symptoms following traumatic experiences [14]. Rather than serving as replacements for established psychotherapies, somatically oriented therapies—including Sensorimotor Psychotherapy (SP), Somatic Experiencing (SE), and other body-based approaches—may provide valuable complementary or adjunctive interventions by targeting trauma through bottom–up strategies that engage physiological regulation, sensorimotor processing, and embodied self-awareness [9]. Beyond their specific theoretical orientations, somatically oriented interventions share common mechanisms through which bodily processing may contribute to trauma recovery. Body-oriented interventions may facilitate cognitive and emotional integration by addressing the physiological and implicit dimensions of traumatic experiences that are often maintained outside conscious awareness. Through focused attention to bodily sensations, movement patterns, and autonomic responses, these approaches help individuals recognize and regulate trauma-related states of arousal while developing a greater sense of safety in the present moment. This process may promote the integration of previously fragmented sensorimotor, emotional, and cognitive experiences by allowing bodily memories and associated affective responses to be processed within a regulated state. Mechanisms such as interoceptive awareness, autonomic regulation, and dual awareness may support the reconnection of somatic experiences with narrative meaning, enabling traumatic memories to be reorganized from implicit physiological responses into more coherent and adaptive autobiographical representations. In this way, bottom–up processing may complement top–down cognitive approaches by providing access to aspects of trauma that are primarily expressed through the body.

A unifying concept across these approaches is that of the somatic narrative, which refers to the way traumatic experiences become encoded and expressed through bodily sensations, movement patterns, posture, autonomic responses, and implicit procedural memory, often beyond conscious verbal awareness. From this perspective, trauma is understood not only as a cognitive or emotional memory but also as a lived bodily experience. Somatically oriented interventions seek to access, regulate, and gradually transform this embodied narrative, enabling individuals to integrate traumatic experiences through physiological regulation and sensorimotor processing rather than through verbal processing alone. An integrative approach that combines traditional psychotherapeutic methods with somatically oriented interventions may therefore offer a more comprehensive framework for addressing the complex cognitive, emotional, and physiological sequelae of trauma [9].

The concepts of the window of tolerance and dual awareness provide an important theoretical framework for understanding the mechanisms of action underlying somatically oriented interventions, including SP and SE, although these concepts assume distinct roles within each therapeutic model. In SP, the window of tolerance represents a core organizing principle of treatment, guiding interventions that help individuals recognize, regulate, and gradually expand their capacity to remain engaged with distressing bodily sensations, emotions, and trauma-related memories without shifting into hyperarousal or hypoarousal. Within this framework, dual awareness is a fundamental therapeutic skill, enabling clients to simultaneously attend to trauma-related internal experiences while maintaining awareness of present-moment safety and therapeutic resources. By fostering this capacity, SP facilitates the exploration and reorganization of the individual's somatic narrative, allowing implicit bodily memories to be integrated with emotional and cognitive awareness. This integration of somatic, emotional, and cognitive processing supports the development of adaptive self-regulation and the integration of traumatic memories.

In contrast, SE places greater emphasis on the regulation of the autonomic nervous system through processes such as titration and pendulation, which facilitate the gradual renegotiation of traumatic activation. Although the therapeutic process occurs within the individual's window of tolerance, the concept primarily serves as a practical guide for pacing autonomic activation rather than as an explicit organizing principle of the model. Likewise, dual awareness in SE is reflected in the client's capacity to track internal bodily sensations while remaining oriented to the external environment, thereby maintaining a sense of safety as defensive responses are gradually completed. In this context, the emphasis is less on the cognitive integration of traumatic experiences and more on restoring physiological flexibility and autonomic regulation. Within this framework, the somatic narrative is transformed through the completion of interrupted defensive responses and the restoration of adaptive autonomic regulation, allowing trauma to be reorganized primarily at the physiological level before it is cognitively elaborated.

Thus, while both SP and SE rely on maintaining clients within a tolerable range of arousal and fostering simultaneous awareness of internal and external experience, SP explicitly conceptualizes the window of tolerance and dual awareness as central therapeutic mechanisms for integrating somatic, emotional, and cognitive processes, whereas SE primarily employs these principles to support the bottom–up restoration of autonomic regulation and the completion of unresolved defensive responses. Despite these differences, both approaches share the overarching objective of reshaping the individual's somatic narrative, enabling traumatic experiences that are stored and expressed through the body to become integrated into a coherent and adaptive autobiographical experience.

Given the growing interest in body-oriented approaches for trauma treatment, the aim of this narrative review is to synthesize and critically examine the current evidence on SP, SE, and related somatic interventions for individuals with trauma, PTSD, and complex PTSD. Specifically, this review provides an interpretive synthesis of the available literature, focusing on the theoretical foundations, proposed mechanisms of action, and clinical applications of these interventions, while highlighting current evidence, methodological limitations, and directions for future research.

SP adopts an approach that focuses on the treatment of autonomic and emotional dysregulation, which constitutes a core component of trauma-related symptomatology [9]. Incomplete and recurrent sensorimotor reactions in patients with a traumatic history—such as intrusive images, unpleasant bodily sensations, hyperarousal, and numbing—interfere with the emotional and cognitive processing associated with the traumatic event, further aggravating the patient's condition [15].

SP distinguishes itself from traditional approaches through its focus on bottom–up work, rather than the typical top–down orientation of conventional psychotherapies. The bottom–up approach in SP privileges bodily experience over the cognitive modification of pathogenic beliefs. This form of psychotherapy aims to regulate the physiological dysregulation that frequently accompanies traumatic experiences, by directing attention to bodily sensations and sensorimotor reactions that emerge in response to traumatic memories [16]. In summary, the bottom–up approach directly addresses bodily reactions, which often manifest outside of the patient's full cognitive awareness.

In contrast, traditional top–down psychotherapies primarily target cognitions, seeking to help patients modify their thoughts and interpretations regarding the traumatic event. One of the main features of SP is its direct engagement with the bodily memory of trauma. This intervention becomes particularly valuable for patients who predominantly present with unpleasant bodily sensations, altered arousal, and dissociative states [15].

2. SP for the Treatment of Trauma

SP, developed in the 1980s by Pat Ogden, is a body-oriented therapeutic approach designed to address the cognitive, emotional, somatic, and autonomic dimensions of trauma-related distress [9,11,17]. SP is grounded in the integration of neuroscience, attachment theory, and somatic psychology, and places particular emphasis on the modulation of autonomic arousal and the restoration of adaptive defensive and self-regulatory responses [15]. These characteristics make SP particularly relevant for individuals with complex developmental trauma, including experiences of chronic neglect, where the impact of trauma is often cumulative, relational, and embedded within everyday interactions rather than resulting from a single discrete event.

