Physical Activity for Trauma-Related Symptoms

A Guided Review of the Literature and Evidence

Learning Objectives

- Describe the efficacy of physical activity interventions for the treatment of trauma-related symptoms.
- Identify what kinds of exercise are associated with improvements in trauma-related symptoms.
- Identify dose response (e.g., frequency, intensity) of exercise associated with improvements in trauma-related symptoms.
- Make recommendations for the inclusion of physical activity for clients with trauma-related symptoms.

Conflict of Interest Statement

- The Center for Movement-based Psychotherapy is committed to the mission of sharing evidence-based practices for the inclusion of movement, physical activity and exercise as modalities for the prevention and treatment of mental health symptoms and disorder.
- The Center for Movement-based Psychotherapy has received no commercial or third-party support for or in the making of this lecture or the information there-in.
- The Center for Movement-based Psychotherapy and the instructor of this lecture have no known conflicts of interest.

Evaluating Intervention Efficacy

Prevention:

- Is there evidence to suggest that physical activity/exercise can help **prevent** trauma-related symptoms?

Therapeutic:

- Is there evidence to suggest that physical activity/exercise can help **alleviate**/decrease trauma-related symptoms?

Treatment:

- Is there evidence to suggest that physical activity/exercise can **treat** trauma disorders.

Prevention of Trauma and Stressor-Related Disorders

- **Primary prevention** occurs before the biologic onset of disease and seeks to reduce disease incidence.
- **Secondary prevention** occurs after a disease has originated but before it becomes symptomatic.
- **Tertiary prevention** refers to prevention of further decline or disability after a disease has already manifested, and overlaps substantially with treatment.

Prevention of Trauma and Stressor-Related Disorders

- *Primary Prevention in Trauma*: Any intervention before trauma exposure to be primary prevention
- *Secondary Prevention in Trauma*: Any intervention after trauma exposure but before development of clinically significant disorder.
- Primary prevention includes any intervention designed to prevent trauma exposure as well as attempts to improve **resilience** before a trauma.

Primary prevention = “Pre-trauma resilience building”

Prevention of Trauma and Stressor-Related Disorders

- Studies have estimated that more than 80% of adults in the United States experience traumatic events that would qualify for ASD or PTSD diagnosis (Breslau, 2012).
- Overall, fewer than 10% of individuals exposed to a traumatic event go on to develop PTSD, although the rate for traumatic violence is between 20-50% (Breslau, 2012).

Trauma- and Stressor-Related Disorder

Adjustment Disorder

- *Emotional distress*: This can include feelings of sadness, anxiety, or anger.
- *Physical symptoms*: These may include headaches, fatigue, or changes in appetite or sleep patterns.
- *Impairment in functioning*: Adjustment disorder can interfere with daily activities, relationships, or work.

Subtypes include: With depressed mood:, With anxiety, With mixed emotional symptoms (A combination of depressed mood and anxiety), With conduct disorder: The individual exhibits disruptive or aggressive behavior, Unspecified

DSM-V-TR Post-Traumatic Stress Disorder (PTSD)

Abbreviated Criteria

- ❏ Exposure to traumatic experiences
- ❏ One or more intrusive symptoms (intrusive thoughts, flashbacks, nightmares)
- ❏ Persistent avoidance
- ❏ Negative alteration in cognition and mood
- ❏ Hyperarousal (e.g., irritability, impulsivity, hypervigilance)

Acute Stress Disorder (3 days to 1 month); PTSD (+1 month)

ACEs, and “Complex PTSD”

Adverse Childhood Experiences (ACEs)

- “Potentially traumatic events that occur during childhood”
- Abuse, Neglect, Household dysfunction (Divorce, Domestic Violence, Substance Use)

“Complex PTSD”

- PTSD symptoms with emphasis on intrapersonal and interpersonal difficulties.
- Often associated with childhood trauma or chronic/prolonged exposure to traumatic events.
- Not formally recognized by the DSM-V-TR

Conceptualizing “Trauma”

We will be using “Trauma-Related” to refer broadly to “Trauma- and Stress-Related Symptoms.

