
Healing the Body and Mind: Sensory and Somatic Interventions for Interpersonal Trauma

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Key Words

- Interpersonal trauma
- Recovery
- Sensory interventions
- Somatic interventions
- Mindfulness
- Neurofeedback

Abstract

In this rapid systematic review, research literature was investigated to evaluate sensory and somatic interventions that aid in the recovery of interpersonal traumatic experiences. This review included the evaluation of creativity-based (art, dance, music), mindfulness, neurofeedback, and emerging therapy interventions (adventure, play, resilience, neurophysiological psychotherapy). Many individuals who have been exposed to one or more traumatic events will experience a variety of side effects or consequences that will impact the rest of their lives. Survivors often experience imbalances in their psychological as well as their physical wellbeing. These imbalances are often presented in different aspects of life as well as in various parts of the body. Yet, there is little research to evaluate the effectiveness of interventions that are sensory and somatic based. The majority of our overall review indicate that there is moderate to strong evidence to support sensory and somatic based interventions used to aid in the recovery of those who have experienced an interpersonal traumatic event.

Focused Clinical Question

The purpose of this rapid systematic review is to critically appraise the evidence of the effectiveness of sensory and somatic interventions to aid interpersonal trauma survivors in recovery.

Throughout the lifespan, for individuals who have experienced interpersonal trauma, what is the effectiveness of using sensory and somatic interventions to aid in recovery?

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Operationalizing Terms

The term “trauma” does not adequately capture the form of violence intentionally caused by a person, as trauma can also occur as a result of motor vehicle accidents, natural disasters, and other distressing events. For this reason, the term “interpersonal trauma” will be used throughout this review to denote the unique form of trauma that can result from experiencing violence at the hands of another person. Interpersonal trauma is “defined as involving any of the following traumatic experiences: emotional abuse (EA), emotional neglect (EN), physical abuse (PA), physical neglect (PN), and/or sexual abuse (SA) in childhood and/or adulthood” (Mauritz et al., 2013, “Operationalization of concepts” section).

Somatic interventions are body-based and involve movement while not requiring verbal expression (Warner et al., 2014). Somatic interventions aim to increase interoception and bring awareness to the body’s experience as a way of improving self-regulation (Warner et al., 2014). Sensory approaches to treating trauma aim to “draw out the sensory information that is blocked and frozen by trauma” (van der Kolk, 2014, p. 98).

The primary outcome being addressed in this review is the umbrella term of “recovery.” According to the Substance Abuse and Mental Health Services Administration (SAMHSA), “recovery is a process of change through which people improve their health and wellness, live self-directed lives, and strive to reach their full potential” (2020, para. 1). This definition of recovery involves four dimensions: health, home, purpose, and community (SAMHSA, 2020). This review aims to examine whether sensory and somatic-based interventions aid in facilitating progress toward recovery for people across the lifespan who have experienced interpersonal trauma.

Statement of Problem and Background

Different forms of interpersonal violence exist, including child abuse, intimate partner violence, elder abuse, and others (Centers for Disease Control and Prevention [CDC], 2018). The CDC reports that one in four women and one in 10 men in the United States have experienced intimate partner violence at some point in their life (2020b). Additionally, one in seven children has experienced abuse (CDC, 2021), and one in 10 people in the US over the age of 60 has experienced elder abuse (CDC, 2020a). The prevalence of interpersonal violence and resulting trauma

necessitate research into interventions that effectively address interpersonal violence and its ramifications.

Experiencing interpersonal trauma greatly impacts one’s psychological and physical health and well-being (López-Martínez et al., 2018). The consequences of this form of abuse are different from those experienced by individuals who experience trauma for reasons not caused by a person (López-Martínez et al., 2018). Additionally, the risk for developing PTSD is higher among individuals who have experienced interpersonal trauma (López-Martínez et al., 2018). A meta-analysis found an association between sexual abuse at any age and having a diagnosis of “anxiety, depression, eating disorders, posttraumatic stress disorder, sleep disorders, and suicide attempts” (Chen et al., 2010, “Results” section). Childhood trauma especially has been shown to impact one’s physical health as an adult. One study found that adults who experienced interpersonal abuse as children were more likely to experience higher risks of developing heart disease, cancer, and other adverse health outcomes as adults (Felitti et al., 1998). These adults were also more likely to rate their health as “poor” (Felitti et al., 1998). Such psychological and physiological conditions impact one’s overall well-being and overall occupational performance and participation, especially in social participation, activities of daily living, work, education, sleep and rest, play, and leisure (Petrenchik & Weiss, 2015). For this reason, it is vital to better understand the effects of interpersonal violence and how individuals who experience interpersonal trauma can progress toward recovery.

Interpersonal trauma’s complex consequences indicate that complex treatment is needed to address the effects on both the body and mind (Ogden et al., 2006). Research regarding sensory and somatic interventions for interpersonal trauma is emerging, but currently limited (van der Kolk, 2014) due to the complexity of factors involved in addressing trauma, such as ethics, court processes, trust toward the healthcare community, and others (McGreevy, 2020; Mueller & McCullough, 2017). This review aims to appraise the current literature on sensory and somatic interventions for people who have experienced interpersonal trauma in order to better understand the effectiveness of these interventions. This review also aims to find implications for occupational therapy practice regarding sensory and somatic interventions for interpersonal trauma.

Method for Conducting the Evidence-Based Review

This rapid systematic review aims to appraise the evidence for sensory and somatic interventions that are within the scope of occupational therapy in progressing individuals who have experienced interpersonal trauma toward recovery. Evidence from any country was considered for inclusion in this rapid systematic review.

Articles that met the following inclusion criteria were considered for review:

- Published in 2015 or after
- Participants' experience of interpersonal trauma
- Involved sensory and/or somatic interventions
- Level I-III evidence
- Written in English

Articles were excluded from the review for the following reasons:

- Published before 2015
- Written in a language other than English
- Meta-analysis or systematic review
- Level IV or V evidence
- Participants experienced trauma that was not interpersonal
- Intervention did not involve a sensory or somatic component

Covidence was used to screen articles according to the inclusion and exclusion criteria (Covidence, 2021). The initial search of PsycINFO, PubMed, and CINAHL databases retrieved 1,782 articles to be considered for title and abstract review. A team of five occupational therapy students participated in the screening process, and two screeners were required to agree on the article to progress it to the next screening stage. After the title and abstract screen, 76 articles progressed to the full text review. A total of 22 articles in the full text review met the inclusion criteria and were included in this review. Additionally, three articles were hand selected.

Table 1

Search Terms

Database(s)	Search Terms	Filters
PubMed	("Interpersonal Relations"[Mesh]) AND ("Violence"[Mesh]) AND ("trauma informed"[Text Word]) AND ("therapy"[Text Word]) OR (("body psychotherapy"[Text Word]) OR ("sensory integration" [Text Word]) OR ("sensory intervention"[Text Word]) OR ("sensory art therapies"[Text Word]) OR ("mindfulness therapy"[Text Word]) OR ("complementary therapies"[MeSH]) OR ("Biofeedback, Psychology"[Mesh]) OR ("massage"[MeSH])) AND (("child abuse"[Text Word]) OR (adverse experience[Text Word]) OR ("domestic violence"[Text Word]) OR ("sexual abuse"[Text Word]) OR ("complex trauma"[Text Word]) OR ("interpersonal violence"[Text Word]))	Published in 2015-2021; English; Academic journals
PsycINFO and CINAHL	(("Interpersonal Relations" AND "Violence") OR "child abuse" OR "adverse experience" OR "domestic violence" OR "sexual abuse OR complex trauma OR "interpersonal violence") NOT (veterans or military or soldiers or servicemen) NOT (refugees or asylum seekers) AND (therapy OR sensory integration OR sensory intervention OR sensory art therapies OR mindfulness OR complementary therapies OR massage OR tai chi OR music OR mind-body therapy OR dance OR Art OR performing arts OR play)	Published in 2015-2021; English; Academic journals

Note. Search terms used in PubMed, CINAHL, and PsycINFO

This rapid systematic review grades the level of evidence of each study by using the guidelines as proposed by Sackett et al. (1996), defined as the following:

- *Level I:* Systematic reviews, meta-analyses, randomized controlled trials
- *Level II:* Two groups, nonrandomized studies (e.g., cohort, case-control)
- *Level III:* One group, nonrandomized (e.g., before and after, pretest and posttest)
- *Level IV:* Descriptive studies that include analysis of outcomes (single-subject design, case series)
- *Level V:* Case reports and expert opinions that include narrative literature reviews and consensus statements.

Figure 1

PRISMA Diagram



Note. PRISMA diagram generated from Covidence.

The strength of evidence is appraised using AOTA's Strength of Evidence Guidelines (American Occupational Therapy Association [AOTA], 2020). These guidelines define strong evidence as having two or more Level I studies and being well-designed. Moderate evidence has at least one Level I study or multiple Level II or III studies and has sufficient findings while lacking some confidence due to the "number, size, or quality of individual studies or inconsistency of findings across individual studies" (AOTA, 2020, p. 4). Low-level evidence has a "small number of low-level studies, flaws in the studies," (AOTA, 2020, p. 4) and insufficient evidence to assess outcomes (AOTA, 2020).

Results

This rapid systematic review includes 25 different studies: seven Level I randomized controlled trials, 10 Level II studies, and eight Level III studies. The studies were categorized by intervention approach and include creativity-based therapies, mindfulness, neurofeedback, and emerging interventions. Further report of results and summary of studies can be found in the evidence table (Table 2).

Creativity-Based Therapies (Art, Dance, Music)

Therapies utilizing creative methods are a relatively common intervention for improving health and well-being in individuals who have experienced interpersonal trauma. These methods include using art, dance, and music as a means for expressing oneself.

Ten different studies were analyzed to determine effectiveness of various creative forms on the recovery process of participants throughout the lifespan who have experienced different forms of interpersonal trauma. Two of these studies were Level I randomized controlled trials, three were Level II nonrandomized studies with two-groups, and five were single-group Level III studies. Together, these studies provided moderate strength of evidence.

Art.

Two Level II studies and three Level III studies examined the impact of art-based therapies on the trauma-related symptoms of individuals who have experienced interpersonal trauma. Together, these five studies have a moderate strength of evidence.

A Level III single group repeated measures study (Becker, 2015) found evidence that supported the use of group art therapy combined with cognitive behavioral therapy (CBT) principles in decreasing the severity and number of posttraumatic symptoms and

depression symptoms in adults who have experienced childhood sexual abuse.

A Level III single group cohort study (Dauber et al., 2015) found evidence that supported the Trauma Recovery Program, involving creative arts, CBT, and attachment-based therapies, in decreasing the posttraumatic symptoms of children who have experienced trauma.

A Level III single group repeated measures study (Özkafacı & Eren, 2020) researched the effects of group marbling art therapy on Turkish adult women who are survivors of domestic violence. The study found statistically significant decreases in depression symptoms, anxiety frequency, and hopelessness.

A Level II nonrandomized controlled trial (van Westrhenen et al., 2019) compared an intervention group participating in the Creative Arts Therapy program with a control group participating in a non-therapeutic court preparation program. Participants were South African children who have experienced trauma. The study found statistically significant decreases in hyperarousal and avoidance symptoms.