A central feature of SP is the clinical focus on how traumatic experiences are encoded and expressed through the body. During therapy sessions, clinicians systematically observe patients' posture, movement patterns, facial expressions, and autonomic responses in order to understand how trauma is manifested through non-verbal behavior and physiological activation [11]. Traumatized individuals frequently experience trauma through muscular tension, visceral sensations, action impulses, and dysregulated arousal, which can interfere with the construction of a coherent, verbally accessible narrative of the traumatic event. This challenge is particularly evident in cases of chronic neglect and complex trauma, where the traumatic experience often consists of the persistent absence of safety, attunement, and caregiving rather than a clearly identifiable event. Because these experiences are repetitive, developmentally embedded, and frequently occur during early childhood, individuals may struggle not only to verbalize them but also to recognize them as traumatic experiences requiring narration. Consequently, trauma is often expressed primarily through bodily sensations, affective dysregulation, and procedural memory rather than explicit autobiographical recall.

One of the primary therapeutic goals of SP is the development of somatic awareness. Treatment therefore begins with the cultivation of mindful, non-judgmental attention to bodily sensations, emotions, and thoughts as they arise in the present moment [18]. By learning to notice internal experiences without avoidance or overidentification, patients gradually increase their tolerance for trauma-related activation and enhance their capacity for autonomic regulation.

A second core therapeutic objective is the development of somatic resources. In SP, somatic resources are understood as bodily capacities, movements, or sensorimotor experiences that enable individuals to modulate their level of arousal and maintain regulation within the "window of tolerance". These resources include, for example, grounding through the feet, supportive touch (e.g., placing a hand on the heart), spinal alignment

and lengthening, and boundary-setting movements such as reaching, pushing away, or orienting toward or away from stimuli [19]. The systematic practice of these resources supports both physiological stabilization and changes in the psychological processes that maintain trauma-related symptoms.

Another defining characteristic of SP is the cultivation of dual awareness, or "awareness of awareness". In this state, patients are able to simultaneously observe their internal experiences while remaining anchored in present-moment safety. Rather than becoming overwhelmed by sensations, emotions, or memories, they learn to relate to them with curiosity, compassion, and reflective distance [18]. This capacity allows traumatic material to be processed without triggering excessive hyperarousal or dissociation.

As treatment progresses, patients become increasingly able to recognize early signs of hyperarousal and hypoarousal and to apply somatic strategies to regulate these states. For example, trauma-related cues that previously elicited automatic defensive reactions (such as freezing or fleeing) can be responded to with greater flexibility and contextual discrimination. Through enhanced somatic awareness and strengthened somatic resources, patients learn to remain within their window of tolerance, reducing the likelihood of retraumatization during trauma recall.

Over time, the strengthening of dual awareness is associated with decreased autonomic reactivity and an increased sense of agency and control. This process facilitates the integration of traumatic experiences as events located in the past, rather than relived in the present. Clinically, this reorganization is reflected in improvements in affect regulation, mood stability, energy, interpersonal functioning, reality testing, and impulse control. The body itself comes to experience the traumatic events as completed, allowing the individual to respond to current environmental stimuli as challenging or safe, rather than as inherently threatening [18].

Although SP appears to be a clinically valuable approach for trauma-related disorders, the empirical literature on its efficacy remains limited. The present review therefore aims to address this gap by examining studies in which somatic techniques inspired by SP and related body-oriented approaches have been applied, with particular attention to interventions focused on somatic self-regulation, both in individual and group treatment contexts.

To facilitate comparison across the principal body-oriented interventions discussed in this review, Table S1 summarizes their key theoretical principles, therapeutic rationale, core techniques, and primary clinical targets. Although these approaches share a common emphasis on bottom–up processing, body awareness, and autonomic regulation, they differ in their conceptual frameworks and therapeutic strategies. This overview provides readers with a concise reference to the distinctive features of each intervention before examining the available evidence.

3. Materials and Methods

A narrative literature search was conducted using the following databases: Google Scholar, PubMed, and Scopus. The search string employed was ("sensorimotor psychotherapy" OR "somatic resource") AND ("trauma" OR "post-traumatic stress disorder" OR "PTSD" OR "complex post-traumatic stress disorder" OR "CPTSD" OR "dissociation"). The keywords were selected following a preliminary literature review, which allowed for the identification of the most commonly used terms to describe the phenomenon. No restrictions were applied regarding the publication period of the articles, but only studies written in English or Italian were included. Only peer-reviewed publications were considered eligible for inclusion.

All reference lists were screened by the authors to identify additional articles not captured by the search string, in accordance with publication guidelines [20–22]. A man-

ual citation search (backward reference searching) was performed to identify potentially relevant studies not retrieved through the electronic database search. Articles identified through the keyword search were then evaluated against the inclusion and exclusion criteria. Title and abstract screening was followed by full-text assessment of potentially eligible studies. To be included in the present review, studies met the following criteria: (1) original peer-reviewed research articles, including quantitative, qualitative, mixed-methods, pilot, and clinical studies; (2) clinical or non-clinical populations of any age with a history of trauma, PTSD, complex PTSD, dissociation, or trauma-related symptomatology; (3) studies evaluating SP, SE, or other body-oriented/somatic therapeutic interventions, with outcomes related to psychological, emotional, physiological, or functional improvement; and (4) articles published in English or Italian.

Studies were excluded if they were conference abstracts, editorials, commentaries, dissertations, book chapters, non-peer-reviewed publications, or theoretical papers without original data. Studies were also excluded when they did not evaluate somatic-based interventions, did not involve trauma-exposed populations, or did not report outcomes relevant to the objectives of the review. Studies were excluded if they duplicated data already included in other studies, unless they provided significant additional information or relevant supplementary details, and if they did not contain information pertinent to the inclusion criteria. Where multiple publications reported findings from the same sample, the most comprehensive article was retained unless subsequent publications contributed additional data directly relevant to the review objectives.

4. Results

The narrative literature search identified 117 scientific articles. After the removal of duplicates and screening for relevance to the research question, 69 articles were assessed for eligibility, of which 21 met the inclusion criteria and were included in the present review. Among the 48 articles excluded at the eligibility stage, the most common reasons were insufficient alignment with the review questions, lack of relevant intervention or trauma-related outcome data, and, for some qualitative or primarily descriptive studies, a study design that did not provide findings sufficiently aligned with the intervention-focused aims of the review. Qualitative studies were not excluded on the basis of design alone, but were retained only when their findings directly addressed the review objectives.

