Triadic Therapy Based on Somatic Eye Movement Desensitization and Reprocessing for Complex Posttraumatic Stress Disorder: A Pilot Randomized Controlled Study

Keisuke Wakusawa
Department of Developmental Neuropsychiatry, Miyagi Children's Hospital, Sendai, Japan
Research Center for Child Mental Development, Hamamatsu University School of Medicine, Hamamatsu, Japan
Department of Advanced Brain Science, Institute of Development, Aging and Cancer, Tohoku University, Sendai, Japan

Toshiro Sugiyama
Research Center for Child Mental Development, University of Fukui, Fukui, Japan

Hiroshi Hotta
Department of Psychiatry, Okinawa Rehabilitation Center Hospital, Okinawa, Japan

Kohei Wada
Department of Child Psychiatry, Mikawa Hospital, Okazaki, Japan

Futoshi Suzuki
Research Center for Child Mental Development, University of Fukui, Fukui, Japan
Department of Child and Adolescent Psychiatry, Kamibayashi Memorial Hospital, Ichikawa, Japan

Takeshi Morimoto
Research Center for Child Mental Development, University of Fukui, Fukui, Japan

Tomoko Shiino
Graduate School of Human Science, Ritsumeikan University, Osaka, Japan

Akemi Tomoda
Research Center for Child Mental Development, University of Fukui, Fukui, Japan

The triadic therapy based on somatic eye movement desensitization and reprocessing (EMDR) for complex posttraumatic stress disorder (TSP) is a combination therapy, which comprises simplified EMDR, a triplet of micro-dose medicines, and a pair of Chinese medicines. The EMDR procedure is a tactile bilateral stimulation on the body surface with minimum verbal intervention within 15 minutes every two weeks in a period of 2–3 months. In this study, 22 adult patients were treated with TSP. The Impact of Event Scale—Revised, Beck Depression Inventory (second edition), and Global Assessment of Functioning scores of the patients were significantly improved. Moreover, TSP is a safe treatment procedure in terms of titration, cost-effectiveness, and time-effectiveness. It could also treat multiple difficulties in patients with cPTSD from medical problems to socioeconomic problems.

Keywords: complex posttraumatic stress disorder; developmental trauma disorder; simplified somatic eye movement desensitization and reprocessing; Kandabashi prescription; micro-dose medicines

 http://dx.doi.org/10.1891/EMDR-2023-0014

Complex posttraumatic stress disorder (cPTSD) is a relatively new diagnostic concept enshrined formally in the International Classification of Diseases 11th Revision (ICD-11) in 2018, while posttraumatic stress disorder (PTSD) itself has been listed in the ICD-9 since 1979 (Brewin et al., 2017; World Health Organization, 2018). However, cPSTD has not been listed in the latest version of the *Diagnostic and Statistical Manual of Mental Disorders (DSM-5)*, and its definition is still unclear (American Psychiatric Association, 2013). Herman (1992) studied the concept of cPTSD in the early 1990s. cPTSD is classified as a severe version of PTSD that develops after exposure to prolonged or repetitive traumatic events. It has been broadly suggested that exposure to prolonged or repetitive traumatic events, such as childhood abuse, causes more severe and complex psychiatric problems than a single traumatic event, such as a traffic accident or a natural disaster (Van der Kolk, 2005). The following are the original symptoms of PTSD: (a) intrusion of traumatic memories (e.g., flashbacks), (b) avoidance of things that remind of traumatic events, and (c) persistent perceptions of heightened current threat (e.g., hypervigilance). On the other hand, cPTSD is characterized by severe and persistent (a) problems in affect regulation; (b) beliefs about oneself as diminished, defeated, or worthless; and (c) difficulties in sustaining relationships and in feeling close to others.

Because of its severity and short history since it has been conceptualized, treatment for cPTSD is still developing. It was also suggested that psychotherapy is the most effective treatment for cPTSD. For example, several guidelines and studies of meta-analysis have recommended psychotherapies, such as trauma-focused cognitive behavioral therapy, skills training in affect and interpersonal regulation, prolonged exposure, and eye movement desensitization and reprocessing (EMDR; Conventry et al., 2020; De Jongh et al., 2016). However, the feasibility of administering these psychotherapies to patients with severe cPTSD is yet to be determined because they consist of long and periodic sessions (Conventry et al., 2020). It is often difficult for the patients to engage in such multiple long sessions regularly and consistently. Furthermore, several studies have shown a high rate of drop-out from treatment in patients with PTSD (Szafranski et al., 2017). Patients with cPTSD tend to have difficulties in building stable interpersonal relationships and be frightened of confronting traumatic memories. When we treat severe patients, it is necessary to start intervention gradually and in a short period of time. The gradual and short intervention is also an important strategy for preventing strong abreaction and is widely recognized as a standard way to treat severe trauma called "titration" advocated by Levine (2010). Furthermore, the tight financial situation of patients with cPTSD is also an impeding factor in continuing treatment. They not only have multiple mental problems but also often suffer from a variety of physical problems (Bothe et al., 2020). Such health complications lead to higher healthcare costs, and they often have problems with occupational functioning (Ontario Health [Quality], 2021; Snoek et al., 2020). This financial problem has been a great concern of the healthcare system as well as the patients themselves (Walker et al., 2003). Moreover, titration, time-effectiveness, and cost-effectiveness are considered to be the key factors in formulating a plan to treat patients with cPTSD.

The other reason which makes cPTSD difficult to treat is the involvement of childhood abuse. Van der Kolk (2005) has conceptualized developmental trauma disorder (DTD), which is a type of cPTSD based on childhood abuse. DTD causes severe emotional and somatic problems and has symptoms, based on traumatic memories in the preverbal period, that are often difficult to treat by conventional verbal psychotherapy (Van der Kolk, 2005). To cover this limitation of verbal and cognitive "top-down" psychotherapy, "bottom-up" psychotherapy, which directly accesses somatic memory or procedural memory, has been developed and utilized effectively, such as somatic experiencing (SE; Levine, 2010).

Based on the aforementioned studies, we developed the triadic therapy based on somatic eye movement desensitization and reprocessing (EMDR) for traumatic stress or, in short, the traumatic stress protocol (TSP), which is a simplified version of EMDR targeted specifically to alleviate flashbacks from cPTSD. Tactile stimuli on the body surface are used in TSP for the purpose of accessing somatic preverbal memories in a bottom-up approach. Several studies have shown that patients with PTSD tend to have a disturbed and reduced body image (Dyer et al., 2013). This tendency is considered to reflect their impaired sense of self-awareness because patients with PTSD are trapped by past traumatic memories. Clinical studies on mindfulness and bodywork have suggested that enhancing one's body awareness is effective in reducing symptoms of PTSD (Boyd et al., 2018; Elton et al., 2021).