A Level III single group repeated measures study (Zielona-Jenek et al., 2019) found evidence that supported the use of a group focusing and art therapy program in increased satisfaction with appearance, decreased disturbances with body identity, and decreased emotional and physiological regulation difficulties in Polish women who are survivors of domestic violence.

A Level II randomized controlled trial (Parra et al., 2020) found evidence to support recreational plastic expression while using emotional freedom techniques to decrease PTSD symptoms in children who were boarded for abuse-related trauma.

Dance Therapy.

One Level III study and one Level II study attempted to determine whether dance interventions were effective in improving self-esteem, pain, health, and emotional control for adults who had experienced trauma or sexual abuse. Together, these studies had a low strength of evidence for dance therapy's effect on these outcomes.

A single-group nonrandomized Level III study did not find any statistical significance ($p < 0.05$) in improvements seen before and after a five-week dance movement therapy intervention (Ho, 2015).

One nonrandomized two group Level II study viewing Flamenco dance in adult participants found statistical significance when comparing scores between groups post-intervention (Koch et al., 2019). These

scores included well-being ($p = 0.033$), perceived pain level ($p = 0.048$), and perceived health ($p = 0.000$) with more positive scores reported in the intervention group (Koch et al., 2019). However, all effect sizes were small or moderate, except for perceived health scores ($\eta^2 = 0.38$).

Music.

Two of the ten creativity-based studies were Level I studies that implemented music interventions for children who were victims of child maltreatment and parent-child dyads who were affected by the parent's childhood abuse/neglect. These two articles provided moderate strength of evidence.

The first Level I study examined if the music intervention, Tuning Relationships with Music, increased responsive parent-adolescent interactions and parent emotion coaching while reducing conflict and adolescent mental health difficulties (Colegrove et al., 2018). The intervention group received the musical program as well as treatment as usual (TAU) while the control group only received TAU. The study found changes that were statically significant including parent participants being less reactive and more responsive with their adolescents and dyads reporting less conflict in their relationship (Colegrove et al., 2018).

The second Level I study examined the effectiveness of a community-based group music therapy program on children exposed to ongoing child maltreatment and poverty in South Korea (Kim, 2017). The intervention group received the group music therapy program as well as standard care while the control group only received standard care. While the study found that the group music therapy was significantly more effective than standard care at reducing internalizing behavioral problems including being depressed/anxious, having attention problems, and being withdrawn, the effect sizes were small in all measures (Kim, 2017).

Mindfulness

Nine studies examined the effectiveness of mindfulness-based interventions on treating individuals across the lifespan who have experienced interpersonal trauma. Out of these nine studies, there were three Level I randomized controlled trials, four Level II nonrandomized studies with two groups, and two single-group Level III studies. Together, these studies provided strong strength of evidence.

One Level II case control study (Caldwell & Shaver, 2015) found evidence to support that Restoring Embodied Awareness, Compassionate Connection, and

Hope (REAC²H) programming relating to both mindfulness and attachment significantly increased mindfulness, decreased rumination, and increased emotional clarity in the intervention group.

A level III pilot cohort study (Gallegos et al., 2015) evaluated the effects of using mindfulness-based stress reduction (MBSR) to impact psychological and functioning as well as inflammatory biomarkers. Researchers found evidence to support the use of a mindfulness-based stress reduction (MBSR) overtime to decrease stress, depression, anxiety, PTSD, emotion dysregulation, and post stress inflammatory response in low-income female survivors of interpersonal violence.

One Level II case control study examined the impact mindfulness-based cognitive therapy had on decreasing anxiety and depression in women victims of domestic violence in Tehran, Iran (Ghahari et al., 2017). The mindfulness-based cognitive therapy intervention included some of the following: meditation, physical checking, three-minute breathing space, mindfulness of the body, and thought training (Ghahari et al., 2017). The intervention group received the mindfulness-based cognitive therapy and effects were compared to a waitlist control group. The study found there was highly statistical significance in the effectiveness of the intervention in reducing depression and state anxiety and statistical significance in the effectiveness in reducing trait anxiety in the intervention participants (Ghahari et al., 2017).

One Level II case control study (Joss et al., 2020a) evaluated the effect of mindfulness-based stress reduction (MBSR) on psychological symptoms and amygdala morphometry in individuals who have experienced childhood maltreatment. The intervention group demonstrated a significant correlation between right amygdala volumetric changes and intervention compliance and improvement in self-compassion. The intervention group also demonstrated a significant negative correlation between left amygdala volumetric changes and perceived stress and interpersonal distress.

One Level II case control study (Joss et al., 2020b) evaluated the effect of mindfulness-based stress reduction (MBSR) on episodic memory, psychological symptoms, and hippocampal morphometry in individuals who have experienced childhood maltreatment. The intervention group demonstrated a significant negative correlation in one area of growth in the left hippocampus and perceived stress.

A Level I pilot randomized waitlist-controlled trial (Kelly & Garland, 2016) evaluated the capability of an eight-week trauma-informed mindfulness-based

stress reduction (TI-MBSR) to improve PTSD symptoms, symptoms of depression and anxiety, and measures of anxious and avoidant attachment. The group receiving the intervention demonstrated strong clinical significance to support the use of TI-MBSR to significantly decrease PTSD symptoms, depressive symptoms and anxious attachment symptoms in female survivors of interpersonal violence.

A Level I randomized controlled trial (Lee et al., 2017) found evidence to support the use of a six-week mindfulness-based Tibetan meditation that focused on breathing, Nying-je (loving kindness) and Tonglen (compassion). This intervention group demonstrated improved mental health outcomes and decreased PTSD symptoms demonstrating benefits of the mindfulness-based Tibetan meditation as a complementary therapy in female survivors of interpersonal violence.

One Level I randomized controlled trial (Michalopoulou et al., 2015) evaluated the effectiveness of relaxation breathing (RB) and progressive muscle relaxation (PMR) stress management techniques on stress, health locus of control, depression symptoms, and coping for women who have experienced abuse. The study found a medium treatment effect ($r = 0.45$) for RB and PMR on perceived stress.

One Level III single group pre- and post-test cohort study (Nicotera & Connolly, 2020) evaluated the effect of Trauma Informed Yoga (TIY) on mindfulness and emotion regulation in female survivors of sexual assault and abuse. The intervention group demonstrated significant improvement in factors of mindfulness including describing experiences, not judging inner experiences, and the capacity to observe self. The intervention group also demonstrated significant improvement in factors of emotional regulation related to emotional clarity, accepting emotions, engaging with goals, and having strategies to regulate emotions.

Neurofeedback Therapy

One Level I study and one Level III study evaluated the effectiveness of neurofeedback therapy (NFT) on mental health, social emotional skills, and trauma symptoms in individuals who had experienced interpersonal trauma. There was moderate evidence to support the use of NFT in assisting this population in the recovery process.

A randomized controlled trial by Rogel et al. (2020) determined that after 24 sessions of video game based NFT with children ages six to 13 years old, the number of reported undesired behaviors had been significantly reduced and significantly lower than the

control group and remained this way at the one-month measure. Reported alexithymia was significantly lower in the intervention group after NFT but did not continue to be statistically significant at the one-month follow-up. This was also true of depressive and overall trauma symptoms, with the NFT group having fewer of these symptoms than the control group (Rogel et al., 2020).

A single-group Level III study by Brown et al. (2019), utilized NFT in adult participants by involving television shows and musicals. The program chosen by the participant would move on the screen and continue audio inputs if measured brain activity goals were met. Statistical significance was reported in regard to reducing depression, anxiety, and PTSD symptoms (p -values = 0.000) when comparing before intervention to after the completion of an average of 42 sessions of NFT (Brown et al., 2019).

Emerging Interventions (Adventure, Play, Resilience, and Neuro-Physiological Psychotherapy)

Four different studies were analyzed to determine the effectiveness of various emerging interventions on treating individuals throughout the lifespan who have experienced interpersonal trauma. The various emerging interventions included an adventure therapy program, family play therapy, a resilience intervention, and neuro-physiological psychotherapy. Out of these four studies, there was a Level I randomized controlled trial and three Level II nonrandomized studies with two-groups. Together, these studies provided moderate strength of evidence.

Adventure.

One Level II quasi-experimental study examined how a trauma-informed adventure therapy program impacted the trauma symptoms and family functioning of child and adolescent survivors of abuse and neglect and their families (Norton et al., 2019). In this study child-caregiver dyads in the intervention group received trauma-informed Family Enrichment Adventure Therapy (FEAT) and traditional counseling services (intervention group) while control group only received traditional counseling services. While there were some improvements in the outcome measures, the results concluded there were no statistically significant gains or losses for the dyads participating in FEAT pre-to-post intervention. (Norton et al., 2019).

Play.

One Level II case control study examined the effectiveness of a crisis-based family play intervention, Family Intervention for Improving Occupational Performance (FI-OP), in improving mother-child

interaction and children's play functioning in mother-child dyads who had experienced domestic violence (Waldman-Levi, A., & Weintraub, N., 2015). The intervention group received the FI-OP program while the control group participated in a playroom program. The study found that mother-child interaction was significantly better in the FI-OP group and that the children in the FI-OP significantly improved their play skills compared to the control group, in which no significant improvements were discovered (Waldman-Levi, A., & Weintraub, N., 2015).

Resilience.

A Level I pilot randomized controlled trial (Chandler et al., 2015) showed low evidence to support the use of an empower resilience intervention (ERI) to increase resilience and healthy behaviors and decrease negative symptoms and behaviors. The intervention group comprising female college students who had experienced an adverse childhood experience (ACE) demonstrated an increase in resilience and health related behaviors in four weeks.

Neuro-Physiological Psychotherapy.

One Level II study assessed how an intervention with a focus on behavior, cognition, and somatic and sensory approaches, called Neuro-Physiological Psychotherapy, affects undesired behaviors in children exposed to adverse childhood experiences (McCullough & Mathura, 2019). This two-group, nonrandomized study determined that the intervention group had significantly more improved global executive composite ($p = 0.008$) and behavioral regulation ($p = 0.000$) scores on the Behavioral Rating Inventory of Executive Functioning (BRIEF) as compared to the control group. When comparing the child participants from both groups who had started the study with high scores on the Child Behavior Checklist (CBCL), the intervention group had significantly fewer total problems ($p = 0.023$) and externalizing problems ($p = 0.025$) than the control group post-intervention (McCullough & Mathura, 2019).

Discussion and Implications for Future Practice and Research

The results from the 25 studies evaluated in this rapid systematic review provide some of the most current evidence available on the topic of sensory and somatic interventions to aid in the recovery of individuals across the lifespan who have experienced interpersonal trauma. From our findings, we concluded that nine studies using mindfulness interventions provided strong strength of evidence, indicating that

these approaches are effective resources that can significantly impact the aid in the recovery for this specific population. In addition, there was moderate strength of evidence for several other interventions evaluated in this review including neurofeedback therapy, emerging interventions, art therapy, and music therapy. Lastly, there were two studies focusing on dance therapy that provided low strength of evidence. Even though this is the lowest level of strength of evidence, these studies should still be considered because their data is valuable and can be utilized in future research. With several Level I studies and a numerous amount of strong Level II and III studies, this rapid systematic review provides ample data to support the use of sensory and somatic interventions in various rehabilitative practices to aid in the recovery of individuals who have experienced interpersonal trauma. Depending on the interpretation of each studies' results, the field of occupational therapy in particular may find significant benefits in the use of these interventions in their practice.

