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Marissa Ionna

Philadelphia College of Osteopathic Medicine, marissaio@pcom.edu

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Is Yoga An Effective Treatment For Post-Traumatic Stress Disorder (PTSD)?

Marissa Ionno, PA-S

A SELECTIVE EVIDENCE BASED MEDICINE REVIEW

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In

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ABSTRACT

Objective: The objective of this selective EBM review is to determine whether or not “Is Yoga An Effective Treatment For Post-Traumatic Stress Disorder (PTSD)?”

Study Design: Systematic review of three randomized controlled trials (RCTs) published in peer reviewed journals between 2010-2014, all English language.

Data Sources: Three randomized controlled trials were found using PubMed.

Outcomes measured: All three studies measured improvement in PTSD symptoms through yoga therapy using self-reported patient questionnaires, visual analog scales, and vital signs.

Results: Studies by Telles et al. and van der Kolk et al. found that yoga therapy significantly improved symptoms in patients with Post-Traumatic Stress Disorder. However, a study by Mitchell et al. demonstrated that participants who engaged in yoga had a significant decrease in their PTSD symptoms, but participants in the control group also had a decrease in their PTSD symptoms.

Conclusions: Based on the results of these three RCTs, it seems that there is a benefit of using yoga therapy to treat patients with Post-Traumatic Stress Disorder, at least on a short-term basis. Due to lack of sufficient post-intervention long-term follow up, it is unable to be determined if yoga has lasting effects as a treatment for PTSD. Therefore, the use of this treatment modality warrants further investigation.

Key words: Post-Traumatic Stress Disorder, yoga, treatment

INTRODUCTION

Post Traumatic Stress Disorder (PTSD) is a serious condition that can occur once a person has witnessed or experienced a traumatic incident, natural disaster, war, or other life-altering event. Not only can patients suffer from severe depression or anxiety for months to years after their experience, but they can have difficulty forming and maintaining personal relationships with family and friends.¹ Patients may have trouble trusting, communicating, and depending on loved ones, which ultimately, may lead to further self-isolation. While there are different methods, such as psychotherapy and pharmacologic treatment to help patients with PTSD, this paper evaluates three randomized controlled trials (RCTs) comparing the efficacy of yoga as an effective treatment for PTSD.

PTSD affects approximately 7.7 million Americans ages 18 years and older.¹ An estimated 1 in 9 women develop PTSD, making them twice as likely as men to get the disorder.⁶ Additional symptoms individuals with PTSD may experience include: flashbacks or bad dreams, avoidant behaviors, feelings of guilt, depression, loss of interest in activities, and feeling emotionally numb.⁵ They may also be hyperaroused, experience sleep disturbances, startle easily, or always feel restless.⁵ These symptoms cause an overall negative impact on a patient's quality of life.

PTSD patients often times are initially misdiagnosed because the severity of their symptoms varies so widely, thus making PTSD patients have one of the highest healthcare service costs as a whole. While there isn't a recent estimate for treatment of PTSD alone, treatment and management of anxiety disorders in general are substantial, estimated to cost over \$42 billion annually.⁶ This includes non-psychiatric and psychiatric treatment costs.⁶ Although

there is no estimate for the number of health care visits yearly for patients with PTSD, there are approximately 63.3 million outpatient mental health visits annually.²

The exact reason certain individuals develop PTSD while others do not is not well understood, but it is known that certain risk factors like genetics, prior history, and social and physical factors play a role. While many people who experience a traumatic event are able to recover from it, patients with PTSD continue to struggle and develop severe anxiety or depression after the incident.¹ It is known that PTSD severely impacts ADLs and people who have experienced a previous traumatic life event have an increased risk of developing PTSD.¹

