

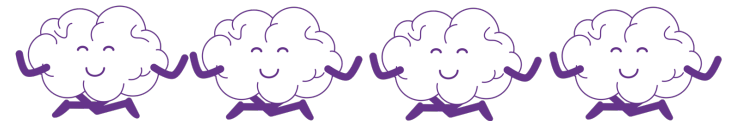
# RESILIENCE AFTER TBI: MINDFULNESS, YOGA, SOCIAL CONNECTION

Kyla Pearce, MPH, PhD, RYT, CBIS  
Senior Director, LoveYourBrain Foundation



# LEARNING OBJECTIVES

- Resilience vs. recovery framework
- Understand key evidence-based benefits of yoga and mindfulness for brain injury
- Experience TBI-friendly mindfulness techniques
- Learn how to access free LoveYourBrain programs for people with brain injury and caregivers



C.A.L.M.

# RESILIENCE *VERSUS* RECOVERY

re·sil·ience



rə'zilyəns/

noun

1. process of adapting well in the face of adversity, trauma, tragedy, threats, and significant sources of stress

re·cov·er·y



rə'kəv(ə)rē/

noun

1. a return to a normal state of health, mind, or strength  
2. process of regaining possession or control of something stolen or lost

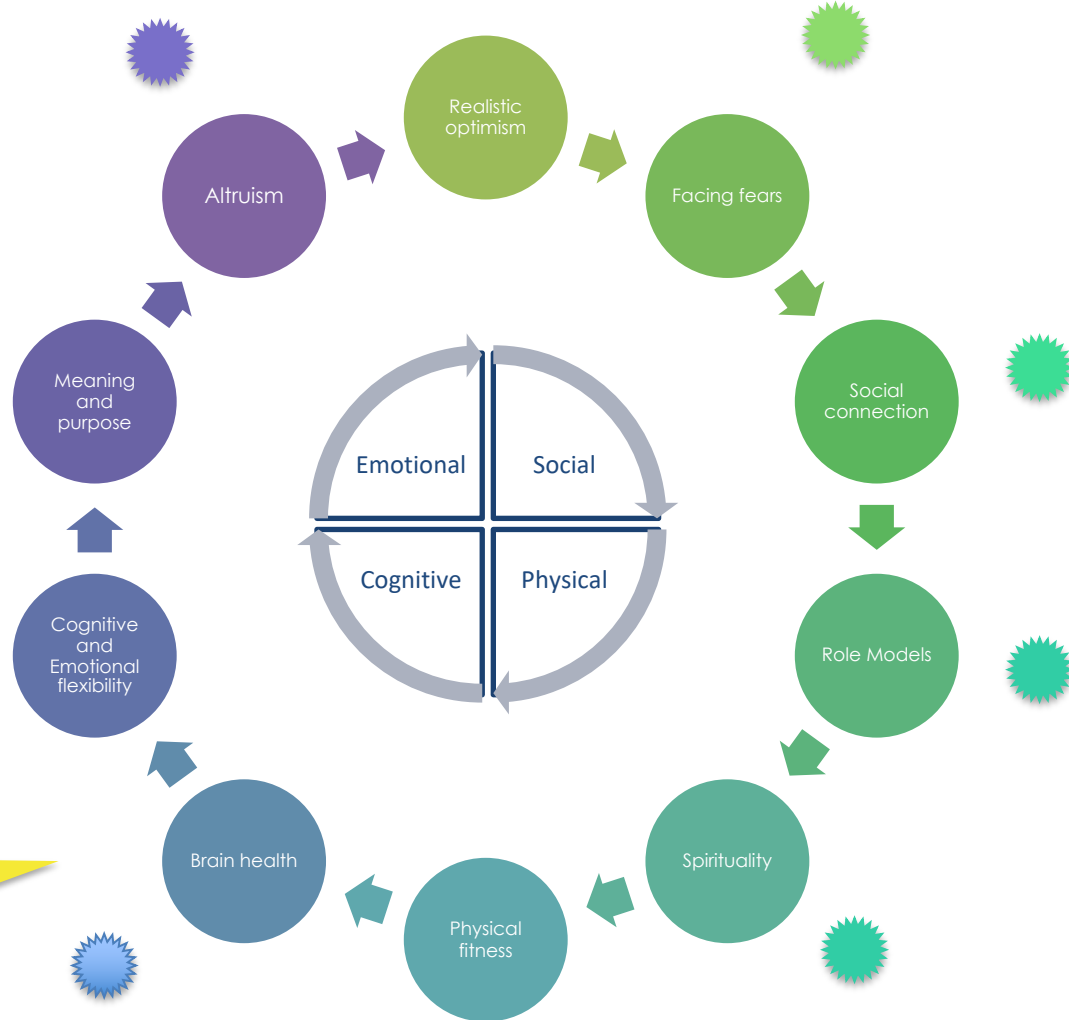




# RESILIENCE

- ✓ **Coping, psychological adjustment, motivation**
- ✓ **Symptoms & functional outcomes**
  - Study of mTBI (n=74), less PPCS, PTSD, fatigue, depression, higher QOL
- ✓ **Participation** in jobs, education, leisure, relationships
  - Cross-sectional study (n = 245 people) with mild-severe TBI, 4.6 years post-injury, found resilience significantly predicted higher participation (along with shorter PTA, more time post-injury, higher education, younger age)
  - Longitudinal study (n=195) resilience significantly associated with participation over first year post-injury
- **Quality of Life**
  - Adverse effects of low resilience stronger influence on well-being than do the positive effects of high resilience
- Moderators: social support, nonminority status, lower anxiety and disability level, greater life satisfaction

