

## Original Research

### Evaluation of effectiveness of Yoga in Children with Epilepsy

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#### ABSTRACT:

**Background:** Regular yoga practice cultivates a sense of calmness and well-being while fostering qualities of kindness, compassion, and increased self-control. It also enhances strength, endurance, and flexibility. Presented study conducted to assess the effectiveness of yoga in children with epilepsy. **Materials & methods:** The study included thirty children, ages nine to fourteen, who had been diagnosed with epilepsy and were on antiepileptic medication on a daily basis. The participants were split into two groups: 15 kids, who made up the study group, received yoga therapy as an intervention, and the other 15 kids, who made up the control group, did not. SPSS software was used for the analysis of the results. Standard statistical tests were employed for statistical analyses, with a significance level of  $P < 0.05$ . **Results:** A total of 30 children were enrolled. Out of the total, 15 received yoga and remaining 15 were included in the control group. There were no statistically significant differences in demographic data between the two groups. In contrast, in the control group, 8 children had seizures at 3 months, and 6 children had seizures at 6 months. This difference was not statistically significant. **Conclusion:** After six months, children with epilepsy who get yoga as an adjunctive treatment experience seizure independence and significant improvements in their EEG readings..

**Keywords:** epilepsy, yoga, electroencephalogram.

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#### INTRODUCTION

Yoga, a 3,000-year-old practice, is now recognized as a comprehensive approach to health in the West and is categorized as complementary and alternative medicine (CAM) by the National Institutes of Health. <sup>1</sup>The Sanskrit root "yuj," which implies unification or yoke, to connect, as well as to focus and direct attention, is where the word "yoga" originates. <sup>2,3</sup>Regular yoga practice cultivates a sense of calmness and well-being while fostering qualities of kindness, compassion, and increased self-control. It also enhances strength, endurance, and flexibility. <sup>4,5</sup> Long-term practice also produces significant benefits like altered perspectives on life, more self-awareness, and increased vitality to fully and really enjoy life. <sup>6-</sup> <sup>8</sup>As a result of the physiological condition that yoga practice induces, which is the reverse of the flight-or-flight stress reaction, one can attain a state of balance and oneness between the mind and body. <sup>9</sup>Yoga combines physical exercise with an inwardly focused, attentive concentration on awareness of the breath,

energy, and self. It is a type of mind-body fitness. <sup>4</sup>The therapeutic methods and teachings of yoga are based on four fundamental ideas. <sup>6</sup>The first is that the human body is a holistic organism made up of different interconnected dimensions that are inextricably linked to one another, and that any illness or health state that affects one dimension also impacts the other dimensions. The second tenet is that every person has different needs, and that each person must be treated as an individual with a practice that is customized to meet those needs. The third tenet of yoga is that each practitioner is an empowered self-healer. Yoga involves the student in the healing process; by actively participating in their path to wellness, the student gains a stronger sense of autonomy and the healing occurs internally rather than externally. The fourth premise holds that mental health and well-being are essential to recovery. Healing occurs more quickly when the person is in a positive mental state; on the other hand, healing may take longer when the person is in a negative mental state.

The hallmark of epilepsy is a propensity for recurring seizures that are not brought on by any known proximate trauma. A partial seizure is caused by epileptiform discharges that affect a specific region of the brain, whereas a generalized seizure is caused by discharges that affect the entire brain. among affluent nations, the prevalence of epilepsy is estimated to be five to eight cases per 1000 people, with partial epilepsy being the most prevalent kind among adults.<sup>10</sup>When given an epilepsy diagnosis, most people have a good prognosis and may control their seizures with a single antiepileptic drug (AED). However, up to 30% of patients do not experience remission even with optimal AED therapy.<sup>11</sup>These individuals frequently experience incapacitating seizures that make it difficult for them to work and engage in other activities. Many of these individuals also experience the long-term, high-dose side effects of AED polytherapy. Compared to people with other chronic illnesses, people who experience seizures more frequently suffer from psychiatric problems such sadness and anxiety as well as having a lower quality of life. The well-documented issues of stigmatization related to epilepsy can be traced to several reasons, such as inadequate medical resources for seizures, poor seizure control, and insufficient awareness about epilepsy.<sup>12</sup>For this reason, it is crucial to discover efficient treatments for uncontrollably occurring seizures. The majority of epilepsy cases start in childhood and can have a negative impact on academic performance and cognitive development. A change in lifestyle that incorporates yoga into daily life may serve as an adjunctive therapy for children with epilepsy. There are a few studies in the literature that evaluate the benefits of yoga for kids with different conditions, but there isn't a randomized controlled trial specifically for kids with epilepsy.<sup>13</sup> Hence, this study was conducted to assess the effectiveness of yoga in children with epilepsy.