We also intended to help patients with PTSD to focus on and strengthen their body awareness, so we selected four points from the head to the abdomen for bilateral stimulus after trial and error in clinical practice. Furthermore, we reduced verbal intervention to a minimum as necessary. By minimizing verbal intervention, we intended to make patients focus on somatic preverbal memories and shorten the period of sessions (10–15 minutes) for reducing the load of trauma exposure. This titrated exposure enables to stabilize patients and keeps them from being caught in strong abreaction, which may lead to impulsive behaviors, including suicide.

The other characteristic of TSP is that it is a low-dose combination therapy. Micro-dose medicines are used to ensure the safety of pharmacotherapy. PTSD is a certain risk factor for suicide by medication overdosing (Cougle et al., 2009; Harned et al., 2006). On the other hand, only limited reports have shown certain contributions of medicines for relieving symptoms of cPTSD (Sutherland & Davidson, 1994; Villarreal et al., 2007). Since no standardized consensus on pharmacotherapy for cPTSD has yet been reached (Abdallah et al., 2019; Hoskins et al., 2015), the authors use micro-dosage of psychiatric medicines at about one-tenth to one-hundredth of the usual dose for TSP. The effectiveness of low-dose medicine against various diseases, including PTSD, has been investigated in terms of its side effects and cost-effectiveness (Chow et al., 2021; Gandotra et al., 2019; Monnelly et al., 2003; Takenoshita et al., 2017; Webster et al., 2018).

As for micro-dose medicines of TSP, we chose a triplet of psychiatric medicines: aripiprazole, lithium carbonate, and ramelteon. Aripiprazole has been reported to be an effective treatment for PTSD (Robert et al., 2009; Villarreal et al., 2007), as well as other psychiatric diseases in low doses (Omori et al., 2018; Takenoshita et al., 2017). Lithium carbonate has been also shown to be effective to treat hyperarousal, poor impulse control, and mood swings in PTSD (Sutherland & Davidson, 1994). For aripiprazole, the efficacy of low-dose lithium carbonate has been indicated for treating some mental diseases, including PTSD (Baethge, 2020; Devanand et al., 2022; Kitchner & Greenstein, 1985). It is more notable that the benefit of lithium carbonate has been suggested in trace level intake (Brown et al., 2018; Mauer et al., 2014).

The third characteristic of TSP is the involvement of Chinese herbal medicines, such as Kampo. The Kampo medications in TSP consisted of a pair of Chinese herbal medicines: Gui Zhi Jia Shao Yao Tang (Keishi-ka-shakuyaku-to in Japanese; GST) or Xiao Jian Zhong Wan (Sho-kenchu-to; XJW), and Si Wu Tang Wan (Shimotsu-to; SWW) or Shi Quan Da Bu Wan (Juzen-taiho-to; SDW). These pairs of Kampo medicines are called "Kandabashi prescription," which is a Japanese empirical treatment for PTSD devised by Kandabashi, and its effectiveness has been supported by recent clinical studies (Tanaka, 2019). The pharmacological function of GST is to regulate and maintain balance in the autonomic nervous system through the production of nitric oxide (Fischer et al., 1996; Danson et al., 2009; Kito & Teramoto, 2012). The dysregulation of the autonomic nervous system has been thought to be the core pathophysiology of symptoms of DTD (Porges, 2003), so GST may relieve symptoms of cPTSD by improving the autonomic regulation. XJW is a combination of GST with saccharum granorum (Yi Tang, 'Koui' in Japanese). Moreover, saccharum granorum reinforces the effect of GST against intestinal symptoms by improving mitochondrial function (Liu et al., 2020). SWW has been shown to help emotional coordination under stress and to improve cognitive deficit in rats as shown in a previous animal study (Watanabe et al., 1991; Watanabe, 1998). These results suggest the effectiveness of SWW for emotional problems and cognitive distortion related to PTSD. SDW is a mixture of SWW with other ingredients of Kampo medicines to improve efficacy against intestinal symptoms.

In this study, we investigated the effect of TSP on adult patients with cPTSD. All of them were the parents of the child patients who visited our clinic for psychological issues related to family abuse. It has been reported that the parents of maltreated children frequently experienced abuse in their own childhood (Warmingham et al., 2020).

It should be noted that the report of this study has already been released to the public in a book in Japanese (Sugiyama, 2021). The present article presents the results of this study and the hypothesis of the mechanisms underlying TSP, which has not been discussed in previous studies.

Materials and Methods

Participants

Twenty-four adult Japanese patients with cPTSD were recruited from the outpatients of the Hamamatsu Child and Adolescent Psychiatry Clinic from January 1st to December 31st, 2021. They were

diagnosed according to the ICD-11. We set the exclusion criteria as follows: (a) coexisting bipolar disorder type 1 and (b) non-compliance in taking medications for more than half of the period of the TSP. Overall, two patients were excluded.

Of the remaining 22 patients, 19 had experienced childhood abuse. They were randomly divided into two groups through a dice roll, each having 11 patients: (a) "treatment group" (TG; 10 females and 1 male, aged 31–43 years, mean: 38.5 years) and (b) "waiting group" (WG; 10 females and 1 male, aged 28–48 years, mean: 41.6 years). No statistically significant difference in age was observed between the two groups. Written informed consent was obtained from all participants.

Trial Design

This study was an open-labeled randomized controlled, cross-over trial. In the first treatment term, the TG underwent TSP. All of the pharmacotherapy by the former hospitals were changed to the medication of TSP at the start of the treatment term. In the case that any patient presented with signs of complications induced by tapering the former pharmacotherapy, they would be hospitalized and administered appropriate medication. Six of the WG were referral patients, so they needed to undergo counseling and pharmacotherapy without TSP. Moreover, five of them did not receive therapy previously before visiting our clinic. In the second term, all patients of WG received TSP, while those of TG stopped receiving TSP. The term duration was about 2 months. During a therapeutic term, the patients underwent a simplified somatic EMDR protocol of TSP (TSP-EMDR) every 2–3 weeks (i.e., 4–5 times in a therapeutic term) and the medicines of TSP were continued through a therapeutic term. The statement of each participant was checked using the Japanese version of the Beck Depression Inventory (second edition; BDI-II; Kojima et al., 2002) and Impact of Event Scale—Revised (IES-R; Asukai et al., 2002) in three time points: before TPS started, soon after the first term finished, and 3 months after TSP finished (time points A, B, and C, respectively). The Global Assessment of Functioning (GAF; Endicott et al., 1976) was also used for time points A and C.