# 10 EMPIRICAL FACTORS OF RESILIENCE

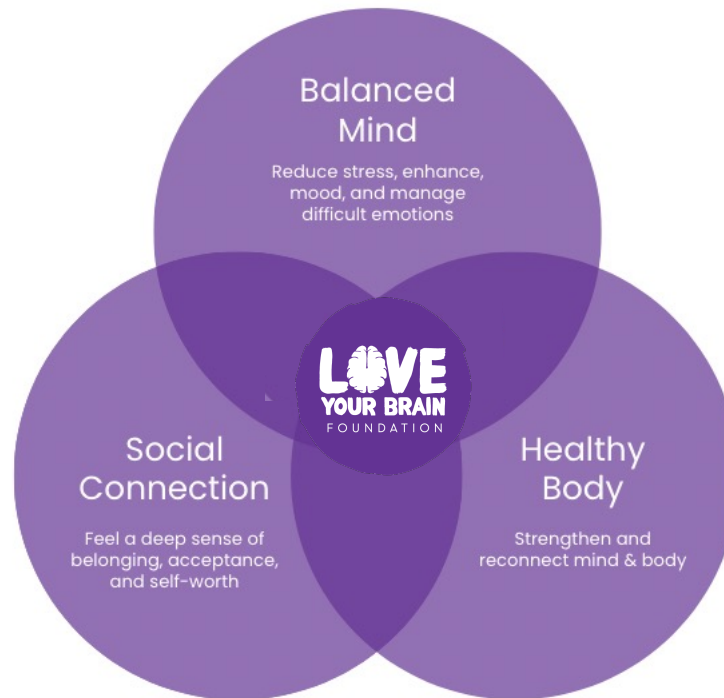


**POLL**



# HOLISTIC HEALTH PROGRAM MODEL

In-person and online to maximize access







Empowering people with traumatic brain injury + concussion and caregivers to build **resilience and community connection** through FREE, research-backed programs:



## YOGA

6-week yoga and meditation program in studios and hospitals across the US and Canada to support wellbeing



## MINDSET

6-week online yoga, mindfulness, and education program to build a resilient mindset



## RETREAT

5-day holistic health retreats to explore mindfulness, movement, nutrition, and community



## TRAININGS

20-hour online and in-person trainings for yoga teachers and clinicians to become certified in accessible yoga for TBI

35,000+ SERVED ACROSS US, CANADA, AND GLOBE

# HOLISTIC | ADAPTABLE | AUTONOMY

physical movement (asana)

breathing exercises (pranayama)

meditation (pratyahara, dharana, dyana)

ethics (yamas, niyamas)

complete wellbeing (samadhi)



WORRIER POSE

“Paying attention: on purpose, in the present, non-judgmentally”

- Jon Kabat-Zinn



# WHY BENEFICIAL FOR TBI?





# COMMON SYMPTOMS

physical  
cognitive  
psychological  
behavioral  
social



# MENTAL HEALTH

- 48% receive psychiatric diagnosis after injury
- *Anxiety* → 36% of people with TBI
  - 18% general population
  - More common mTBI vs. severe
- *Depression* → 43% of people with TBI
  - 3-6% general population
  - More common mTBI vs. severe - 1 in 5 people with concussion



