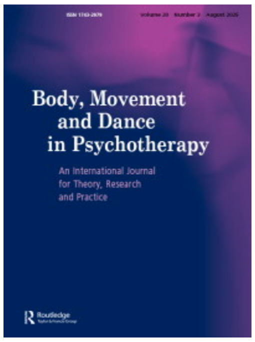

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Movement in trauma – a body- and movement-oriented intervention for adults with post-traumatic stress disorder: intervention protocol and pilot study

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ABSTRACT

Prolonged and repeated psychotrauma can result in enduring problems in affect regulation, negative body experience, persistent interpersonal problems and low self-image; consequences that are not always treated effectively with regular cognitively oriented treatment options for PTSD. Body- and movement-oriented interventions may be an addition or an alternative. This study describes and evaluates a body- and movement-based intervention designed to supplement trauma treatment as suggested in the guidelines. The intervention focuses on: (1) recognising and tolerating bodily sensations, (2) arousal regulation techniques, and (3) (re)-establishing a sense of control. A pilot study was conducted to assess outcomes on trauma symptoms, general symptoms of psychopathology and body experience. Preliminary findings suggest that the intervention effectively reduces trauma symptoms and may offer a valuable complement to more verbally and cognitively oriented trauma therapies, particularly for patients with complex PTSD. Further research should explore its underlying mechanisms, broader applicability and effects.

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KEYWORDS Complex PTSD; embodied trauma; affect regulation; psychomotor therapy; intervention

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Introduction

Classifying traumatic stress

Persistent re-experiencing of the traumatic events, avoidance of trauma-related stimuli, negative cognitions and moods and alterations in arousal and reactivity, such as dissociative symptoms, irritability, hypervigilance and sleep disturbances are characteristic symptoms of posttraumatic stress disorder (PTSD) (DSM 5; American Psychiatric Association, 2013). PTSD is associated with high rates of comorbid mood disorders, anxiety disorders (Kuzminskaite et al., 2021) substance use disorders (Bartholow & Huffman, 2023; Driessen et al., 2008) and sexual and relational problems (Yehuda et al., 2015). Additionally somatic problems such as cardiovascular, respiratory, musculoskeletal, neurological and gastrointestinal disorders (Gupta, 2013), metabolic syndrome, chronic pain and inflammation (Yehuda et al., 2015), and other chronic physical complaints that do not derive from injuries (Krakau et al., 2021) are common in patients with PTSD.

Disrupting events during child development may result in the above mentioned PTSD-related symptoms, but also bring on other problems, such as problematic or unsafe attachment and issues related to low self-esteem. Herman (1992) was the first to suggest naming these consequences 'complex PTSD' (CPTSD). Although not classified in the DSM, CPTSD is defined in the 11th revision of the International Classification of Diseases and Related Health Problems (ICD-11; World Health Organization, 2019). According to the ICD-11, individuals suffering from CPTSD do not only experience the core PTSD symptoms but also disturbances in self-organisation (DSO), consisting of affect dysregulation, negative self-concept, and enduring interpersonal problems (Bachem et al., 2021).

Treating traumatic stress

Current clinical practice guidelines for PTSD encompass cognitive and exposure-based therapies (American Psychiatric Association, 2025). However, these approaches primarily address the prefrontal cortex whereas neurobiological research suggests that especially the subcortical brain centres play a significant role in processing overwhelming stress (van der Kolk, 2014). Learning arousal regulation skills is central in effective trauma treatment (Cloitre et al., 2012), while interventions based on verbal processing do not suffice in facilitating physiological arousal regulation (Ogden et al., 2006). Also, residual symptoms after the guideline-recommended treatments are common (Larsen et al., 2019), of which hyperarousal symptoms were found to be the most frequently present after cognitive processing treatment for PTSD. This might suggest that these more physiologically than cognitively mediated symptoms are difficult to change with cognitively oriented treatments accessing primarily higher-order cortical areas (Larsen et al., 2019). Furthermore, nonresponse rates of ∼40% were found after cognitive interventions for PTSD (Semmlinger et al., 2024).