To facilitate navigation of the evidence presented in this review, Table S2 provides an overview of the interventions included in each Results subsection together with the corresponding number of outcome studies, principal outcome domains, level of evidence, and overall interpretation of the findings. This summary is intended to offer readers a structured overview of the available evidence before the detailed narrative synthesis presented in the following sections.

4.1. Individual Interventions

This section summarizes the evidence on individual body-oriented interventions for trauma treatment. The studies include established somatic psychotherapies, such as SP andSE, as well as emerging body-based interventions that target autonomic regulation, interoceptive awareness, and trauma processing.

4.1.1. Body Oriented Psychotherapies

This subsection focuses on the principal body-oriented psychotherapies specifically developed for the treatment of trauma-related disorders. These approaches share a theoretical framework centered on the role of bodily experience, autonomic regulation, and

sensorimotor processing in trauma recovery and currently represent the most established body-based psychotherapeutic models described in the literature.

One body-oriented therapy centered on the somatosensory channel is SE [23], a trauma-focused, body-based therapeutic approach developed for the treatment of individuals with PTSD. SE systematically integrates awareness of bodily sensations into the therapeutic process and is distinguished by its primary focus on interoceptive and proprioceptive experience. Within this framework, post-traumatic symptoms are conceptualized as the result of dysregulated autonomic activation and incomplete instinctive defensive responses to overwhelming events. Therapeutic work in SE aims to facilitate the gradual discharge and integration of traumatic activation by increasing the individual's capacity to tolerate bodily sensations and the associated emotional states [1,23–25].

As described in the previous section, SP is a trauma-focused, body-oriented approach that integrates neuroscience and somatic psychology to address trauma-related dysregulation. It emphasizes awareness of physiological responses, resource development, and dual awareness to support autonomic regulation and trauma integration.

SP and SE can both be classified within the broader domain of somatic psychotherapies, as they explicitly incorporate the body into the therapeutic process for the treatment of trauma and stress-related conditions. However, they differ in their conceptual emphases and clinical techniques. SP adopts an integrative model that explicitly links bodily experience with cognitive and emotional processes, using movement, posture, and action tendencies to explore the relationship between somatic patterns and affective meaning. In contrast, SE places primary emphasis on the moment-to-moment tracking of bodily sensations and autonomic nervous system states, with a clinical focus on present-moment physiological regulation rather than on explicit cognitive or narrative processing.

4.1.2. Innovative and Integrative Body-Oriented Approaches

Although the interventions discussed in this subsection originate from different theoretical and clinical traditions, they are grouped together on the basis of shared therapeutic mechanisms rather than a common theoretical lineage. Specifically, each approach includes a substantive bottom–up or embodied component, such as physical movement, attention to interoceptive or proprioceptive sensations, multisensory stimulation, or the modulation of physiological arousal, with the aim of supporting emotional regulation and trauma processing. Yoga and 3MDR engage these mechanisms directly through movement, bodily awareness, and multisensory exposure. Trauma-informed cognitive–behavioral and other integrative models are included only when somatic or sensorimotor regulation constitutes an explicit and clinically meaningful component of the intervention. Accordingly, the category "innovative and integrative body-oriented approaches" is used as a pragmatic umbrella and should not be interpreted as indicating that all these interventions are formal sensorimotor psychotherapies or that they share equivalent theoretical foundations or levels of empirical evidence.

A recent meta-analysis [17] explored physical interventions for trauma-related disorders, highlighting a substantial increase in scientific research over the past seven years. Among the most widely adopted sensorimotor approaches are yoga, aerobic exercise, martial arts, and multicomponent interventions [26]. Positive outcomes have been reported, with significant reductions in trauma-related symptoms. For example, one study [27] reported a 31% reduction in mean trauma-related symptom scores after a 16-week yoga program. Additional research suggests benefits in reducing depressive symptoms and improving sleep quality through various forms of physical intervention [28,29]. It has been suggested that moderate-intensity interventions, such as yoga, show the most promising results, possibly reflecting common mechanisms of action such as physical activity and

movement [30–32]. In particular, Trauma-Sensitive Yoga (TSY) represents an example of a non-verbal somatic approach to self-regulation, which was found in a randomized controlled trial to reduce PTSD and related symptoms in adults with chronic, treatment-resistant PTSD and related conditions [33].

Among body-oriented psychotherapies, SE and SP are the two approaches with the greatest clinical relevance and the strongest theoretical foundation for the treatment of complex trauma. Although the evidence base remains limited, available studies suggest that both interventions may reduce trauma-related symptoms by promoting autonomic regulation, increasing interoceptive awareness, and facilitating the integration of traumatic experiences through body-based processing. SP has shown particular value in addressing the dysregulation, attachment disturbances, and fragmented bodily experiences commonly observed in individuals with complex developmental trauma, whereas SE focuses on restoring autonomic balance through the gradual resolution of defensive responses that remain physiologically "stuck" following traumatic experiences. While preliminary findings are encouraging, further randomized controlled trials and longitudinal studies are needed to establish the efficacy of both approaches across different trauma populations.

Another approach to coping with trauma is based on the concept of resilience [9,34] within the context of somatic psychotherapy, which includes four core components. The first is innate survival wisdom, whereby individuals rely on their autonomic defense systems to respond to traumatic experiences. The second component involves long-term defensive attachment strategies that people develop to cope with adverse family dynamics and suboptimal caregiving. The third component focuses on the development of somatic boundaries through work with patients' peripersonal space to address both trauma and attachment-related difficulties. The fourth component involves work on natural vitality and joy, which are gradually rediscovered through the building of somatic resources. This process leads to increased self-regulation and interactive regulation, greater capacity for movement and action, embodied personal efficacy, and an overall sense of mastery in life [9]. These four aspects of resilience help patients shift from outdated predictive body–mind patterns toward innate core sensations, greater present-centeredness, and experiences of pleasure, joy, trust, and self-esteem. Working somatically with resilience leads clients toward greater integration and a sense of unity as embodied beings in the world. From the lens of SP, resilience is not considered merely an idea to be processed cognitively and emotionally; rather, it must be fully embodied through therapeutic activities that stimulate interoceptive and exteroceptive pathways, including sensations, tensions, impulses, gestures, postures, peripersonal space (boundaries), perception through the five senses, and movement completion, carried out through mindful exploration within a relational field [35,36].