mind and body  
integration



mind to body

Confidence

Fear

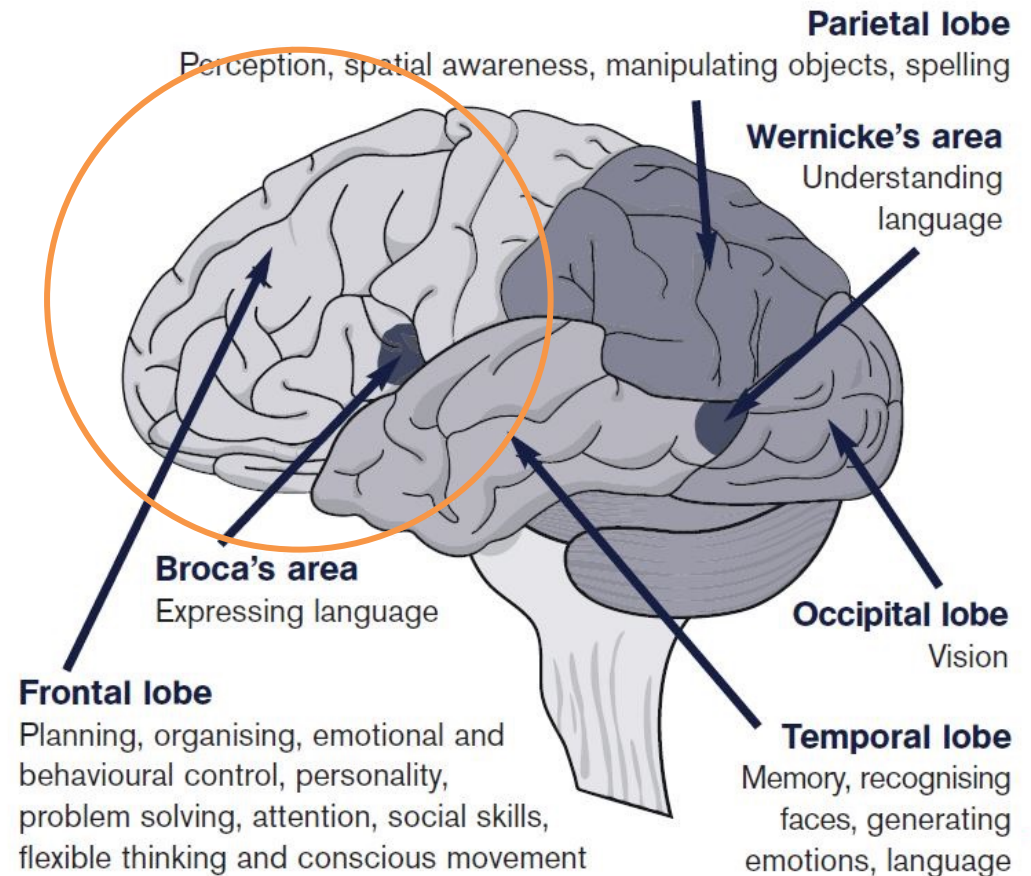
Anger

Joy

body to mind

# EXECUTIVE FUNCTIONING

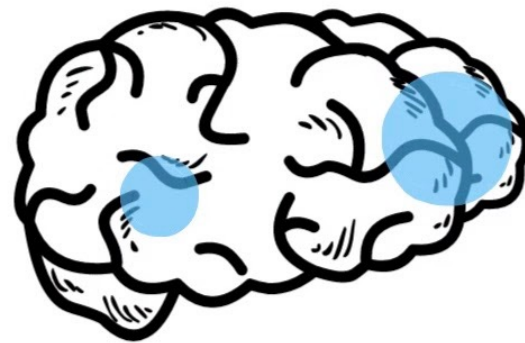
- Decision-making
- Planning
- Attention
- Working memory
- Self-awareness



# IMPROVE ATTENTION



Default Mode  
Network

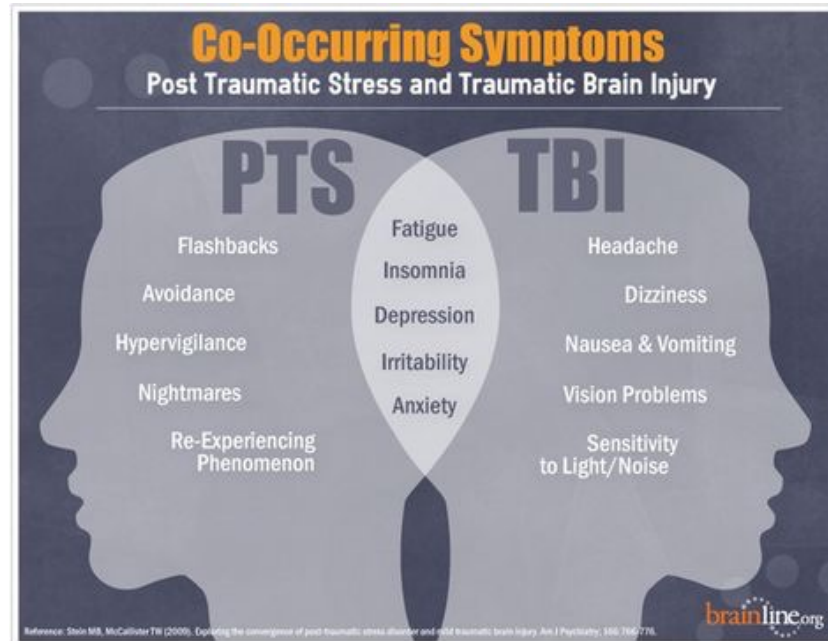


Task Positive  
Network



# PTSD & TBI

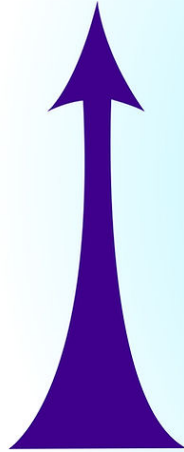
- TBI/PTSD can co-occur
  - 3-27% people with TBI have PTSD
- 7-8% US population will have PTSD at some point in lives
  - Motor vehicle accident most common cause of PTSD