Individuals across the lifespan who have experienced interpersonal trauma is an emerging occupational therapy population in dire need of more evidence-based interventions, specifically somatic and sensory ones, to aid in the recovery process. Fortunately, the majority of the interventions evaluated in this review fall within the scope of occupational therapy. Additionally, many of these intervention studies provided strong supporting evidence with cost-effective benefits such as decreasing post-traumatic stress disorder (PTSD) symptoms, dysfunctional behavioral and emotional symptoms, and depression and increasing parent-child relations and behavioral regulation. Due to these factors, these interventions may be utilized and/or adapted to aid in the recovery of this specific population within the realm of occupational therapy. Moreover, there were multiple intervention studies that provided low to moderate strength of evidence. Due to the strength of evidence and limitations found within each of these studies, future research based on these interventions is necessary, and it is recommended that occupational therapists proceed with caution when considering the implementation of these interventions into practice. Instead, it may be suggested that these interventions be used supplemental to stronger evidence-based interventions. Overall, these studies provide applicable data on the effectiveness of these somatic and sensory interventions that should be considered by occupational

therapists when designing treatment plans to aid in the recovery of this crucial population.

Limitations

The studies within this review involved diverse limitations: absence of blinding, nonrandomization, dissimilar treatment between intervention and control groups, small sample sizes, lack of long-term follow up, diversity in country of origin inhibiting generalization, inadequate description of intervention for thorough replication, substantial self-report measures, and possible selection bias, among others. A notable limitation of the evidence within the grouping of mindfulness-based interventions is that Joss and colleagues published several articles utilizing the same sample of participants, resulting in overrepresentation of the given sample. Because the outcomes of two of Joss and colleagues' articles (2020a and 2020b) were relevant and diverse, the two articles were included in the review. Two additional Joss et al. articles were decisively excluded due to overlap in outcomes of interest. A limitation of the current systematic review is the scarcity of high-quality, Level I evidence within the literature due to the nature of the population of focus. The inclusion of hand-selected articles also may limit feasibility of replication of the search.

Conclusions

The population of individuals who have experienced a form of abuse or trauma at the hands of another person is substantial when compared to the current available evidence. A large gap in the literature calls for a need for both a greater quantity and quality of evidence. High quality evidence in the form of randomized controlled trials is necessary in this area of research, as less than 30% of the reviewed articles were of this type. Although the vulnerability of this population creates difficulty around creating studies involving interpersonal trauma, their vulnerability is the same reason that more evidence is necessary for supporting their recovery process and improving their overall quality of life.

Further research is required on the effectiveness of the sensory and somatic interventions on the recovery process of interpersonal trauma in order to determine potential practice guidelines or recommendations. However, results from the 25 articles reviewed show promise in the role of these interventions in aiding survivors of interpersonal trauma in their recovery. Strong evidence supports the use of mindfulness and creativity-based therapies, while

moderate evidence supports use of NFT and emerging therapies to improve the recovery process for individuals with a history of experiencing interpersonal trauma.

Results from this rapid systematic review demonstrate the requirements for more funding and research in this area, as well as the necessity of occupational therapy in the recovery process of interpersonal trauma.

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*Indicates studies reviewed for this article.

Table 2

Evidence Table

Author/Year	Level of Evidence/ Study Design/ Participants/ Inclusion Criteria	Intervention and Control Group	Outcome Measures	Results
ADVENTURE THERAPY				
<p>Norton et al. (2019). https://doi.org/10.1007/s40653-017-0133-4</p>	<p>Level of Evidence: Level II Study Design: Quasi-experimental, two-group design</p> <p><i>N</i> = 64 [Child-Caregiver Dyads]</p> <p>Child Age Range: 8-17 yrs</p> <p>Intervention: <i>n</i> = 18 children and 1 caregiver for each child Control: <i>n</i> = 14 children and 1 caregiver for each child</p> <p>Inclusion Criteria</p> <ul style="list-style-type: none"> • Dyads are clients of ChildSafe • Child/Adolescent was a survivor of abuse and neglect • The adult of the dyad was not a perpetrator of abuse • Children who are sexually reactive or siblings of primary clients who have sexually acted out on a 	<p>Intervention: Family Enrichment Adventure Therapy (FEAT) program connects family members with one another while they work together to connect with the outdoors and other families healing from the effects of child abuse and neglect. In conjunction with “talk therapy” in individual, group, and family settings, participants travel, hike, and camp outdoors, among other adventure-based activities. Along with the intervention, the participants continued to receive traditional counseling services at Childsafe.</p> <p>Control: Did not partake in FEAT program (intervention), but continued to receive traditional counseling services at ChildSafe</p>	<p>Outcome Measures:</p> <ul style="list-style-type: none"> • Trauma Symptom Checklist for Children (TSCC) • Family Assessment Device (FAD) • Qualitative Data was collected via focus groups. <p>Outcome measures were completed by both sample groups at baseline (before receiving any services) and at three-months post-admission.</p>	<p>Results: According to the quantitative results, there were improvements in the TSCC subscales of anxiety, anger, PTSD, and depression symptoms for youth who participated with their families in the FEAT program compared to youth who did not participate in the FEAT program. Depression levels for the intervention youth significantly improved at the three-month mark, with mean differences in all four subscales associated with strong effect sizes greater than 1.0. However, smaller to no improvements were reported in the three subscales for dissociation symptoms or sexual issues for the intervention youth. While the results showed no statistically significant gains or losses for families participating in FEAT pre-to-post intervention, data identified that the FEAT families moved from clinical to subclinical scores in areas of communication and general functioning. Furthermore, the FEAT families’ FAD scores decreased in all categories, indicating decreased stress in the family, with moderate effect sizes in the areas of communication. For the control group youth, there were no statistically significant differences on any TSCC subscales. Rather</p>

	primary client was allowed to participate in intervention if they received clearance from a mental health professional			than have any statistically significant improvements, the control group actually declined at a statistically significant rate in affective involvement. These quantitative results are supported by qualitative data. The qualitative results showed that FEAT families reported greater communication, trust/closeness, and problem-solving skills gained through adventure therapy intervention. The data also showed that the FEAT intervention enhanced family behavioral and skill building.
ART THERAPY				
Becker (2015) https://doi.org/10.1080/07421656.2015.1091643	<p>Level of evidence: Level III Study design: One group, nonrandomized, repeated measures</p> <p>N= 5 adults</p> <p>80% Female, 20% Male</p> <p>M age = 48.6 years</p> <p>Intervention group, n = 5</p> <p>Inclusion criteria:</p> <ul style="list-style-type: none"> • Ability to speak, read, and write in English • Between 18-90 years old • Have symptoms meeting PTSD criteria • Have experienced sexual abuse before age 16 	<p>Intervention: The intervention involved group art therapy and cognitive behavioral therapy (CBT) techniques. The intervention was administered for 2 hours once per week for 9 weeks. Each session featured a CBT theme and related art task and was followed by group discussion. During the sessions, participants recorded their Subjective Units of Distress (SUDs) every 2-3 minutes, which measure emotions on a scale of 0 to 100. If the participants ever experienced an SUD above 80 they were advised to stop sharing until their SUD decreased.</p>	<p>Outcome measures:</p> <ul style="list-style-type: none"> • Trauma Symptom Inventory (TSI) • PTSD Checklist-Civilian Version (PCL-C) • Beck Depression Inventory-II (BDI-II) <p>All outcome measures were administered directly before, directly after, and 1 month after treatment.</p>	<p>Results: The study found clinically significant decreases in the amount and severity of posttraumatic symptoms and depression symptoms.</p> <p>Effect sizes were measured as Cohen's <i>d</i>. Effect sizes measured directly after the treatment for the TSI, PCL-C, and BDI-II were 1.56, 2.05, and 1.44, respectively. One month after treatment the effect sizes for the TSI, PCL-C, and BDI-II were 1.51, 1.86, and 1.15, respectively.</p>
Dauber et al. (2015)	<p>Level of evidence: Level III Study design: Cohort study</p>	<p>Intervention: This study utilized the secondary data of children</p>	<p>Outcome measures:</p> <ul style="list-style-type: none"> • Trauma Symptom Checklist 	<p>Results: Participants displayed statistically significant decreases in posttraumatic</p>

<p>https://doi.org/10.1007/s10560-015-0393-5</p>	<p><i>N</i> = 31 children 61% Female, 39% Male M age = 12.15 years Intervention group, <i>n</i> = 31 Inclusion criteria:</p> <ul style="list-style-type: none"> ● Children who completed at least 3 months of Trauma Recovery Program (TRP) sessions ● Children who completed 2 standardized assessments ● Previous experience of trauma ● Being between 5-18 years old 	<p>who participated in the Trauma Recovery Program (TRP) at a child welfare treatment center. TRP involves creative arts, attachment-based, and cognitive-behavioral methods. Children participated in TRP for differing amounts of time, from 2 to 26 months.</p>	<p>for Children (TSCC)</p> <ul style="list-style-type: none"> ● The TSCC was administered before and after participants received TRP treatment. 	<p>symptoms after participation in TRP sessions.</p> <p>Effect sizes are reported as Cohen's <i>d</i>. Five of the six TSCC scales showed a statistically significant change ($p < .008$) with medium to large effect sizes. The scales of anxiety ($d = .60$), depression ($d = .64$), anger ($d = .64$), and dissociation ($d = .65$) demonstrated large effect sizes. The scale of sexual concerns ($d = .54$) demonstrated a medium effect size.</p>
<p>Ozkafaci & Eren (2020) https://doi.org/10.1016/j.aip.2020.101703</p>	<p>Level of evidence: Level III Study design: One group, nonrandomized, repeated measures <i>N</i> = 8 adults 100% Female M age = 42 years Intervention group, <i>n</i> = 8 Inclusion criteria:</p> <ul style="list-style-type: none"> ● Female ● Survivor of domestic violence ● Diagnosis of PTSD 	<p>Intervention: The intervention consisted of 14 sessions occurring once per week. Each session lasted for 120 minutes and included body and breathing techniques, art marbling, sharing, and discussion. Different marbling techniques were used to address specific psychological themes associated with experiencing domestic violence.</p>	<p>Outcome measures:</p> <ul style="list-style-type: none"> ● Beck Hopelessness Scale (BHS) ● Beck Depression Scale (BDS) ● Beck Anxiety Scale (BAS) <p>Each outcome measure was administered directly before and after the intervention program. All measures were administered in Turkish.</p>	<p>Results: The study found statistically significant decreases in participants' depression symptoms, anxiety frequency, and hopelessness.</p> <p>Results are reported as z-scores. The results of the outcome measures demonstrated decreased symptoms of depression ($z = -2.041$, $p < .05$), anxiety ($z = -2.214$, $p < .05$), and hopelessness ($z = -2.22$, $p < .05$).</p>