In recent years, within the field of cognitive and behavioral therapies, other innovative therapeutic approaches for the treatment of trauma have been developed. Among these models, three stand out for their originality, potential effectiveness, and clinical impact.

The first approach is Multi-modular Motion-assisted Memory Desensitization and Reconsolidation (3MDR), introduced by Van Gelderen et al. [37]. This model aims to treat patients with PTSD who are resistant to conventional therapies by combining advanced techniques such as virtual reality (VR), multisensory input, physical movement, and attentional tasks. The goal is to enhance the effectiveness of trauma-focused therapy by facilitating the reprocessing of traumatic memories and reducing associated avoidance. However, further studies are needed to fully evaluate the effectiveness of this approach, especially in cases with more severe or complex symptoms.

A second innovative approach was proposed by Laricchiuta and colleagues in 2023, focusing on the treatment of trauma manifested through externalizing problems such

as aggression and conduct disorder. This model emphasizes the retrieval of traumatic memories and the reduction in physical and emotional tension associated with the traumatic experience itself, offering an integrated perspective that considers both the psychological and physical dimensions of trauma.

Finally, the Trauma Resiliency Model (TRM), developed by Miller-Karas in 2015 [34], represents another important innovation in trauma treatment. This approach aims to process trauma resulting from environmental disasters by promoting body awareness and strengthening somatic resilience and the nervous system. By integrating neurophysiological principles, TRM provides a comprehensive framework for addressing the physical and psychological consequences of trauma, facilitating processing and healing.

Resilience should be considered an important therapeutic outcome and process rather than a distinct treatment modality. Within SP, resilience is conceptualized as the progressive restoration of adaptive self-regulation through four interconnected components: innate survival wisdom, adaptive attachment strategies, the development of healthy somatic boundaries, and the recovery of vitality and joy [9,34]. Through mindful engagement with bodily sensations, movement, posture, gestures, and interpersonal boundaries, patients gradually develop greater autonomic regulation, embodied self-efficacy, and present-moment awareness [35,36]. Thus, resilience represents a central mechanism through which body-oriented psychotherapies such as SP facilitate recovery from complex trauma, rather than an independent therapeutic approach.

In conclusion, these innovative approaches represent a significant advancement in trauma treatment, offering new perspectives and tools to address the complex manifestations of trauma. Among them, SE and SP currently provide the strongest theoretical rationale for the treatment of complex trauma, although additional high-quality clinical studies are needed to further establish their effectiveness. Further research is essential to evaluate the effectiveness of these approaches across diverse clinical settings and populations in order to ensure optimal treatment for individuals who have experienced trauma.

4.2. Group-Based Interventions

This section presents studies investigating group-based body-oriented interventions for trauma. These approaches aim not only to reduce trauma-related symptoms but also to promote interpersonal safety, social connectedness, emotional regulation, and embodied self-awareness through shared therapeutic experiences.

Among the articles identified through the literature search, several examined the effectiveness of sensorimotor or somatic psychotherapies delivered in a group format, as well as protocols derived from sensorimotor approaches (e.g., the STARS protocol; Hopper et al., 2018) [38]. Studies evaluating the efficacy of yoga-based and dance/movement-based therapies were also included. In addition to empirical clinical studies, findings from several reviews and systematic reviews were incorporated.

4.2.1. Body-Oriented Psychotherapies

The following studies evaluate the clinical effectiveness of body-oriented psychotherapies and related somatic interventions in different trauma-exposed populations. Unlike the previous subsection, which introduces the theoretical principles and distinctive characteristics of SP and SE, this section synthesizes the empirical evidence supporting body-oriented interventions, highlighting treatment outcomes, study designs, and methodological limitations.

The literature review conducted by Bloch-Atefi [39] investigated the effectiveness of body-oriented psychotherapy across a broad spectrum of psychological disorders. Body-oriented psychotherapy refers to interventions that integrate psychological and physical

techniques within a therapeutic process characterized by bodily interaction between patient and therapist. This type of approach has been applied to a wide range of clinical conditions, including eating disorders, somatoform disorders, and schizophrenia, and appears to yield improvements in emotional regulation, emotional processing, motor behavior, and bodily self-awareness [40].

Among the selected clinical studies, a wide range of questionnaires and assessment tools were used to evaluate multiple outcome measures, and considerable heterogeneity emerged regarding intervention type, duration, and participant characteristics. The main findings are summarized below.

Three studies implemented a weekly 20-session group protocol incorporating clinical tools derived from SP [13,41,42]. In the first study [41], 10 women with a history of interpersonal trauma completed a 20-session SP-informed group intervention. Body awareness significantly increased across assessments, $F(2,14) = 11.52$, $p = 0.001$, with improvements evident both immediately after treatment ($p = 0.01$) and at six-month follow-up ($p = 0.003$). Psychoform dissociation, assessed with the Dissociative Experiences Scale (DES), also decreased significantly, $F(2,14) = 3.51$, $p = 0.03$, although the post-treatment improvement was only at trend level at six-month follow-up. Importantly, these changes were symptom-specific; bodily dissociation did not significantly improve, while somatoform dissociation showed only a trend toward improvement. Receptivity to soothing also increased from baseline to post-treatment and six-month follow-up. Given the small sample and absence of a control group, these findings should be considered preliminary.

In the second study [42], the sample included 20 individuals exposed to complex trauma and diagnosed with PTSD. Gene-Cos et al. [42] evaluated a 12-session Sensorimotor Psychotherapy group in individuals with complex and chronic trauma presentations. PTSD symptoms decreased by approximately 19% on the IES-R (median 56.0 to 45.5, $p = 0.047$), while depressive symptoms decreased by 26% on the BDI-II (median 36.5 to 27.0, $p = 0.002$). Work and social impairment also significantly improved ($p = 0.011$). In contrast, reductions in dissociation (DES: 23.0 to 17.5) and difficulties in emotion regulation did not reach statistical significance. Thus, the observed effects appeared stronger for overall PTSD symptoms, depression, and functioning than for dissociative or emotion-regulation outcomes. As with the previous study, no control group was included.

