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**Does parent and therapist delivered Qigong massage therapy
decrease sensory and self-regulation impairments in children ages
3-6 years old with autism?**

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A SELECTIVE EVIDENCE BASED MEDICINE REVIEW

In Partial Fulfillment of the Requirements For

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In

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Abstract

Objective: The objective of this selective EBM review is to determine whether or not parent and therapist delivered Qigong massage therapy decreases sensory and self-regulation impairments in children ages 3-6 years old with autism.

Study Design: Reviewed three English primary studies published in 2005, 2009 and 2011.

Data Sources: All studies were randomized controlled trials that compared a group of children with autism who received Qigong massage treatments to a controlled group of children with autism who did not receive the treatments. All studies were found using PubMed and Cochrane research databases.

Outcomes Measured: Overall reduction in sensory and self-regulation, as well as the general autistic behaviors of the children, were measured by the utilization of different combinations of professional behavioral tests to evaluate the children before and after the intervention. For example, the Autism Behavior Checklist (ABC) and the Childhood Autism Rating Scale (CARS) were utilized to determine the general autistic behaviors of the children. The Sense and Self-Regulation Checklist (SSC) was utilized to measure the sensory and self-regulation impairments of the children.

Results: All three randomized controlled trials included in this review indicated that the Qigong massage treatments decreased the sensory and self-regulation impairments of the children as compared to the control group.

Conclusions: Based on the three randomized controlled trials reviewed, there is measurable evidence to indicate that the incorporation of Qigong massage into the treatment plans of children with autism aids in a reduction of sensory and self-regulation impairments. This review only analyzed the effects of the massage on small sample sizes of children between ages 3 and 6 years old. Further research should include larger sample sizes and included individuals of other ages. Additionally, further research should specify which disease on the autism spectrum the patient possesses.

Key Words: autism, autism treatment, Qigong massage

Introduction

According to the DSM-IV-TR, autism is a disorder characterized by developmental delays and difficulties in social interaction, communication and the evidence of repetitive and stereotyped behaviors¹. The diagnosis of autism encompasses a group of disorders, collectively referred to as autism spectrum disorder (ASD). Currently, the DSM-IV-TR includes five specific disorders in ASD: Classic Autism, Asperger Syndrome, Pervasive Developmental Disorder Not Otherwise Specified, Rett Syndrome, and Childhood Disintegrative Disorder².

The incidence of autism has increased tremendously in the past several decades. The CDC estimates that 1:88 children and 1:54 boys are diagnosed with autism. The national advocacy organization, Autism Speaks, estimates that autism costs the United States \$126 billion a year and that the lifetime cost of caring for an individual with autism in the United States is \$2.3 million³.

There is no known cause for autism; it is believed that the cause of the disorder is a complex combination of genetics and environmental factors such as advanced maternal and parental age, antepartum illness, difficult labor, and exposure to infections and heavy metals¹.

Due to the complex nature of the diagnosis and the range of disease on the spectrum, the symptoms of autism are incredibly wide-ranging. These can include impairments in intelligence, social interaction, communication, sensory perception and motor skills. In addition, unusual behaviors and repetitive behaviors are a common finding in those diagnosed⁴. Many of these symptoms are due to impairments in the sensory nervous system, which results in an inability to sense neurologic impulses⁵. Consequently, this population experiences a profound lack of neuronal coordination. Additionally, these symptoms can also be attributed to impairment in self-regulation, which in this context, is the person's inability to control his or her own behaviors⁵.

Currently, there is no cure for autism. There are no pharmacologic therapies that have been proven safe and effective in improving language and communication impairments in this population¹. However, pharmacologic therapies have been demonstrated safe and effective in alleviating symptomatology of this population. For instance, antidepressants, anxiolytics, and antipsychotics have all been utilized to alleviate severe behavioral issues in this population⁶. Research demonstrates that the most effective management for autism is an individualized treatment plan, which includes a variety of early intervention services. Some of the services include behavioral therapy, auditory training, occupational therapy, physical therapy, anti-yeast therapy, music therapy, vitamin therapy, and several other alternative interventions³. One such intervention is the utilization of Qigong massage programs. The practice of Qigong massage has been utilized in Chinese medicine for millennia. Interestingly, for children who are diagnosed as having developmental delays similar to the diagnosis of autism, Eastern medical practices consider Qigong massage a first-line treatment¹. In the trials analyzed, the goal of the massage treatment was to remove the impairment of Qi, or energy, through the sensory channels of the body.