<p>Trejos et al. (2020) http://dx.doi.org/10.14482/psdc.37.1.155.4</p>	<p>Level of Evidence: Level II Study Design: Case Control <i>N</i> = 47 school age children boarded for abuse-related trauma Age = 7-14yrs old (actual mean not listed) Intervention group: <i>n</i> = 27 Control group: <i>n</i> = 20 Inclusion Criteria:</p> <ul style="list-style-type: none"> • Comply with the DSM-5 criteria for PTSD • Voluntary acceptance in the research participation • Being between the ages of 7-14 	<p>Intervention: The recreational plastic expression (RPE) program was a 2 hour, 6 session program that included, “ a short psychomotor activation phase, a central phase of the aforementioned program, and a final phase of awareness into the present moment while generating positive emotions” (Parra, et al., 2020, p. 10). It was a progressive program that utilized different art materials like puppets, masks drawings, paintings, collage, etc. Participants started with memory recall of traumatic event(s) first indirectly then directly and then eventually moved to where there was a project of life without PTSD developed. Emotional Freedom Techniques (EFT) were also implemented every 10 minutes throughout the RPE sessions. EFT phrases were converted into a song so that they would be more entertaining for the children. Control: Control group completed the same pre and post measures but no other protocols were identified.</p>	<p>Outcome Measures:</p> <ul style="list-style-type: none"> • DSM-5 PTSD Symptom Criteria <p>The singular outcome measure for this study was administered before and after EFT/RPE intervention.</p>	<p>Results: According to the one-tailed t-tests both groups showed significant differences between the pre and post assessments, but the intervention group improved significantly more; 46% stopped experiencing PTSD symptoms whereas there were only 28% in the control group. Both groups' symptoms either decreased or stopped likely due to being in a better environment where they were protected, away from the aggression, and were not experiencing new exposures. Plastic expression was found to be an adequate way of approaching therapy for mistreated children; due to incomplete verbal skills and hypoactivation of the stress speech area. EFT showed decreased in the stress response, adding to research about suppression of avoidance and facilitating the elaboration of a memory that may be traumatic.</p>
<p>van Westrhenen et al. (2019) https://doi.org/10.1371/journal.pone.0210857</p>	<p>Level of evidence: Level II Study design: Two groups, nonrandomized <i>N</i>= 47 children</p>	<p>Intervention: The Creative Arts in Psychotherapy (CAP) intervention involved ten 90-minute group sessions once per week. The program utilized different artistic expression</p>	<p>Outcome measures:</p> <ul style="list-style-type: none"> • Child PTSD Checklist (C-PTSD-C) • Child Behavior Checklist (CBCL) • Posttraumatic Growth 	<p>Results: Statistically significant results were found for decreased avoidance symptoms and decreased hyperarousal symptoms (both measured by the C-PTSD-C). None of the other variables showed statistically significant changes, including total PTSD symptoms,</p>

	<p>77% Female, 23% Male</p> <p>M age= 10.22 years</p> <p>Intervention group, n= 23 Control group, n= 24</p> <p>Inclusion criteria:</p> <ul style="list-style-type: none"> • 1 or more experiences of trauma occurring 3-12 months prior to study • Being between 7-13 years old • Able to speak English 	<p>methods (such as dance, mask decoration, and music) and combined those with psychotherapeutic practice techniques.</p> <p>Control: Children in the control group participated in a court preparation program.</p>	<p>Inventory for Children-Revised (PTGI-C-R)</p> <p>Each outcome measure was administered before and after the treatment program. In the control condition, measures were administered during the first session and again ~2 months after baseline.</p>	<p>reexperiencing symptoms, total behavioral problems, internalizing, externalizing, and posttraumatic growth characteristics.</p> <p>Effect sizes are reported as Cohen's <i>d</i>. Hyperarousal symptoms showed a statistically significant decrease ($d= .61$, $p<.05$) with a medium effect size. Avoidance symptoms also showed a statistically significant decrease ($d= .41$, $p<.05$) with a small effect size.</p>
<p>Zielona-Jenek et al. (2019) https://doi.org/10.5114/cipp.2019.92958</p>	<p>Level of evidence: Level III Study design: One group, nonrandomized, repeated measures</p> <p><i>N</i> = 21 adults</p> <p>100% Female</p> <p>M age = 38.90 years</p> <p>Intervention group, <i>n</i> = 21</p> <p>Inclusion criteria:</p> <ul style="list-style-type: none"> • Survivor of domestic violence • Meeting diagnostic criteria for PTSD or DESNOS (disorder of extreme stress not otherwise specified) • No current participation in psychological or therapeutic services • Weekend availability 	<p>Intervention: The intervention consisted of four 16-hour modules, with one module occurring once per month over a weekend. The sessions involved focusing training, artistic expression, and discussion. Several different modalities were used for artistic expression, such as drawing, painting, sculpting, and plaster body casts.</p>	<p>Outcome measures:</p> <ul style="list-style-type: none"> • Body-Self Questionnaire (BSQ) • Draw-a-Woman Test (DAW) • Affective Body Image method (ABI) <p>The outcome measures were administered directly before and after the intervention program.</p>	<p>Results: There were statistically significant results for several outcomes. There was a large effect for fewer regulation problems (BSQ), less disturbances with sense of body identity (BSQ), and increased satisfaction with appearance (BSQ). There was a medium effect for fewer difficulties in interpreting emotional and physical needs (BSQ), an increase in positively marked body area (ABI), an increase in size of figure (DAW), and an increased amount of female body attributes (DAW).</p> <p>Effect size is reported as Cohen's <i>d</i>. The BSQ outcomes that were statistically and clinically significant were regulation ($d= .80$, $p<.005$), interpretation ($d= .58$, $p<.05$), sense of body identity ($d= .89$, $p<.005$), and satisfaction with appearance ($d= .76$, $p<.005$). The ABI outcomes showed one statistically and clinically significant outcome: an increase in positively marked body area ($d= .53$, $p<.05$). The DAW outcomes that were statistically and clinically significant were size of figure</p>

	<ul style="list-style-type: none"> • Interest in participation 			($d = .53, p < .05$), and female body attributes ($d = .46, p < .05$).
DANCE THERAPY				
<p>Ho (2015) https://doi.org/10.1016/j.aip.2015.09.004</p>	<p>Level of Evidence: Level III Study Design: One group, nonrandomized</p> <p>$N = 25$ Chinese women (25-52 years old) who had experienced childhood sexual abuse</p> <p>100% Female, 0% Male</p> <p>M Age = 36.2 years</p> <p>Intervention Group, $n = 25$</p> <p>Inclusion criteria:</p> <ul style="list-style-type: none"> • Survivor of childhood sexual abuse • Adult (18 or older) • Participate in regular consultation meetings at rehabilitation program • Female • Informed consent is given 	<p>Intervention Group: Participants engaged in Dance Movement Therapy (DMT) for two hours once per week for a total of five weeks. The intervention consisted of “creative dance, improvisational movement, and movement games” with an emphasis on “developing a sense of security and personal space, redefining the boundaries of the body, and instilling connectedness to the self and others” (p 12). The same dance movement therapist led all sessions, which included a 20-minute warm-up, 25-minute exploration of place: placement and grounding, 10-minute break, 25-minute exploration of space: spacing and reaching out, 30-minute sharing: beyond place and space, and a 10-minute closing ritual.</p>	<p>Outcome Measures:</p> <ul style="list-style-type: none"> • General Health Questionnaire (GHQ12) • Courtauld Emotional Control Scale (CECS) • Rosenberg Self-Esteem Scale (RSES) • Stagnation Scale (SS) <p>All measures were completed prior to DMT intervention, after completing five weeks of DMT, and again five weeks after the last DMT session.</p>	<p>Results: No statistically significant results (p-values < 0.05) were found. The most statistically significant improvements were found to be the Rosenberg Self-Esteem Scale ($p = 0.08$) when comparing post-test to pre-test and Overattachment Subscale ($p = 0.08$) when comparing 5 weeks post-test to pre-test. All Cohen's d values reported demonstrated small effect size. Treatment had little effect on outcomes measured according to these results. However, results demonstrated some potential treatment effect with two outcomes having improved at a significance level of 0.08, meaning that it was somewhat unlikely that the improved outcomes occurred due to chance. However, potential confounding variables could have created some improvements in participants.</p>
<p>Koch et al. (2019) https://doi.org/10.1080/15325024.2018.1507472</p>	<p>Level of Evidence: Level II Study Design: Two groups, non-randomized</p> <p>$N = 32$ adults ages 18 to 59 years who were inpatients at a psychiatric hospital and had experienced trauma</p>	<p>Intervention Group: The intervention, Flamenco therapy, was implemented in the morning from 8 to 9am in a room with a wooden floor, curtains, and ample daylight. Researchers were not present during the therapy session for some of the participants. Each participant</p>	<p>Outcome Measures:</p> <ul style="list-style-type: none"> • Heidelberg State Inventory • Body Self-Efficacy Scale (BSE) • Perception of Boundaries Scale • Embodied Intersubjectivity Scale • Self report fitness, pain, and 	<p>Results: Results of the intervention demonstrated statistically significant differences in well-being ($p = 0.033$; $\eta^2 = 0.14$), perceived pain level ($p = 0.048$; $\eta^2 = 0.12$), and perceived health ($p = 0.000$; $\eta^2 = 0.38$). The intervention group had fewer negative answers to self-reported well-being compared to the control group after intervention. The change in pain level and</p>

