

Zen Shiatsu: A Longitudinal Case Study Measuring Stress Reduction in a Child with Autism Spectrum Disorder

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Introduction: Autism Spectrum Disorder (ASD) is a developmental disability that manifests as impairments in social interaction, communication, and behavior.

Objective: The objective of this study is to determine if Zen Shiatsu can reduce short- and long-term stress levels in a child with ASD.

Methods: This is a longitudinal case study of a seven-year-old male with a diagnosis of autism who was given 20-min Zen Shiatsu sessions weekly for six consecutive weeks. Using a five-point stress scale designed for children with autism, the client indicated his stress level before and after each session. In addition, the parent was given the PEDS QL 4.0 Young Child Questionnaire to determine the child's HRQoL (Health Related Quality of Life) prior to Zen Shiatsu treatment to establish a baseline. The parent completed the same questionnaire after six weeks of sessions to compare results.

Results: Based on the five-point pictorial stress scale, data collected before and after each Zen Shiatsu session indicated a decrease in stress levels after treatment. The PEDS QL 4.0 showed higher HRQoL scores in all domains, indicating that the child's overall quality of life improved within the six weeks of receiving Zen Shiatsu.

Conclusions: Zen Shiatsu, a Japanese modality based on traditional Chinese medicine, provided meaningful and positive benefits for a child with autism. This case study offers preliminary evidence for the possibility of Zen Shiatsu providing a viable complementary therapy for alleviating stress in children with Autism Spectrum Disorder, thereby potentially improving the overall health-related quality of life.

KEY WORDS: traditional Chinese medicine; autistic; health-related quality of life; massage; complementary therapies; PedsQL; Incredible 5-Point Scale

INTRODUCTION

Sensory Impairments

Autism Spectrum Disorder is typically diagnosed in Western medical terms by observable autistic behavior and delay in social and language skills⁽¹⁾.

Recently, the new DSM-5 has included abnormal sensory responses to the diagnostic criteria for ASD⁽²⁾. The addition of this criterion validates the need for tactile treatment. Individuals with ASD tend to avoid touch, due to how it adversely feels physiologically within their bodies⁽³⁾. They may avoid proximity to others, including hugs or typical social greetings and gestures, which may add to their difficulty with interpersonal relationships⁽³⁾. This aversion may also lead to self-deprivation of touch⁽⁴⁾. Because of this resistance, many individuals involved in the life of a child with ASD may be unsure of how to demonstrate affection. A barrier exists between parent and child when an abnormal response to touch is present⁽²⁾. Touch abnormality is directly related to social development; therefore, a lack of touch may contribute to the degree of stress the child experiences and the coinciding behavior that manifests⁽²⁾. It is critical to note that, although children with ASD demonstrate a dislike of touch in general, they respond well to forms of bodywork that are predictable⁽⁴⁾.

Touch

Touch is the first sense to develop in a child, providing comfort and reassurance which lay a foundation for emotional and intellectual growth⁽⁴⁾. Touch quiets the sympathetic division of the nervous system that responds to fight or flight⁽⁵⁾. This is critical because children with a low tolerance for arousal, such as those on the spectrum, often experience heightened sympathetic responses with the presence of mild stressors⁽⁶⁾. These children are often living in a state of anxiety because their nervous systems are constantly on alert. Fortunately, by stimulating the parasympathetic nervous system, stress hormones decrease and the immune system is strengthened⁽⁴⁾. One way to possibly alleviate this chronic state of arousal is touch. Touch is critical for developing self-regulation⁽²⁾. Furthermore, by involving parents, the parent-child relationship can be strengthened, breaking down initial barriers caused by sensory aversion⁽⁷⁾.

Stress

Children with Autism Spectrum Disorder demonstrate an amplified stress response that may be due

to neurochemical factors, including abnormal excretion of cortisol, as well as difficulty handling stress and overstimulation of physiological response⁽⁸⁾. Anxiety disorders are higher in children with ASD and may be directly related to heightened sensory response, including touch⁽⁹⁾. Stress in a child with ASD can manifest in a variety of ways including withdrawal, obsessive interests, rumination, lack of focus, hyperactivity, and meltdowns⁽¹⁰⁾. The meltdown cycle generally includes a trigger that may or may not be evident, followed by rumbling, in which the child exhibits the first indication of a need to escape the stressor⁽¹⁰⁾. If the cycle is not stopped at this stage, rage may proceed which is exemplified by an outburst or severe withdrawal. Once the rage begins, it will generally run its course until the final phase of recovery is established. Because stress is a major attribute of ASD, it is important to utilize proactive measures to ensure the meltdown cycle is stopped⁽¹⁰⁾.