Considering the above, including body- and movement-oriented interventions (BMOI) as a part of trauma treatment may form a key element in addressing the chronic dysregulation of the biological stress-processing system. BMOI are characterised by their use of movement activities and focus on bodily experiences (Emck & Scheffers, 2019). A specific type of BMOI, much used in mental health care in the Netherlands and Belgium is psychomotor therapy (PMT), which aims to diminish patients' psychiatric symptoms, increase mental health and improve psychosocial functioning (Emck & Scheffers, 2019). In a recent review of literature van de Kamp et al. (2024) found that PMT, specifically targeting trauma symptoms, may be beneficial in PTSD treatment.

People with posttraumatic stress interpret physiological arousal and interoceptive signals predominantly as dangerous, which may lead to maladaptive responses in the present moment (Courtois & Ford, 2009; Kearney & Lanius, 2022) as well as a disturbed body experience (Scheffers et al., 2017). Therefore, treatments starting with the physical sensations to support a process towards regulation of arousal may be an appropriate addition to complex trauma treatment (Krupnik, 2021; Putica et al., 2024; van de Kamp et al., 2023).

In line with this reasoning, we developed the bottom-up intervention 'Movement in Trauma' (MiT), to strengthen feelings of safety in one's own body and to learn arousal regulation skills.

In this article, the aim is twofold: (1) to describe the MiT intervention and (2) to report its evaluation in terms of trauma-related symptoms, general symptoms of psychopathology, and body experience. The change in severity of core symptoms of trauma and DSO-symptoms will also be evaluated for differences between a group of complex-PTSD and non-complex PTSD.

Method

Intervention protocol: movement in trauma

Starting points

MiT was developed based on multiple discussions and exchanges between psychomotor therapists working in specialised trauma centres as well as therapists' clinical insights during PMT provided as part of multidisciplinary specialised trauma treatment in the Netherlands. In PMT a context is created where new or alternative behaviours can be safely explored, allowing for corrective experiences and a supportive learning environment (Emck & Scheffers, 2019).

During the MiT-intervention the participants train awareness and skills to learn to self-regulate the chronic dysregulation of the biological stress-processing system caused by trauma (Kearney & Lanius, 2022). A characteristic of this dysregulation is reacting with hyper- or hypoarousal in various contexts, which restricts normal functioning.

Van der Kolk (2014, 2006) stated that effective trauma treatment should include three elements: learning to (1) deal with and tolerate feelings and sensations by increasing the capacity for interoception; (2) control and modulate arousal and alertness; (3) turn physical impotence into active, decisive and effective actions. These elements were taken as starting points when developing MiT.

Another starting point is play. Ogden et al. (2006) point out that play is hindered by the dysregulation and sense of insecurity experienced by traumatised individuals. However, play is a crucial part of one's development. It is necessary to learn to attune to others, learn to recognise one's vulnerabilities and to gain resilience (Sheets-Johnstone, 2003). During the MiT intervention a context is created in which playfulness, having fun and expressing oneself can be (re)discovered.

Working on behavioural change is a last key element of MiT. Being able to distinguish between behavioural reactions that originate from trauma and those that do not is important in determining the difference between past and present experiences. When awareness of the automatic trauma-induced reactions has been gained, alternative behaviour can be explored. Discovering and experiencing the effect of alternative behaviour in the present moment during therapy sessions possibly increases the feeling of mastery and gives the patient a basis for more control over their daily functioning.

Set-up

The intervention programme consists of twelve 90-minute weekly meetings in a closed group of 6-8 people. Based on clinical observations three main themes were distinguished: observing body signals, regulating arousal, and restoring a sense of control. All themes are addressed during the meetings with a different focus per theme ranging from an individual focus to a focus on interaction (Table 1). Below an explanation of the three focus areas:

- Me: observing, understanding and trusting body signals
  At the beginning it is important to create support and curiosity for interoception, to make contact with one's body and to learn to tolerate feelings and sensations.

Table 1. Overview of the themes and areas of focus

Meeting	Theme	Areas of focus on theme
1.	Introduction therapists, goal/focus programme Motivation participants	Observe (difference 'me, personal space, other')
2.	Body signals	Observe (difference 'me, personal space, other')
3.	Regulation of the signals	Observe and act ('me, personal space')
4.	Own wishes and needs	Observe and act ('me, personal space, other')
5.	Own wishes and needs Safety	Observe and act ('me, personal space')
6.	Safety and boundaries	Act ('me, personal space')
7.	Creating personal space	Act ('me, other')
8.	Own wishes and needs Making choices	Act ('me')
9.	Boundaries	Observe and act ('me, other')
10.	Play Boundaries	Observe ('me, personal space, other')
11.	Play Having fun	Act ('me, personal space, other')
12.	Completing programme	Act ('me')

- Me & personal space
  Focus is broadened to the experience of personal space. The challenge is to overcome the tendency to generally interpret situations as dangerous and as a result adapting automatically to others or the surroundings. Opportunities are created to consciously experience pleasure and creativity, and make contact with others.
- Me & the other: improving interpersonal functioning
  Experimenting with being able to indicate one's wishes and boundaries in contact with others.