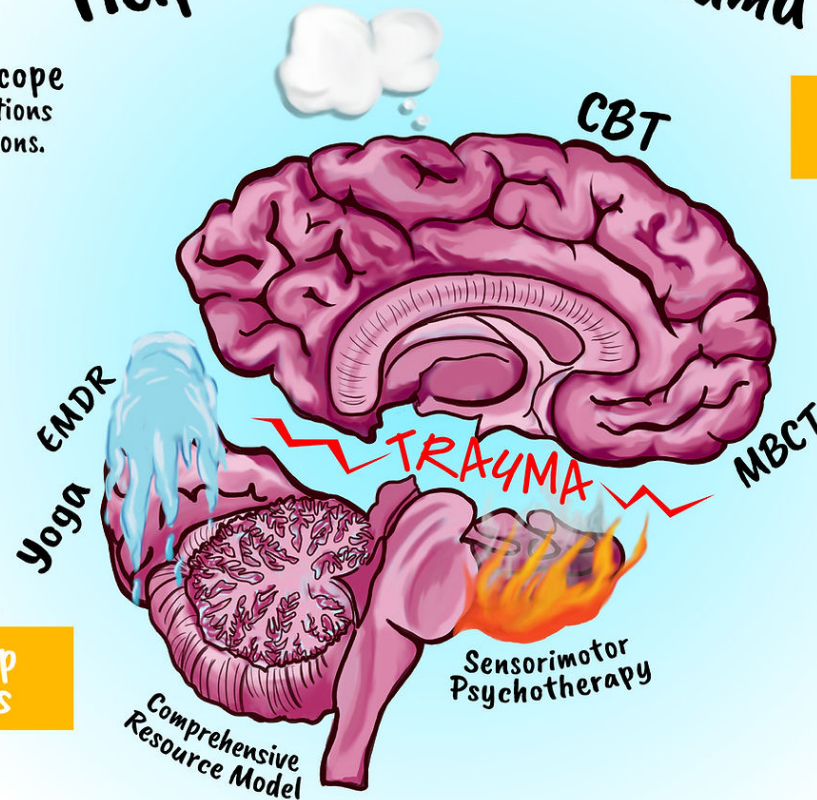
# REGULATE NERVOUS SYSTEM

## Brain-Based Approaches to Help Clients After Trauma

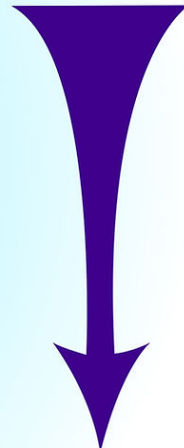
How to help clients cope with their raw emotions and defense reactions.



Bottom - Up Approaches



Top-Down Approaches



How to help clients think differently.

# HYPERAROUSAL

Use mindfulness,  
grounding, Breath work

Overreactive, unclear thought,  
Emotionally distressed

Can't calm down

# WINDOW OF TOLERANCE

The body is in its optimal state, Can access both  
reason and emotion, Mentally engaged

Shutting Down

Depressed, lethargic,  
numb, unmotivated

Use mindfulness, breath work,  
physical activity

# HYPOAROUSAL



TAKE 5



**WHAT DOES  
RESEARCH  
SHOW?**





# META-ANALYSIS ON MINDFULNESS FOR CONCUSSION

- 20 studies, 539 participants
- Meditation (95%), breathing practices (90%), yoga (65%), other physical activity (35%)
- 1:1 and group, av. 11 wk duration
- Overall symptoms improved compared to controls
  - Depression ( $d=0.42$ , 95% CI 0.16, 0.69)
  - Fatigue ( $d=0.96$ , 95% CI 0.29, 1.63)

Meta-Analysis > Appl Psychol Health Well Being. 2021 Feb;13(1):34-62.

doi: 10.1111/aphw.12244. Epub 2020 Nov 2.

## Therapeutic Effects of Meditation, Yoga, and Mindfulness-Based Interventions for Chronic Symptoms of Mild Traumatic Brain Injury: A Systematic Review and Meta-Analysis

Rebecca L Acabchuk <sup>1</sup>, Julie M Brisson <sup>1</sup>, Crystal L Park <sup>1</sup>, Noah Babbott-Bryan <sup>1</sup>, Olivia A Parmelee <sup>1</sup>, Blair T Johnson <sup>1</sup>

Affiliations + expand

PMID: 33136346 DOI: 10.1111/aphw.12244

### Abstract

**Background:** Chronic symptoms of mild traumatic brain injury (mTBI) vary greatly and are difficult to treat; we investigate the impact of meditation, yoga, and mindfulness-based interventions on this treatment group.

**Method:** Search included four databases, allowing studies of any design containing pre/post outcomes for meditation, yoga, or mindfulness-based interventions in people suffering from brain injury acquired by mechanical force. Analyses used robust variance estimation to assess overall effects and random-effects models for selected outcomes; we evaluated both between- and within-group changes.