Zen Shiatsu

Zen Shiatsu is a Japanese treatment derived from traditional Chinese medicine⁽¹¹⁾. It consists of utilizing a combination of pressure with the thumbs and fingers, stretching, and energy work theoretically influenced by the Earth's magnetic field⁽¹¹⁾. Zen Shiatsu improves the flow of blood, lymph, and ki within the body⁽¹²⁾. Its purpose is to treat the whole person by interconnecting the physical, emotional, and spiritual spheres through touch in order to return equilibrium⁽¹³⁾. Based on traditional Chinese medicine concepts, autism is a result of a partial block in an opening of the sensory system due to toxicity or deficiency⁽¹⁾. The senses do not collaborate due to the brain's lack of sensory retrieval from the outside world⁽¹¹⁾. It is theorized that by treating the sensory impairment, the severity of autism may decrease⁽¹¹⁾.

Case Study Objectives

There is very little research linking Zen Shiatsu as a complementary health treatment for individuals with ASD. Other forms of complementary medicine, including Qigong Sensory Training (QST), have shown significant improvements as an early intervention in self-regulation of behavior and social/language in children with ASD⁽¹⁴⁾. In a recent study, Qigong massage demonstrated capabilities of improving tactile abnormalities in young children⁽²⁾. Acupuncture has also demonstrated varying measures of success⁽¹⁵⁾. Based on these results, it is natural to question if Zen Shiatsu is a viable intervention for stress reduction in children with ASD. The objective of this case study is to measure one child's stress levels before and after a 20-min Shiatsu session, as well as compare the results of a parent inventory,

before the six week intervention and afterward, in order to measure overall change.

METHODS

Client Profile

The client is a seven-year-old male with a diagnosis of Autism Spectrum Disorder. He was diagnosed by an Autism Specialist one week after turning three years of age. The client's communication skills are basic. Although he has speech, it mainly consists of echolalia comprising of repetitive dialogue from his favorite television shows. He is able to make short requests and will repeat what is said to him. The client attends an Intensive Learning Center at the local elementary school where he receives special support, including therapy from the Speech/Language Pathologist, Occupational Therapist, and Social Worker. The client also receives ABA Therapy (Applied Behavioral Analysis) at an Autism Center.

The client has frequent meltdowns when he becomes frustrated. His mother reports meltdown behavior occurring 5–20 times per day, lasting from 30 s to 1 hr. The client expresses stress through vocalization. He will clearly say “no” or cry or scream. Loud noises create additional stress. The client's parents proactively avoid stressful environments and are in sync to his basic needs, including hunger and toileting that can trigger additional discomfort.

Selected Treatment

Zen Shiatsu was the chosen modality for this study due to its noninvasive and holistic nature. Zen Shiatsu can be given fully clothed⁽¹²⁾ and, unlike acupuncture, there are no needles that may trigger adverse effects including bleeding, crying, fear, and pain⁽¹⁶⁾. Likewise, Shiatsu has the capabilities of addressing not only the physical body, but the emotional and spiritual well-being of the client. Zen Shiatsu has the potential to restore balance to the body while preventing the buildup of stress, including anxiety and depression⁽¹⁷⁾. Autism Spectrum Disorder is a multifaceted and complex disorder that has multiple causal elements and requires an integrative approach to treatment⁽¹⁸⁾. Zen Shiatsu takes into account the whole person and utilizes touch to integrate the child's systems, allowing for an embodied experience that enables the body, brain, and mind to cohesively process information⁽¹⁸⁾.

Treatment was given at the Boulder College of Massage Therapy Clinic in Boulder, Colorado. The licensed Massage Therapist who provided the treatments (author) in this case study has over 100 hrs of training in Zen Shiatsu, specializes in pediatric massage, possesses a Master's Degree in Special Education and, at the time of the study, had 12 years

of experience working with children with Autism Spectrum Disorders.