This can range widely from significant:

- Prolonged exposure to chronic stressors
- Adjustment-related issues
- Acute reaction to traumatic experiences
- Post-traumatic reaction to traumatic events

Physical Activity for Trauma-Related Symptoms

Part 1: Prevention

Exercise as a Buffer Against Difficulties with Emotion Regulation

2018 Cross-Sectional Analysis

- n = 140 (30 minutes of “Moderate cycling” vs. Stretching)
    - Measured affect was measured after a “stressful speech task”

Key Findings:

- Individuals reported greater coping self-efficacy, or perceived ability to cope with stressors or negative mood, than did less active peers.
- Aerobic exercise is associated with fewer or less severe symptoms of depression, anxiety and general stress.

Exercise as a Buffer Against Difficulties with Emotion Regulation

Highlights

- Exercise may help an individual to adaptively respond to or recover from stress or negative mood states.
- Regular exercise may alter the way people process and respond to their emotions, rather than necessarily directly elevating mood.

Physical Activity, Adverse Childhood Experiences and Quality of Life

2022 Cross-Sectional Analysis with Moderation Analysis

- n = 127,370 participants
  - *Adverse childhood experiences* (ACEs) are associated with poor outcomes of *health-related quality of life* (HRQOL)

Key Findings:

- HRQOL in adults is negatively associated with ACEs, but is positively associated with Physical activity (PA).

Physical Activity, Adverse Childhood Experiences and Quality of Life

Highlights:

Found “buffering effects” (moderator) for physical activity for the following relationships:

- Child abuse and HRQOL
- Child abuse and percieved health
- ACEs and perceived mental health
- Child abuse and percieved mental health
- Household dysfunction and perceived mental health

Physical Activity and Trauma Prevention

2024 Umbrella Review and Meta-Analysis

- 11 prospective studies (n = 69,037)

Key Findings:

- Higher levels of physical activity were significantly associated with a reduced risk of incident depression and anxiety or stress-related disorders.
- Higher levels of physical activity significantly reduced the subsequent risk of incident anxiety.

Physical Activity and Trauma Prevention

Highlights:

- “Non-interventional prospective studies in populations who **did not** have depression, anxiety or stress-related disorders, and psychosis/schizophrenia at baseline”
- Significant reduction for post-traumatic stress disorder *but not* panic, obsessive-compulsive disorder (OCD), social phobia or specific phobia.
- Suggests that exercise may play a unique role in improving stress-related resilience but may not prevent other specific anxiety disorder.

Physical Activity and Mental Health After Traumatic Events

2023 Systematic Review

- 33 studies cross-sectional, prospective studies, qualitative studies and RCTs

Key Findings:

- 32 of the 33 studies found that exercise/ physical activity had a positive effect on the mental health of post-disaster residents.
- Physical activity can be used as an effective intervention for individuals psychological health both before and after traumatic events.

Physical Activity and Mental Health After Traumatic Events

Highlights:

- Included events such as natural disasters, accident disasters (e.g., Fukushima nuclear accident), public health incidents (e.g., COVID-19) and war.
- Lack of exercise/physical activity was positively associated with individual mood deterioration and peer relationship problems.
- High levels of physical activity could prevent individual psychological health from stress injury caused by various traumatic events.

Physical Activity & Prevention

- Some preliminary evidence suggesting physical activity/exercise can be a preventative factor in the development of Trauma-Related Symptoms
- Studying trauma is methodologically complex!

Physical Activity for Trauma-Related Symptoms

Part 2: Therapeutics & Treatment

Exercise and Distress Symptoms

2023 Meta-Analysis

- 2 Systematic Reviews assessing the impact of exercise on “psychological distress”

Key Findings:

- Physical activity was found to be moderately more effective than usual care in reducing psychological distress.
- Results also showed a moderate positive effect on reducing depression and small positive effect for anxiety symptoms.