There are three mainstay treatments when treating PTSD: patient education, pharmacologic treatment, and psychotherapy. Thoroughly explaining PTSD to patients and giving them a list of local support groups and hotlines to call all encompass patient education. Pharmacotherapy is a treatment that can be used in conjunction to psychotherapy.³ Pharmacotherapy most commonly includes the use of Selective Serotonin Reuptake Inhibitors (SSRIs), such as Sertraline, Fluvoxamine, Trazadone, Monoamine Oxidase Inhibitors (MAOIs), such as Phenzelzine, Antiadrenergic Agents, such as Clonidine, Propanolol, Guanfacine, and Benzodiazepines, like Alprazolam and Clonazepam.³ Additionally, psychotherapy is used mainly to reexamine the traumatic incident, look at the way the patient reacted, and try to figure out what is causing their response and how it can be changed.³ Psychotherapy teaches the patient different coping mechanisms and how to avoid specific triggers that would cause an episode.³

While the treatment options mentioned above all play an effective role in helping to treat PTSD, pharmacotherapy does not come without the risk of adverse drug effects, such as dependence, insomnia, weight gain, anxiety, and other mood disorders to name a few. The use of

yoga therapy has been shown to be an effective non-pharmacologic alternative in treating the disorder.

OBJECTIVE

The objective of this selective EBM review is to determine whether or not “Is Yoga An Effective Treatment For Post-Traumatic Stress Disorder (PTSD)?”

METHODS

Three randomized controlled trials that included men and women greater than 18 years of age who were affected by PTSD due to a traumatic or life-altering event were selected for the study. Studies by Mitchell et al. and Telles et al. used yoga as their intervention and compared their results to patients who received non-yoga intervention. Van der Kolk et al. also used yoga as their intervention, but their comparison group was a non-yoga intervention receiving weekly health education.

All three studies found an overall decrease in PTSD symptoms after yoga intervention. It is worthy to note, however, that the patients in the control group from the Mitchell et al. study also had a decrease in their PTSD symptoms, causing the results to be inconclusive for that study.

All articles were published in English in peer-reviewed journals. Articles were found in PubMed using the keywords “Post-Traumatic Stress Disorder” AND “yoga” AND “treatment.” Articles were selected based on relevance and that the outcomes of the studies mattered to patients (POEMs). Inclusion criteria were any RCTs published between 1999-2015, and men and women greater than 18 years old who had been affected by PTSD due to a traumatic or life-altering event. Excluded from the studies were patients who enrolled in yoga classes within the past 6 months, those with current suicide or homicide risk, unstable medical conditions,

substance abuse/dependence, or anyone on psychiatric medications/with a change in psychiatric medications. Statistics reported and used included the p-value, RBI, ABI, NNT, mean change from baseline, and t- score.

Table 1- Demographics and characteristics of included studies

Study	Type	# Pts	Age (yrs)	Inclusion Criteria	Exclusion Criteria	W/D	Interventions
Mitchell ⁴ (2014)	RCT	38	18-65 years old	Age 18-65 yo veteran and civilian women with who screened positive on the Primary Care PTSD Screen (PC-PTSD)	Yoga class participation within the previous 6 months, substance-dependence problem within the previous 3 months, recent change in psychiatric medication, current suicide or homicide risk	12	Yoga vs Non-yoga intervention
Telles ⁷ (2010)	RCT	22	>22 years old	Male survivors of floods in the Indian state of Bihar, Normal health, Not on medication, Readiness to be present for all assessments and to be assigned to either the yoga or control group, No prior knowledge of yoga	Diagnosed illness, On prescription medication, If participants were not able to be relocated to another camp during the study	0	Yoga vs Non-yoga intervention
van der Kolk ⁸ (2014)	RCT	83	18-58 years old	Women with chronic, treatment nonresponsive PTSD	Unstable medical condition, Pregnancy or breast feeding status, Alcohol or substance abuse/dependence win the past 6 months, Active suicide risk or life threatening mutilation, 5 or more prior yoga sessions, Global Assessment of Functioning (GAF) score < 40	19	Yoga vs. non-yoga intervention who received weekly health education

OUTCOMES MEASURED

Reduction of Post-Traumatic Stress Disorder Symptoms were measured in all three studies by using self-reported patient questionnaires: The Trauma Life Events Questionnaire (TLEQ), Center for Epidemiological Studies-Depression Scale (CES-D), State-Trait Anxiety Inventory (STAI), Post-Traumatic Stress Disorder Checklist- Civilian (PCL-C), Primary Care-PTSD (PC-PTSD), Clinician-Administered PTSD Scale (CAPS). Each questionnaire varied in its method of evaluation. The questions ranged from evaluation of patients' feelings after a traumatic event, to their exposure to certain traumatic occurrences, to how they feel about their appetite, sleep, and mood on a daily basis. Additionally, visual analog scales (VAS) were used, as well as the monitoring of vital signs such as heart rate and respiratory rate.