The Procedure of TSP-EMDR

TSP-EMDR was conducted by certified EMDR therapists who have completed the "Weekend 2 training." The first day of TSP was the preparation session. The patients were instructed only to deal with mildly negative memories. We intended to minimize the first exposure of traumatic memories by setting this preparation session considering titration. Before receiving the procedure, the patients were informed that the traumatic memories themselves would not disappear but that the afflictions of somatic sensations and emotions linked to the traumatic memories would be alleviated by TSP, leading to the remission of flashbacks. They were also informed of the possibility that the intensity with which they recalled traumatic memories would increase temporarily at the initial stage of TSP. Patients also checked what kind of sensation occurred and the area in their body in which the sensation was felt in response to remembering their traumatic memories. They were instructed to avoid remembering the traumatic memories themselves as much as possible during TSP. Moreover, they were instructed to recall a mildly negative memory from the past two weeks, with a subjective unit of distress (SUD) rating of approximately 5–6, and to focus on the somatic sensation associated with this memory. Focusing on the somatic sensations and putting aside the image of the negative memory itself as much as possible, they received bilateral stimulation (BLS) by Tactile Pulsers and Tac Kit (NeuroTek, Odessa, FL, USA). Each of the 4 points on the body surface was stimulated by 20–30 cycles of tactile BLS from the abdomen to the head (Figure 1). The frequency of BLS was set as the same value as that of the patient's initial heart rate. Each set of BLS was followed by a deep breath, which was a strong thoracic respiration, before moving to the next points. Patients were instructed to visualize the release of the obnoxious sensation of traumatic memories from their top of the head when exhaling with each deep breath. The first points were both sides of the lateral abdomen. The patients were instructed to grasp the pulsers and put them on the intersection of the perpendicular line from the nipple and lower costal margin. The second points were infraclavicular fossae. Moreover, the patients were instructed to cross their hands and put fists on the opposite sides. The third points were the middle of both sternocleidomastoid muscles on the neck. The patients were instructed to put the pulsers on the carotid arteries. The final and fourth points were the temples. After finishing four sets of BLS, the patients were instructed to scan their whole body and check whether any uncomfortable sensations remained. If

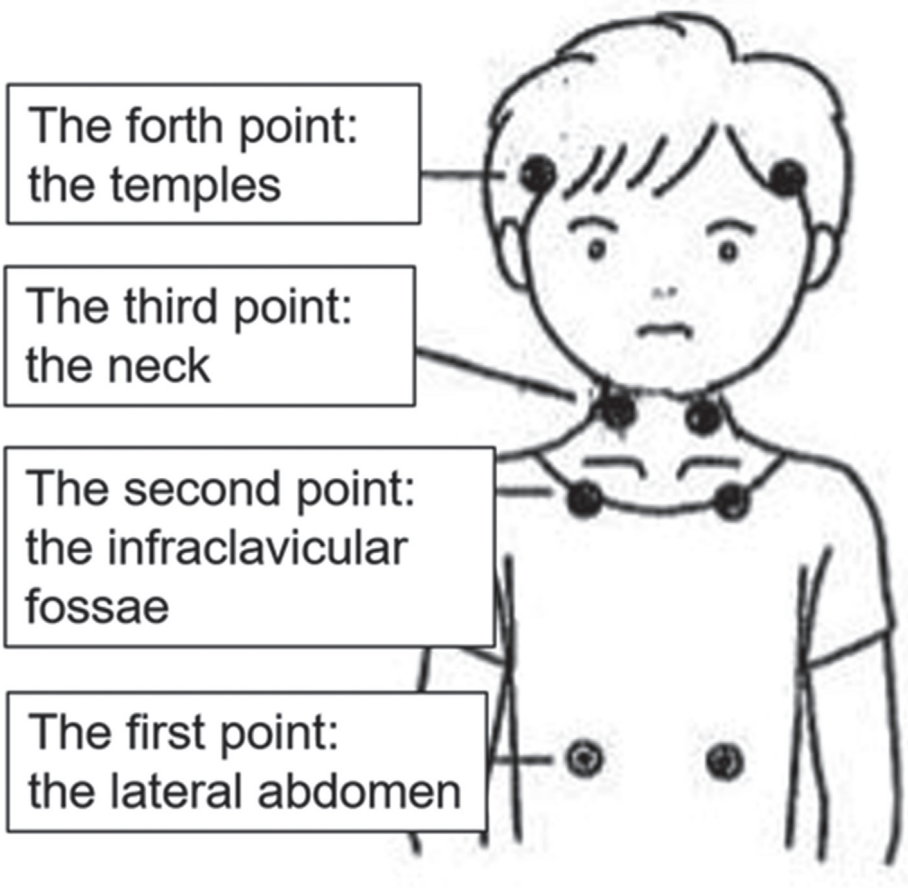

Figure 1. The four pairs of positions were stimulated during the triadic therapy based on EMDR for PTSD.

they found such sensations, an extra set of BLS was added on the closest point to the position of the uncomfortable sensations, as chosen from the four points of TSP. The extra set of BLS was done by manual self-tapping. When the patients tapped the points of the neck, they were invited to choose either the middle part of the sternocleidomastoid muscle or lateral back part of the neck. The temples were stimulated by crossed opposite-side hands, stroking down alternately. From the second session, the patients focused on the sensation related to the traumatic memories as instructed in the first session and received TSP-EMDR every 2–3 weeks. The sensations related to trauma were a somatic aspect of the traumatic memories and represented preverbal traumatic memories (Paulsen, 2017). In order to help patients focus on the sensations and reduce the exposure to the traumatic memory itself for titration, verbal instructions and explanations were minimized as described above. As a result, several verbal components of the standard EMDR protocol were omitted (i.e., checking emotions, SUD, positive cognition, and negative cognition; Shapiro, 1995). The patients were not interviewed regarding their symptoms or recent conditions. Even if the patients wanted to talk about their conditions. They were urged to do otherwise and instructed that further discussion could take place after TSP.

Medication of the Triadic therapy on Somatic EMDR for PTSD

The medication of TSP was a combined medication of a triplet of psychiatric medicines and a pair of Kampo medicines. The triplet of psychiatric medicines consisted of 0.2 mg/day of aripiprazole, 2 mg/day of lithium carbonate, and 0.8 mg/day of ramelteon. The pair of Kampo medicines (Kandabashi prescription) consisted of 5 g/day of GST and 5 g/day of SWW, or XJW and SDW. The latter pair was chosen for patients who had more severe abdominal symptoms. Presuming the tendency of poor adherence in patients with cPTSD, we accepted the patients who took the medicines at least during half of the period of TSP for this study or those who could continue to take either the triplet of psychiatric medicines or the pair of

Kampo medicines. Medication adherence was checked through an interview in every session.

Statistical Analysis

The total scores and three types of subscores (intrusion, avoidance, and hyperarousal) of IES-R and those of BDI-II were compared between the TG and WG via a mixed-design analysis of variance (ANOVA; 2 groups × 3 time points). The scores of GAF were also compared between the two groups by mixed-design ANOVA at two time points (A and C). When a significant main effect was detected, the Holm test was used for a post-hoc analysis among the groups or time points. The number of sessions and the duration of intervention for both groups were compared using the two-sample *t* test.