**MATERIALS & METHODS**

The study included thirty children, ages nine to fourteen, who had been diagnosed with epilepsy and were on antiepileptic medication on a daily basis. The participants were split into two groups: 15 kids, who made up the study group, received yoga therapy as an intervention, and the other 15 kids, who made up the control group, did not. Every youngster was regularly given the right antiepileptic medications in the right dosages. A thorough history of seizures and background data were recorded for the study. Ten one-hour sessions total made up the yoga therapy sessions. Electroencephalogram (EEG) measurements and seizure frequency were compared at baseline, three months, and six months. Fisher's exact test, Mann-Whitney U test, and unpaired t-test were used to compare the two groups. SPSS software was used for the analysis of the results. Standard statistical tests were employed for statistical analyses, with a significance level of P < 0.05.

**RESULTS**

A total of 30 children were enrolled. Out of the total, 15 received yoga and remaining 15 were included in the control group. There were no statistically significant differences in demographic data between the two groups. All children were receiving appropriate antiepileptic drugs at proper doses. However, at the outset, 5 children in the study group and 8 in the control group had a history of seizures in the preceding 3 months. Upon analyzing the impact of yoga intervention on seizures, it was observed that none of the children in the yoga group experienced seizures at the end of 3 and 6 months. In contrast, in the control group, 8 children had seizures at 3 months, and 6 children had seizures at 6 months. This difference was not statistically significant.

**Table 1: basic characteristics**

Variables	Study group (n=15)	Control group (n=15)	P value
Age (months)	134.7	110.6	0.06
Gender			
Male	10	12	1.0
Female	5	3	
Age at onset (months)	98	70	0.3
Mean duration of epilepsy at enrollment (months)	40	55	0.8
Mean duration of AED (months)	35	34	0.6

**Table 2: duration of seizures**

Time period	Subjects		P value
	Study group	Control group	
Baseline	5	8	1.0
3 months	0	8	0.08
6 months	0	6	0.3

Initially, both groups had 10 children each with an abnormal EEG. After 3 months, the study group showed a decrease, with only 4 children having an

abnormal EEG compared to 7 in the control group; however, this difference did not reach statistical significance (P = 0.2). By the end of the 6-month

period, following yoga intervention, only 1 child in the yoga group had an abnormal EEG, while in the

control group, 9 children still exhibited abnormal EEGs. This disparity was statistically significant.

**Table 3: children with abnormal EEG**

Time period	Subjects with abnormal EEG		P value
	Study group	Control group	
Baseline	10	10	1.0
3 months	4	7	0.2
6 months	1	9	0.03

## DISCUSSION

Yoga is an embodied meditative practice that is movement-based and has the potential to change the neurobiology of several brain regions. Yoga improves working memory in particular and has a regulating influence on brain synaptic plasticity.<sup>14,15</sup> Furthermore, yoga increases inter-hemispheric coherence and symmetry and improves neurocognitive functions.<sup>16</sup> Additionally, yoga may cause noticeable structural changes in the limbic system and other brain regions.<sup>17</sup> Hence, this study was conducted to assess the effectiveness of yoga in children with epilepsy.

In the present study, a total of 30 children were enrolled. Out of the total, 15 received yoga and remaining 15 were included in the control group. There were no statistically significant differences in demographic data between the two groups. All children were receiving appropriate antiepileptic drugs at proper doses. However, at the outset, 5 children in the study group and 8 in the control group had a history of seizures in the preceding 3 months. Upon analyzing the impact of yoga intervention on seizures, it was observed that none of the children in the yoga group experienced seizures at the end of 3 and 6 months. In contrast, in the control group, 8 children had seizures at 3 months, and 6 children had seizures at 6 months. This difference was not statistically significant. In a study, Kanhere SV et al. examined how yoga affected children with epilepsy's electroencephalogram (EEG) results and seizure frequency. In a tertiary care teaching hospital's pediatric neurology outpatient department, a randomized controlled experiment was carried out. Twenty children, ages 8 to 12, who had been diagnosed with epilepsy and were using antiepileptic medications on a regular basis were enrolled. Ten kids received yoga treatment (study group), while ten kids made up the control group. Ten one-hour yoga therapy sessions were administered. We contrasted baseline, three, and six-month EEG data with seizure frequency. Standard statistical tests were used to conduct the statistical analysis. P values less than 0.05 were regarded as significant. At three and six months, none of the children in the study group experienced seizures. At three and six months, respectively, four and three children in the control group experienced seizures. At enrollment, eight children from each of the two groups had an abnormal EEG. Six months later, seven EEGs in the control group and one in the