This selective review will analyze three randomized controlled trials evaluating the efficacy of Qigong massage therapy in decreasing sensory and self-regulation impairments in children with autism.

Objective

The objective of this selective EBM review is to determine whether or not parent and therapist delivered Qigong massage therapy decreases sensory and self-regulation impairments in children ages 3-6 years old with autism.

Methods

All three studies in this review were randomized controlled trials and included a population of children ages 3 years old to 6 years old with a diagnosis of autism. The intervention evaluated throughout the three randomized controlled trials is a Qigong massage program. Two of the trials compared the treatment groups receiving the intervention to control groups who did not receive the intervention. In addition to measuring the treatment group to the control group, the third trial also compared participants receiving the intervention at school by therapists and at home by parents to participants solely receiving the intervention at home by parents. However, for the purpose of this selective EBM review, only the data that compared the massage program to the control group will be evaluated. All outcomes analyzed qualified as patient oriented evidence that matters (POEMs) and included a decrease in sensory and self-regulation impairments, which contributes to a better awareness of the child's environment, an increase in the learning and development process, a decrease in aversive behaviors in response to sensory stimuli, and a decrease in overall autistic behaviors¹. All three studies were randomized controlled trials.

A detailed search using PubMed and Cochrane research databases was conducted by the author using key words such as autism, autism treatments, and Qigong massage. All articles were written in English and published in peer review journals (The American Journal of Chinese Medicine and The American Journal of Occupation Therapy) in the years 2005, 2009 and 2011. The author of this selective EBM review conducted the research of the articles used and articles were selected based on the importance of outcomes in patients (POEMs) and on their relevance to the topic question.

Table 1 illustrates the specific inclusion and exclusion criteria for each study. Inclusion criteria included children who were between the ages of 3 years old and 6 years old.

Additionally, the children must have possessed a diagnosis of autism and must have been eligible to receive state-funded early intervention services. Participants were included if their parents agreed not to initiate any other treatment modalities and interventions while the study was being conducted. Exclusion criteria included any child who possessed another medical diagnosis or any chronic medical condition that may complicate their diagnosis. For instance, these conditions included a diagnosis of cerebral palsy or seizure disorder, among others. The summary of statistics reported and utilized in the studies were p-values.

Table 1. Demographics & Characteristics of included studies.

Study	Type	# Pts	Ages (years)	Inclusion Criteria	Exclusion Criteria	W/D	Intervention
Silva ⁷ (2011)	RCT	47	3-6	Age < 6; Children receiving Oregon state-funded, early intervention services	Children with complicating medical diagnoses; children taking chronic medicine, including active medical therapies for autism	8	Qigong massage therapy delivered by both parents and therapists
Silva ⁵ (2009)	RCT	46	3-6	Age < 6; Children receiving early intervention services	Children with complicating medical diagnoses; children taking chronic medicine, including active medical therapies for autism	0	Qigong massage therapy delivered by both parents and therapists
Silva ¹ (2005)	RCT	8	3-6	Age < 6; Children with a formal diagnosis of uncomplicated autism by DSM IV criteria; Willingness of the parents not to initiate any new treatments while the study was underway	Children possessing other medical conditions such as cerebral palsy or seizures	3	A medical Qigong protocol delivered by parents and Qigong trainers

Outcomes Measured

The trials each analyzed a variety of outcomes, including sensory and self-regulation impairments, general autistic behaviors, language development, and gastrointestinal and sleep pattern abnormalities. For the purpose of this selective EBM review, the results of the sensory and self-regulation impairments outcome will be analyzed in subsequent sections.