Results

No significant difference in the number of sessions in the therapeutic term was observed between the two groups (TG: 4–7, mean: 5.4 ± .8; WG: 4–7, mean: 5.2 ± 1.0). Moreover, no significant difference in the total duration of TSP was observed between the two groups (TG, 110.9 ± 32.3 days; WG, 99.5 ± 38.0 days). Table 1a and Figure 2 show the IES-R results. A mixed-design ANOVA revealed significant main effects between the two groups and among the three time points ($F(1, 20) = 4.44$, $p < .05$, partial $\eta^2 = .18$, $F(2, 40) = 50.43$, $p < .001$, partial $\eta^2 = .72$, respectively). Interaction was also significant. In the TG, the score in time point A was significantly lower than those in time points B and C ($t(20) = 7.04$, $p < .001$, $r = .77$, $t(20) = 6.90$, $p < .001$, $r = .80$, respectively). No statistically significant difference was observed between the scores in time points B and C. In the WG, the scores in time points A and B were significantly higher than those in C ($t(20) = 6.71$, $p < .001$, $r = .79$, $t(20) = 7.26$, $p < .001$, $r = .78$, respectively). Those in time points A and B were not significantly different. Comparing the scores of the two groups in each time point, a statistically significant difference was observed only in time point B; the scores in TG were significantly lower than those in WG ($t(20) = -5.22$, $p < .001$, $r = -.90$). A mixed-design ANOVA indicated that the mean subscores for intrusion, avoidance, and hyperarousal had the same statistical tendency as the total score of IES-R, except that the significant main effects were not detected between the two groups with regard to intrusion and avoidance (Table 1a, Figure 2). A significant main effect was detected among the three time points ($F(2, 40) = 45.14$, $p < .001$, partial $\eta^2 = .69$, $F(2, 40) = 19.25$, $p < .001$, partial $\eta^2 = .49$, $F(2, 40) = 32.10$, $p < .001$, partial $\eta^2 = .62$, intrusion, avoidance, and hyperarousal, respectively). In the analysis for hyperarousal, a significant main effect was also observed between the two groups ($F(2, 40) = 4.00$, $p < .05$, partial $\eta^2 = 0.17$). In the TG, the score in time point A was significantly lower than those in time points B and C: intrusion ($t(20) = 6.14$, $p < .001$, $r = .74$, $t(20) = 7.63$, $p < .001$, $r = .79$, respectively), avoidance ($t(20) = 5.22$, $p < .001$, $r = .65$, $t(20) = 4.12$, $p < .01$, $r = .64$), and hyperarousal ($t(20) = 4.82$, $p < .001$, $r = .62$, $t(20) = 5.47$, $p < .001$, $r = .70$, respectively). In the WG, the scores in time points A and B were significantly higher than those in C: intrusion ($t(20) = 15.12$, $p < .001$, $r = .78$, $t(20) = 15.25$, $p < .001$, $r = .78$, respectively), avoidance ($t(20) = 3.34$, $p < .01$, $r = .56$, $t(20) = 5.24$, $p < .001$, $r = .64$, respectively), and hyperarousal ($t(20) = 6.44$, $p < .001$, $r = .75$, $t(20) = 4.71$, $p < .001$, $r = .68$, respectively). A statistically significant difference was observed between two groups only in time point B. Furthermore, the scores in the TG were significantly lower than those in the WG: intrusion ($t(20) = -4.86$, $p < .001$, $r = -.89$), avoidance ($t(20) = -3.73$, $p < .001$, $r = -.83$), and hyperarousal ($t(20) = -3.71$, $p < .001$, $r = -.83$).

Table 1b and Figure 3 show the BDI-II results. A mixed-design ANOVA revealed the same tendency as the total scores of IES-R. Significant main effects were detected between the two groups and among the three time points ($F(1, 20) = 6.68$, $p < .05$, partial $\eta^2 = .25$, $F(2, 40) = 22.17$, $p < .001$, partial $\eta^2 = .53$, respectively). The interaction was also significant ($F(2, 40) = 4.24$, $p < .05$, partial $\eta^2 = .18$). In the TG, the score in time point A was significantly lower than those in time points B and C ($t(20) = 4.82$, $p < .001$, $r = .62$, $t(20) = 4.84$, $p < .001$, $r = .65$, respectively). In the WG, the scores in A and B were significantly higher than that in time point C ($t(20) = 4.17$, $p < .01$, $r = .59$, $t(20) = 3.58$, $p < .01$, $r = .54$, respectively). The scores in the TG were significantly lower than that in the WG only in time point B ($t(20) = -3.82$, $p < .001$, $r = -.84$).

Table 1c and Figure 3 show the GAF results. A mixed-design ANOVA revealed significant main effects between the two groups and among two time points ($F(1, 20) = 9.63$, $p < .01$, partial $\eta^2 = .33$, $F(1, 20) = 657.72$, $p < .001$, partial $\eta^2 = .97$, respectively). Moreover, interaction was not significant.

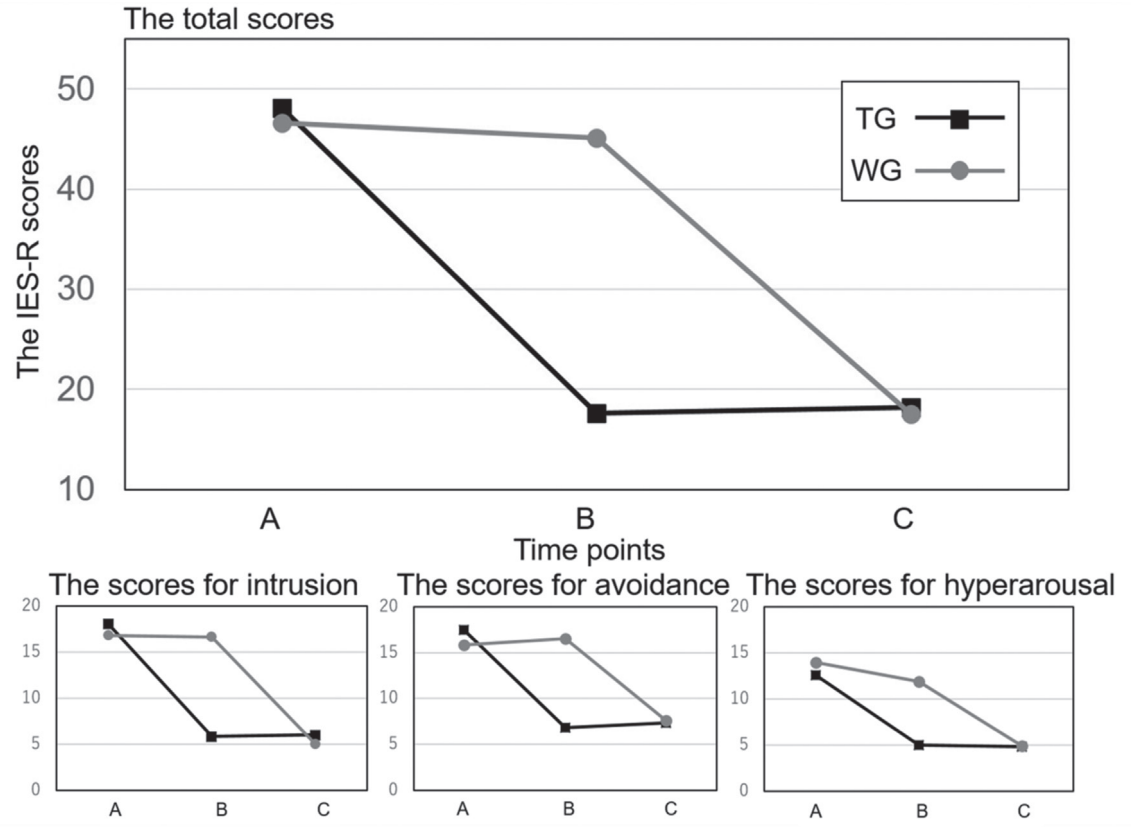

Figure 2. The results of IES-R.
Note. IES-R = Impact of Events Scale—Revised; TG = treatment group; WG = waiting group.

