

Preliminary Cost-Effectiveness of Transcendental Meditation (TM) for Treating PTSD in Veterans

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Disclosures

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Background

- ▶ PTSD - diagnosed when symptoms (intrusive thoughts, emotional dysregulation, sleep problems, avoidance of trauma cues) do not diminish and are functionally impairing.
- ▶ PTSD is linked to a range of health problems - depression, substance use, chronic pain, disability, suicidality, lower QOL, and higher health care costs.
- ▶ Rates of PTSD are higher in military veterans, with 22% of combat-exposed veterans (in recent conflicts) meeting criteria for PTSD.

Background

- ▶ Effective PTSD treatments exist, with trauma-focused, CBT-based therapies such as (PE) and (CPT) recommended in guidelines and evidence-based.
- ▶ However, trauma-focused therapies often have high drop-out rates (~40%) and subsequently, high non-response rates (~ 50%)
- ▶ Transcendental Meditation (TM) is non-trauma-focused, involves the use of a mantra (sound), without concentration or contemplation.
- ▶ After smaller trials, a DoD-funded trial (2018) randomized 203 veterans with PTSD to either TM, PE, or health education (HE). (Nidich, 2018).

RCT Results

- ▶ Main result: TM was found to be non-inferior to PE, a first-line guideline-concordant psychotherapy.
- ▶ The mean decreases in CAPS-IV scores were 16.1, 11.2, and 2.5 for TM, PE, and HE respectively.
- ▶ Rates of clinically significant improvement (CAPS score decrease ≥ 10) were 61.2%, 41.5% and 32.3% respectively.
- ▶ Treatment non-completion rates = 25% - TM, 38% - PE, and 35% - HE.

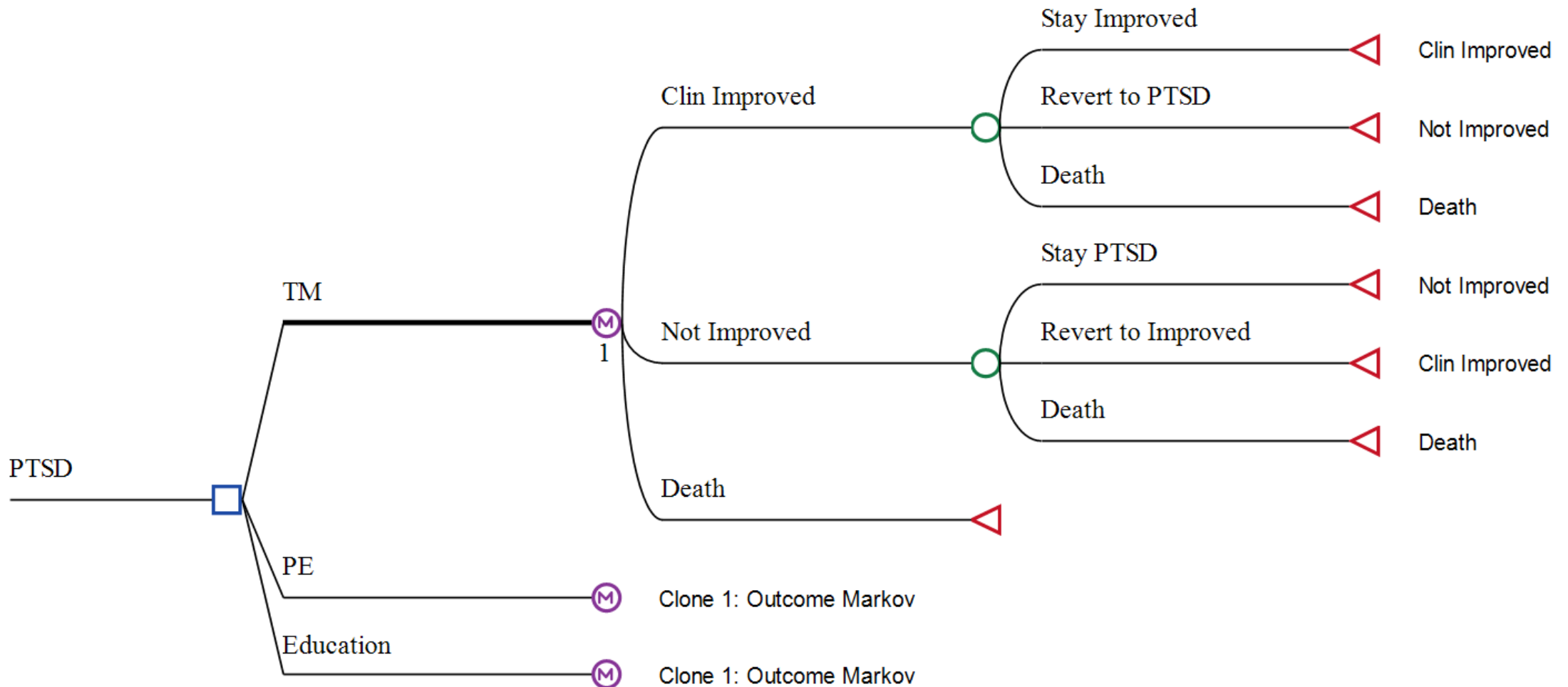
Objective

- ▶ Examine the preliminary cost-effectiveness of TM for veterans with PTSD.
- ▶ Results considered preliminary because...
 - ▶ findings from a single RCT
 - ▶ did not track participant health care utilization/costs
 - ▶ limited to outcomes measured at three months.