Participants and procedure

A convenience sample of patients from seven Dutch trauma treatment centres was recruited. In accordance with the responsible health practitioner, all patients meeting criteria to start treatment between April and August 2015 were asked to participate in the intervention (MiT), which was offered as one of the treatment components. Inclusion criteria to participate were: PTSD diagnosis according to the DSM-IV-TR; age > 18; given informed consent; and sufficient fluency in Dutch. Exclusion criteria were: intellectual disability (IQ < 80); an actual suicide risk according to their therapist; a history of severe drug dependency as determined by the staff. The study was approved by the Medical Ethics Review Committee of the University Medical Centre Groningen (METc 2014/452).

The psychomotor therapist offering the intervention had an introductory session with each participant before the start, in which the main themes were explained and patient-specific goals were set. Two weeks prior to the start (T0: pre-test), participants were sent a link to an online study portal to complete several questionnaires (see Measures). After completion of the intervention, participants again received an e-mail with a link to the questionnaires (T1: post-test).

The therapists providing the MiT took part in a 1-day training and were handed a manual with background information, an outline for each session and psycho education to be shared with participants.

Measures

All measures were based on self-report questionnaires. Trauma symptoms, general symptoms of psychopathology, and dissociative symptoms were assessed as primary outcome measures.

PTSD symptoms were assessed with the 17-item Davidson Trauma Scale (DTS) (Davidson et al., 1997). The subject rates both frequency and severity per item during the previous week on a five-point Likert scale (0='not at all distressing' to 4='extremely distressing'). The total score is the sum of all frequency and severity scores (range 0-136). A score of over 40 indicates a high probability of PTSD. Subscales are: re-experiencing, avoidance/numbing, and hyperarousal. The original DTS demonstrates internal consistency of α=.99 (Davidson et al., 1997). In the present study the Dutch translation (Sijbrandij et al., 2008) produced: re-experiencing α=.90, avoidance/numbing α=.86, hyperarousal α=.84.

General Symptoms of Psychopathology were assessed using the Brief Symptom Inventory-53 (BSI) (Derogatis & Melisaratos, 1983), evaluating psychological distress and psychiatric disorders. Items were scored on a five-point Likert scale (0='not at all' to 4='extremely'). Subscales are: somatisation, obsession-compulsion, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. The original BSI alpha coefficients ranged from .71 for psychoticism to .85 for depression (Derogatis & Melisaratos, 1983). In the Dutch translation (de Beurs, 2008) α >.80 for eight subscales and α=.71 for psychoticism (de Beurs & Zitman, 2006). In the current data alpha for somatisation, obsession-compulsion, and depression were >.80, all others were α >.70.

Dissociative symptoms were assessed using the 28-item Dissociative Experience Scale (DES) (Bernstein & Putnam, 1986) designed to screen for dissociative pathology. The items relate to experiences of disturbance in identity, memory, awareness, and cognition, and feelings of depersonalisation and derealization. The frequency of such experiences are indicated on a 11-point Likert-type scale ranging from 0%='never' to 100%='always'. The total is the mean score. A score higher than 25% requires further research into a dissociative disorder. The DES has an internal consistency of α=.95 (Frischholz et al., 1990), and differentiates well between dissociative and non-dissociative clinical groups (Dubester & Braun, 1995). The current data produced α=.93.

Two instruments were used to gain further insights into body experience (secondary outcomes).

Body attitude was assessed with the Dresden Body Image Questionnaire (DBIQ-NL; Scheffers et al., 2017) measuring five dimensions of body attitude: vitality, body acceptance, self-aggrandisement, physical contact, and sexual fulfilment (Pöhlmann et al., 2014, 2008). Responses are scored on a five-point Likert scale, from 'not at all' to 'entirely', higher score meaning more positive body attitude. The internal consistency of the Dutch version ranged from α=.83 to α=.92 (non-clinical sample; Scheffers et al., 2017). The current data produced alphas ranging from α=.70 for body acceptance to α=.92 for sexual fulfilment.