All of the patients in the TG and WG could switch from the medications prescribed by the former hospitals to the medications of TSP safely without any adverse events. All patients except one in the TG continued to take the triplet of psychiatric medicines in very low doses. As for the Kandabashi prescription, three patients took GST and SWW, seven patients took XJW and SDW, and one took XJW and SWW in the TG. In WG, five patients took GST and SWW, five took XJW and SDW, and one took GST and SDW.

Discussion

This study indicated that the IES-R, BDI-II, and GAF scores significantly improved in patients with cPTSD withTSP. This improvement was maintained for three months during the follow-up period. Thus, TSP appears effective for the treatment of cPTSD, despite its short treatment period, short duration of each session, and quite simple and structured procedure. The simplicity and time-effectiveness of the TSP make this treatment cost-effective. It may also play a role in solving costly situations for both patients and the healthcare system. Furthermore, it could be suggested that TSP may be used as an effective treatment for cPTSD not only among specialists but also in primary care facilities. The simplicity and cost-effectiveness of TSP enables the treatment of cPTSD without requiring any expertise and in a cost-effective way, making it a convenient procedure for primary care therapists. Although a comprehensive approach is necessary for treating the whole body for cPTSD, including care for impaired attachment and social adaptability, TSP may contribute to the progress of the treatment and care system for cPTSD as part of relieving flashbacks in the acute stage.

It can be suggested that TSP especially fits the current situation of the trauma-care system in Japan, where it is difficult to conduct standard psychotherapies including EMDR. Some clinics and counseling offices provide long sessions at the patient's own expense, but such kinds of private practices are too expensive for most patients with severe cPTSD who are financially challenged. Furthermore, the number of specialists for the treatment of trauma is chronically disproportionate to the growing number of

TABLE 1. The Mean Scores and the Statistical Results for the IES-R, BDI-II, and GAF in Both Groups

	Time point A		Time point B		Time point C		Groups		Time points		Interaction	
	Mean	*SD*	Mean	*SD*	Mean	*SD*	*F* value	Partial η^2	*F* value	Partial η^2	*F* value	Partial η^2
(a) IES-R: Total												
TG	48.09	6.71	17.64	9.93	18.18	9.60	4.44*	.18	50.43***	.72	15.66***	.44
WG	46.63	16.88	45.09	14.56	17.55	9.79						
Intrusion												
TG	18.09	3.87	5.82	3.86	6.00	3.91	2.85	.13	45.14***	.69	15.05***	.43
WG	16.82	6.79	16.64	6.77	5.00	3.38						
Avoidance												
TG	17.46	5.81	6.82	4.74	7.36	5.00	1.00	.09	19.25***	.49	8.52**	.29
WG	15.82	7.63	16.55	6.13	7.64	5.19						
Hyperarousal												
TG	12.55	5.21	5.00	3.38	4.82	2.76	4.00*	.17	32.10***	.62	5.87**	.23
WG	14.00	4.61	11.91	5.45	4.91	2.61						
(b) BDI-II												
TG	24.18	8.74	9.73	7.62	8.55	7.49	6.68*	.25	22.17***	.53	4.24*	.18
WG	27.55	10.95	25.09	9.26	14.09	9.52						
(c) GAF												
TG	50.27	3.93	-	-	76.55	4.91	9.63**	.33	657.72***	.97	1.05	.05
WG	40.00	5.97	-	-	72.45	3.36						

Note. BDI-II = Beck Depression Inventory Second Edition; GAF = Global Assessment of Functioning; IES-R = Impact of Event Scale—Revised; SD = standard deviation; TG = treatment group; WG = waiting group. *$p < .05$, **$p < .01$, ***$p < .001$

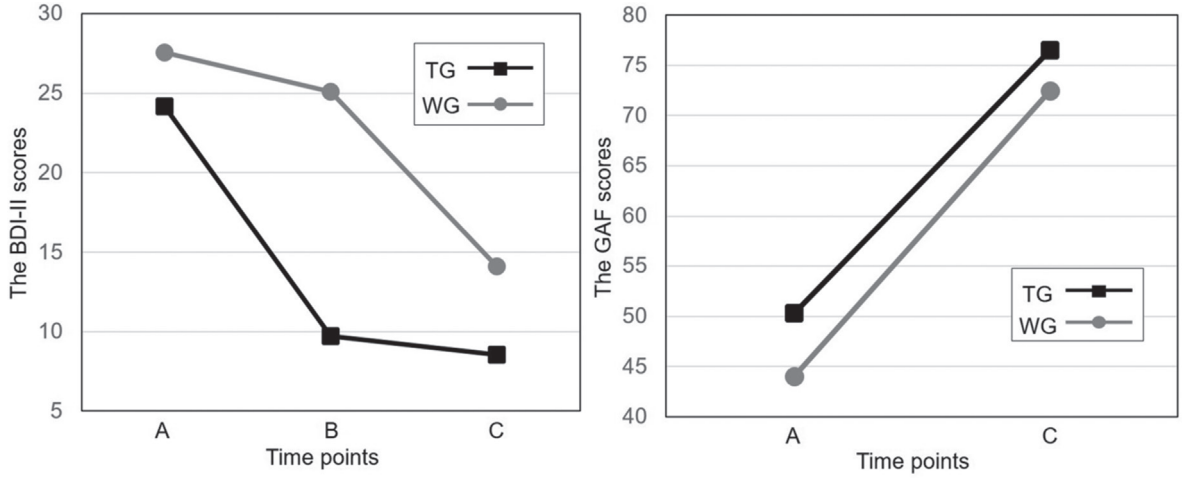

Figure 3. The BDI=II and GAF results.
Note. BDI-II = Beck Depression Inventory Second Edition; GAF = Global Assessment of Functioning; TG = treatment group; WG = waiting group.

patients with cPTSD. On the other hand, Kampo is a treatment that is more familiar in Japan than in other countries and can be prescribed by a general physician without a traditional Chinese medicine license, which is required in other Asian countries including China. Because of these cultural and institutional backgrounds, Kampo is commonly used even at the primary care level. Therefore, TSP, which includes Kampo and is technically simple, should be integrated in the current medical treatments.