Methods

- ▶ Markov decision model - repeated cycles simulate response or non-response to the three study interventions from a healthcare organization perspective.
- ▶ In the first cycle, each participant (or cohort) accrues an estimated intervention cost
- ▶ In the first and subsequent cycles, each participant accrues Quality Adjusted Life Years (QALYs), estimated health care costs associated with intervention response or non-response.

Markov Model



Model Inputs

Inputs for the Markov Model were:

- ▶ Time Horizon: 5 years (20 3-month cycles: Marseille 2022)
- ▶ Mortality Rates - age 47, 83% male, CDC tables, (32% - Nilaweera 2023)
- ▶ Reversion rate - 2.5% /3-mo cycle (Mavranezouli 2020)
- ▶ Inflation: Costs adjusted to 2023 US\$ - (US CPI calculator)
- ▶ Discount rate: 3% annual (convention for CEA) - (Neumann 2017)

Intervention Cost Estimates

- ▶ TM cost - \$1,504/participant
 - ▶ TM administrators in \$2023 plus small add-on for scheduling
- ▶ PE cost - \$2,822/participant
 - ▶ Mavranezouli et al. 2020 - CEA of psych treatments for PTSD
 - ▶ Adjusted for 12 90-minute sessions, \$US, and to \$2023
- ▶ HE cost - \$492/participant
 - ▶ Groessl et al. 2016 - LIFE Study
 - ▶ adjusted for # sessions and to \$2023

Effectiveness and Health Utility Values

- ▶ Rates of clinically significant improvement (CAPS score decrease \geq 10) - 61% (TM), 41% (PE), and 32% (HE).
- ▶ Health Utility
 - ▶ Values range from 0 to 1.0
 - ▶ Lack of good estimates
 - ▶ Some recent studies have used complex and wide-ranging values (Marseille 2022)
 - ▶ Mavranezouli et al. 2020 – conservative values –
 - ▶ 0.63 - clinically improved
 - ▶ 0.54 - not clinically improved

Cost Estimates - health care costs

- ▶ Harper et al. 2022
 - ▶ costs for 1,377 VA patients with and without PTSD were tracked
- ▶ Adjusting for inflation
 - ▶ \$12,154 annually for with PTSD
 - ▶ \$7,855 annually for without/resolved PTSD