A subsequent pilot RCT by Classen et al. [13] examined a 20-session body-oriented group intervention based on SP principles in 32 women with histories of childhood trauma. Compared with the no-treatment condition, the intervention produced a large improvement in body awareness (Cohen's $d = 0.91$, $p = 0.007$), anxiety ($d = 0.81$, $p = 0.02$), and receptivity to soothing ($d = 1.12$, $p = 0.001$). However, effects were not significant for bodily dissociation ($d = 0.14$), psychoform dissociation ($d = 0.32$), or overall PTSD symptoms ($d = 0.12$). Somatoform dissociation and depressive symptoms showed moderate effect sizes ($d = 0.59$ for both) but did not reach statistical significance. These findings suggest that the intervention may primarily enhance somatic awareness, anxiety regulation, and self- and relational soothing rather than producing broad reductions across all trauma-related symptom domains.

In a larger RCT, Brom et al. [8] evaluated 15 weekly sessions of Somatic Experiencing in 63 adults with PTSD. The intervention produced large effects on PTSD severity, with Cohen's d ranging from 0.94 to 1.26 across clinician-rated and self-reported measures and assessment points, as well as moderate-to-large effects on depressive symptoms ($d = 0.70$–1.08). At post-treatment, 44.1% of participants receiving SE no longer met diagnostic criteria for PTSD. These findings provide comparatively stronger evidence for clinically meaningful changes in overall PTSD severity, although the study did not specifically isolate effects on individual hyperarousal, avoidance, or dissociation domains.

A qualitative study by Hopper et al. [38] examined the STARS protocol in 17 women who were survivors of sexual trafficking. This approach, which integrates elements of art and theater, appeared to exert beneficial effects on interpersonal functioning and on the regulation of physiological states.

Additional evidence comes from the clinical study by Warner et al. [43], which assessed the effectiveness of the Sensory Motor Arousal Regulation Treatment (SMART)—a model emphasizing somatic regulation as the foundation of emotional and behavioral regulation. This pilot study compared SMART to treatment as usual (TAU) in two residential facilities for adolescents with PTSD. Warner et al. [43] found that adolescents receiving SMART showed a significant reduction in CBCL internalizing symptoms, $F = 7.29$, $p = 0.011$, particularly in Somatic Complaints, $F = 6.52$, $p = 0.016$, and Anxious/Depressed symptoms, $F = 5.55$, $p = 0.025$. In contrast, the overall PTSD-RI score did not show a significant treatment effect. Exploratory analyses indicated only a trend toward greater improvement in the PTSD-RI Overarousal subscale ($p = 0.06$), highlighting that the observed benefits were more robust for internalizing and somatic symptoms than for overall PTSD severity.

4.2.2. Yoga and Relaxation-Based Group Interventions

Another category of interventions relies on physical relaxation techniques to promote emotional regulation. Numerous studies have demonstrated the effectiveness of such methods in improving somatic symptoms and fostering self-awareness in trauma-exposed individuals [15,44]. Notably, van der Kolk and colleagues [33] evaluated the benefits of integrating yoga into psychotherapy in 64 patients with treatment-resistant PTSD, who were assigned either to a 10-week group-based yoga intervention (N = 32) or to a health-focused psychoeducational program. In this RCT by van der Kolk et al. [33], the reduction in clinician-rated PTSD symptoms corresponded to a large within-group effect in the trauma-informed yoga condition (Cohen's $d = 1.07$), compared with a medium-to-large effect in the health-education control condition ($d = 0.66$). At post-treatment, 52% of women in the yoga group no longer met diagnostic criteria for PTSD, compared with 21% of controls ($p = 0.013$). At post-treatment, both groups showed significant reductions in PTSD symptoms relative to baseline; however, the decrease was significantly larger in the psychotherapy-plus-yoga group. Moreover, a substantially higher proportion of participants in this group no longer met diagnostic criteria for PTSD (52% vs. 21%). These improvements emerged already at the mid-point of the intervention and persisted through its conclusion. Both groups also exhibited significant improvements in depressive symptoms, reductions in tension, and better affect regulation, with greater changes again observed in the yoga-based intervention.

4.2.3. Dance, Body Movement, and Complementary Somatic Practices

The review highlighted the therapeutic potential of dance and body movement. Such interventions not only appear to support the rebalancing of central nervous system functioning, but also foster emotional awareness and empathy, contribute to the repair of insecure attachment patterns, and enhance self-awareness [44–46]. Dance- and movement-based therapeutic techniques seem to provide these benefits through diverse methods, including body scanning, mirroring, and body-based coping strategies [47].

However, because these interventions directly engage bodily sensations and trauma-related memories, they should be implemented within a trauma-informed framework that prioritizes safety, stabilization, and the careful regulation of emotional and physiological arousal.

The study conducted by Welych-Miller [48] on dance/movement therapy (DMT) further suggests that this approach may be effective in addressing trauma symptoms in individuals with a history of childhood sexual abuse (CSA). Because sexual abuse involves a direct violation of bodily integrity, it is essential for clinicians to employ creative

modalities that directly engage the body to address its long-term effects. For this reason, many researchers have turned to body-based interventions such as DMT to explore trauma treatment in CSA survivors [49]. Given the vulnerability of this population, DMT should be delivered only by appropriately trained mental health professionals with specific expertise in trauma-informed care and dance/movement therapy. Appropriate clinical safeguards, including careful assessment of patients' readiness, ongoing monitoring of emotional and physiological activation, pacing of interventions, and access to clinical supervision, are essential to minimize the risk of retraumatization or emotional overwhelm. DMT is a form of psychotherapy that uses dance and movement to cultivate safety and trust, promote self-awareness, strengthen interpersonal connection, facilitate the reintegration of mind and body, and expand the individual's repertoire of movement and self-expression. Recent research indicates that DMT can be successfully applied to survivors of CSA, particularly because it targets the non-verbal, bodily manifestations of trauma [49]. Welych-Miller's review highlights these positive outcomes while acknowledging persistent gaps in the literature, including limited gender diversity, insufficient demographic information, and a general scarcity of empirical evidence supporting DMT.

Additional somatic approaches have also been examined. The article by Susan Cohen [14] discusses various somatic techniques applicable in group settings, emphasizing the relevance of posture and movement observation, breath awareness, and physical exercises aimed at releasing tension and stress. These practices contribute to strengthening individuals' connection with their internal experiences. Cohen also underscores the potential role of somatic psychotherapy in treating attachment disorders and promoting the development of secure attachment.

The article by Grodin et al. [50] explores the potential benefits of qigong and t'ai chi as therapeutic practices for survivors of torture and refugee trauma. In a small pilot study involving four torture survivors, participants engaged in simplified qigong and t'ai chi sessions before and after psychotherapy. They reported improvements in physical, emotional, and spiritual well-being, along with reductions in hypervigilance and psychosomatic symptoms. Although preliminary, these findings suggest that integrating qigong and t'ai chi into trauma treatment for torture survivors may be beneficial and merits further investigation. As with other body-oriented interventions, these approaches should be implemented by clinicians trained in trauma-informed practice to ensure that somatic activation remains within a safe therapeutic window and supports recovery rather than exacerbating trauma-related distress.