However, the mechanisms underlying TSP is unknown. We empirically chose a vibratory stimulus by pulsers and self-taps on four points of the body to access somatic preverbal memories. Somatic traumatic memories are considered to be represented as a dysregulation in the autonomic nervous system, and recovering the coordinative autonomic nervous system is the key strategy of treatment for trauma (Porges, 2003). It has been suggested that a vibratory stimulus and self-taps on the body surface are useful in the regulation of the autonomic nervous system by psychotherapeutical practices of SE (Levine, 2010). SE is a bottom-up psychotherapeutic approach based on the principle of coordination of the autonomic nervous system. It has been reported that SE is effective in the treatment of various mental illnesses, including PTSD (Briggs et al., 2018; Kuhfuß et al., 2021). The vibratory stimulus called the "Voo sound," which is a vibratory exhalation intended to stimulate the abdomen, is utilized as one of the effective methods of SE for coordinating the autonomic nervous system. The four points of TSP resulted in locating the nearby positions of the "diaphragms" in the head and upper body. The diaphragms are empirically hypothesized to be seven internal structures distributed from the head to the soles, which have a function to bear and store mental stress. Stimulation by touch on the positions of the body surface corresponding to the diaphragms is utilized to help recover coherence and tolerance. TSP appears to be an effective nonverbal procedure that enables the access to and treatment of preverbal memories hypothesized to underlie cPTSD.

However, several limitations need to be addressed, as well as the mechanisms underlying TSP. First is the uncertainty of the involvement of medicines in the efficacy of TSP. As suggested by the outcome of the Butterfly Hug, somatic BLS on the body surface itself has a strong therapeutic effect (Jarero et al., 2008), so it is possible that monotherapy by TSP-EMDR may be effective enough for treating cPTSD. On the other hand, the benefits and effectiveness of combination therapies have been shown by previous studies, especially in the treatment of various mental diseases, such as those between psychotherapy and pharmacotherapy (Miklowitz et al., 2021; Zhou et al., 2020) and between antipsychotics and Kampo (Rathbone et al., 2007; Zeng et al., 2007). However, to date, no study has investigated the interaction and the effect of combination among TSP medications and Kampo. The effect of each component should be verified separately in future studies. Other issues also require clarification, such as the necessity for alignment among therapists (psychotherapists, prescribers, and specialist of the Chinese medicine), concern for switching medications from the former hospitals, and choice of Chinese herbal medicines.

Another limitation is the statistical limitations of our study including the relatively small sample size (n = 22). Thus, further research with larger samples is required.

References

Abdallah, C. G., Averill, L. A., Akiki, T. J., Raza, M., Averill, C. L., Gomaa, H., Adikey, A., & Krystal, J. H. (2019). The neurobiology and pharmacotherapy of posttraumatic stress disorder. *Annual Review of Pharmacology and Toxicology*, *59*, 171–189. https://doi.org/10.1146/annurev-pharmtox-010818-021701

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). American Psychiatric Association. https://doi.org/10.1176/appi.books.9780890425596

Asukai, N., Kato, H., Kawamura, N., Kim, Y., Yamamoto, K., Kishimoto, J., Miyake, Y., & Nishizono-maher, A. (2002). Reliabiligy and validity of the Japanese-language version of the impact of event scale-revised (IES-R-J): Four studies of different traumatic events. *The Journal of Nervous and Mental Disease*, *190*(3), 175–182. https://doi.org/10.1097/00005053-200203000-00006

Baethge, C. (2020). Low-Dose lithium against dementia. *International Journal of Bipolar Disorders*, *8*(1), 25. https://doi.org/10.1186/s40345-020-00188-z

Bothe, T., Jacob, J., Kröger, C., & Walker, J. (2020). How expensive are post-traumatic stress disorders? Estimating incremental health care and economic costs on anonymised claims data. *The European Journal of Health Economics*, *21*(6), 917–930. https://doi.org/10.1007/s10198-020-01184-x

Boyd, J. E., Lanius, R. A., & McKinnon, M. C. (2018). Mindfulness-based treatments for posttraumatic stress disorder: A review of the treatment literature and neurobiological evidence. *Journal of Psychiatry & Neuroscience*, *43*(1), 7–25. https://doi.org/10.1503/jpn.170021

Brewin, C. R., Cloitre, M., Hyland, P., Shevlin, M., Maercker, A., Bryant, R. A., Humayun, A., Jones, L. M., Kagee, A., Rousseau, C., Somasundaram, D., Suzuki, Y., Wessely, S., van Ommeren, M., & Reed, G. M. (2017). A review of current evidence regarding the ICD-11 proposals for diagnosing PTSD and complex PTSD. *Clinical Psychology Review*, *58*, 1–15. https://doi.org/10.1016/j.cpr.2017.09.001

Briggs, P. C., Hayes, S., & Changaris, M. (2018). Somatic experiencing® informed therapeutic group for the care and treatment of biopsychosocial effects upon a gender diverse identity. *Frontiers in Psychiatry*, *9*, 53. https://doi.org/10.3389/fpsyt.2018.00053

Brown, E. E., Gerretsen, P., Pollock, B., & Graff-Guerrero, A. (2018). Psychiatric benefits of lithium in water supplies may be due to protection from the neurotoxicity of lead exposure. *Medical Hypotheses*, *115*, 94–102. https://doi.org/10.1016/j.mehy.2018.04.005

Chow, C. K., Atkins, E. R., Billot, L., Chalmers, J., Hillis, G. S., Hay, P., Neal, B., Nelson, M., Patel, A., Reid, C. M., Schlaich, M., Usherwood, T., Webster, R., & Rodgers, A. (2021). Ultra-low-dose quadruple combination blood pressure-lowering therapy in patients with hypertension: The quartet randomized controlled trial protocol. *American Heart Journal*, *231*, 56–67. https://doi.org/10.1016/j.ahj.2020.09.017

Conventry, P. A., Meader, N., Melton, H., Temple, M., Dale, H., Wright, Y., & Gilbody, S. (2020). Psychological and pharmacological interventions for posttraumatic stress disorder and comorbid mental health problems following complex traumatic events: Systematic review and component network meta-analysis. *Public Library of Science Medicine*, *17*(8), e1003262. https://doi.org/10.1371/journal

Cougle, J. R., Resnick, H., & Kilpatrick, D. G. (2009). PTSD, depression, and their comorbidity in relation to suicidality: Cross-sectional and prospective analyses of a national probability sample of women. *Depression and Anxiety*, *26*(12), 1151–1157. https://doi.org/10.1002/da.20621

Danson, E. J., Li, D., Wang, L., Dawson, T. A., & Paterson, D. J. (2009). Targeting cardiac sympathovagal imbalance using gene transfer of nitric oxide synthase. *Journal of Molecular and Cellular Cardiology*, *46*(4), 482–489. https://doi.org/10.1016/j.yjmcc.2008.12.013