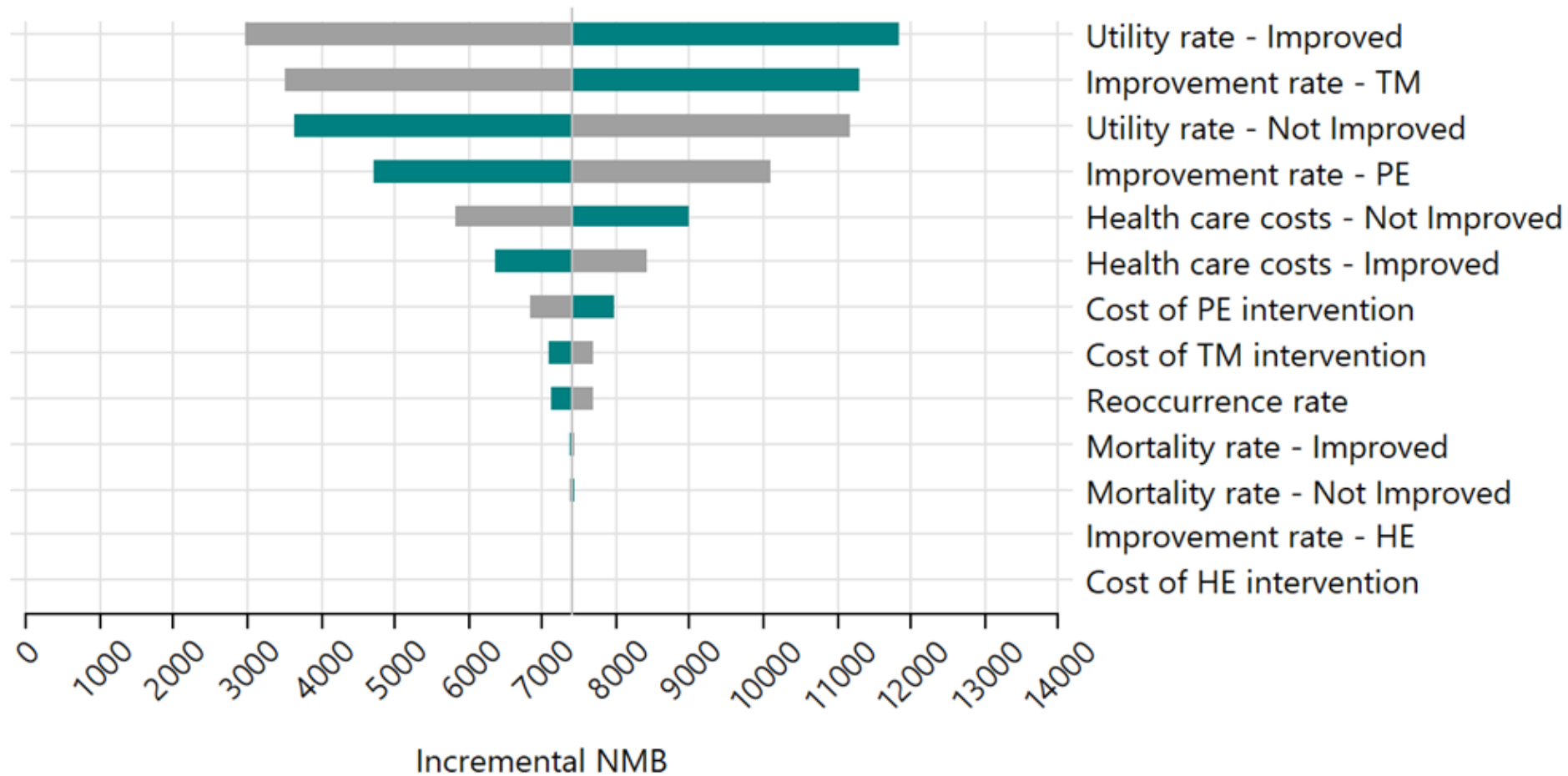
Sensitivity Analysis

- ▶ Model inputs were varied to examine the sensitivity of the results to variation in model inputs.
 - ▶ inputs were varied using 95% confidence intervals when available
 - ▶ or + or - 20% in either direction
- ▶ A probabilistic sensitivity analysis (PSA) was conducted
 - ▶ Monte Carlo procedure with 5000 simulations
 - ▶ inputs values were randomly selected from variable distributions