Initial Intake

Upon arriving at the first Zen Shiatsu session with his mother, the client was immediately alarmed due to the clinical environment which he perceived to be a doctor's office. He continuously walked toward the door of the room, wanting to leave. Due to his anxiety with hospital and clinical settings, it took an additional 10 min for him to agree to lie on the massage table. The entire first session was given with his mother on the table beside him. At this point, a treatment goal was to establish familiarity and comfort in the massage setting and to work on independence apart from his mother. The treatment plan was to reduce overall stress, including anxiety.

Treatment Overview

The client received 20-min weekly Zen Shiatsu sessions for six consecutive weeks. The sessions consisted mostly of palming and tracing the meridians, with some tsubo (point) work. Each session began with gentle rocking to initiate a parasympathetic response before beginning palming. The client responded well to palming techniques, preferring to lie in the prone position. Treatment in the supine position was also administered. The client did not like his arms touched initially; however, by the third session he allowed the practitioner to palm his arms and trace the meridians. He tolerated tsubos with bladder, kidney, gallbladder and stomach being the most frequently scanned meridians requiring treatment. During the first two treatments, very light pressure was used. The pressure increased with each session and by the fifth and sixth sessions, body weight pressure was applied by the practitioner with success. It is critical to note that, although the session was structured, room for modifications was allowed in order to best meet the client's needs. His mother was a source of comfort and she was in the room at all times, most often within a hand's reach of the client.

Measures

Prior to the session, the client was given a chart of the "The Incredible 5-Point Scale", created by Kari Dunn Buron and Mitzi Curtis⁽¹⁹⁾. The scale is a specifically designed tool for children with ASD that provides a systematic avenue to express emotional information⁽¹⁹⁾. The scale is a pictorial chart displaying five facial expressions ranging in emotions from 1, indicating feelings of calm and peace, to 5, indicating explosive, fight or flight, meltdown behavior. Each of the numbers was thoroughly discussed so that the pictures made sense to the client. The pictures expressed succinct levels of stress that the client

could relate to and apply to his own behavior and emotions with meaningful, real-life examples. The client's mother assisted with this process. The client pointed to the picture that corresponded to how he was feeling before the session. After Zen Shiatsu, he pointed again to the picture and number indicating his current stress level. The ratings were compared to demonstrate the change in stress levels prior to and after Zen Shiatsu.

Due to the high amounts of parental stress and care involvement by parents of Autistic children, feedback from the client's mother was important to this case study⁽²⁾. The Pediatric Quality of Life Inventory Version 4.0 (PEDS QL 4.0)⁽²⁰⁾ was used to measure the client's health-related quality of life (HRQoL) via parent proxy. Data collected from the PEDS QL 4.021 established a baseline from which to gauge progress over the six-week course of treatments. Data were gathered in the following domains and calculated in summary scores: Physical Functioning (8 items), Emotional Functioning (5 items), Social Functioning (5 items), and School Functioning (5 items). The questionnaire consists of ratings as follows: 0 = never a problem; 1 = almost never a problem; 2 = sometimes a problem; 3 = often a problem; 4 = almost always a problem. The scores were transformed into a scale range of 0–100, with higher scores indicating a more positive HRQoL.

RESULTS

The stress level of the client decreased after each 20-min Zen Shiatsu session as measured by the "Incredible 5-Point Scale" designed for children with Autism. Figure 1 is a graphical representation of client-reported stress levels ranging from 1 (calm) to 5 (meltdown behavior) collected prior to and after each treatment session. Prior to the start of Session 1, the client experienced the greatest amount of stress, which was close to meltdown behavior, including a strong desire to leave the room. With the help of his mother, touch was slowly introduced and the stress level declined post-treatment. As the weekly

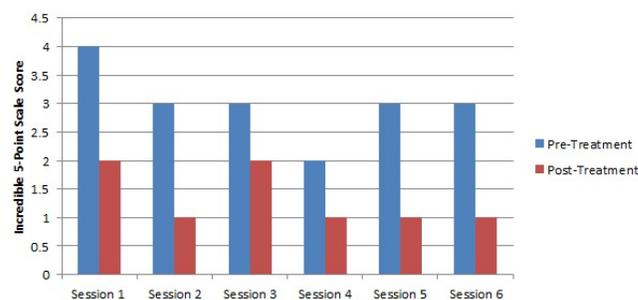


FIGURE 1. Pretreatment stress levels prior to 20 min of Zen Shiatsu compared to post-treatment levels, using a five-point scale ranging from 1 (low stress) to 5 (meltdown).

sessions progressed, the client became familiar with the technique and tolerance to touch increased. The client exhibited favorable response to the tracing of meridians and had moments of complete stillness.