**Results:** Twenty studies ( $N = 539$ ) were included. Results revealed significant improvement of overall symptoms compared to controls ( $d = 0.41$ ; 95% CI [0.04, 0.77];  $\tau^2 = 0.06$ ), with significant within-group improvements in mental health ( $d = 0.39$ ), physical health ( $d = 0.39$ ), cognitive performance ( $d = 0.24$ ), quality of life ( $d = 0.39$ ), and self-related processing ( $d = 0.38$ ). Symptoms showing greatest improvement were fatigue ( $d = 0.96$ ) and depression ( $d = 0.40$ ). Findings were homogeneous across studies. Study quality concerns include lack of randomisation, blinding, and recording of adverse events.

**Conclusions:** This first-ever meta-analysis on meditation, yoga, and mindfulness-based interventions for chronic symptoms of mTBI offers hope but highlights the need for rigorous new trials to advance clinical applications and to explore mechanistic pathways.

YOGA AND MEDITATION HAVE MANY  
**HEALING BENEFITS FOR TBI**  
and can change the structure and function of the brain



IMPROVE  
**ATTENTION SKILLS**

(COLE ET AL., MIL MED 2015)

**by increasing the thickness of the  
pre-frontal cortex, associated with  
focus and decision-making**

(HÖLZEL ET AL., SOC COGN AFFECT NEUROSCI 2010)

# AUGMENT MEMORY

(AZULAY ET AL., HEAD TRAUMA REHABIL 2013)

**by changing brain structures  
associated with memory,  
including the hippocampus**

(HÖLZEL ET AL., SOC COGN AFFECT NEUROSCI 2010)



# REDUCE MENTAL FATIGUE

**by supporting better  
information processing**

(LOHANSSON ET AL., BRAIN IN JULY 2012)



## A qualitative study of psychoeducation in traumatic brain injury

Kyla Z. Donnelly<sup>a</sup>, Shari Goh

<sup>a</sup>The Dartmouth Institute for Health Professions, Colby-Sawyer College,

### ABSTRACT

**Purpose:** To explore participation designed to facilitate community-based yoga intervention and three caregivers interviewed were analyzed using interviews. **Results:** We identified seven physical health, self-regulation yoga studio environment and in strength, balance, flexibility, and ability to move breathing exercises) to cope relationships built during Love their community. **Conclusions:** LoveYourBrain traumatic brain injury. It also facilitates, which suggest that it may

### IMPLICATIONS FOR REHABILITATION

- Traumatic brain injury rehabilitation
- Yoga is a holistic therapy at the community level
- Participants in a community-based and meaningful program
- Group-based yoga with community-based rehabilitation

## The feasibility and effectiveness of an online yoga-based LoveYourBrain Mindset program for people with acquired brain injury

Kyla Z. Donnelly<sup>a</sup>, Kate L

<sup>a</sup>The Dartmouth Institute for Health Professions, Colby-Sawyer College,

### ABSTRACT

**Objective:** This pilot study explored the feasibility and effectiveness of an online yoga-based LoveYourBrain Mindset program for people with acquired brain injury. **Methods:** Thirty-one adults with traumatic brain injury completed the program. **Results:** No significant differences were found between pre- and post-intervention scores for the primary outcome (Quality of Life Positive Affect) and secondary outcomes (Quality of Life Resilience, Quality of Life Well-being, and the Neurological Symptom Checklist). **Conclusions:** Adults with acquired brain injury showed improvements in quality of life and satisfaction with the program. Specific implications for rehabilitation are discussed.

## Research

## A retrospective study of LoveYourBrain Yoga for people with traumatic brain injury

Kyla Z. Donnelly<sup>a,b</sup>, Niral

<sup>a</sup>Department of Psychiatry, Colby-Sawyer College, USA; <sup>b</sup>The Dartmouth Institute for Health Professions, Colby-Sawyer College,

### ABSTRACT

**Purpose:** To conduct a retrospective study of the effectiveness of the LoveYourBrain Mindset program for people with traumatic brain injury. **Materials and Methods:** We conducted a retrospective study of 1563 people with traumatic brain injury who participated in the LoveYourBrain Mindset program. **Results:** Mean satisfaction, and mean affect and well-being (measured using the Quality of Life Positive Affect and Well-being (QOLPAW) scale) improved significantly from baseline to post-intervention. **Conclusions:** LoveYourBrain Mindset is an effective mode of, or

### IMPLICATIONS FOR REHABILITATION

- People with traumatic brain injury accessing community-based programs
- Yoga is a holistic, meaningful program for people affected by traumatic brain injury
- Participants in LoveYourBrain Mindset program in 18 states showed improvements in resilience, cognition, and quality of life
- LoveYourBrain Mindset is an effective mode of, or

> Complement  
Online ahead of

## A crossover study of the effectiveness of a community-based LoveYourBrain Mindset program for people with traumatic brain injury

Kyla Z. Donnelly, Martha L Bruce

Affiliations + e  
PMID: 3578054

## Abstract

**Background and Objective:** This study aimed to assess the feasibility and effectiveness of a rural, community-based LoveYourBrain Mindset program for people with traumatic brain injury.