research group were abnormal ( $P = 0.020$ ). When yoga is used in addition to other therapies for epileptic children, the results show considerable improvement in the EEG at six months and seizure freedom.<sup>18</sup>

In the present study, initially, both groups had 10 children each with an abnormal EEG. After 3 months, the study group showed a decrease, with only 4 children having an abnormal EEG compared to 7 in the control group; however, this difference did not reach statistical significance ( $P = 0.2$ ). By the end of the 6-month period, following yoga intervention, only 1 child in the yoga group had an abnormal EEG, while in the control group, 9 children still exhibited abnormal EEGs. This disparity was statistically significant. Another study by Naveen GH et al, study was designed to explore the knowledge, attitude and practice (KAP) about yoga among people living with epilepsy (PLWE). The study was conducted on 300 PLWE attending the neurology out-patient services of a tertiary care hospital. Three hundred PLWE (male:female=173:127; age:  $31.6 \pm 12.4$  years) attending the neurology out-patient services of a neuropsychiatry hospital were administered a pre-tested KAP questionnaire. About 87.4% were on regular anti-epileptic drugs and half (50.3%) on monotherapy. Use of complementary and alternative medicine by the respondents included: Ayurveda (26.7%), yoga (25.6%) and homeopathy (16.3%) or folk medicine (29.1%). Nearly 33.7% of the respondents reported that yoga is beneficial in managing epilepsy. More than half the respondents (54.8%) were willing to practice yoga. Those who practiced yoga opined that regular practice of yoga might reduce dosage of medication (62.8%), their side effects (51.3%) and frequency of seizures (54.5%). Majority of the patients were willing to practice yoga, if yoga services were offered. The gaps in KAP identified in the study point to the need for more systematic effort to bring about awareness of yoga in patients with epilepsy.<sup>19</sup> Yoga is a traditional Indian practice and way of life that is said to promote relaxation and a "healthy body and sound mind" in its practitioners. It also helps to reduce stress.<sup>20</sup> The Sanskrit term "Yug," which meaning "controlling the mind," is most likely where the word "yoga" originated. Yoga activities that are frequently practiced include meditation (dhyana), asanas (postures), devotional sessions, and breathing exercises (pranayama). There have been descriptions of many different types of yoga, including Hatha,

Karma, Bhakti, and Raja yoga. The popular form of meditation known as transcendental meditation uses a single stage in which the practitioner sits quietly and closes their eyes for 20 minutes twice a day, mentally repeating a chosen Sanskrit word or mantra.<sup>21</sup> Sahaja yoga practitioners sit comfortably with their hands facing up and palms facing up. They are asked to focus on a picture that has been placed in front of them with a lit candle in front of it. They may close their eyes and focus their attention on the top of their head, also known as the "sahasrara chakra," as their thoughts gradually fade. The person meditates for ten to fifteen minutes while sitting still. It is said that practicing Sahaja yoga cures emotional, spiritual, and physical illnesses by reawakening the kundalini, or dormant divine energy in our bodies.<sup>22</sup> The objective of treatment strategies for epilepsy, a prevalent neurological condition marked by irregular electrical activity in the brain,<sup>23</sup> is to eliminate or decrease the number and duration of seizures and improve the quality of life. <sup>24</sup>Numerous studies indicate that yoga poses can help people with various forms of epilepsy experience fewer seizures. 32 individuals with idiopathic epilepsy participated in an experiment to see how yoga affected their seizures and EEG. Three and six months after the intervention, the number of seizures decreased by 62% and 83%, respectively. Additionally, this study has demonstrated a notable shift in EEG frequency from 0–8 Hz to 8–20 Hz.<sup>25</sup> A clinical research found no appreciable differences in seizure frequency between the yoga and control groups, despite these findings. However, the quality of life of the yoga group significantly improved.<sup>26</sup>

## CONCLUSION

After six months, children with epilepsy who get yoga as an adjunctive treatment experience seizure independence and significant improvements in their EEG readings.

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