Each of the trials utilized different combinations of professional behavioral tests to evaluate the children before and after the intervention. The behavioral tests were utilized to measure the baseline autistic behaviors and progress of the study participants. For example, the trials utilized the Autism Behavior Checklist (ABC), the Childhood Autism Rating Scale (CARS) and the Pervasive Developmental Disorders Behavior Inventory (PDDBI) to determine the baseline level of functioning of each participant and to determine which autistic behaviors the participants exhibited throughout the trials. The social and language developments of the children were measured using the Rossetti Infant-Toddler Language Scale and the Preschool Language Scale (PLS-3). The motor development of the children was measured by the Peabody Developmental Motor Scale. The trials also utilized the Sense and Self-Regulation Checklist (SSC) and the Autism Parent Stress Index (APSI). The tests were performed by independent autism specialists, occupational therapists, and speech pathologists.

Additionally, each of the trials utilized questionnaires completed by physicians, teachers, and parents to further evaluate the children's behaviors before and after the intervention. The specific questions and measures of the behavior tests and questionnaires were not disclosed in the articles reviewed.

Results

The three randomized controlled trials in this selective review involved incorporating the intervention of Qigong massage into each participant's autism treatment plan. Each of the trials compared the treatment groups receiving the intervention to control groups who did not receive the intervention.

In the 2005 study by Silva, et al., all of the participants possessed lower scores on the ABC and CARS scales after the intervention (see Figure 1 and Figure 2). This means the children exhibited less autistic behaviors that, as previously stated, are a direct result of sensory and self-regulation impairments. It is important to note in the ABC, a score of greater than 67 denotes a high probability for autism and a score of less than 54 denotes no diagnosis of autism¹. Additionally, for the CARS criteria, a score of greater than 37 indicates a diagnosis of autism and a score of less than 30 indicates no criteria for the diagnosis of autism¹. The researchers utilized paired sample t-test analyses for each scale. Specifically, ABC $t(d.f. = 7) = 4.60$, $p < 0.001$ and CARS $t(d.f. = 7) = 5.86$, $p < 0.001$. This data was demonstrated to be statistically significant.

Figure 1. Autism Behavior Checklist (ABC) scores before and after intervention. Recreated from Silva LMT, Cignolini A. A medical Qigong methodology for early intervention in autism spectrum disorder: a case series. American Journal of Chinese Medicine. 2005; 33(2):315-327.