4.3. Mind–Body Integration in the Treatment of Childhood and Adolescent Trauma

The following studies specifically address the application of sensorimotor and body-oriented interventions in children and adolescents. Because trauma during development often manifests through somatic, behavioral, and emotional dysregulation rather than verbal narratives, these interventions may provide developmentally appropriate strategies for improving self-regulation, body awareness, and adaptive functioning. Importantly, their implementation requires careful adaptation to the child's developmental stage, cognitive abilities, emotional maturity, and relational context to ensure that interventions remain safe, engaging, and therapeutically appropriate.

In recent years, growing attention has been directed toward children and adolescents exposed to traumatic experiences, leading to the development of age-specific therapeutic approaches [51,52]. Complex trauma during childhood and adolescence has profound effects on developmental trajectories, sensory integration, and self-regulation capacities [6,43,52,53]. Traditional treatments for complex trauma—primarily cognitive–behavioral or verbally based therapies—were long considered the standard of care [54].

However, the developmental disruptions associated with complex trauma often compromise adolescents' verbalization skills and their capacity for self-regulation, thereby limiting the effectiveness of these approaches [51].

In this context, sensory-based and somatic approaches have shown particular promise. These interventions can improve self-regulation and autonomic stability and may serve as effective preparatory or adjunctive treatments to cognitive-behavioral modalities [43,51,52,54–57]. Body-oriented interventions targeting traumatized youth rely on "bottom-up" mechanisms that engage the body to facilitate symptom reduction, relational functioning, and adaptive behavior. They rest on the concept of a somatic narrative, expressed through movement, posture, arousal patterns, and sensory processing capacities [58]. Because children and adolescents differ substantially in their developmental capacities, therapeutic activities are typically tailored according to age and level of functioning. For younger children, play-based, movement-oriented, and sensory experiences are generally emphasized, whereas adolescents may benefit from more structured body awareness, mindfulness, and reflective exercises that support increasing autonomy and emotional insight.

Porges [58] underscored the centrality of autonomic regulation via bodily engagement, while Fisher and Ogden [59] described the use of exercises such as tracking bodily sensations or rhythmic activities (e.g., drumming) to enhance postural organization and body awareness. These methods support the reorganization of procedural memory and the reduction in impulsive defensive reactions, promoting integration of traumatic experiences and increased interpersonal trust. Across these interventions, careful pacing and continuous monitoring of arousal are essential to minimize the risk of overwhelming activation or retraumatization. Therapists are encouraged to work within each child's window of tolerance, ensuring that body-focused experiences remain tolerable and are accompanied by adequate stabilization strategies.

One of the most established models for children is the Sensory Motor Arousal Regulation Treatment (SMART) developed by Warner et al. [43]. SMART emphasizes "embodied play" [51], encouraging children and adolescents to use the whole body within play to access and regulate affective and arousal states. Developed through extensive clinical observation and video analysis, SMART integrates sensory and motor strategies into a comprehensive trauma treatment framework. A pilot study reported significant improvements in somatic and PTSD symptoms for youth receiving SMART compared to treatment as usual, indicating its promise for treating complex trauma in residential care settings [57].

Other sensorimotor-based approaches offer related benefits by employing sensory and motor activities to strengthen emotional regulation and sensory integration [54]. For example, Ayres Sensory Integration (ASI®) interventions aim to improve the brain's capacity to process sensory input, thereby supporting more adaptive behavioral responses [60]. Interventions may also include massage, deep pressure activities, or whole-body motor play.

Similarly, dance/movement therapy (DMT), as described by Matson et al. [61] and Goggin [62], facilitates mind–body integration by promoting emotional expression and body awareness—key components in the treatment of childhood trauma. Yoga interventions have also shown promise in addressing complex trauma in youth through the use of breathwork, meditation, and physical postures to enhance self-regulation and body awareness [57]. Art therapy provides an additional non-verbal modality through which children can express and process traumatic material [54].

Over the past decade, several promising models for treating complex trauma in youth have emerged [63–65]. Many of these models prioritize the development of self-regulation skills as a central therapeutic goal. For instance, the Trauma Affect Regulation: Guide for Education and Therapy (TARGET) model aims to enhance emotion regulation capacities

in highly traumatized adolescents in the juvenile justice system [66,67]. The Attachment, Regulation and Competency (ARC) framework similarly identifies child and caregiver regulation as core components of treatment [3,4,68].

A potentially integrative yet still under-examined approach involves cultivating interoceptive awareness and the capacity to modulate physiological arousal. Neuroscientific evidence supports the relevance of somatic interventions in trauma treatment [33,69]. Somatic forms of regulation may be particularly beneficial for children and adolescents whose traumatic experiences manifest in somatic, affective, and behavioral dysregulation, and for whom language-based modalities may be insufficient or inaccessible.

Importantly, these interventions are typically integrated within broader therapeutic frameworks and adapted to individual needs. Evidence suggests that combining sensory-based and cognitive–behavioral techniques may be especially effective in enhancing self-regulation and emotional well-being among trauma-exposed youth [51,54]. Successful implementation also depends on careful attention to ethical and developmental considerations, including obtaining informed consent from parents or legal guardians, seeking the child's or adolescent's assent whenever developmentally appropriate, and actively engaging caregivers throughout treatment. Family involvement not only supports treatment adherence but also facilitates the generalization of self-regulation skills across everyday environments, while ensuring that body-oriented interventions are delivered within a safe, collaborative, and trauma-informed framework.

4.4. Somatic Interventions in Group Settings

Group-based somatic interventions also involve specific structural and relational features that distinguish them from individual body-oriented treatment. Although protocols vary across approaches, sessions are generally structured around a gradual progression from stabilization and psychoeducation toward increasingly experiential body-based exercises. For example, sensorimotor group protocols may include psychoeducation on autonomic arousal and the window of tolerance, grounding and orienting exercises, directed mindfulness, exploration of somatic resources and interpersonal boundaries, and the rehearsal of alternative bodily responses. Sessions can combine therapist-led instruction and demonstration, individual experiential practice, exercises in pairs, and subsequent group discussion and integration [42]. Similarly, trauma-sensitive yoga interventions have typically been delivered through structured and predictable sessions emphasizing bodily awareness, choice, and non-coercive participation [57].