RESULTS

Three double blind Randomized Control Trials were used to determine if yoga was an effective treatment for PTSD. Telles et al. followed 22 male flood survivors with mean ages \pm S.D. 32.1 ± 9.3 years for the yoga group and 30.8 ± 5.5 years for the control group.⁷ Participants were excluded from the study if they were female (due to heart rate variability between sexes), if they had a higher likelihood of relocating to different camps during the seven day study, if they were on prescription meds, and if they had been diagnosed with a mental illness.⁷ The yoga group performed yoga one hour daily for seven days straight.⁷ The control group did not practice yoga and performed their daily activities as usual.⁷ Data from this study was reported as continuous data and could not be converted to dichotomous form, therefore, results evaluating treatment efficacy could not be calculated. Zero percent of participants were lost to follow up.⁷ Autonomic and respiratory variables, as well as assessment of emotional responses using visual analog scales were used to evaluate improvement of PTSD symptoms.⁷ No significant changes

were observed in autonomic and respiratory variables, however, paired t-test values showed a significant decrease in sadness ($p < 0.05$) in the yoga group compared to the control group.⁷ In the yoga group, there was a mean baseline change in sadness of 7.12 (\pm SD 3.21) and the baseline change of the control group at 6.25 (\pm SD 2.75) pre-yoga therapy.⁷ Mean post-yoga therapy change was reported to be 5.98 (\pm SD 3.58) which was higher than the control group at 5.07 (\pm SD 2.89).⁷

A study by Mitchell et al. included 29 civilians and 9 veterans who were recruited from a VA medical center, a research participant recruitment database, and Craigslist.⁴ The participants were all female and the civilians had a lower mean age (42.72) than the veterans (49.67).⁴ Researchers allowed participants to decide if they wanted to attend 12 once per week sessions or 12 bi-weekly sessions over 6 weeks, but they had to remain in the same group over the course of the study.⁴ All 75 minute sessions were taught by the same instructor and participants met weekly to complete questionnaires.⁴ Per Mitchell et al., the full intent-to-treat (ITT) sample ($n=38$) was included in the analyses and 13% were lost to follow-up due to withdrawing for unstated reasons by researchers.⁴ Participants were excluded if they had partaken in a yoga class within the past 6 months, if they had substance dependence problems within the past 3 months, a change in their psychiatric medications, or if they were on current suicide or homicide risk.⁴ Data from this study was reported as continuous data and could not be converted to dichotomous form, therefore, results evaluating treatment efficacy could not be calculated. While the study used several questionnaires to assess a decrease in PTSD symptoms, when analyzing study outcomes, it focused on the PTSD Checklist-Civilian (PCL-C) for results. A weekly questionnaire was distributed and changes of 10-20 points were considered statistically significant.⁴ The yoga group participants showed statistically significant ($p < 0.1$) changes over

time in PTSD symptoms according to PCL-C measures, especially in total PCL, re-experiencing, and hyperarousal. The yoga group had decreases in anxiety and re-experiencing symptoms, however, the control group, which met weekly to fill out questionnaires, also showed decreases in these same factors. The results can be found in tables 2a and 2b.

Table 2a – Results of yoga group pre and post-treatment

Yoga Group Pre-treatment		
	CI	P value
Total mean change	+58.23, -45.64	0.003
Re experience mean change	+17.55, -12.95	0.001
Hyperarousal mean change	+18.45, -14.39	0.003
Yoga Group Post-Treatment		
	CI	P value
Total mean change	+49.19, -32.63	0.003
Re experience mean change	+14.06, -9.78	0.001
Hyperarousal mean change	+16.06, -11.48	0.003