Body awareness was assessed with the 12-item subscale body awareness from the Scale of Body Connection (SBC-A) (Price & Thompson, 2007), using a five-point Likert scale from 'not at all' to 'all of the time'. Higher scores reflect more conscious attention to sensory cues. The original and the Dutch version produced α=.83 (Price & Thompson, 2007), and α=.80 (van der Maas, 2015), respectively. The current data produced α=.89.

Statistical analysis

All analyses were conducted using IBM SPSS Statistics 29.0.1.0.

Missing data was handled by calculating average of the existing item scores. A subject was disregarded for the relevant analysis if more than two items were missing, or more than one item within a subscale.

A drop-out analysis was performed with independent *t*-tests.

Pre-test-posttest comparisons were run using paired samples *t*-tests on the total scores of all outcome measures.

Using the DSM-classification for diagnoses allowed no CPTSD diagnosis prior to the intervention. Following Cloitre et al. (2013) and Elklit et al. (2014) the presence of CPTSD was determined by scoring five BSI-items and one DTS-item referring to DSO (see Table 2). The item scores were re-coded into binary variables meaning: score ≥ 2 symptom was 'present' (code $= 1$); score < 2 'not present' (code $= 0$). A score $\geq$ four (maximum is six) identified the presence of CPTSD.

Once the presence of CPTSD was determined, the sample was split into complex-PTSD and non-complex PTSD groups. Independent samples *t*-tests were performed on the gain scores of various subscales representing the symptom profiles of CPTSD to compare differences.

Table 2. Items used to determine complex PTSD symptoms in participants

Cluster	Questionnaire	Item
Affect dysregulation	BSI	13. Temper outbursts
	BSI	20. Your feelings being easily hurt
Negative self-concept	BSI	50. Feelings of worthlessness
	BSI	52. Feelings of guilt
Interpersonal problems	BSI	44. Never feeling close to another person
	DTS	10. Have you felt distant or cut off from other people?

Note. Items selected based on Cloitre et al. (2013). BSI = Brief Symptom Inventory 53, DTS = Davidson Trauma Scale.

Table 3. Characteristics of participants and differences between subgroups with and without CPTSD.

		Total ($n = 30$)	Complex PTSD ($n = 17$)	Non-complex ($n = 13$)
Gender	Female	23 (77%)	14 (82%)	9 (69%)
	Male	7 (23%)	3 (18%)	4 (31%)
Age (M(SD))		41.17 (10.45)	41.06 (11.47)	41.31 (9.41)
			Range = 19-59	Range = 27-56
Country of birth	Netherlands	13 (43%)	3 (17.6%)	10 (77%)
	Other	17 (57%)	14 (82.4%)	3 (23%)
Education	None	3 (10%)	3 (17.6%)	0 (0%)
	Secondary	7 (23.3%)	4 (23.5%)	3 (23.1%)
	Average	15 (50%)	8 (47.1%)	7 (53.8%)
	Higher	5 (16.7%)	2 (11.8%)	3 (23.1%)

BSI-subscales were matched with the DSO symptom clusters (with some overlap); interpersonal problems were matched with interpersonal sensitivity and psychoticism, negative self-concept with depression and psychoticism and affect dysregulation with anxiety and hostility.

The primary outcome measure dissociative symptoms was also analysed for differences in gain scores between the complex-PTSD and non-complex PTSD.

All statistical tests were conducted at $p \leq .05$.

Results

Fifty-one patients gave informed consent and were allocated to the intervention. At post-test, 30 patients (59%) completed the measurements and filled out the questionnaires at both pre- and post-measurement (for missing data on the DTS, DES, DBIQ-NL and SBC-A see Table 5). These participants were aged 19-59 ($M = 41.17$, $SD = 10.45$), including seven men (23%) and 23 women (77%). The sample was further divided into two groups, complex-PTSD ($n = 17$) and non-complex PTSD ($n = 13$), see Table 3.

Participants who filled out the questionnaires at pre-test, but did not complete the post-test measurements, are considered the drop-outs. Comparing the drop-outs ($n = 21$; Table 4) with the completers ($n = 30$)

Table 4. Mean total scores of all outcome measures at pre-test in drop-outs and participants.