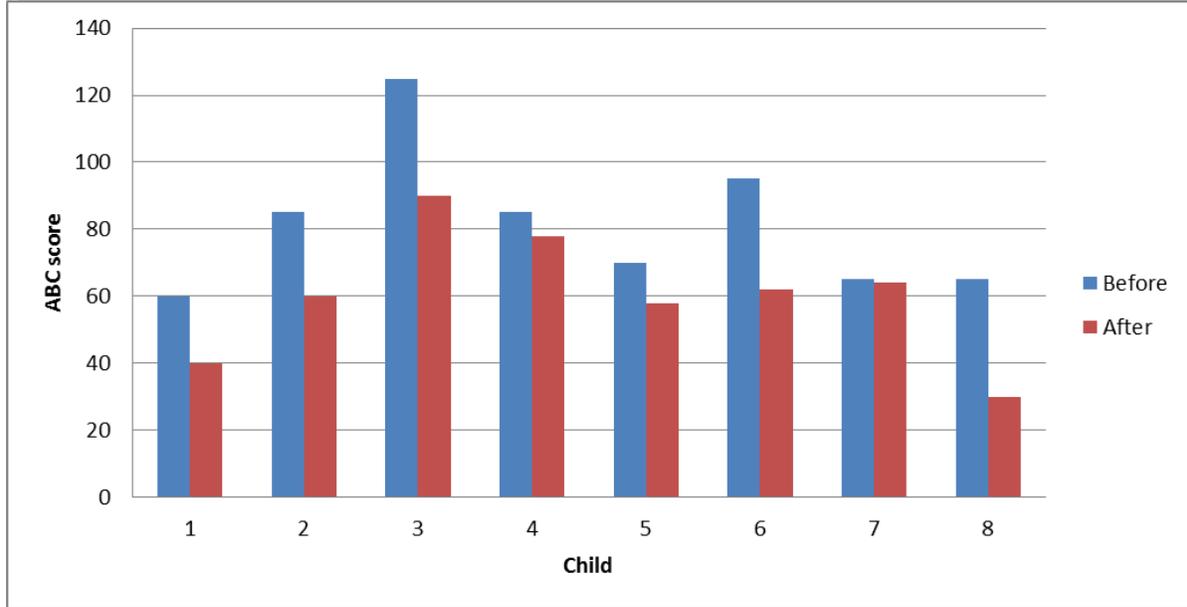
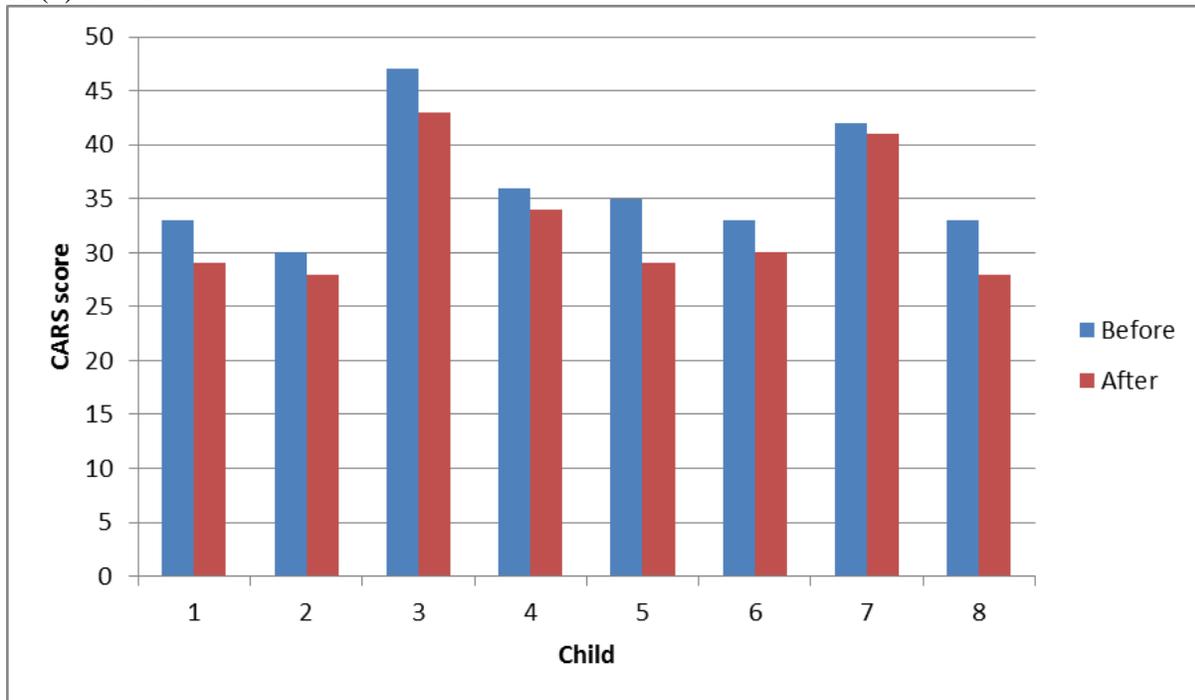


Figure 2. Childhood Autism Rating Scale (CARS) scores before and after intervention. Recreated from Silva LMT, Cignolini A. A medical Qigong methodology for early intervention in autism spectrum disorder: a case series. American Journal of Chinese Medicine. 2005; 33(2):315-327.



Improvements were also reported with regard to sensory abnormalities. Of the 7 participants with initial sensory abnormalities, 3 markedly improved and 4 slightly improved. Therefore, 100% of the participants with sensory impairment demonstrated a positive improvement: 43% with a marked improvement and 57% with a slight improvement.

The 2009 study by Silva, et al. measured the effects of the intervention on the treatment group as well as the control group. As demonstrated in Table 2 and Table 3, a change of scores in the negative direction indicated an improvement on sense-system impairments. With $p < .00$, analyses of these changes indicated more significant improvements for the treatment group as compared to the control group. Analyses indicated statistically significant improvements for the treatment group participants. Additionally, statistically significant improvements were not demonstrated for the control group participants.