	<p>81% Female, 19% Male</p> <p><i>M</i> Age = 34.2 years</p> <p>Intervention Group, <i>n</i> = 16 Control Group, <i>n</i> = 16</p> <p>Inclusion criteria:</p> <ul style="list-style-type: none"> • Adult (18 or older) • Trauma survivor (not operationalized) • Inpatient in psychiatric hospital (University Hospital in Heidelberg or SRH Hospital in Karlsbad-Langensteinbach) 	<p>engaged in a single one-hour long Flamenco therapy session. Pre-test measures were taken prior to the Flamenco therapy session, and post-test measures were taken after the session.</p> <p>Control Group: This group participated in therapy treatment as usual rather than participating in the Flamenco dance intervention.</p>	<p>health measure</p> <p>Measures were taken before the Flamenco therapy session and again after the session.</p>	<p>health were also more positive in the experimental group than the control group after the intervention.</p> <p>All effect sizes were small or moderate, except for the perceived health scores, which had an effect size of $\eta^2 = 0.38$.</p>
MINDFULNESS				
<p>Caldwell & Shaver (2015) https://doi.org/10.1007/s12671-014-0298-y</p>	<p>Level of Evidence: Level II Study Design: Case Control</p> <p><i>N</i> = 39 participants</p> <p>100% Female</p> <p>Intervention group: <i>n</i> = 17 Control group: <i>n</i> = 22</p> <p><i>M</i> age = 47 years</p> <p>Inclusion Criteria</p> <ul style="list-style-type: none"> • Received services from a healthcare facility to address psychological trauma • Female gender • Between age 18 and 80 	<p>Intervention group: It is noted that most participants were assigned randomly to the intervention or control groups, but some were non-randomly assigned based on scheduling conflicts. The exposure is outlined in detail as the Restoring Embodied Awareness, Compassionate Connection, and Hope (REAC²H) program, relating to both mindfulness and attachment. Each of the three 8-hour days contained a theme (body, thoughts, or emotions) and specific activities and educational components relating to the theme.</p> <p>Control group: The control</p>	<p>Outcome Measures:</p> <ul style="list-style-type: none"> • Childhood Trauma Questionnaire (CTQ) • Experiences in Close Relationships inventory (ECR) • Emotion Regulation Questionnaire (ERQ) • Trait Meta-Mood Scale (TMMS) • Rumination-Reflection Questionnaire (RRQ) • Difficulties in Emotion Regulation Scale (DERS) • Home-Based Practice Scale <p>Each outcome measure was answered in the context of “during the past week.” Both groups were evaluated at baseline, one week</p>	<p>Results: When evaluating the effects of a mindfulness-based intervention on attachment anxiety (measuring rumination and negative emotion) and attachment avoidance (measuring emotional suppression and emotional unclarity), the study found significant decreases in rumination and emotion suppression and significant increases in clarity of emotions, emotion regulation, and mindfulness. The intervention group demonstrated significant improvement in the majority of the study outcome variables, particularly all variables of mindfulness. Increased mindfulness correlated with improvements in rumination and emotional clarity in adults who have experienced childhood maltreatment.</p>

	<ul style="list-style-type: none"> Reported history of childhood maltreatment 	group did not receive an intervention.	after intervention, and five weeks after intervention.	
Gallegos et al. (2015) https://doi.org/10.1037/tra0000053	<p>Level of Evidence: Level III Study Design: Cohort study</p> <p>N= 42 trauma exposed low income females</p> <p>Mean age= 44.1 [SD=11.2]</p> <p>Intervention Group: Eight cohorts of 5-10 members</p> <p>Inclusion Criteria:</p> <ul style="list-style-type: none"> Female Over the age of 18 English speaking History of one interpersonal trauma before the age of 18 Report high-perceived stress 	<p>Intervention: This eight-week curriculum included weekly 120-min sessions and one intensive 4-hr retreat for all females of the study. These sessions included mindfulness based stress (MBSR) that was delivered by an experienced teacher. The teacher followed the curriculum in the MBSR manual developed by the University of Massachusetts Center for Mindfulness (CFM) and also had advanced CFM training. In this curriculum four mindfulness practices are emphasized; they include sitting meditation, walking meditation, mindful movement (being aware of the body's movement and holding poses, similar to yoga), and a body scan (giving attention to different sensations and regions of the body). After trauma, a body scan can cause distress of difficult emotions. Noticing thoughts, feelings, sensations and refocusing attention on breathing and meditation can enhance participants' feelings of safety.</p>	<p>Outcome Measures:</p> <ul style="list-style-type: none"> Traumatic Life Events Questionnaire (TLEQ) Mini-Mental State Exam (MMSE). Perceived Stress Scale (PSS-10) Center for Epidemiologic Studies Depression Scale (CES-D) Spielberger State-Trait Anxiety Inventory-Trait/State (STAI-T OR STAI-S) Difficulties in Emotion Regulation Scale (DERS) Modified PTSD Symptom Scale Self Report (MPSS-SR) Five Facet Mindfulness Questionnaire (FFMQ) Immunological Data- LLM Analysis <p>The TLEQ and MMSE were used as screening tools for the studies inclusion criteria. The PSS-10, CES-D, STAI-T, STAI-S, DERS, MPSS-SR, FFMQ as well as Immunological data were taken at each time point (a total of 4).</p>	<p>Results: Mindfulness-based stress reduction (MBSR) was found to be associated with significant decreases in stress, depression, anxiety, posttraumatic symptoms, and emotional dysregulation. There were also significant improvements found in other outcome variables like psychological and mindfulness at Time point 3 and 4; the more time the participants spent building one's practice/skills leads to being able to maintain those skills. It was also found that lower levels of inflammatory cytokine IL-6 was related to great MBSR program attendance. Significant changes in TNF-α and CRP levels were not observed.</p>
Ghahari et al. (2017)	<p>Level of Evidence: Level II Study Design: Pretest-Posttest Case Control</p>	<p>Intervention: Eight 45-minute sessions based on mindfulness-based cognitive therapy protocol for generalized</p>	<p>Outcome Measures:</p> <ul style="list-style-type: none"> Beck's Depression Inventory 2 (BDI-II) Spielberger's State-Trait 	<p>Results: According to the results, there was highly statistical significance ($p < 0.001$) in the effectiveness of mindfulness-based cognitive therapy in reducing depression and state</p>

<p>https://doi.org/10.18311/ajprhc/2017/7644</p>	<p><i>N</i> = 30 [Adults] 100% Female <i>M</i> Age = 36.6 yrs Intervention group: <i>n</i> = 15 Control Group: <i>n</i> = 15 Inclusion Criteria</p> <ul style="list-style-type: none"> • Victim of domestic violence in Tehran • Had high scores in depression and anxiety inventories 	<p>anxiety disorder. The first session involved explaining eight-session content of MBCT plan, and explaining the elements of CBT. The second session involved 3-minute breathing space (3MBS), training in consciousness during activities, training in awareness and concentration on functions of the mind, body scan meditation, training lack of judgment and criticism of thoughts and feelings of self; training observation of individuals, feelings, and behaviors; checking homework of last session and giving new homework. The third session involved explaining emotions and their dimensions; training in breathing with focus on some parts of the body where stress and emotion is felt. The fourth session involved training presence in being mode; mindfulness of the body and thoughts; doing an enjoyable task. The fifth session involves training mindfulness in relationship; accepting thoughts and actions of self and spouse as they are; training meta-meditation and giving homework. The six session involved thought training and balancing emotion. The seventh training involved training mindfulness in relationships; mindfulness and meditation</p>	<p>Anxiety Inventory (STAI)</p> <p>Outcome measures were completed by both groups at baseline (pre-test) and at end of treatment (post-test).</p>	<p>anxiety of women victims of violence. In addition, there was statistical significance ($p < 0.01$) in the effectiveness of mindfulness-based cognitive therapy in reducing trait anxiety of women victims of violence. The results have been consistent with findings of Zeidan et al. (2010) showing that training mindfulness can lead to reduction of pain and anxiety and with findings of Evans et al. (2008) showing the effect of mindfulness-based cognitive therapy on symptoms of anxiety and depression.</p>
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		<p>while facing problems. The eight sessions involved meditation of body checking and review of last sessions.</p> <p>Control: Participants were placed in waiting list until the end of intervention</p>		
<p>Joss., Khan., Lazar., & Teicher. (2020a) https://doi.org/10.1016/j.bbr.2020.113023</p>	<p>Level of Evidence: Level II Study Design: Case Control</p> <p><i>N</i> = 34 participants</p> <p>M age = 26.27 years for intervention group; 25.26 years for control group</p> <p>Intervention group: n = 15 (12 Female, 3 Male) Control group: n = 19 (12 Female, 7 Male)</p> <p>Inclusion Criteria</p> <ul style="list-style-type: none"> • Prior Joss study requirements (reference Joss, 2019): between age 21-35 years; had not attempted suicide within the past 6 months; no history of neurological disorders or psychiatric disorders; appropriate for MRI testing; no past MBSR or meditation experience; and not using illicit drugs during study • Participants invited from Joss (2019) pool if they 	<p>Intervention group: The intervention group attended mindfulness intervention sessions for ~2.5 hours per week with a designated instructor. These sessions occurred once a week for eight consecutive weeks. During week six, participants attended a six-hour session in addition to the weekly session. The mindfulness intervention was described to be based on MBSR programming with modifications to best accommodate the population of interest (to be trauma sensitive). Modifications included adjusted length of meditation practice audio instruction (clients could choose from several lengths) and the incorporation of additional mindful movement components.</p> <p>Control group: The control group was created due to scheduling conflicts in attending the majority of the nine meetings required for the intervention group protocol. The control group was placed on a waitlist</p>	<p>Outcome Measures:</p> <ul style="list-style-type: none"> • Detailed MRI parameters • Perceived Stress Scale (PSS) • Mindful Attention Awareness Scale (MAAS) • Self-Compassion Scale (SCS) • Adult Rejection Sensitivity Questionnaire (ARSQ) <p>Interpersonal Reactivity Index – Personal Distress (IRI-PD)</p>	<p>Results: The intervention group demonstrated a significant positive correlation between right amygdala volumetric changes and intervention compliance and improvement in self-compassion. The intervention group demonstrated a significant negative correlation between left amygdala volumetric changes and perceived stress and interpersonal distress. Further, the study demonstrated unique effects of early and late childhood maltreatment on amygdala volumetric changes (left amygdala changes correlated with early childhood maltreatment while right amygdala changes correlated with adolescent maltreatment). The results are useful as preliminary studies on the effects of mindfulness interventions on the amygdala morphometrics and psychological symptoms in individuals who have experienced childhood maltreatment.</p>

	<p>had score of at least 1 on the ACE or MACE</p> <ul style="list-style-type: none"> • Informed consent 	<p>and therefore did not receive any intervention during the eight-week study.</p>		
<p>Joss., Lazar., & Teicher (2020b) https://doi.org/10.1016/j.psychres.2020.111087</p>	<p>Level of Evidence: Level II Study Design: Case Control</p> <p><i>N</i> = 36 participants</p> <p>Intervention Group: 76% Female Control Group: 67% Female</p> <p>Male = 26.05 years for intervention group; 25.19 years for control group</p> <p>Intervention group: <i>n</i> = 21 Control group: <i>n</i> = 21 (6 of which also completed the intervention and were included in the intervention group)</p> <p>Inclusion Criteria</p> <ul style="list-style-type: none"> • Prior Joss study requirements (reference Joss, 2019): between age 21-35 years; had not attempted suicide within the past 6 months; no history of neurological disorders or psychiatric disorders; appropriate for MRI testing; no past MBSR or meditation experience; and not using illicit drugs during study • Participants invited from Joss (2019) pool if they 	<p>Intervention group: The intervention group attended mindfulness intervention sessions for ~2.5 hours per week with a designated instructor. These sessions occurred once a week for eight consecutive weeks. During week six, participants attended a 6-hour session in addition to the weekly session. The mindfulness intervention was described to be based on MBSR programming with modifications to best accommodate the population of interest (to be trauma sensitive). Modifications included adjusted length of meditation practice audio instruction (clients could choose from several lengths) and the incorporation of additional mindful movement components.</p> <p>Control group: The control group was created due to scheduling conflicts in attending the majority of the nine meetings required for the intervention group protocol. The control group was placed on a waitlist and therefore did not receive any intervention during the initial eight-week study. The researchers report that “subjects on the waiting list were</p>	<p>Outcome Measures:</p> <ul style="list-style-type: none"> • Detailed MRI parameters • Standardized episodic memory task • The Perceived Stress Scale (PSS) • State-Trait Anxiety Inventory (STAI) • The Beck Depression Inventory (BDI) <p>The researchers analyzed the Gray Matter Volume of the left and right hippocampus (per voxel) and plotted them against the psychological or other outcome variables of interest (PSS, BDI, and episodic memory task).</p>	<p>Results: Researchers did not find significant changes for the episodic memory task in the intervention group or control group across time. The intervention group demonstrated a significant negative correlation with perceived stress and anxiety, and the control group did not demonstrate significant changes in psychological assessment scores across time. The researchers found one area of growth of the right hippocampus that demonstrated significant negative correlation with depression and one area of growth of the left hippocampus that demonstrated significant negative correlation with perceived stress. The areas of impact are relevant because “changes in GMV were significantly associated with reduction in perceived stress and depression, suggesting that hippocampal changes may be accompanied by clinical improvement” (p. 6) of PTSD-related symptoms in populations who have experienced childhood maltreatment.</p>