	T0			
	Drop-outs		Participants	
Outcome measure	*n*	Mean (*SD*)	*n*	Mean (*SD*)
Trauma symptoms (DTS)	18	91.00 (27.24)	30	91.80 (25.60)
Symptoms of psychopathology (BSI)	21	2.64 (0.62)	30	2.51 (0.69)
Dissociative symptoms (DES)	20	32.34 (20.16)	30	31.15 (17.64)
Body attitude (DBIQ-NL)*	19	2.18 (0.60)	27	2.55 (0.58)
Body awareness (SBC-A)	20	2.99 (0.89)	30	3.45 (0.82)

Note. T0 = pre-test, SD = standard deviation, BSI = Brief Symptom Inventory 53 – general severity index, DTS = Davidson Trauma Scale, DES = Dissociation Experience Scale, DBIQ-NL = Dresden body image Questionnaire, SBC-A = scale of body connection-subscale awareness
*significant difference between groups at T0

Table 5. Mean total scores of all outcome measures at pre-test and post-test.

	T0		T1	
Outcome measure	*n*	Mean (*SD*)	*n*	Mean (*SD*)
Trauma symptoms (DTS)*	30	91.80 (25.60)	29	71.48 (29.94)
Symptoms of psychopathology (BSI)*	30	2.51(0.69)	30	2.14 (0.76)
Dissociative symptoms (DES)	30	31.15 (17.64)	28	28.83 (19.26)
Body attitude (DBIQ-NL)	27	2.55 (0.58)	27	2.55 (0.59)
Body awareness (SBC-A)	30	3.45 (0.82)	28	3.35 (0.62)

Note. T0 = pre-test, T1 = post-test, SD = standard deviation, BSI = Brief Symptom Inventory 53 – general severity index, DTS = Davidson Trauma Scale, DES = Dissociation Experience Scale, DBIQ-NL = Dresden body image Questionnaire, SBC-A = scale of body connection-subscale awareness
*significant difference between T0 and T1

revealed no significant differences in the pre-test outcomes except for a trend in poorer body attitude in the drop-outs at T0 ($t(44) = 2.11$, $p = .04$).

Analyses in the whole group of thirty completers (Table 5) showed that trauma symptoms decreased significantly post-intervention with moderate effect size, $t(28) = 3.56$, $p = .001$, $d_{DTS} = 0.66$. Whereas 6.7% of participants scored below the clinical cut-off of 40 points at pre-intervention, post-intervention this was 17.2%. The severity of general psychopathology was significantly lower post-intervention with a moderate effect size, $t(29) = 3.52$, $p = .001$, $d_{BSI} = 0.64$. Dissociative symptoms showed no significant change, $t(27) = 0.54$, $p = .596$.

No significant changes were found in the secondary outcome measures body attitude, $t(25) = 0.15$, $p = .884$, and body awareness, $t(27) = 1.19$, $p = .245$, post-intervention compared to baseline.

Seventeen of the 30 MiT-completers met the criteria applied for CPTSD (see Table 2). At T0 a significantly higher score was detected in complex-PTSD than in non-complex PTSD in the severity of general psychopathology ($t(28) = -5.96$, $p < .001$; Table 6). At T0, more severe trauma symptoms on all the subscales measuring the PTSD symptom clusters were found in the complex-PTSD than in the non-complex PTSD (re-experiencing $t(28) = -3.70$, $p < .001$; avoidance/numbness $t(28) = -2.71$, $p = .011$; hyperarousal $t(28) = -3.80$, $p < .001$).

The gain score comparisons in six trauma symptom clusters (three shared and three CPTSD-specific) between the complex-PTSD and non-complex PTSD produced significant differences in the following subscales: hyperarousal (DTS), interpersonal sensitivity (BSI), depression (BSI), psychoticism (BSI) (see Table 6).

Dissociative symptoms measured with the DES did not show significant differences in the gain scores between the two groups ($t(26) = 1.24$, $p = .227$). When looking at the absolute mean scores (see table 6), the CPTSD-group started and ended above the cut-off score (although the score decreased from T0 to T1), whereas the PTSD-group scored below the cut-off at T0 and T1 indicating an absence of dissociative pathology.

