



## **Does High Intensity Physical Activity Reduce the Impact of Posttraumatic Stress Disorder in Individuals After Experiencing Trauma?**

Raquel Bachman, Amanda Lee, Mari Mueller, Emma Spelt  
Dr. L. Macedo, Dr. R. Gewurtz, Nick Halmasy



## Introduction

- Collaborative project between OT and PT
- OT students: qualitative research with firefighters
- Our group: scoping review on HIPA and PTSD
  - Unable to identify research on first responders
  - Expanded population to all individuals with PTSD

## Introduction

- PTSD is prevalent in first responders
  - 10-22% in paramedics, police, firefighters
- Currently: stigma receiving treatment
- Less stigma with exercise?

## Introduction

- Post-Traumatic Stress Disorder (PTSD)
  - Caused by exposure to a traumatic event
  - Duration >1 month
  - Symptoms: re-experiencing, avoidance, negative affect, hyperarousal, sense of imminent threat
- High-Intensity Physical Activity (HIPA)
  - Maximum heart rate 70-85% or 6 METs
  - Examples: running, plyometrics, resistance training

## Purpose and Objectives

- Purpose: examine the literature on HIPA for PTSD, with a focus on first responders
- Primary question: **‘Does high intensity physical activity reduce the impact of PTSD in individuals after experiencing trauma?’**



## Methods

- Databases: MEDLINE, PsychINFO, EMBASE, CINAHL
- Study designs: RCTs, quasi-experimental designs, cohort studies, case-controlled studies, longitudinal cohort studies
- Population: those who experienced an emotional trauma

## Methods

- Data collection: worked in pairs to review titles and abstracts, perform full text screening, retrieve articles, and extract data from studies
- Risk of bias assessment: Critical Review Form for Quantitative Studies (Law et al.)

## Results

- Initial search: no studies on HIPA and PTSD in first responders identified
- Broader search: 5,274 articles
- Title and abstract screening: 52 articles
- 48 articles retrieved
  - 4 articles: authors emailed with no reply
- 11 articles included



## Results: Study Characteristics

- Study Designs
  - 5 pre-post test
  - 4 RCT
  - 2 prospective cohort
- Participants
  - 2 studies: children
  - 3 studies: veterans
  - 8 studies: community
- Sample Sizes
  - 8 studies; < 50 subjects
  - 2 studies; > 100 subjects
- Locations
  - All developed countries
  - 8 US, 2 Canada, 1 Aus



## Results: Characteristics of Exercise

### Study Types:

- 4 aerobic exercise
  - Walking, running on treadmill; biking
  - 20-40 min bouts
- 2 group-based
  - Plyometrics
- 2 combined: aerobic + resistance
- 2 self-report
- 1 surfing intervention

## Results: Outcome Measures

- PTSD Checklist-Civilian Version
- PTSD Checklist-Military Version
- Children PTSD inventory
- Depression Anxiety and Stress Scale (DASS)
- Beck Depression Inventory
- Beck Anxiety Inventory
- State-Trait Anxiety Inventory

## RCTs

## Results: HIPA outcomes

- **Fetzner et al (2015):** no between group differences for PTSD symptoms between attentions to somatic arousal, distraction from somatic arousal, and exercise with no distractions (1 month follow up)
- **Powers et al (2015):** PE + exercise had greater effects on BDNF than PE alone (3 month follow up)
- **Rosenbaum et al (2015):** resistance training greater improvements in PTSD symptoms vs. usual care (immediately post-intervention)
- **LeBouthiller et al (2017):** improvements in PTSD in aerobic and resistance group vs. waitlist (1 week follow up)

## Results: HIPA Outcomes

### Longitudinal Cohort

- **Whitworth et al (2017):** self-report vigorous activity associated with decreased PTSD symptoms (3 month follow-up)
- **Leardmann et al (2011):** self-report vigorous physical activity associated with decreased PTSD symptoms vs. moderate and light (3 year follow-up)

## Results: HIPA Outcomes

- **Pre-post (within group differences)**
  - **Newman et al (2007):** group plyometric exercise associated with significant in PTSD in children (1 month follow-up)
  - **Manger et al (2005):** supervised group aerobic exercise associated with decreased PTSD (1 month follow-up)
  - **Diaz et al (2008):** aerobic exercise associated with reductions in PTSD (1 month follow-up)
  - **Rogers et al (2014):** improvements in PTSD after 5 weeks of surfing (immediately post-intervention)

## Discussion

- Large heterogeneity in studies
- Overall HIPA associated with decreased prevalence of PTSD symptoms from baseline
- Studies found improvements in PTSD symptoms using both high intensity aerobic + resistance training
  - Compared to: usual care, waitlist, exercise with somatic arousal, prolonged exposure therapy

## Limitations

- No clear definition of HIPA in literature
- Lack of clear definition of exercise intensity – *could not include these studies*
- Heterogeneity of studies
- Risk of Bias tool



## Clinical Relevance

- Limited evidence that HIPA may positively impact those diagnosed with PTSD
- Possible alternative for PTSD management
  - May reduce stigma

## Future Directions

- Establish parameters and guidelines
- Is one type of exercise superior to another?
- HIPA for PTSD in first responders
- Optimal time to implement exercise (primary or secondary prevention)?
- Feasibility in first responders?

## Conclusion

- Literature limited in first responders
- Results of scoping review: low quality evidence that HIPA may have beneficial effect on PTSD
- Many unknowns and need for future research

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## Questions