	<p>had score of at least 1 on the ACE or MACE</p> <ul style="list-style-type: none"> • Informed consent 	<p>administered the same research procedures around the same time as subjects participating in the intervention program” in regard to the six participants who completed the intervention after the initial eight weeks on a waitlist (p. 2).</p>		
<p>Kelly & Garland (2016) https://doi.org/10.1002/jclp.22273</p>	<p>Level of Evidence: Level I Study Design: Randomized controlled trial</p> <p><i>N</i> = 45 female survivors of interpersonal violence</p> <p><i>M age</i> = 41.5 [SD=16.5]</p> <p>Intervention group: <i>n</i> = 23 Control group: <i>n</i> = 22</p> <p>Inclusion Criteria:</p> <ul style="list-style-type: none"> • Female gender • 18yrs or older • History of interpersonal violence (IPV) • Comprehends written and spoken English • Have their own transportation to and from study. 	<p>Intervention: Trauma Informed Mindfulness Based Stress Reduction (TI-MBSR) took place over eight weeks; weekly sessions lasting approx. 2-2.5hrs with one all-day meditation retreat that took place in week six. “Each session consisted of guided meditations, gentle movement exercises, didactic lecture, and group discussion, closely aligning with the practices offered in the same timeline for the standard MBSR model” (Kelly, 2016, p. 314). Participants were also asked to practice mindfulness on their own outside of meeting times; they were given handouts which included readings and an audio CD to listen to.</p> <p>Control: Control group was offered the TI-MBSR after the completion of the second round of questionnaires.</p>	<p>Outcome Measures:</p> <ul style="list-style-type: none"> • PTSD Checklist-Civilian Version (PCL-C) • Beck Depression Inventory, Second Edition (BDI-II) • Relationship Structures Questionnaire (RSQ) <p>The PCL-C, BDI-II, and the RSQ were administered before and after the intervention program.</p>	<p>Results: According to the PCL-C and BDI-II measure results, TI-MBSR intervention demonstrated significant decreases in PTSD symptoms as well as depression than the waitlist control group. Both PTSD and depression went from moderate to minimal levels. The RSQ measure reported significantly greater decreases in anxious attachment than the waitlisted control but there was no significant decrease shown in participants avoidant attachment.</p>
<p>Lee et al. (2015) https://doi.org/10.1002/jclp.22273</p>	<p>Level of Evidence: Level I Study Design: Randomized controlled trial</p>	<p>Intervention: This six week meditation treatment was based on a specific Tibetan meditation</p>	<p>Outcome Measures:</p> <ul style="list-style-type: none"> • Symptom Distress Scale (SDS) 	<p>Results: According to the paired sample t-test there was a significant reduction of both mental health and PTSD symptoms when</p>

<p>177/08862605155 91277</p>	<p><i>N</i> = 63 female survivors of interpersonal violence with co-occurring disorders</p> <p>Age = 38.6 [SD= 8.6]</p> <p>Intervention group: <i>n</i> = 32 Control group: <i>n</i> = 31</p> <p>Inclusion Criteria:</p> <ul style="list-style-type: none"> • Female • Clients who had experienced interpersonal abuse • Clients with co-occurring disorders (CODs) 	<p>tradition where breathing meditation as well as Nying-je (loving kindness) and Tonglen (compassion) are present. Participants met for a class that lasted 1hr five days a week. Participants also received regular therapy services like group therapy counseling, and substance use treatment from the agency.</p> <p>Control: Received regular therapy services like group therapy counseling, and substance use treatment from the agency.</p>	<ul style="list-style-type: none"> • Modified PTSD Symptom Scale (MPSS) <p>Outcome measures were used before and after meditation intervention.</p>	<p>comparing pre/post tests of the treatment group. While there was only 35.5% of reliable change in mental health symptoms and 42.3% of reliable change in trauma symptoms, there was no reliable negative change in mental health and trauma symptoms.</p>
<p>Michalopoulou et al. (2015) https://doi.org/10.1007/s10896-015-9740-8</p>	<p>Level of Evidence: Level I Study Design: Randomized Controlled Trial</p> <p><i>N</i> = 34 female participants</p> <p>Age = 41 for intervention group; 38 for control group</p> <p>Intervention group: <i>n</i> = 16 Control group: <i>n</i> = 18</p> <p>Inclusion Criteria</p> <ul style="list-style-type: none"> • Written consent • Self-identified as experienced verbal, emotional, physical, and/or sexual abuse by a man • 18 years of age or older • Ability to converse and write in Greek 	<p>Intervention group: The intervention group experienced eight weeks of relaxation breathing (RB) and progressive muscle relaxation (PMR) stress management techniques. After the first session which collected background information and established a healthy therapeutic relationship, the intervention group practiced RB and PMR with the use of an audio CD (10 minutes of RB and 15 minutes of PMR). The intervention was completed twice a day for eight weeks in the home environment. The intervention group had access to counseling intervention if a problem occurred. The intervention group received weekly phone calls to encourage</p>	<p>Outcome Measures:</p> <ul style="list-style-type: none"> • Socio-demographic Variables • Perceived Stress Scale (PSS) • Health Locus of Control Scale (HLC) • Beck Depression Inventory (BDI) • Ways of Coping Checklist (WCCL) <p>Both the intervention and the control group had the same screening, initial evaluation, and final evaluation procedures/timing.</p>	<p>Results: There was a medium treatment effect ($r = .45$) for PSS (Perceived Stress Score). Treatment effects were not significant for sleeping hours, health locus of control, depression, and ways of coping. The researchers presented RB and PMR relaxation techniques as a valuable addition to a comprehensive program serving women who have experienced abuse; it is an additional support that has demonstrated potential to minimize perceived stress.</p>

	<ul style="list-style-type: none"> • Not having been in abusive relationship for at least 30 days; no intention of reconciling • Not currently using psychotropic drugs • Not currently practicing other relaxation techniques 	<p>compliance to study which included a self-report checklist.</p> <p>Control group: The control group experienced eight weeks of standard shelter services. The control group received identical verbal and written information about stress and how stress affects health during the first session. The control group received weekly phone calls to encourage compliance to study which included open questions about mood and sources of stress. At the end of the eight-week intervention, members of the control group received access to the CD recordings of relaxation techniques.</p>		
<p>Nicotera & Connolly (2020) https://doi.org/10.17761/2020-D-18-00031</p>	<p>Level of Evidence: Level III Study Design: Cohort (one-sample pre- and post-test design)</p> <p><i>N</i> = 37 participants</p> <p>100% Female</p> <p>Age = 29 years</p> <p>Inclusion Criteria</p> <ul style="list-style-type: none"> • Existing members of metropolitan, community-based nonprofit organization providing resources to 	<p>Intervention group: The authors measured the effects of participation in Trauma-Informed Yoga (TIY) (exposure) on mindfulness and emotion regulation (outcome). The yoga intervention was outlined in detail (orientation session followed by eight intervention sessions each with a distinct theme: 1.5 hours each session with check-in/check-out, brief discussion, and 1 hour of yoga and mindfulness). The intervention is built on robust prior research that indicates that “yoga interventions have a</p>	<p>Outcome Measures:</p> <ul style="list-style-type: none"> • Five Facet Mindfulness Questionnaire (FFMQ) • Difficulties in Emotion Regulation Scale (DERS) <p>The researchers selected only 30 items total to reduce burden on participants in the data collection process. The researchers tested the subscale items for strong to acceptable reliability (using Cronbach’s Alpha) to include them in analysis (one item was dropped for not meeting acceptable reliability).</p>	<p>Results: The authors concluded that TIY may offer an important alternative to current interventions for female survivors of sexual assault in the reduction of PTSD-related symptomatology. The results support that mindfulness and emotion regulation skills are significantly improved in the practice of TIY. Specifically, the researchers found significant improvement in the Five Facet Mindfulness Questionnaire subscales of describe experiences, not judge inner experiences, and capacity to observe self as well as significant improvement in the Difficulties in Emotion Regulation Scale subscales of not accept emotions, engage with goals, limited strategies to regulate emotions, lack of emotional clarity, and lack of emotional</p>

	<p>survivors of sexual assault and abuse</p> <ul style="list-style-type: none"> • Within organization, existing members of established yoga, mindfulness, and therapy group • Informed consent 	<p>significant positive effect on PTSD symptomology” (p. 22). The authors utilized a standardized Trauma Center Trauma-Sensitive Yoga (TCTSY). All subjects were classified into the exposure groups using the same procedure.</p>	<p>The authors note that they did not take attendance to honor the natural setting of a community-implemented program, which means that they could not measure if attendance was a confounding variable.</p>	<p>awareness. Each result is significant ($p < .05$).</p>
MUSIC THERAPY				
<p>Colegrove et al. (2018) https://doi.org/10.1016/j.chiabu.2018.02.017</p>	<p>Level of Evidence: Level I Study Design: Pilot Randomized Controlled Trial <i>N</i> = 26 (parent-child dyad) Child Age Range: 10-17 yrs Parent Gender % ~96% Female ~4% Male Child Gender % ~58% Female ~42% Male Intervention: <i>n</i> = 13 Control: <i>n</i> = 13 Inclusion Criteria:</p> <ul style="list-style-type: none"> • Adolescent was 10-18 yrs • The parent reported experiences of childhood abuse or neglect on the Childhood Trauma Questionnaire • The dyad reported conflict in their relationship on the Conflict Behavior Questionnaire. 	<p>Intervention: <i>Tuning Relationships with Music</i> intervention program consisted of eight one-hour sessions conducted weekly. Sessions one, two, and five were individual meetings with parent and adolescent dyad, sessions three-four and six-eight were conjoint sessions. The program involves teaching nonverbal skills through the sequence use of musical exercises using instruments. Verbal skills are also taught to parents using psycho-educational materials from the Tuning in to Teens parenting program. In addition, the intervention participants participated in treatment as usual (TAU) as well.</p> <p>Control: The participants in the control group received treatment as usual (TAU) which included psychological services, psychiatric treatment, family therapy, family support, and</p>	<p>Outcome Measures:</p> <ul style="list-style-type: none"> • Assessment of parent-child interaction (APCI) • Assessment of Responsiveness, reactivity, and turn-taking (ARRT) • Conflict behavior questionnaire (CBQ) • Emotions as a child questionnaire (EAC) • Strengths and difficulties questionnaire (SDQ) <p>The outcome measures were completed by both groups at baseline and 4-months post-baseline at follow-up.</p>	<p>Results: <u>Assessment of parent-child interaction (APCI)</u> The total score results for the APCI showed that the parents significantly improved their non-verbal interaction with their adolescent, to be more emotionally responsive, and better able to respond to their adolescent non-verbal communication for the intervention group compared to the control group. However, there was no change in parents’ ability to be attuned to their adolescent.</p> <p><u>Assessment of Responsiveness, reactivity, and turn-taking (ARRT)</u> The ARRT results showed that the intervention parents were observed to be significantly less reactive, more responsive, and more likely to take turns during parent-adolescent conflict interaction at follow-up compared with control group parents.</p> <p><u>Conflict Behavior Questionnaire (CBQ), Emotions as a child questionnaire (EAC), & Strengths and Difficulties Questionnaire (SDQ)</u> In addition, intervention group participants</p>