Discussion

The goal of the current paper was twofold. First, we described the theoretical background and content of the body- and movement-oriented intervention, 'Movement in Trauma', for patients with complex trauma. Second, we reported a pilot study exploring the outcome of the MiT-intervention in a group of patients diagnosed with (complex) PTSD. Trauma-related symptoms and severity of general psychopathology decreased significantly, while dissociative symptoms, body attitude and body awareness did not. We also examined differences between participants with CPTSD and non-complex PTSD. Participants with CPTSD started with more severe trauma symptoms and general psychopathology at pre-test. They also reported a significantly greater decrease in hyperarousal symptoms as well as in symptoms of interpersonal problems and negative self-concept. Dissociative symptom scores indicated the presence of dissociative pathology in the CPTSD-group, but not in the non-complex PTSD group.

The primary outcome measures of trauma symptoms and general psychological wellbeing improved significantly at completing the intervention. Although the average trauma symptoms score was still above the cut-off score, 17.2% of the completers scored below the cut-off point of 40. The significant reduction in the trauma symptoms supports the idea that MiT is a suitable intervention targeting symptom reduction.

Body awareness and body attitude did not change significantly after completing the 12-week intervention. Although there is evidence on the physical and physiological impact of trauma on the body and body attitude (Scheffers et al., 2017), more research is needed to determine the mechanisms to re-establish a healthy relation to one's own body as well as experiencing oneself in relation to others. Remarkably, the drop-outs scored

Table 6. Pre- and post-test scores for all outcome measures and selected subscales, and *t*-test results on gain scores in PTSD core symptoms and DSO-symptoms between CPTSD and PTSD.

	T0		T1		Gain score comparisons				
	CPTSD Mean (*SD*)	PTSD Mean (*SD*)	CPTSD Mean (*SD*)	PTSD Mean (*SD*)	CPTSD Mean	PTSD Mean	*t*	*p*	*d*
DTS	104.38 (14.49) *	74.08 (26.44)	76.19 (29.90)	65.69 (30.14)					
Re-experiencing	32.94 (4.57) *	21.25 (11.77)	24.25 (8.75)	18.17 (10.52)	−8.69	−3.08	1.73	.096	–
Avoidance/ Numbness	39.37 (10.01) *	29.53 (10.84)	30.75 (14.42)	25.30 (13.17)	−8.62	−4.23	0.83	.415	–
Hyperarousal	32.06 (5.37) *	22.62 (8.58)	21.19 (10.97)	21.77 (9.70)	−10.88	−0.85	2.58	.016	0.96
BSI-GSI	2.96 (0.37) *	1.93 (0.57)	2.39 (0.77)	1.83 (0.65)					
Interpersonal	2.84 (0.68) *	1.27 (0.72)	1.94 (1.14)	1.33 (0.87)	−0.90	0.06	2.71	.011	1.0
Anxiety	2.90 (0.38) *	1.64 (0.76)	2.07 (1.11)	1.47 (0.70)	−0.83	−0.17	1.84	.076	–
Hostility	1.40 (0.81) *	0.85 (0.86)	0.92 (0.80)	0.83 (0.90)	−0.48	−0.02	2.02	.053	–
Depression	2.78 (0.70) *	1.47 (0.75)	2.23 (1.24)	1.83 (1.04)	−0.56	0.36	2.39	.024	0.88
Psychoticism	3.03 (0.64) *	1.44 (0.67)	2.17 (1.02)	1.63 (1.01)	−0.67	0.32	2.83	.009	1.04
DES	40.54 (15.48) *	17.13 (10.89)	35.56 (20.72)	19.88 (13.09)	−4.98	2.74	1.24	.227	–
DBIQ-NL	2.53 (0.59)	2.60 (0.62)	2.56 (0.61)	2.52 (0.60)	0.04	−0.08	−0.65	.523	–
SBC-A	3.57 (0.87)	3.36 (0.73)	3.51 (0.70)	3.14 (0.44)	−0.06	−0.22	−0.71	.484	–

Note. T0 = pre-test, T1 = post-test, CPTSD = complex PTSD, PTSD = non-complex PTSD, SD = standard deviation, *p*=significance, *d*=effect size, DTS = Davidson Trauma Scale, BSI = Brief Symptom Inventory 53 – general severity index, DES = Dissociation Experience Scale, DBIQ-NL = Dresden body image Questionnaire, SBC-A = Scale of Body Connection-subscale awareness
*significant difference between CPTSD and PTSD at T0

poorer on the body attitude scale at pre-test than the completers. We may speculate that experiencing the body predominantly as threatening and unsafe possibly affects body attitude in a negative way and results in avoidance of body-oriented interventions.