Exercise and Distress Symptoms

Highlights:

- All exercise modes included in the study (strength training, mixed-mode exercise, stretching, yoga, and other mind-body exercises, and aerobic exercise) were found to be *similarly effective*.
- While all intervention durations were shown to be beneficial, the effectiveness decreased as the length of the program increased.
- While this review looked at “psychological distress”, it did not specifically review trauma-related symptoms.

Physical Activity in the Treatment of PTSD

2015 Systematic Review and Meta-Analysis

- 4 Randomized Control Trials (n = 200)

Key Findings:

- PA was effective at decreasing PTSD and depressive symptoms among people with PTSD.
- Results suggest that PA may be a useful adjunct to usual care to improve the health of people with PTSD.

Physical Activity in the Treatment of PTSD

Highlights:

- Two trials of “Active Yoga”
- One Trial of aerobic and resistance based intervention
- One Trial of Aerobic (stationary cycling) intervention
- Controls were “Treatment as usual”, health education and no-treatment controls.

Describes the evidence base as “clearly in its infancy”.

- Many PTSD related articles were included in “anxiety” prior to the DSM-V.

Physical Interventions for Trauma and Stress-Related Disorders

2021 Comprehensive Systematic Review

- 44 Randomized Control Trials (n = 1,912)

Key Findings:

Preliminary evidence suggests that physical interventions may have a beneficial effect as treatment for the symptoms of trauma and stress-related disorders.

Physical Interventions for Trauma and Stress-Related Disorders

Highlights:

- The most commonly studied intervention was some variant of “yoga”
- Physical interventions have significant small to moderate effects on PTSD symptoms.
- Reduction in trauma-related symptoms was observed across intervention types and intensity levels.
- Evidence for improved sleep-quality across interventions types.

Physical Exercise as Treatment for PTSD

2022 Systematic Review and Meta-Analysis

- 11 Randomized Control Trials (n = 605)
  - PTSD diagnosis (or clinically relevant symptoms)

Key Findings:

- There was a positive effect of exercise on PTSD symptoms severity compared to non-active treatment.
- Findings justify the inclusion of exercise as a part of PTSD treatment as an adjunct treatment with greater amounts of exercise providing more benefit.

Physical Exercise as Treatment for PTSD

Highlights:

- There was no significant difference between exercise types, high or low intensity activities (yoga vs. other exercise), or group and individual exercise.
- The researchers hypothesized that low intensity activity might show improved outcomes (due to so emphasis on yoga in past literature).
- Significant positive effects of exercise were also found on depression and sleep, substance use and increased quality of life.

Is Physical Activity Effective at Reducing PTSD Symptoms?

2022 Systematic Review

- 13 Randomized Control Trials (n = 531)

Key Topics:

- Combined (multimodal) exercises administered over a 12 week period, three times a week for 30-60 minutes was most effective for PTSD symptoms.
- Combined exercise intervention has the best evidence for having a beneficial effect on PTSD symptoms.

Is Physical Activity Effective at Reducing PTSD Symptoms?

Highlights:

- Evaluated evidence for multimodal training, yoga, resistance training, aerobic exercise, sailing, mindfulness-based stretching and deep breathing exercise, and therapeutic horseback riding
- Restricted to studies of adults with current diagnosis of PTSD
- The review suggests that overall the risk of bias was high in approximately 50% of the included studies”

Body-and Movement-Oriented Interventions

2023 Systematic Review and Meta-Analysis

- 29 Randomized Control Trials (n = 2,271)
  - **“Body- and movement-oriented interventions (BMOIs)** are characterized by their emphasis on using movement activities and bodily experiences to help reduce symptoms, increase mental health, and improve psychosocial functioning.”

Key Findings:

- Moderate effect size on PTSD symptom reduction and a small-to-moderate effect size for depression symptoms.
- Large effect of BMOIs on sleep quality and a small effect on *interoceptive awareness*.