		other allied health interventions.		<p>reported significantly less parent-adolescent conflict at follow-up compared to the control group. However for the EAC & SDQ, changes were in the expected direction, but ANCOVAs were not significant for either outcome.</p> <p><u>Reliably and Clinically Significant Change Analyses</u> A significantly higher proportion of intervention parents were observed to be more emotionally responsive, less reactive, and take more turns during music exercises and conflict interactions with their adolescent compared with the control group parents. Significantly more intervention parents reported a reliable improvement compared to the control group parents on parent-adolescent conflict. Furthermore, more intervention parents reported and were observed to shift out of the clinical range of problematic conflict interaction compared with control parents. For deterioration, <i>Non-verbal Communication, Emotional Parental Response, Reactivity and Turn taking</i> were reliably deteriorated at follow-up for one control parent only. In addition, no reliable deterioration was reported or observed for intervention dyads. However, one control parent and two adolescents reported that conflict had reliably deteriorated at follow-up.</p>
<p>Kim (2017) https://doi.org/10.1016/j.aip.2017.01.001</p>	<p>Level of Evidence: Level I Study Design: Block Randomized Controlled Trial N= 26 (youth aged 7-12 yrs.)</p>	<p>Intervention: The intervention participants were split into three groups. Each group consisted of five to six children respectively. Each group participated in a once-a week 60-minute group</p>	<p>Outcome Measure:</p> <ul style="list-style-type: none"> The Child Behavior Checklist - Korean Version (K-CBCL) <p>The outcome measure was completed by both groups at</p>	<p>Results: <u>K-CBCL: Teacher Report Form (TRF)</u> The results of repeated measures ANCOVA indicate that the interaction of time and group was significant (p<0.05), suggesting that group music therapy was significantly more</p>

	<p>~42% Female ~58% Male</p> <p>Intervention group: $n = 14$</p> <ul style="list-style-type: none"> • M Age: 9.25 ± 1.22 <p>Control group: $n = 12$</p> <ul style="list-style-type: none"> • M Age: 7.45 ± 3.01 <p>Inclusion Criteria:</p> <ul style="list-style-type: none"> • Children aged 7-12 yrs • Attended one of the 13 local CCCs in Jeollabukdo • Exposed to dual adversities (poverty and child maltreatment) • Had any subscale scores of the CBCL above the sub-clinical range (T-scores >64) 	<p>music therapy session that took place on-campus at University Music Therapy Center for 12 consecutive weeks. Each session allowed for children to explore and express their feelings, thoughts, and concerns with their peers and the music therapist. The sessions consisted of two parts: improvisation and song writing. During the first half, children had the opportunity to play with any instrument available in any way they liked. The second half involved the therapist introducing pre-selected ranges of songs for discussion, song parody, and/or song writing. A pre-composed or pre-arranged greeting and good-bye song ritual was included as well to prepare the children for the beginning and the ending of each session. In addition, each intervention participant received standard care when not attending intervention sessions.</p> <p>Control: Participants in the control group participated in standard care which included the requirement of attending local CCCs after school during weekdays. The local CCCs' provided basic child welfare and protection services for the children.</p>	<p>baseline (survey period), pre-test (before any services), and post-test (12 wks post-intervention).</p>	<p>effective than standard care at reducing internalizing behavioral problems (depressed/anxious, attention problem, and withdrawn) over time from baseline to post-test period, while the children's internalizing behavior problems in the control group (standard care) increased over time. From the teacher's report results, time was significant for withdrawn behaviors ($p < 0.05$), and nearly significant for attention problems ($p < 0.10$) that children's withdrawn behaviors and attention problems were improving over time in music therapy conditions while behavior problems were increasing for children receiving only standard care. However, the effect sizes were small in all measures.</p> <p><u>K-CBCL: Youth Self Report (YSR)</u></p> <p>The results of the YSR measured by the children suggested an almost similar, but slightly different pattern from the results of the teacher's measures. The results of the repeated measures ANCOVA indicated that the intervention group had significantly ($p < 0.05$) less depressed/anxious and withdrawn behaviors than the children in the control group. However, both groups showed improvements over time for depressed and anxious behaviors while withdrawn behaviors only increased for children in the control group. For attention problems and withdrawn behaviors, the interaction of time and group was nearly significant ($p < 0.10$) indicating that these problems were reduced at post-test compared with the baseline in the intervention group. For the control group, attention problems and withdrawn behaviors increased overtime. However, effect sizes</p>
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				<p>were again small in all measures.</p> <p>In addition, the correlations (Pearson correlation coefficient) between teacher and child reported CBCL were low: Anxious/depressed, $r = 0.28$ ($p < 0.001$), attention problem, $r = 0.21$ ($p < 0.001$), and withdrawn, $r = 0.20$ ($p = 0.001$).</p>
NEUROFEEDBACK				
<p>Brown et al. (2019) https://doi.org/10.1080/10926771.2019.1603176</p>	<p>Level of Evidence: Level III Study Design: One group, nonrandomized</p> <p>$N = 32$ adults who had experienced intimate partner violence and head injury from partner</p> <p>97% Female, 3% Male</p> <p>M Age = 46.9 years</p> <p>Intervention Group, $n = 32$</p> <p>Inclusion criteria:</p> <ul style="list-style-type: none"> • Experience of intimate partner violence (IPV) • Participant at a domestic violence program in Texas • Adult • Experienced head injury caused by partner 	<p>Intervention Group: Participants received Neurofeedback Therapy (NFT) using the “BrainMaster Atlantis II 2 x 2 amplifier and corresponding 3.7i software on a Lenovo Thinkpad laptop” (p 768). Electrodes attached to the scalp and ears were used to measure brain activity while the participant watched their choice of a selection of shows or animations with music. Shows included I Love Lucy, Bugs Bunny, and The Jetsons. When participants met brain activity goals, the screen would move, continuing the program they were watching. When brainwave activity goals weren’t met, the screen wouldn’t move and would instead dim and the sound would begin to fade.</p> <p>Participants were trained by a clinician and completed an average of 42 sessions of NFT total, each session being 30</p>	<p>Outcome Measures:</p> <ul style="list-style-type: none"> • World Health Organization Disability Assessment Schedule 2.0 (WHODAS) • Severity Measure for Depression • Severity Measure for Generalized Anxiety Disorder - Adult • National Stressful Events Survey PTSD Short Scale. • qEEG data <p>Participants performed measures both prior to completing the NFT intervention, and after completing all NFT sessions.</p>	<p>Results: Results were found to be statistically significant for improvement on all written assessments as well as qEEG data for coherence, absolute power, and phase lag, which together measure brain activity and functioning. Statistical analysis included paired-samples t-tests, a multiple regression analysis, and a Pearson's R correlation between qEEG data and other measures. No confidence intervals were reported. Assessments completed all had statistically significant findings when comparing data pre-study to post-study. Disability score, depression, anxiety, and PTSD symptoms all statistically significantly improved with p-values of 0.000. Data from qEEG measures that demonstrated improved brain function were statistically significant with p-values of < 0.05.</p>

		minutes long.		
Rogel et al. (2020) https://doi.org/10.1037/tra0000648	<p>Level of Evidence: Level I Study Design: Randomized Controlled Trial</p> <p><i>N</i> = 37 children 6-13 years old 35% Female, 65% Male</p> <p>M Age = 9.6 years</p> <p>Intervention Group, <i>n</i> = 20 Control Group, <i>n</i> = 17</p> <p>Inclusion criteria:</p> <ul style="list-style-type: none"> • Two or more interpersonal traumatic experiences • Participating in weekly individual therapy with the same therapist for at least 3 months prior to study • No medication or psychosocial treatment changes in the past 3 months • Clinically significant PTSD on structured assessment or clinically significant symptoms on the Child Behavioral Checklist 	<p>Intervention Group: This group received neurofeedback training (NFT) twice per week for 24 total sessions (12 weeks). There were two administrators, but each child had the same technician training them (6-18 minutes) with the intervention. NFT was implemented using a “<i>Spectrum2 amplifier by J&J Engineering Inc. and EEGer4 Software by EEG Software, LLC</i>” (p 922). Participants in this group watched games from different software programs which reflected and recorded their brain electrical activity. Participants were rewarded with audio and visual inputs if their brain activity goals were met, which depended on their reward band. Physical rewards of toys were also rewarded if desired EEG changes occurred.</p> <p>Electrode impedance was kept under 10 kΩ and placement was compliant with the international 10/20 system. Each participant in this group initially received the same electrode placement and voltage. The reward bands were dependent upon the individual’s posterior dominant rhythm, so this was not consistent between each child. Based on reports from each child and caregivers,</p>	<p>Outcome Measures:</p> <ul style="list-style-type: none"> • Child Behavioral Checklist (CBCL) • Behavior Rating Inventory of Executive Function (BRIEF) • Trauma Symptom Checklist for Young Children (TSCYC) • PTSD-RI • Kiddie Schedule for Affective Disorders and Schizophrenia for School Aged Children (KSADS) • Children’s Alexithymia Measure (CAM) • Child Dissociative Checklist • Children’s Depression Inventory 2 • NIH Toolbox cognitive battery • Caregiver NFT Symptom Checklist • Child NFT Symptom Checklist <p>These assessments measure PTSD symptoms, undesired behaviors, alexithymia, dissociation, depression, and cognition.</p> <p>Outcome measures were assessed prior to intervention, when the intervention group was halfway through the intervention (at about 6 weeks after baseline or 12 sessions of NFT for the intervention group), at the end</p>	<p>Results: Twenty-four sessions of NFT significantly decreased PTSD symptoms, dysfunctional behavioral and emotional symptoms, and improved behavioral regulation, anxiety, and depression. These improvements were all statistically significant ($p < 0.05$) between groups and within group from baseline to post-intervention and one month follow-up measures. Mild side effects from NFT occurred, but adverse reactions were resolved by adjusting treatment, such as changing the game or location of electrodes. Reported undesired behaviors from both the CBCL and BRIEF had statistical significance when comparing the NFT group to the control group, with the NFT group having fewer undesired behaviors post-intervention (CBCL externalizing scores $p = 0.000$; BRIEF Global Executive scores $p = 0.001$). Both of these questionnaires still had statistical significance later on at the one-month follow-up (CBCL externalizing scores $p = 0.000$; BRIEF Global Executive scores $p = 0.001$). Although the Behavioral Regulation section of the BRIEF had statistical significance between groups at after treatment measure and one-month follow up, the groups began treatment with the NFT group already having a statistically significantly lower average score. Within the Metacognition scores, the NFT group had significantly lower scores than the control group at both the after treatment measure and at one-month follow up (after treatment $p = 0.05$; one-month follow-up $p = 0.01$). The total score from the CAM showed statistical significance after treatment with the</p>