Main Results

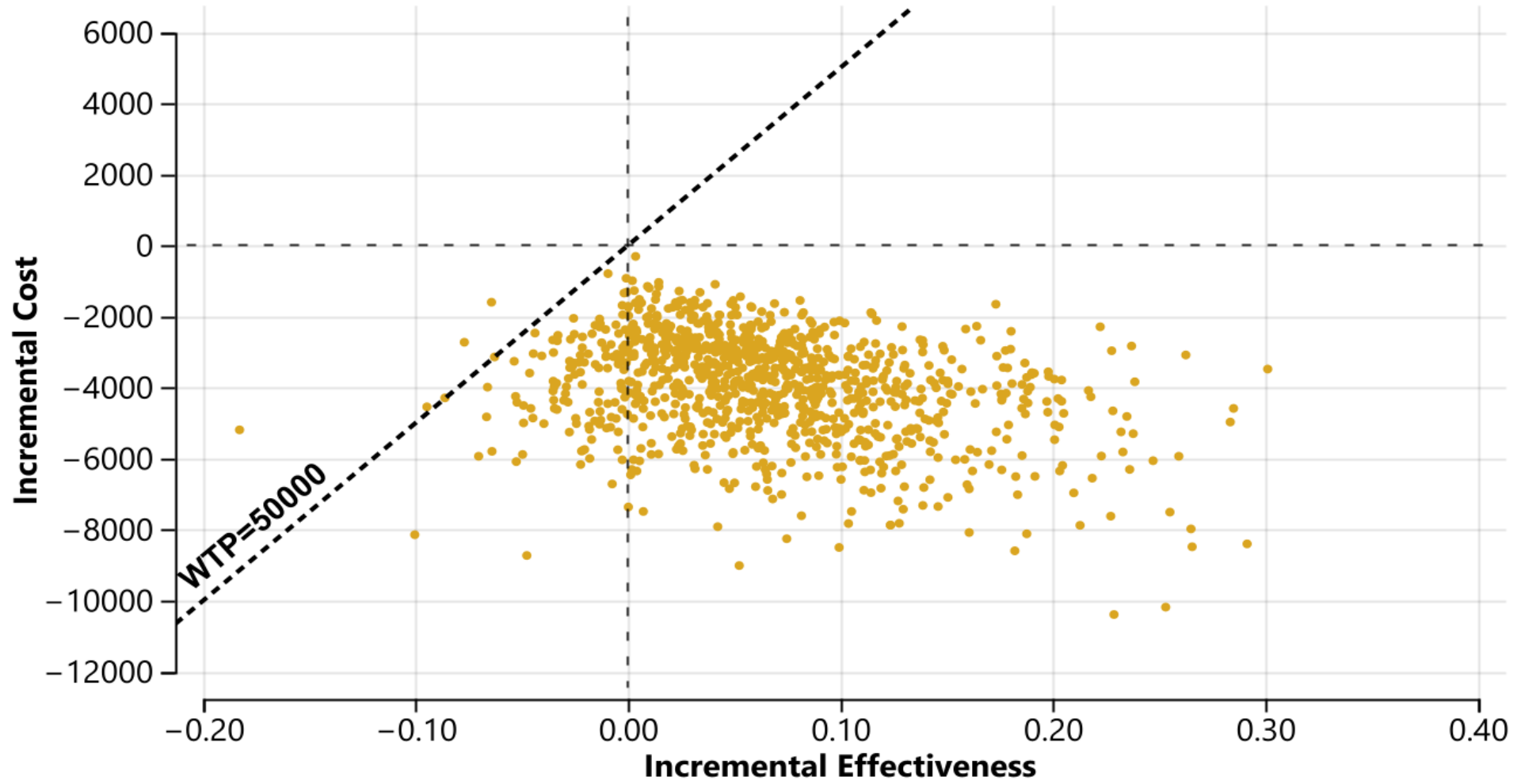
	HE	TM	PE	Difference TM vs HE	Difference TM vs PE	Difference PE vs HE
Effectiveness						
-rate of clinical improvement	0.32	0.61	0.42	0.29	0.19	0.10
-QALYs	2.60	2.70	2.63	0.10	0.07	0.03
Costs						
-Intervention costs	\$492	\$1,504	\$2,822	\$1,012	-\$1,318	\$2,330
-Consequent health care costs	\$48,218	\$43,968	\$46,753	-\$4,250	-\$2,785	-\$1,465
Total Costs	\$48,710	\$45,472	\$49,575	-\$3,238	-\$4,103	\$865
ICER				dominant	dominant	\$28,833
Incremental NMB				\$8,267	\$7,397	\$870

Sensitivity Analysis



ICER Scatterplot

(86%)



Summary

- ▶ TM was the dominant treatment strategy
- ▶ TM was more effective - clinical improvement in PTSD, results in lower subsequent hc costs, saving money long-term
- ▶ Savings per person are means from all participants and thus can be multiplied by a cohort
- ▶ Limitations include a single RCT, estimates, and 3-month outcomes

References

1. Nidich S, Mills PJ, Rainforth M, et al. Non-trauma-focused meditation versus exposure therapy in veterans with post-traumatic stress disorder: a randomised controlled trial. *Lancet Psychiatry*. 2018;5(12):975-986.
2. Neumann PJ, Sanders GD, Russell LB, Siegel JE, Ganiats TG. *Cost-Effectiveness in Health and Medicine*. Second ed. New York, NY: Oxford University Press; 2017.
3. Nilaweera D, Phyo AZZ, Teshale AB, et al. Lifetime posttraumatic stress disorder as a predictor of mortality: a systematic review and meta-analysis. *BMC psychiatry*. 2023;23(1):229.
4. Mavranezouli I, Megnin-Viggars O, Grey N, et al. Cost-effectiveness of psychological treatments for post-traumatic stress disorder in adults. *PloS one*. 2020;15(4):e0232245.
5. US Department of Labor. Bureau of Labor Statistics. May 2019 National Occupational Employment and Wage Estimates. https://www.bls.gov/oes/current/oes_nat.htm#29-0000. Published 2021. Accessed January 28, 2021.
6. U.S. Bureau of Labor Statistics. CPI Inflation Calculator. 2023.
7. Groessl EJ, Kaplan RM, Castro Sweet CM, et al. Cost-effectiveness of the LIFE Physical Activity Intervention for Older Adults at Increased Risk for Mobility Disability. *J Gerontol A Biol Sci Med Sci*. 2016.
8. Harper KL, Moshier S, Ellickson-Larew S, et al. A prospective examination of health care costs associated with posttraumatic stress disorder diagnostic status and symptom severity among veterans. *Journal of traumatic stress*. 2022;35(2):671-681.
9. Neria Y, al. e. Transcendental Meditation in Veterans and First Responders With PTSD. (Trial registration). *ClinicalTrials.gov*. <https://clinicaltrials.gov/study/NCT05645042>. Published 2022. Accessed 2023.