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Skyler Krull  
*Fort Hays State University, skylerkanekrull@gmail.com*

Whitney Whitaker  
*Fort Hays State University, wkwhitaker@fhsu.edu*

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The impact of Ashtanga yoga on reducing seizures and increasing quality of life among individuals with intractable epilepsy

Skyler Krull — Psychology Department (Virtual Student)

Faculty Research Mentor: Dr. Whitney Whitaker

Importance of the Problem

- Epilepsy is a serious neurological condition that impacts approximately 1.2% of people (or about 3.4 million people) in the United States of America (Zack & Kobau, 2017).
- Treatment of epilepsy may involve prescribed medications; however, it is important to note that about one third of individuals who have been diagnosed with epilepsy find no relief from anti-epileptic drugs (AED; Tan et al., 2009).
- When an individual continues to suffer debilitating seizures after being prescribed two AEDs, this person is considered to have intractable epilepsy (Tang, Poon, & Kwan, 2015). When medications fail to control seizures, individuals are left with few choices and can be in desperate need of treatment options that are less extreme (and less expensive) than options involving brain surgery and/or vagal nerve stimulation. More research is needed to better understand the efficacy of behavioral interventions used to reduce seizures and improve quality of life.

Detrimental Impact of Seizures

- Previous research indicates that the experience of seizures can have a negative impact on well-being. Specifically, this literature suggests that depression, anxiety, stress, and mood may be impacted.
- According to Kotwas et al., 2017, the prevalence of psychological distress, especially depressive and anxiety disorders, is higher in epilepsy than in other chronic health conditions.
- Seizure frequency and depression are the most important predictors of quality of life in epilepsy patients (Mehta et al., 2014).
- Preictal mood states can raise or lower one’s seizure threshold. Negative moods are associated with increased risk for seizure occurrence in a 12-hour period. Conversely, improvements in various mood states were associated with a 25% decreased chance of having a seizure (Haut et al., 2012).
- Importantly, reducing seizure frequency is one of the best ways to increase well-being and quality of life. Five studies conducted between 1994 and 2009 reported a significant decrease in seizure frequency in groups treated with yoga (Streeter, Gerbarg, Saper, Ciraulo, & Brown, 2012). However, more research using larger sample sizes, brain imaging, and other emerging technologies is needed to generalize these results.

Application of Prior Literature to Current Study

- Past studies on biofeedback (Tan et al., 2009) have shown that behavioral practices, such as yoga (Lundgren et al., 2008) may lower seizure frequency increase overall quality of life.
- However, it is important to note that more research is needed on this topic to better understand the potential benefits of yoga for individuals who have been diagnosed with epilepsy (Roddis & Tanner, 2019).
- In addition, a limitation of prior research is a focus on in-person training for these behavioral approaches with a guide at a clinic or hospital. Less research has been conducted on at-home training using technology as a guide (e.g., training videos of yoga practices) to examine possible changes in seizure frequency and quality of life among those who suffer from epilepsy.

Application (cont.)

- For some who suffer from epilepsy, driving and being present for on-site training can be challenging. As such, the convenience and inexpensive nature of training at home may be a benefit, namely for this specific population.
- To help address limitations of prior research and to focus on a sample of individuals who may benefit from behavioral practices due to the limited effectiveness of medication, the main purpose of this study was to examine the potential therapeutic value of Ashtanga yoga for people diagnosed with intractable epilepsy.
- Yoga may be efficacious at helping to enhance health and overall well-being (see Lundgren et al., 2008). Ashtanga yoga was selected for the emphasis on ujjayi breath – a technique that improves vagal tone (Streeter et al., 2012) and ability to enhance health through physical activity and stimulating parts of the body.
- The current study sought to expand on prior research with a focus on decreasing seizure frequency and increasing quality of life among people who are diagnosed with intractable epilepsy. We hypothesized that Ashtanga yoga can help to reduce seizure frequency, and we expected to see an increase in quality of life.

Method

- In the fall of 2019, recruitment efforts began. Local and national Epilepsy Foundations and organizations, support groups, and clinics were contacted to assist with recruitment of participants who suffer from intractable epilepsy.
- Given the longitudinal nature and targeted sample, recruitment efforts are still underway; currently, only one participant has completed at least half of the study.
- Participants were given a list of inclusion/exclusion criteria and asked to sign an authorization to release medical information (completed by their doctor) to confirm their diagnosis.
- Participants were informed that the duration of the study would occur over a two-month period. The first two weeks were designated as a baseline; the next six weeks were designated as the training period.
- Participants completed self-report measures on quality of life (using a validated measure called the Quality of Life in Epilepsy Inventory; Cramer et al., 1998), answered questions regarding seizure frequency (similar to a seizure diary; Fisher et al., 2009), and used the CorSense Device to measure HRV.
- The researchers consulted with a certified Ashtanga yoga instructor (with doctoral-level training) to develop a training video that participants could watch and practice in the comfort of their own home (or wherever they chose to practice).
- Participants were provided a CorSense Device as a physiological measure of heart rate variability. HRV is correlated with seizure activity (Streeter et al., 2011). In general, a higher HRV score is considered healthy and indicates that the body can efficiently change heart rate depending on activity.
- In total, participants practiced Ashtanga yoga for about 25 minutes at least six-days a week, recorded information about seizures daily, and also completed the quality of life measure before the study began, at the mid-point of the study.
- To reduce potential attrition, participants will be compensated for their time and effort to complete the study.

Preliminary Results

- One participant has completed at least half of the study. Results represent findings for this participant and should be interpreted with caution.
- This participant is a 39-year-old male in good health, with the exception of a verified diagnosis of epilepsy.
- This participant has completed questions regarding quality of life (i.e., overall quality of life; worry about seizures; difficulties completing tasks due to seizures), seizure frequency, and has used the CorSense Device to measure HRV.
- Although preliminary, results overall suggest that the participant’s quality of life has increased from baseline to the training phase.
- In addition, the participant’s HRV has increased weekly.

Discussion & Future Directions

- Although preliminary, findings suggest that quality of life may be impacted positively through the practice of Ashtanga yoga. The participant’s HRV also appears to be positively impacted.
- Yoga asanas have been shown to improve coping with physical, emotional, and vocational stress (Brems, 2015). Importantly, stress not only lowers quality of life for epileptics (Streeter et al., 2012), but also is associated with increased seizure frequency.
- Recruitment efforts for this study will continue. It is our goal to collect data from at least 20 participants to further test the efficacy of Ashtanga yoga at enhancing quality of life and reducing seizure frequency.