		<p>as well as side effects of NFT, adjustments were made to better fit each individual.</p> <p>Control Group: This group continued current treatments and remained on a waitlist for NFT. They were assessed at the same frequency as the intervention group. After study completion, this group received NFT.</p>	<p>point of the intervention, and one month after the end point. The same blind rater performed all assessments.</p>	<p>NFT group presenting fewer signs of alexithymia ($p = 0.016$).</p> <p>The depression score from the TSYCYC showed statistical significance after treatment with the NFT group presenting fewer depressive symptoms ($p = 0.022$). The TSCYC total score also showed statistical significance with the NFT group presenting fewer trauma symptoms overall ($p = 0.008$; NFT group average = 39.02; control group average = 50.52).</p>
NEURO-PHYSIOLOGICAL PSYCHOTHERAPY				
<p>McCullough & Mathura (2019) https://doi.org/10.1016/j.chiabu.2019.104128</p>	<p>Level of Evidence: Level II Study Design: Two groups, non-randomized</p> <p>$N = 54$ children 4-18 years old</p> <p>45% Female, 55% Male</p> <p>M Age = 9.8 years</p> <p>Intervention Group, $n = 31$ Control Group, $n = 23$</p> <p>Inclusion criteria:</p> <ul style="list-style-type: none"> • No moderate or severe learning disability has been diagnosed • Not evaluated using different assessment tools prior to study intervention • Exposure to adverse childhood experiences (ACEs) which includes emotional abuse, physical abuse, sexual abuse, 	<p>Intervention Group: This group participated in Neuro-Physiological Psychotherapy (NPP), which focuses on behavior, cognition, somatosensory difficulties, affect regulation, and attachment. This approach draws on aspects of Ayres Sensory Integration, Theraplay, and Dyadic Developmental Psychotherapy. NPP was provided by a psychotherapist, social worker, or clinical psychologist with master's or doctoral level training. It is unclear how long participants in this group received the intervention and how long after completion of intervention the retest was completed.</p> <p>Control Group: A local funding authority determined whether or not NPP or an alternative therapy</p>	<p>Outcome Measures:</p> <ul style="list-style-type: none"> • Child Behavior Checklist (CBCL) • Behavior Rating Inventory of Executive Function (BRIEF) • Assessment Checklist for Children (ACC), and the Assessment Checklist for Adolescents (ACA) • Parent interview <p>Assessments were utilized prior to the start of intervention and again after the intervention group completed the intervention. The average time between the two measures for the intervention group was 5.54 years and the average time for the control group was 5.38 years.</p>	<p>Results: Significant results found included the intervention group having improved BRIEF scores including the Global Executive Composite ($p = 0.008$; Cohen's $d = 0.147$), Behavioral Regulation Index ($p = 0.000$; Cohen's $d = 0.435$), and for participants with elevated scores at initial assessment, significant improvements were also seen in the Global Executive Composite ($p = 0.002$; Cohen's $d = 0.239$), and Behavioral Regulation Index ($p = 0.000$; Cohen's $d = 0.252$).</p> <p>Within the CBCL, statistically significant results were only found within the participants who had elevated scores at assessment, with improvements being greater in the intervention group for Total Problems ($p = 0.23$; Cohen's $d = 0.121$) and Externalizing Problems ($p = 0.025$; Cohen's $d = 0.119$). ACC/ACA scores showed significant difference between intervention and control groups, with the intervention group demonstrating fewer mental health difficulties within the Total Shared-Item Score ($p = 0.020$; Cohen's $d = 0.212$) and</p>

	<p>physical neglect, emotional neglect, parental separation, domestic violence, substance abuse, mental illness, and incarceration.</p>	<p>was best for each participant. Therefore, this group consisted of those who the funding authority determined were not appropriate for NPP, or their family decided not to have the child participate in NPP. Although they did not receive NPP, they did receive alternative interventions which were not comparable to NPP. However, these alternative therapies were not operationalized in the study.</p>		<p>Composite Self-Esteem ($p = 0.008$; Cohen's $d = 0.330$). Results from the interviewing process determined statistical significance comparing the treatment group to the control group, with more participants in the treatment group having improved Parent-Child Relationship ($p = 0.005$; Cramer's $V = 0.444$), and Peer Relationship ($p = 0.003$; Cramer's $V = 0.485$).</p>
PLAY THERAPY				
<p>Waldman-Levi, A., & Weintraub, N. (2015). https://doi.org/10.5014/ajot.2015.013375</p>	<p>Level of Evidence: Level II Study Design: Pretest-Posttest Case Control Study $N = 37$ [Mother-Child Dyads] Gender of Child: 62.16% Female, 37.84% Male M age of mothers = 29.23 yrs [SD = 5.14] M age of children = 32 mo [SD = 13.94] Intervention: $n = 20$ dyads Control: $n = 17$ dyads Inclusion Criteria:</p> <ul style="list-style-type: none"> • Mother-child dyad who have experienced domestic violence and resided in one of eight domestic violence shelters in Israel 	<p>Intervention: The Family Intervention for Improving Occupational Performance (FI-OP) intervention involved eight 30-minute sessions, with an interval of four days to one week between sessions. Each session involved an opening (5 min), joint play (20 min), and closure and separation (5 min). Themes addressed by the intervention program include mother-child interaction, reciprocity, playfulness, and play skills. Control: Playroom program took place in a quiet room in the shelter with toys and play materials adapted to the child's age. Mothers and children were given an opportunity to play together in this room in a structured, development-enhancing</p>	<p>Outcome Measures:</p> <ul style="list-style-type: none"> • The Revised Knox Preschool Play Scale (R-KKPS). • The Test of Playfulness (ToP) • The Coding Interactive Behavior (CIB) <p>Outcome measures were in Hebrew and were completed by both groups at baseline (pre-test) and after playroom participants participated in a minimum of four sessions (post-test).</p>	<p>Results: <u>The Coding Interactive Behavior (CIB)</u> When comparing the intervention and control groups' scores with respect to mother-child interaction (CIB) using Mann-Whitney U tests, the results showed significantly greater improvements in the intervention group compared to the control group as reflected in the CIB total score ($U=101$, $p<0.05$) and two categories, Sensitivity ($U=92$, $p<0.05$) and Limit Setting ($U=101$, $p<0.05$). When using the Wilcoxon test to examine within-group differences in mother-child interaction for both groups, there were significant differences in the intervention groups with respect to Limit Setting ($Z= -1.96$, $p<0.05$) and Negative States ($Z= -2.17$, $p<0.05$). <u>The Revised Knox Preschool Play Scale (R-KKPS)</u> When using the Mann-Whitney U test to compare the two groups' difference scores with respect to children's play skills</p>

	<ul style="list-style-type: none"> • Child was free of known neurological or sensory dysfunction • Mother spoke Hebrew well enough to complete the study questionnaire and participate freely in the intervention 	g environment.		<p>(R-KPPS), the results revealed that the improvement in the intervention group was significantly greater than in the control group in the Pretense-Symbolic dimension ($U=11.5$, $p<0.01$). However, no significant differences were found for R-KPPS total score or the Material Management or Participation dimension scores. When using the Wilcoxon test to examine within-group differences in children's play skills, the results showed significant differences in the intervention group with respect to the R-KPPS total score ($Z=-3.14$, $P<0.001$) and the three dimension scores; Material Management ($Z=-1.88$, $p<0.05$), Pretense-Symbolic ($Z=-2.84$, $p<0.1$), and Participation ($Z=-2.45$, $p<0.01$). The control group did not show any significant differences ($p>0.05$) in total R-KPPS scores or the four dimension scores.</p> <p>The Test of Playfulness</p> <p>When using the Mann-Whitney U test to compare the groups' difference scores with respect to children's playfulness (ToP), the results revealed no significant difference between the intervention and control group. When using the Wilcoxon test to examine within-group differences in playfulness, the results showed no significant differences in the intervention group ($Z=-1.19$, $p>0.5$), but there was significant difference in the control group ($Z=-1.76$, $p<0.05$).</p>
RESILIENCE INTERVENTION				
Chandler, Roberts, & Chiodo, (2015)	Level of Evidence: Level I Study Design: Randomized Controlled Trial	Intervention: This four week resilience intervention took place once a week for 4 weeks. Each	Outcome Measures: <ul style="list-style-type: none"> • ACE Screening Survey • Physical and Psychological 	Results: According to the analyses run showed no overall main effect of time on reduced frequency of risk behaviors or better

<p>https://doi.org/10.1177/1078390315620609</p>	<p><i>N</i> = 28 female college age participants</p> <p>M age = 18-24 (actual mean not listed) from % most participants in this age group</p> <p>Intervention Group: <i>n</i> = 17 Control Group: <i>n</i> = 11</p> <p>Inclusion Criteria:</p> <ul style="list-style-type: none"> ● Female ● 18-24yrs old ● Enrolled in northeastern university traditional undergraduate program 	<p>session was an hour long and located on the students campus. Facilitators worked with the participants to make sure meditation, freewriting, and weekly reports on home exercise was being properly given. Each session began with guided meditation and then responses were recorded for home exercise adherence. Educational topics about ACE, resilience, physical health, social support, etc. were then presented for about 10min. After the educational topic was presented participants would respond to the topic by writing using Amherst Writers and Artists method; they were then invited to read what they wrote to other participants who listened. The listeners relayed the writer's strengths. Homework was then assigned and a closing ritual took place where affirming words are shared.</p> <p>Control: Control group completed the same pre and post measures but no other protocols were identified.</p>	<p>Symptom Checklist:</p> <ul style="list-style-type: none"> ● Health Behavior Questionnaire ● Resilience Scale <p>Measures were administered prior to the resilience intervention and directly after resilience intervention.</p>	<p>resilience and symptom scores, there was a group by time interaction that was found statistically significant for physical activity. Steins in the intervention group were significantly more active post invention compared to the control group. While there were no changes in overall symptoms in the intervention group, the control group did have an increase in the symptoms. This leads to a possible theory that the resiliency intervention administered may not help reduce symptoms but reduce potential for the symptoms to increase. Qualitatively participants felt empowered and acknowledged health benefits from the intervention. Participants reported immediate benefits from the intervention including a positive perspective, improved sleep, reduced stress and increased mindfulness/ relaxation. Participants also had 100% attendance rate and mentioned that it “became a microcosm of a safe community.” They mentioned that they understood the importance of feeling safe and making connections with people as well as to their personal experiences.</p>
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