**Methods:** This was a crossover study involving 15 people with traumatic brain injury. The program was delivered in English-speaking communities. The primary outcome was mean difference in Quality of Life Positive Affect and Well-being (QOLPAW) score, and secondary outcomes were Quality of Life Resilience, Quality of Life Well-being, and the Neurological Symptom Checklist (NSC).

**Results:** Significant improvements in QOLPAW (MD 2.14) and a mean difference in NSC (MD 1.4) were observed.

## The feasibility and effectiveness of an online yoga-based LoveYourBrain Mindset program for people with traumatic brain injury

Kyla Z. Donnelly

<sup>a</sup>The LoveYourBrain Mindset program, Lebanon, NH, USA;

### ABSTRACT

**Purpose:** To evaluate the feasibility and effectiveness of an online yoga-based LoveYourBrain Mindset program for people with traumatic brain injury. **Materials and Methods:** We conducted a feasibility and effectiveness study of the LoveYourBrain Mindset program. **Results:** 68% of participants completed the program. Mean Quality of Life Positive Affect/Well-being (QOLPAW) score improved significantly from baseline to post-intervention (MD 2.14, 95% CI 0.50–3.78). Mean Quality of Life Resilience (MD 1.4, 95% CI 0.14–5.54) and Neurological Symptom Checklist (MD 1.4, 95% CI 0.14–5.54) also improved significantly. **Conclusions:** The LoveYourBrain Mindset program is a feasible and effective mode of, or

### IMPLICATION:

- Ongoing, holistic program for people with traumatic brain injury
- Residential and community-based programs
- LoveYourBrain Mindset program among people with traumatic brain injury
- The program may support

## Introduction


Traumatic brain injury (TBI) is a leading cause of disability and death in both short- and long-term. It is a complex condition that affects cognitive and behavioral functions, and can lead to significant physical, emotional, and social challenges. The LoveYourBrain Mindset program is a community-based, online yoga and mindfulness program designed to help people with TBI improve their quality of life and resilience. This study aimed to assess the feasibility and effectiveness of the LoveYourBrain Mindset program for people with TBI.

# LoveYourBrain Mindset: Feasibility and Effectiveness of an Online Yoga-based Psychoeducation Intervention for Traumatic Brain Injury

Christine E. Callahan , Ling Beisecker, Shilo Zeller & Kyla Z. Donnelly 

Received 25 Apr 2022, Accepted 09 Jan 2023, Published online: 24 Jan 2023

 Download citation  <https://doi.org/10.1080/02699052.2023.2168062>

 Full Article

 Figures & data

 References

 Citations

## ABSTRACT Objective

Despite the benefits of yoga, mindfulness, and psychoeducation, limited research suggests that a community-based program exists. This study investigated the feasibility, acceptability, and effectiveness of the LoveYourBrain Mindset online program for people with TBI.

## Research Design

Pre-post, retrospective intervention.

## Methods

LoveYourBrain Mindset is a six-week online yoga, mindfulness, and psychoeducation program. The program includes interactive Zoom classes and prerecorded mindfulness tools. The primary outcome was mean difference in Quality of Life Positive Affect/Well-being (QOLPAW) score, and secondary outcomes were Quality of Life Resilience, Quality of Life Well-being, and the Neurological Symptom Checklist (NSC). Participants were eligible if they experienced TBI, were a caregiver, or clinician; ≥18 years old; and had a minimum of 12 months since TBI. We analyzed attendance, program ratings, and pre/post-intervention differences in QOL, resilience, emotional well-being, and group discussion. We analyzed attendance, program ratings, and pre/post-intervention differences in QOL, resilience, emotional well-being, and group discussion.

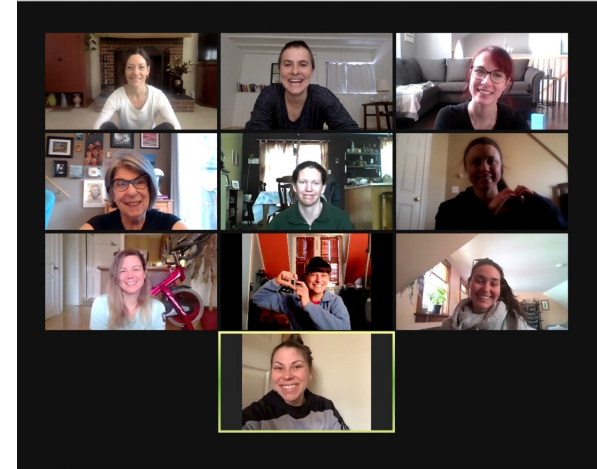




Research-backed, FREE, six-week online yoga, mindfulness, and education program



YOGA CLASS



GROUP DISCUSSION



1: EDUCATION



2: MEDITATION

## MINDFULNESS TOOLS



3: YOGA



4: YOGA NIDRA





# FIRST-EVER ONLINE YOGA FOR TBI STUDY

We wanted to know...