Body-and Movement-Oriented Interventions

Body-and Movement Oriented interventions included in the study have a high degree of heterogeneity:

- ❏ Physical Exercise (Aerobic, Resistance Training)
- ❏ Multimodal exercise programs
- ❏ Group Trauma-Sensitive Yoga
- ❏ Hatha Yoga
- ❏ Kundalini Yoga
- ❏ Sudarshan Kriya Yoga
- ❏ “Somatic Experiencing”
- ❏ “Mind-body Bridging”
- ❏ “Mission Reconnect”
- ❏ “Body-Oriented Therapy
- ❏ Basic Body Awareness Therapy
- ❏ Mindfulness-Based Deep Stretching
- ❏ Deep Breathing
- ❏ Meditative Diving

Mind-Body Interventions for PTSD

2018 Systematic Review

- 22 Randomized Control Trials
    - Mindfulness & Yoga (n = 764)
    - Relaxation (n = 417)

Key Findings:

- The review supports mind-body interventions (i.e., mindfulness, yoga, and relaxation) for the treatment of PTSD.

Mind-Body Interventions for PTSD

Highlights:

- No studies using tai-chi or qi-gong were included following exclusion criteria.
- Mind-body interventions include deep breathing exercises, meditation, stress management, progressive muscle relaxation and guided imagery.
- Literature base remains limited because many of methodologic weaknesses (small numbers of participants, lack of active control groups, and un-blinded assessments).

Exercise & Sleep Quality on Anxiety, Depression and PTSD

2021 Systematic Review & Meta-Analysis

- Four Randomized Control Trials (n = 149)

Key Findings:

- Exercise training was associated with small to moderate improvements in symptoms of PTSD, anxiety, and depression.
- Exercise training was accompanied by small to moderate improvements in sleep quality.
- Effect was consistent and deemed “high quality” but the limited number of studies included similarly limits drawing conclusions.

Physical Activity & Treatment

- Preliminary data over the past decade suggests that physical activity and exercise can help attenuate trauma- and stress related symptoms.
- Multimodal Exercise? Yoga?
- Research quality negatively impacted by high risk of bias and heterogeneity of interventions

Physical Activity for Trauma-Related Symptoms

Part 3: Clinical Recommendations

Summary of Findings

- Physical Activity may play a preventative/resilience-boosting role.
- Evidence is insufficient to suggest that physical activity/exercise alone is a stand alone treatment for PTSD.
- Evidence suggests that movement-based interventions may support individuals in adjustment following adverse life events.
- Physical activity may have beneficial effects for commonly associated symptoms like depression, anxiety, sleep disturbance.
- Recommended to be combined with existing “gold-standards” including psychotherapy and medication.

Top-Down vs. Bottom-Up

- Trauma-Related Symptoms often present with dissociative symptoms.
- A regular movement practice may support re-association.
- Where trauma may be a reaction to feeling “out of control”, one may establish bottom-up control of their body through movement.

Top-Down vs. Bottom-Up

- Exercise allows for exposure and desensitization to internal arousal cues
- Relaxation and mindfulness based movement can support emotional regulation through improved efficacy management of physiological arousal.
- Regular physical activity can improve sleep quality and facilitate psychological adaptation following a traumatic event (e.g., BDNF)

Top-Down vs. Bottom-Up

- Exercise supports many systems in the body that moderate our stress response (circulatory, immune, endocrine etc.,)
- A regular (chronic) movement practice may improve stress-related resilience preventing tragic events from manifesting into trauma-related symptoms.

Clinical Considerations

- “Some patients may over-use exercise as a form of avoidance coping and/or may engage in physical activities in an excessive of dyscontrolled manner. Eating disorder, which may entail compulsive exercise are often comorbid to PTSD. Physical activity may be contraindicated for patients with these clinical presentations.”
- Caution with client’s with manic symptoms, history of disordered eating or some obsessive-compulsive tendencies.
- State of the literature is still admittedly young, with high levels of heterogeneity and methodological challenges.

Recommendations

- Targeted multimodal exercise seems to be the best.
- Light physical activity and body- movement- interventions **may** be best for symptoms associated with hyperarousal and anxiety.
- Moderate to vigorous physical activity including aerobic exercise and resistance training **may** be best for negative symptoms.
- Mind-body oriented exercise may be best for dissociative symptoms.
- Defer to CDC recommendations and forms of activity the client is likely to adhere to and continue.

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