De Jongh, A., Resick, P. A., Zoellner, L. A., Van Minnen, A., Lee, C. W., Monson, C. M., Foa, E. B., Wheeler, K., Broeke, E., Feeny, N., Rauch, S. A. M., Chard, K. M., Mueser, K. T., Sloan, D. M., Van der Gaag, M., Rothbaum, B. O., Neuner, F., De Roos, C., Hehenkamp, L. M. J., … Bicanic, I. A. E. (2016). Critical analysis of the current treatment guidelines for complex PTSD in adults. *Depression and Anxiety*, *33*(5), 359–369. https://doi.org/10.1002/da.22469

Devanand, D. P., Crocco, E., Forester, B. P., Husain, M. M., Lee, S., Vahia, I. V., Andrews, H., Simon-Pearson, L., Imran, N., Luca, L., Huey, E. D., Deliyannides, D. A., & Pelton, G. H. (2022). Low dose lithium treatment of behavioral complications in Alzheimer's disease: lit-AD randomized clinical trial. *The American Journal of Geriatric Psychiatry*, *30*(1), 32–42. https://doi.org/10.1016/j.jagp.2021.04.014

Dyer, A., Borgmann, E., Kleindienst, N., Feldmann Jr., R. E., Vocks, S., & Bohus, M. (2013). Body image in patients with posttraumatic stress disorder after childhood sexual abuse and co-occurring eating disorder. *Psychopathology*, *46*(3), 186–191. https://doi.org/10.1159/000341590

Elton, J., Stage, K., Sternhagen Nielsen, A. B., & Hjort Svendsen, A. L. (2021). The experience of basic body awareness therapy and its transfer to daily life amongst Danish military veterans with PTSD. *Journal*

of Bodywork and Movement Therapies, *28*, 202–211. https://doi.org/10.1016/j.jbmt.2021.07.001

Endicott, J., Spitzer, R. L., Fleiss, J. L., & Cohen, J. (1976). The global assessment scale. A procedure for measuring overall severity of psychiatric disturbance. *Archives of General Psychiatry*, *33*(6), 766–771. https://doi.org/10.1001/archpsyc.1976.01770060086012

Fischer, A., Mayer, B., & Kummer, W. (1996). Nitric oxide synthase in vagal sensory and sympathetic neurons innervating the guinea-pig trachea. *Journal of the Autonomic Nervous System*, *56*(3), 157–160. https://doi.org/10.1016/0165-1838(95)00085-2

Gandotra, K., Jaskiw, G. E., Wilson, B., Konicki, P. E., Rosenberg, C. E., & Strohl, K. P. (2019). Low-Dose risperidone diminishes the intensity and frequency of nightmares in post-traumatic stress disorder. *Sleep*, *42*(10), zsz144. https://doi.org/10.1093/sleep/zsz144

Harned, M. S., Najavits, L. M., & Weiss, R. D. (2006). Self-Harm and suicidal behavior in women with comorbid PTSD and substance dependence. *The American Journal on Addictions*, *15*(5), 392–395. https://doi.org/10.1080/10550490600860387

Herman, J. L. (1992). *Trauma and recovery*. Basic Books.

Hoskins, M., Pearce, J., Bethell, A., Dankova, L., Barbui, C., Tol, W. A., Van Ommeren, M., De Jong, J., Seedat, S., Chen, H., & Bisson, J. I. (2015). Pharmacotherapy for post-traumatic stress disorder: systematic review and meta-analysis. *The British Journal of Psychiatry*, *206*(2), 93–100. https://doi.org/10.1192/bjp.bp.114.148551

Jarero, I., Artigas, L., Montero, M., & Lena, L. (2008). The EMDR integrative group treatment protocol: Application with child victims of a mass disaster. *Journal of EMDR Practice and Research*, *2*(2), 97–105. https://doi.org/10.1891/1933-3196.2.2.97

Kitchner, I., & Greenstein, R. (1985). Low dose lithium carbonate in the treatment of post traumatic stress disorder: Brief communication. *Military Medicine*, *150*(7), 378–381. https://doi.org/10.1093/milmed/150.7.378

Kito, Y., & Teramoto, N. (2012). Effects of hange-shashin-to (tj-14) and keishi-ka-shakuyaku-to (tj-60) on contractile activity of circular smooth muscle of the rat distal colon. *American Journal of Physiology-Gastrointestinal and Liver Physiology*, *303*(9), G1059–66. https://doi.org/10.1152/ajpgi.00219.2012

Kojima, M., Furukawa, T. A., Takahashi, H., Kawai, M., Nagaya, T., & Tokudome, S. (2002). Cross-cultural validation of the Beck Depression Inventory-II in Japan. *Psychiatry Research*, *110*(3), 291–299. https://doi.org/10.1016/s0165-1781(02)00106-3

Kuhfuß, M., Maldei, T., Hetmanek, A., & Baumann, N. (2021). Somatic experiencing-effectiveness and key factors of a body-oriented trauma therapy: A scoping literature review. *European Journal of Psychotraumatology*, *12*(1), 1929023. https://doi.org/10.1080/20008198.2021.1929023

Levine, P. A. (2010). *In an unspoken voice: How the body releases trauma and restores goodness*. North Atlantic Books.

Liu, Y., Li, X., & Qin, X. (2020). Saccharum granorum ameliorated mitochondrial dysfunction in chronic atrophic gastritis rats using organelle-specific metabolomics and network pharmacology approaches. *Food Research International*, *136*, 109503. https://doi.org/10.1016/j.foodres.2020.109503

Mauer, S., Vergne, D., & Ghaemi, S. N. (2014). Standard and trace-dose lithium: A systematic review of dementia prevention and other behavioral benefits. *The Australian and New Zealand Journal of Psychiatry*, *48*(9), 809–818. https://doi.org/10.1177/0004867414536932

Miklowitz, D. J., Efthimiou, O., Furukawa, T. A., Scott, J., McLaren, R., Geddes, J. R., & Cipriani, A. (2021). Adjunctive psychotherapy for bipolar disorder: A systematic review and component network meta-analysis. *JAMA Psychiatry*, *78*(2), 141–150. https://doi.org/10.1001/jamapsychiatry.2020.2993

Monnelly, E. P., Ciraulo, D. A., Knapp, C., & Keane, T. (2003). Low-Dose risperidone as adjunctive therapy for irritable aggression in posttraumatic stress disorder. *Journal of Clinical Psychopharmacology*, *23*(2), 193–196. https://doi.org/10.1097/00004714-200304000-00012

Omori, Y., Kanbayashi, T., Sagawa, Y., Imanishi, A., Tsutsui, K., Takahashi, Y., Takeshima, M., Takaki, M., Nishino, S., & Shimizu, T. (2018). Low dose of aripiprazole advanced sleep rhythm and reduced nocturnal sleep time in the patients with delayed sleep phase syndrome: An open-labeled clinical observation. *Neuropsychiatric Disease and Treatment*, *14*, 1281–1286. https://doi.org/10.2147/NDT.S158865

Ontario Health (Quality). (2021). Internet-Delivered cognitive behavioural therapy for post-traumatic stress disorder or acute stress disorder: A health technology assessment. *Ontario Health Technology Assessment Series*, *21*(9), 1–120.