Table 2b – Results of control group pre and post-treatment

Control Group Pre-treatment		
	CI	P value
Total mean change	+58.32, -48.56	0.02
Re experience mean change	+17.41, -13.93	0.006
Hyperarousal mean change	+19.37, -15.63	0.01
Control Group Post-Treatment		
	CI	P value
Total mean change	+48.74, -35.62	0.02
Re experience mean change	+15.30, -11.54	0.006
Hyperarousal mean change	+15.75, -10.59	0.01

A study by van der Kolk et al. looked at 64 females experiencing chronic PTSD symptoms, ages 18-58, over a 10 week period.⁸ Those in the treatment group went to hour-long classes once per week for 10 weeks, and those in the control group were offered hour-long women’s health education classes once per week for ten weeks.⁸ A total of 6.3% of participants were lost to follow-up due to withdrawing from the study for reasons not stated by the

researchers.⁸ The full intent-to-treat (ITT) sample was included in the analyses. Participants were excluded if they had an unstable medical condition, were pregnant or breastfeeding, had substance dependence in the past 6 months, were actively suicidal or a homicide risk, or if they had participated in 5 or more prior yoga classes.⁸ A Clinician-Administered PTSD Scale (CAPS) and self report measures were used to assess patient symptoms after yoga therapy vs after control group women’s health education classes.⁸ The estimate of treatment efficacy was statistically significant at $p < 0.001$.⁸ RBI was calculated to be 1.48, ABI was calculated to be 0.31, and NNT was calculated to be 4. This means that they would need to treat four patients for one patient to benefit. These values can be seen in table 3.

Table 3: Calculations for Treatment from van der Kolk et al.

YOUR CALCULATIONS for Treatment – using dichotomous data		Relative benefit increase (RBI)	Absolute benefit increase (ABI)	Number needed to treat (NNT)
CER	EER	$\frac{EER - CER}{CER}$	EER - CER	1/ABI
.21	.52	1.48	.31	4

DISCUSSION

This systematic review investigated yoga’s efficacy as a treatment for patients suffering from Post-Traumatic Stress Disorder (PTSD). All three studies overall concluded that yoga therapy does improve symptoms in patients with PTSD, at least short-term. Assessing the impact of yoga therapy may not provide adequate information about its efficacy if patients aren’t followed over a long-term period. Additionally, the study by Mitchell et al. concluded that patients in the control group, while not as significant as those undergoing yoga therapy, also had an improvement in PTSD symptoms.⁴ Therefore, the study surmised that an increase in self-monitoring alone may have been sufficient enough for patients to have a decline in symptoms.⁴

The limitations of all three studies may call into question the true efficacy of yoga therapy as an effective treatment for PTSD in the long-term. Among the studies included in this selective review, all three lacked an adequate post-intervention follow up. Telles et al. had to keep the duration of follow up at seven days because flood survivors were being relocated to other camps regularly.⁸ The van der Kolk et al. study chose not to follow up with patients for unstated reasons and Mitchell et al. followed up with patients one month after, but nothing long term, for unstated reasons as well. Additionally, the van der Kolk et al. study only included women and Telles et al. only included men. A small sample size was also a limitation in all three studies.

Although yoga may be an effective treatment for patients with PTSD, accessibility may also be a limiting factor. Transportation to and from classes on a regular basis may be difficult for those who can't drive or have trouble using public transportation. Additionally, yoga therapy is many times done in a private setting, which can be costly and out of the question for some patients, especially because insurance does not pay for classes.

CONCLUSION

Based on the information provided by these three RCTs, it can be concluded that yoga is an effective treatment for PTSD, but only for an unknown short-term period. Results are still inconclusive as to if yoga therapy is sufficiently able to treat PTSD long-term.

This area of research is still new and very few studies have been done looking at the impact that yoga can have on PTSD patients. It would be beneficial for future studies to look at hundreds to thousands of men and women who have undergone a similar experience and are PTSD survivors. They can take one standard form to evaluate the efficacy of yoga therapy, such as using the PTSD checklist, and follow participants over a period of years to see if yoga's

effects are lasting. If researchers can prove that yoga is an effective treatment for PTSD long term, patients suffering from PTSD may have another option, in addition to psychotherapy and pharmacotherapy, when seeking treatment.

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