Within this format, the therapist or facilitator has a particularly important role in maintaining a safe and predictable interpersonal environment, monitoring signs of hyperarousal, hypoarousal, or dissociation, and adapting exercises so that participants can remain within a tolerable level of activation. Rather than emphasizing correct performance, therapists encourage curiosity toward bodily experience, model exercises, provide clear boundaries, and support participants in choosing whether and how to engage in specific movements or sensations. Dysregulation emerging during the session may therefore be approached as an opportunity to practice grounding and self-regulation skills rather than as a treatment failure [42].

The group format may offer additional therapeutic opportunities beyond those available in individual treatment. Participants can observe others experimenting with new bodily responses, experience normalization and interpersonal support, and gradually explore bodily and relational cues in the presence of others. This may be particularly relevant for individuals with complex trauma, for whom both bodily sensations and interpersonal proximity can themselves function as trauma-related triggers; preliminary findings suggest that group-based sensorimotor work may simultaneously reduce avoidance of these do-

mains and foster self- and relational soothing capacities [13]. At the same time, somatic work in groups presents distinctive challenges. Attention to bodily sensations, movement, physical proximity, or interpersonal exercises may evoke shame, self-consciousness, dissociation, or trauma-related activation, while differences in participants' levels of arousal and readiness make titration more complex than in individual therapy. Group leaders must therefore balance shared activities with individual choice, carefully manage interpersonal boundaries and potential triggering, and ensure that participation remains voluntary and adaptable to each participant's regulatory capacity. These considerations reinforce the importance of trauma-informed facilitation, appropriate therapist training, and clearly structured protocols when body-oriented interventions are delivered in group settings.

5. Discussion

Across the studies examined, somatic and body-oriented psychotherapies appear to represent a valuable and increasingly recognized resource in the treatment of trauma, offering a complementary and integrative approach that can be incorporated into comprehensive, evidence-based treatment plans, rather than replacing traditional, verbally based approaches. Evidence suggests how traumatic experiences profoundly affect both psychological and physiological systems, disrupting autonomic regulation, sensory integration, and the capacity for self-organization [18,19,33]. Traditional psychodynamic and cognitive–behavioral treatments may not always fully or adequately address these somatic and autonomic dimensions of traumatic stress [70], whereas somatic therapies—such as SP [19,59], SE [23], yoga-based interventions [33], and dance/movement therapy [48,49]—may help bottom–up processes to restore physiological balance and enlarge the window of tolerance [71]. Accordingly, these interventions may be particularly valuable when integrated with established psychotherapeutic approaches, allowing clinicians to address both the cognitive–emotional and physiological consequences of trauma within a unified treatment framework.

Although the primary focus of this review was on SP and SE, consideration of the broader literature on body-oriented psychotherapy, sensorimotor-based interventions, trauma-informed yoga, and related somatic therapies provides additional context for interpreting the available evidence. Collectively, these complementary approaches share common therapeutic principles—including embodied awareness, autonomic regulation, and bottom–up processing—and further support the growing interest in body-oriented strategies as components of integrative trauma care.

These interventions show benefits in enhancing body awareness, modulating autonomic arousal, and reorganizing procedural trauma memories, which otherwise maintain dysregulated patterns of hyperactivation or hypoactivation [18,58]. Clinical evidence from group protocols implementing sensorimotor tools [13,41,42] suggests improvements in body awareness, dissociation, depressive symptoms, and PTSD severity, although important methodological limitations remain. Additional contributions come from somatic-focused models such as SMART [43,57], in which sensorimotor regulation is used as the basis for behavioral and affective stabilization in children and adolescents exposed to complex trauma. Such approaches are particularly relevant for young populations, whose developmental vulnerabilities often compromise their verbal and self-regulatory capacities, making bottom–up methods especially suitable [51,52]. Integrative programs such as TARGET [66] and ARC [4] further illustrate how somatic and regulatory components can be embedded within broader trauma frameworks. Complementary modalities—including qigong and t'ai chi [50], physical relaxation practices [15,44], and the STARS protocol combining somatic and expressive techniques [38]—provide additional evidence for the therapeutic relevance of bodily engagement. Similarly, emerging evidence from broader

body-oriented psychotherapy and trauma-informed movement-based interventions suggests that improvements in interoceptive awareness, physiological regulation, and embodied self-awareness may represent shared therapeutic mechanisms across different somatic approaches, despite differences in their theoretical orientation and specific techniques. Considering these related interventions contributes to a more comprehensive understanding of the evolving field of somatic trauma therapy. Overall, the literature suggests that somatic interventions meaningfully reduce PTSD symptoms, enhance emotion regulation, and support the reconstruction of a coherent body-based sense of safety. Nevertheless, important limitations remain, including small sample sizes, heterogeneity in intervention protocols, limited longitudinal designs, and a scarcity of rigorous RCTs directly comparing somatic and traditional treatments [8,17].

These findings may be particularly relevant for children and adolescents, as sensorimotor and movement-based interventions appear to promote autonomic regulation and improve sensorimotor integration, thereby supporting developmental competencies that are fundamental for psychological, emotional, and social functioning. Although the available evidence is encouraging, the current literature remains constrained by methodological limitations, including heterogeneous intervention protocols, small sample sizes, and the limited availability of longitudinal investigations.

Future research should prioritize standardized methodological frameworks while also examining a broader spectrum of body-oriented interventions, including trauma-informed movement-based approaches and other somatic psychotherapies. Comparative studies evaluating common and intervention-specific mechanisms of action across these modalities would help clarify their respective contributions to trauma treatment. Despite these gaps, preliminary evidence suggests that somatic resources may constitute a promising and clinically meaningful adjunct to trauma treatment, potentially improving self-regulation, expanding the window of tolerance, and enhancing psychological and somatic well-being. Rather than functioning as standalone treatments, they appear to be most beneficial when incorporated into multimodal, individualized treatment plans tailored to patients' clinical needs.

In addition, future investigations should explore integrated treatment protocols combining somatic, cognitive, and behavioral approaches, while greater emphasis should also be placed on clinician training to facilitate the safe and effective dissemination of body-oriented interventions across different clinical settings.