There is scientific and clinical debate about the exact function and nature of dissociation. Those who see dissociation as a survival or defense mechanism, emphasise that it serves as a way to regulate emotional involvement. Others interpret dissociation as a state of extreme dysregulation in the brain that extends to dysregulation of attention and orientation. Both perspectives offer an explanation for the fact that dissociation is a common symptom in patients with complex trauma. The current findings on dissociative symptoms in the CPTSD group demonstrated scores that both started and ended above the cut-off score confirming findings in earlier studies, that experiences of dissociation are common in CPTSD. Although no significant decline in dissociation could be observed in the small sample and participants' scores were still elevated at post-test, this underlines the importance of including a MiT-type intervention that focuses on training interoceptive awareness and arousal regulation. All in all, considering these results, measuring the level of dissociation is important in trauma treatment, also for diagnostic purposes.

There are no clear indications in the literature of the required time span to be able to reach a feeling of safety in one's own body or to adapt one's attitude to their body. One can imagine that for patients with complex trauma, experiencing frequent unsafety and relying on dissociation as a defense mechanism, a 12-week intervention is not sufficient. Re-establishing contact with the body is central for recovery from trauma to (re)gain safety within oneself (van der Kolk, 2014), although the time required for such a change may be substantial.

MiT was developed to be implemented at the start of treatment for complex trauma. It consists of body- and movement-oriented interventions (BMOI) concentrating on interoceptive awareness, physiological arousal regulation, and restoring a sense of control. The results show that in participants with CPTSD hyperarousal symptoms improved significantly more than in participants with non-complex PTSD. This result is relevant because research has shown that in evidence-based treatments PTSD hyperarousal symptoms are more resistant to change than other symptom clusters (Miles et al., 2023). The current results indicate that a more holistic approach which includes BMOI as part of standard treatment may effectively influence these 'resistant' hyperarousal symptoms in CPTSD.

Although more research is needed, the results of our split sample showed support for the distinction in CPTSD and non-complex PTSD, as has been suggested by others. Patients with CPTSD started with higher scores at pre-test in all three shared symptom clusters. They improved significantly more with regard to negative self-concept and interpersonal problems with large effect sizes. Affect dysregulation (subscales anxiety and hostility) did not show significant gain-score differences between groups.

Strengths and limitations

A key strength of this pilot study lies in incorporating trauma-specific symptom measures and general symptoms of psychopathology as well as assessments of body attitude and body awareness. By doing so our study reflects a holistic view, acknowledging the growing evidence on the relevance of addressing body-related issues in trauma treatment. Additionally, the division between CPTSD and non-complex PTSD was performed only post-intervention, meaning participants from both groups were mixed during the intervention, mirroring typical clinical group treatment settings and thus enhancing the generalisability of the results to clinical settings.

Although the results of this pilot study should be interpreted with caution because of the pre-post design and the small sample size, they show the potential of the MiT-intervention to improve arousal regulation in PTSD patients, which is beneficial regarding any type of following trauma treatment. Melton et al. (2020) found that multicomponent therapies provided better outcomes compared to single-component trauma treatment. These findings support the implementation of the MiT-intervention in multidisciplinary trauma treatment. Unfortunately, no data were available in the current study on how the MiT-intervention possibly affected the rest of the treatment, or residual symptoms at the end of treatment.

The small sample size was also a limitation to investigating differences and similarities in the MiT-intervention between the participating institutions.

More research is needed to study the differences in effect of BMOI in specific subgroups of patients suffering from complex trauma, such as veterans, refugees and asylum seekers, or patients with developmental trauma.

In conclusion, 'Movement in Trauma' was developed to incorporate a body- and movement-centred intervention in the beginning of treatment for complex trauma, with the objective of symptom reduction as well as adding to the mounting evidence for the benefits of a holistic multicomponent treatment approach. Findings from the pilot study demonstrated a reduction in mean trauma symptom scores. The more pronounced improvements observed in patients with CPTSD suggest that the intervention has the potential to influence the unique symptomatology of CPTSD. Secondary outcomes related to body experience did not show significant change. Further research is needed to elucidate the mechanisms underlying changes in body experience as well as the necessary time span needed to influence negative body experience.

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The authors report there are no competing interests to declare.

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Data availability statement

The data supporting the findings of this study are available from the corresponding author on request.

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