## **Is it helpful?**

*Does LYB Mindset benefit health outcomes after TBI?*

## **It is good enough?**

*Are people satisfied with the LYB Mindset content and design?*

## **Does it work for TBI?**

*Can people with TBI & caregivers successfully participate in LYB Mindset?*

How the study went...

**Design:** Mixed-methods, pre-post retrospective study

**Eligibility:** TBI, caregiver, 15+ years, capable of gentle exercise and group discussion

**Data collection:** self-reported demographics & 5 clinical outcomes

**Analysis:** Multiple linear regression, content analysis



# IMPROVED CLINICAL OUTCOMES



- 1,093 people (71.0%) participated >1 class in 127 programs in 1.5 yr period
- Mean satisfaction was 9.1 out of 10 (SD 1.28)
- 411 people with TBI experienced **significant improvements** in:
  - ✓ Quality of Life MD = 0.59, 95% CI=0.51, 0.67,  $p<0.001$
  - ✓ Resilience MD = 0.70, 95% CI=0.62, 0.78,  $p<0.001$
  - ✓ Cognition MD = 0.74, 95% CI=0.68, 0.80,  $p<0.001$
  - ✓ Positive Affect MD = 0.77, 95% CI=0.70, 0.85,  $p<0.001$
  - ✓ Emotional/Behav Dysregulation MD = 0.58, 95% CI=0.52, 0.65,  $p<0.001$

# POTENTIAL PROBLEMS

- Some meditation techniques (e.g., insight) may be associated with unpleasant psychological experiences (Schlosser et al., 2019)
- Some movement patterns can exacerbate cognitive and physical symptoms
- Some breathwork techniques (e.g., emphasize forced exhalation and retention) may increase stress response

# TIPS & BEST PRACTICES





# INTENTION, ATTENTION, ATTITUDE

**Intention:** knowing why you're doing what you're doing

- 'to meditate for the next few minutes' or 'to treat myself gently'
- releases dopamine that helps with motivation and learning

**Attention:** focusing your attention on what's happening now

- learning the skill of noticing distraction and reorienting attention to present
- Normalize mind-wandering so people don't feel like they're failing

**Attitude:** *how* we pay attention really matters

- Self-judgment shuts down the learning centers of the brain, and keeps us stuck in the behaviors we're trying to change



**ACTIVITY**



# SAFETY, PREDICTABILITY, AND CONTROL

- Can meditate in any posture (seated/lying down/standing)
  - “Find a way to be in your body”
- Invitation for eyes closed or open
- Orienting + Grounding techniques:

3, 2, 1 Exercise:

- Name 3 things you can see in the room with you
- Name 2 things you can hear
- Name 1 thing you can feel

# CHOOSE AN 'ANCHOR' OF ATTENTION

- Breath
- Touchpoints between body and surfaces
- Listen to sound

# NORMALIZE MIND WANDERING

- Label thoughts



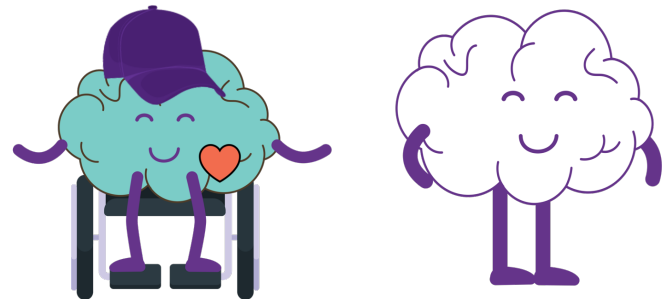
# ATTENTION, LEARNING, MEMORY

- Slow, simple, repeated instruction
  - “I liked that they were simple & focused on one topic each”
  - “Instructions could be given a little slower”
- Shorter duration (2-10 mins)
  - “I have trouble concentrating for meditation so the shorter ones I like better”
- Background music / bells
  - “Liked that there was even sound, no gongs. Liked that they were short”
  - “I would like some nice soothing background music.” / “love that they don't have distracting amounts of background music.”



# RESILIENCE RESOURCES

- Resilience and Adjustment Intervention
- Brainline.org – articles & videos
  - Positive Ways to Reinvent Yourself After a TBI
  - Tapping into Skills of Resilience After Brain Injury
- LoveYourBrain programs



# LOVEYOURBRAIN PROGRAMS



- FREE holistic health programs for TBI/ABI & caregivers
- Improve resilience, QOL, community participation via psychosocial & mindfulness-based components

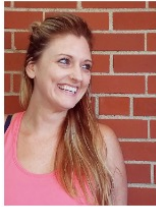


# 60+ PROGRAM LEADERS

Majority with lived TBI experience!