6. Strengths and Limitations of the Present Review and Current Evidence

A major strength of the current literature is the increasing recognition of the role of somatic processes in trauma-related psychopathology and the development of theoretically grounded interventions targeting autonomic regulation, body awareness, and sensorimotor integration. Across different populations and therapeutic contexts—including individuals with PTSD, complex trauma, and developmental trauma—preliminary evidence suggests that somatic approaches may provide clinically meaningful benefits. Furthermore, the growing integration of somatic principles within broader trauma treatment frameworks represents an important step toward more comprehensive and multidimensional models of care that address the cognitive, emotional, behavioral, and physiological consequences of traumatic experiences.

Building on this evolving evidence base, the present review has several strengths. First, it provides a broad and integrative overview of somatic and body-oriented approaches to trauma treatment, encompassing a wide range of intervention modalities, clinical populations, age groups, and treatment settings. Second, it combines current theoretical perspectives—including autonomic regulation, interoceptive awareness, sensorimotor pro-

cessing, the window of tolerance, and dual awareness—with the available clinical evidence, offering a coherent framework for understanding the proposed mechanisms through which body-oriented interventions may contribute to trauma recovery. Finally, the literature search was strengthened by complementary manual reference screening and citation tracking, allowing for potentially relevant studies not captured by the initial database search to be identified and considered, thereby enhancing the comprehensiveness of the review.

However, several limitations of both the present review and the available evidence should be acknowledged. As a narrative review, this study was not conducted according to a preregistered systematic review protocol, and no formal assessment of the methodological quality or risk of bias of the included studies was performed. In addition, the literature search was restricted to peer-reviewed publications in English or Italian and to the selected databases, which may have introduced language, publication, and selection biases. These methodological considerations should be taken into account when interpreting the findings of this review.

Beyond the limitations of the review itself, the current evidence base remains characterized by considerable methodological heterogeneity, including variability in study populations, intervention protocols, treatment duration, study designs, and outcome measures. This heterogeneity precluded a quantitative synthesis or meta-analysis and limits direct comparisons across interventions. Furthermore, many of the available studies are based on small sample sizes, uncontrolled or non-randomized designs, and relatively short follow-up periods. Consequently, although the findings are encouraging, they should be interpreted with caution, as they do not yet allow for definitive conclusions regarding the efficacy or long-term effectiveness of somatic interventions.

A key priority for future research is the generation of more robust evidence through well-designed randomized controlled trials directly evaluating somatic interventions and comparing them with established evidence-based treatments or examining their added value within integrated treatment protocols. Future studies should employ standardized intervention protocols, adequately powered samples, objective physiological outcome measures—including autonomic and interoceptive markers—and long-term follow-up assessments. Addressing these methodological challenges will be essential to clarify the mechanisms of action, identify the patient populations most likely to benefit, and define the role of somatic interventions within contemporary trauma care.

Beyond methodological limitations, the implementation of somatic interventions in routine clinical practice presents important practical and ethical challenges that should be carefully considered. Many somatic approaches require specialized and extensive clinician training, which may limit their accessibility and increase treatment costs compared with more widely established interventions. Furthermore, because these approaches involve direct attention to bodily sensations, physiological activation, and trauma-related experiences, inadequate pacing or insufficient therapist expertise may increase the risk of emotional overwhelm or re-traumatization. Therefore, appropriate clinical training, adherence to trauma-informed principles, careful assessment of patients' readiness, and the use of stabilization strategies are essential to ensure that somatic interventions are delivered safely and effectively.

Strengthening the methodological rigor of future investigations, while addressing these practical and ethical considerations, will be fundamental to defining the role of somatic interventions within contemporary trauma care, particularly by determining whether they are most effective as standalone approaches, adjunctive interventions, or integrated components of multimodal treatment plans.

7. Conclusions

Overall, the body of literature reviewed suggests that somatic and body-oriented interventions may represent an important complementary component of contemporary trauma treatment offering therapeutic mechanisms that directly target the physiological, sensory, and nonverbal dimensions of traumatic stress. Across a range of modalities—including SP, SE, yoga-based practices, dance/movement therapy, SMART, and other somatic–expressive protocols—preliminary evidence indicates improvements in autonomic regulation, body awareness, emotion regulation, dissociation, and PTSD symptom severity. These findings support the potential importance of restoring a sense of safety and agency at the bodily level is a crucial component of recovery, particularly for individuals with histories of complex or developmental trauma. Nevertheless, despite promising clinical and preliminary experimental results, current research remains limited by methodological variability, small sample sizes, and a relative scarcity of randomized controlled designs. Future work should prioritize standardized protocols, rigorous efficacy trials, physiological outcome measures, and long-term follow-up assessments to better clarify mechanisms of change and strengthen the evidence base. Even with these limitations, the existing findings underscore the potential of somatic resources to complement and enrich traditional trauma therapies, contributing to a more integrated, embodied, and comprehensive approach to healing.

Taken together, the available evidence suggests that somatic interventions should not be viewed as replacements for established evidence-based psychotherapies, but rather as valuable complementary or adjunctive approaches that can enhance treatment by addressing dimensions of trauma that may not be fully targeted through verbal or cognitive methods alone. Their integration within multidisciplinary and individualized treatment plans has the potential to provide a more comprehensive response to the cognitive, emotional, behavioral, and physiological sequelae of trauma.

By fostering body awareness, autonomic regulation, and embodied self-regulation, these interventions may provide a clinically meaningful pathway toward greater emotional stability, improved adaptive functioning, and enhanced quality of life across diverse trauma-exposed populations when implemented as part of an integrated, trauma-informed therapeutic approach.

Supplementary Materials: The following supporting information can be downloaded at https://www.mdpi.com/article/10.3390/psychiatryint7040177/s1, Table S1: Comparison of the principal body-oriented interventions discussed in this review, including Sensorimotor Psychotherapy (SP), Somatic Experiencing (SE), dance/movement therapy (DMT), Trauma-Sensitive Yoga (TSY), and other relevant approaches. The table summarizes the core theoretical principles, proposed mechanisms of action, key therapeutic techniques, and primary clinical targets of each intervention. Although these approaches differ in their theoretical foundations and clinical implementation, they share common objectives related to enhancing body awareness, promoting autonomic regulation, expanding the window of tolerance, and supporting the integration of traumatic experiences through bottom–up therapeutic processes; Table S2: Overview of the body-oriented interventions included in this narrative review. The table summarizes the therapeutic approaches discussed in each Results subsection, the corresponding number of outcome studies identified, the principal outcome domains evaluated (e.g., PTSD symptoms, autonomic regulation, body awareness, emotion regulation, dissociation), the overall level of evidence, and the main conclusions drawn from the available literature. This overview is intended to provide readers with a concise roadmap of the review and facilitate comparison across the different intervention modalities.

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