Table 2. Before and After Scores on Measures of Sensory Impairment for Treatment Group.

Group & Scale	Before Intervention	After Intervention	Change
Parent Reported Data			
Sensory Score	54.2	46.2	-8.0 ($p < .00$)
SSC			
Sense Checklist	16.4	10.8	-5.6 ($p < .00$)
Systems Checklist	8.2	4.8	-3.4 ($p < .00$)

Table 3. Before and After Scores on Measures of Sensory Impairment for Controlled Group.

Group & Scale	Before Intervention	After Intervention	Change
Parent Reported Data			
Sensory Score	56.0	55.3	-0.7
SSC			
Sense Checklist	19.5	18.7	-0.8
Systems Checklist	10.1	10.1	0

The researchers explained that changes in sensory-systems scores accounted for 67% of the improvements in the overall behaviors. The researchers reported that the main result of the intervention were children who appeared to be in a more calm and comfortable physiological state than before the intervention. From this, the researchers hypothesized that many of the developmental delays exhibited in autism are the direct result of sensory and self-regulation impairments.

A 2011 study by Silva, et al. measured the massage program compared to a control group. Additionally, the study measured two different forms of the Qigong program. One program was delivered by parents at home as well as therapists at school and its comparison program was solely delivered by parents at home. However, for the purpose of this selective EBM, only the data that compared the massage program to the control group will be evaluated.

Table 4 and Table 5 illustrate that a negative change indicates an improvement in the sensory and self-regulation impairments of the treatment group. This is evidence by the *p* values ranging from .0001 to .0003. Therefore, this data is statistically significant. Conversely, Table 4 and Table 5 illustrate no improvement in the controlled group. This is evidenced by the *p* values ranging from .641 to .914. Therefore, this data is not statistically significant.

Table 4. Before and After Scores on Measures of Sensory Impairment for Treatment Group.

Group & Scale	Before Intervention	After Intervention	Change
Parent Reported Data			
Sensory Score	56.4	50.1	-6.3 (<i>p</i> = .0003)
SSC			
Sense Checklist	38.1	28.5	-9.6 (<i>p</i> = .0001)
Systems Checklist	49.1	39.2	-9.9 (<i>p</i> = .0001)

Table 5. Before and After Scores on Measures of Sensory Impairment for Controlled Group.

Group & Scale	Before Intervention	After Intervention	Change
Parent Reported Data			
Sensory Score	56.5	55.6	-0.9 ($p = .693$)
SSC			
Sense Checklist	40.6	39.4	-1.2 ($p = .641$)
Self-Regulation Checklist	48.9	49.2	0.3 ($p = .914$)

Discussion

This selective review investigated three randomized controlled trials regarding the intervention of Qigong massage and sensory and self-regulation impairments in children with autism. All three of the randomized controlled trials demonstrated that the massage intervention is a safe and effective treatment. The trials demonstrated that the data is both statistically and clinically significant.

A limitation of the methodology of the studies is the sample size. In one study, the sample size of the participants was as small as 8 participants. Although, the data demonstrated significant improvements in each of the 8 participants, a larger sample size may demonstrate results that are more consistent with the global autism population. Another limitation of the methodology involves the utilization of parental feedback and its effect on the results. Parental feedback is very subjective and may be inaccurate due parental bias and partiality. Although beneficial and crucial to these particular study designs, a more impartial methodology may demonstrate different results.

Conclusion

In conclusion, the three randomized controlled trials analyzed in this selective EBM review demonstrate that parent and therapist delivered Qigong massage therapy decreases sensory and self-regulation impairments in children ages 3-6 years old with autism.

As previously mentioned, autism is a wide-ranging diagnosis and actually includes five distinct diagnoses into its classification. The three studies analyzed do not disclose the actual diagnoses of each of its participants. Therefore, future research warrants more specifically grouped participants in order to evaluate whether or not the intervention is successful in all subcategories of autism spectrum disorder. Further research should also include participants outside the age ranges of 3 years old and 6 years old in order to demonstrate whether or not infants, toddlers, teenagers, and adults would benefit from such an intervention. Finally, further research should include larger sample sizes as to better generalize the outcomes to the global autism community.

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