**Adrienne Cadbury**  
Mindset



**Alana Abdal**  
Mindset



**Aliss Wang**  
Mindset



**Andrea Rapp**  
Mindset



**Jenni Foltz**  
Mindset, LYB Ambassador



**Josee Charbonneau**  
Mindset, Yoga



**Keith Jundanian**  
Retreat



**Kourtney Smith**  
Mindset



**Nancy Burtenshaw**  
Mindset, Yoga



**Natasha Chaoua**  
Mindset, Yoga, Training



**Ann Diebel**  
Retreat



**Anne-Phyfe Palmer**  
Mindset



**Arielle Earthman**  
Mindset



**Becky Miles**  
Mindset



**Kristy Joy Schoyen**  
Mindset



**Kyla Pearce**  
Mindset, Yoga, Training, Retreat



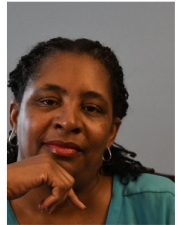
**Lisa Hartzler**  
Mindset



**Liv Kesselhaut**  
Mindset, Retreat, Training



**Paula Bentley**  
Mindset



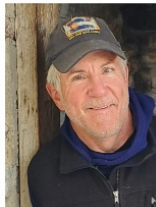
**Rachel Davis**  
Mindset



**Bonnie Currie**  
Mindset, Yoga



**Brett Tivers**  
Mindset



**Brian Heber**  
Retreat



**Chloe Triantafillis**  
Mindset



**Madeline Mason**  
Mindset



**Mallory Fox**  
Mindset



**Marisol Enriquez**  
Mindset



**Megan Cauley**  
Mindset



**Ramsay Pierce**  
Training, Retreat, Mindset, Yoga



**Reba Gray**  
Yoga, Mindset



**Chris Chambers**  
Mindset



**Cindy Murray**  
Mindset, Retreat



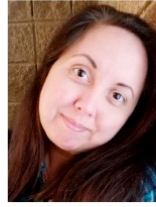
**Claudette Evans**  
Yoga, Retreat, Training, Mindset



**Corbin Ellis**  
Mindset



**Melissa Pennington**  
Retreat, Yoga



**Michelle Butts**  
Mindset



**Michelle Coppola**  
Mindset, Yoga, Retreat



**Monica A. Rasmussen**  
Mindset





# LYB MEDITATION & YOGA LIBRARY

+100 free practices to support brain health, specifically for the brain injury community



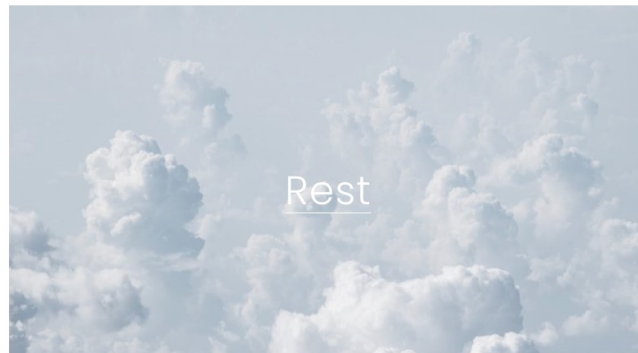
Increase awareness, concentration, and focus.



Cultivate kindness, joy, and belonging.



Grow inner steadiness, emotional health, and stress control.



Improve sleep quality and inner calm.

# FIRST-EVER MINDFULNESS FOR TBI COURSE



## Power of Awareness

Weekly video lessons (~15 mins) plus guided meditations (~10 mins)



---

Week 1: "Best" Position & Intention, Attention, Attitude +

---

Week 2: Power of Pause & Working with Distraction +

---

Week 3: Two Wings of Mindfulness +

---

Week 4: Why Mindfulness? +

---

Week 5: Pause, Stabilize, Open +

---

Week 6: Body & Pain +

---

Week 7: Stress & the Window of Tolerance +

---

Week 8: Thoughts are Thoughts... not Facts +

---

Week 9: Working with Emotions +

---



9-week, self-paced course

Best practices for mindfulness to TBI



# LYB MINDSET PROGRAM – JAN, APRIL, JULY, OCT

Looking for peer support, community connection, and mindfulness tools for TBI?

ONLINE, free, 6-week yoga, mindfulness, and education program!



1: EDUCATION



2: MEDITATION



3: YOGA



4: YOGA NIDRA



# AFFINITY GROUPS TO DEEPEN BELONGING AND IMPACT

Affirming spaces for people with shared identities to meaningfully connect, learn with, and support each other.

- Black, Indigenous, People of Color
- Caregivers
- Chair Yoga
- LGBTQIA+
- Young Adult
- Veterans





# LOVEYOURBRAIN RETREATS

5-day, manualized, holistic health residential retreats

- Somatic movement
- Mindfulness
- Brain Health Nutrition
- Community Building
- Art therapy



Offered 5x per year in nature-based retreat centers in Colorado and Maine





# THANK YOU & QUESTIONS?

kyla@loveyourbrain.com  
loveyourbrain.com



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