Paulsen, S. I. (2017). *When there are no words. Repairing early trauma and neglect from the attachment period with EMDR therapy*. A Bainbridge Institute for integrative psychology publication.

Porges, S. W. (2003). Social engagement and attachment: A phylogenetic perspective. *Annals of the New York Academy of Sciences*, *1008*, 31–47. https://doi.org/10.1196/annals.1301.004

Rathbone, J., Zhang, L., Zhang, M., Xia, J., Liu, X., Yang, Y., & Adams, C. E. (2007). Chinese herbal medicine for schizophrenia: Cochrane systematic review of randomised trials. *The British Journal of Psychiatry*, *190*, 379–384. https://doi.org/10.1192/bjp.bp.106.026880

Robert, S., Hamner, M. B., Durkalski, V. L., Brown, M. W., & Ulmer, H. G. (2009). An open-label assessment of aripiprazole in the treatment of PTSD. *Psychopharmacology Bulletin*, *42*(1), 69–80.

Shapiro, F. (1995). *Eye movement desensitization and reprocessing (EMDR): Basic principles, protocols, and procedures*. Guilford Press.

Snoek, A., Beekman, A. T. F., Dekker, J., Aarts, I., Van Grootheest, G., Blankers, M., Vriend, C., Van den Heuvel, O., & Thomaes, K. (2020). A randomized controlled trial comparing the clinical efficacy and cost-effectiveness of eye movement desensitization and reprocessing (emdr) and integrated emdr-dialectical behavioural therapy (DBT) in the treatment of patients with post-traumatic stress disorder and comorbid (sub) clinical borderline personality disorder: Study design. *BMC Psychiatry*, *20*(1), *396*. https://doi.org/10.1186/s12888-020-02713-x

Sugiyama, T. (2021). *Textbook traumatic stress protocol for developmental trauma disorder and complex post-traumatic stress disorder*. Nihon hyoronsha.

Sutherland, S. M., & Davidson, J. R. (1994). Pharmacotherapy for post-traumatic stress disorder. *The Psychiatric Clinics of North America*, *17*(2), 409–423.

Szafranski, D. D., Smith, B. N., Gros, D. F., & Resick, P. A. (2017). High rates of PTSD treatment dropout: A possible red herring? *Journal of Anxiety Disorders*, *47*, 91–98. https://doi.org/10.1016/j.janxdis.2017.01.002

Takenoshita, M., Motomura, H., & Toyofuku, A. (2017). Low-Dose aripiprazole augmentation in amitriptyline-resistant burning mouth syndrome: Results from two cases. *Pain Medicine*, *18*(4), 814–815. https://doi.org/10.1093/pm/pnw200

Tanaka, R. (2019). Use of keishikashakuyakuto and shimotsuto for flashback of traumatized patients: Revived. *Journal of Japanese Association of Oriental Psychosomatic Medicine*, *34*(1 / 2), 34–38.

Van der Kolk, B. A. (2005). Developmental trauma disorder: Toward a rational diagnosis for children with complex trauma histories. *Psychiatric Annals*, *35*(5), 401–408. https://doi.org/10.3928/00485713-20050501-06

Villarreal, G., Calais, L. A., Cañive, J. M., Lundy, S. L., Pickard, J., & Toney, G. (2007). Prospective study to evaluate the efficacy of aripiprazole as a monotherapy in patients with severe chronic posttraumatic stress disorder: An open trial. *Psychopharmacology Bulletin*, *40*(2), 6–18.

Walker, E. A., Katon, W., Russo, J., Ciechanowski, P., Newman, E., & Wagner, A. W. (2003). Health care costs associated with posttraumatic stress disorder symptoms in women. *Archives of General Psychiatry*, *60*(4), 369–374. https://doi.org/10.1001/archpsyc.60.4.369

Warmingham, J. M., Rogosch, F. A., & Cicchetti, D. (2020). Intergenerational maltreatment and child emotion dysregulation. *Child Abuse & Neglect*, *102*, 104377. https://doi.org/10.1016/j.chiabu.2020.104377

Watanabe, H. (1998). Protective effect of a traditional medicine, shimotsu-to, on brain lesion in rats. *The Journal of Toxicological Sciences*, *23 Suppl 2*, 234–236. https://doi.org/10.2131/jts.23.supplementii_234

Watanabe, H., Ni, J. W., Ohta, H., Ni, X. H., & Matsumoto, K. (1991). A Kampo prescription, shimotsu-to, improves scopolamine-induced spatial cognitive deficits in rats. Yakubutsu Seishin Kodo, *11*(3), 215–222.

Webster, R., Salam, A., De Silva, H. A., Selak, V., Stepien, S., Rajapakse, S., Amarasekara, S., Amarasena, N., Billot, L., De Silva, A. P., Fernando, M., Guggilla, R., Jan, S., Jayawardena, J., Maulik, P. K., Mendis, S., Mendis, S., Munasinghe, J., Naik, N., & TRIUMPH Study Group. (2018). Fixed low-dose triple combination antihypertensive medication vs usual care for blood pressure control in patients with mild to moderate hypertension in Sri Lanka: A randomized clinical trial. Journal of American Medical Association, *320*(6), 566–579. https://doi.org/10.1001/jama.2018.10359

World Health Organization. (2018). International Classification of Diseases 11th Revision (ICD-11). https://icd.who.int/en

Zeng, D., Luo, J., & Fan, X. (2007). Clinical observation on effect of jieyu anshen decoction combined with aripiprazole in treating chronic schizophrenia. *Zhongguo Zhong Xi Yi Jie He Za Zhi*, *27*(4), 358–361.

Zhou, X., Teng, T., Zhang, Y., Del Giovane, C., Furukawa, T. A., Weisz, J. R., Li, X., Cuijpers, P., Coghill, D., Xiang, Y., Hetrick, S. E., Leucht, S., Qin, M., Barth, J., Ravindran, A. V., Yang, L., Curry, J., Fan, L., Silva, S. G., & Xie, P. (2020). Comparative efficacy and acceptability of antidepressants, psychotherapies, and their combination for acute treatment of children and adolescents with depressive disorder: A systematic review and network meta-analysis. *The Lancet. Psychiatry*, *7*(7), 581–601. https://doi.org/10.1016/S2215-0366(20)30137-1

Disclosure. The author has no relevant financial interest or affiliations with any commercial interests related to the subjects discussed within this article.

Acknowledgments. We would like to thank Tamaki Amano (OPNDR) and Enago (www.enago.jp) for the English language review.

Funding. The authors received no specific grant or financial support for the research, authorship, or publication of this article.

Correspondence regarding this article should be directed to Keisuke Wakusawa, Department of Developmental Neuropsychiatry, Miyagi Children's Hospital, 4-3-17, Ochiai, Aobaku, Sendai, Miyagi, 989-3126, Japan. Email: k-wakusawa@nifty.com