The information gathered from the PEDS QL 4.0 demonstrated an increase in HRQoL from baseline to postcourse of treatment (Table 1). Scores were linearly transformed from a 5-point Likert scale to a 0–100 scale using the scoring manual⁽²¹⁾. Higher numbers indicate a better HRQoL.

Table 1 shows an increase in HRQoL on all four multidimensional scales from baseline to postcourse of treatment. The baseline result for Physical Functioning was 63, with the after-treatment score improving to 69. Emotional Functioning changed from a score of 50 to 55. Although the Social Functioning domain had the lowest HRQoL scores, it also had the greatest increase, with a baseline of 45 and a post-treatment score of 54. School Functioning improved by five points, with a baseline of 70 and an after-treatment score of 75. Lastly, the Total Score for the PEDS QL 4.0 improved 6.5 points from baseline to postcourse of treatment with the post-treatment Total Score (64.1) approaching that of the established cutoff point for at-risk status when using the parent proxy, which is 65.4⁽²²⁾.

Subsequent and Final Intakes

The client demonstrated noticeable improvement in his willingness to come to the Zen Shiatsu sessions. His mother reported that he “seems very happy to go to Shiatsu sessions” and consistently wrote that he was calm and in good spirits afterward and into the evening. By the second session, the client independently got on the massage table with his mother close by. During the third session, the client made noticeable eye contact with the practitioner and at the end of the six week interval, the client willingly gave the practitioner a hug.

DISCUSSION

The objective in this case study was to explore the effects of Zen Shiatsu on one child with autism

TABLE 1. Baseline and Post-Treatment Summary Scores for the PEDS QL 4.0 Prior To and After Six Weeks of Zen Shiatsu; Higher Scores Indicate a Better HRQoL

<i>PEDS QL 4.0</i>	<i>Baseline</i>	<i>Post-Treatment</i>
Physical Functioning	63	69
Emotional Functioning	50	55
Social Functioning	45	54
School Functioning	70	75
Total Score	57.6	64.1

to determine if his stress level could be reduced, thereby improving his overall health-related quality of life. For this child, a course of Zen Shiatsu achieved these goals and offered preliminary evidence for the possibility of Zen Shiatsu providing a viable complementary therapy for alleviating stress in children with ASD.

The findings from this case study are important because stress in children with ASD can become a never-ending cycle, catapulting the child into crisis level living for weeks at a time⁽¹³⁾. Negative stress is more evident in children with low tolerance for external and internal stimuli, such as children with ASD⁽²³⁾. When stress is experienced, hormones, including adrenalin and cortisol, are released in the body to prepare the individual for action⁽¹³⁾. Muscles tense, blood pressure increases, breathing intensifies, and the heart and lungs must work harder⁽¹³⁾. Additional issues may arise including constipation, sleep problems, headaches, eczema, and a lack of focus⁽¹³⁾. Long-term stress can lead to a depression of the immune system⁽¹³⁾.

Because stress and anxiety are common in children on the spectrum, it is imperative that stress management techniques are implemented⁽¹⁰⁾. Living in a constant state of stress is not healthy for the child's overall quality of life. Children with ASD have minimal autonomic flexibility, preventing them from moving out of a state of high arousal to relaxation with ease⁽²⁴⁾.

Touch is a natural treatment for stress, especially for children⁽¹³⁾. In this case study, Zen Shiatsu was implemented with positive results, indicating the modality may be useful for treating symptoms of stress on a short- and long-term basis. Touch has the capabilities of stimulating the central nervous system in order to lessen levels of stress and anxiety⁽⁴⁾. This was evident in the congregated data measuring stress levels prior to and after a 20-min Zen Shiatsu session. The stress level of the client consistently dropped, providing support to the hypothesis that the meltdown cycle may be proactively stopped if treatment is provided during the rumbling phase. Future efforts to examine Zen Shiatsu's effectiveness in this regard are warranted. Positive results were also apparent when comparing the baseline results of the PEDS QL 4.0 prior to six weeks of Zen Shiatsu and afterward. Results were most profound in the Social Functioning domain with a 9-point increase in HRQoL which may indicate Zen Shiatsu's benefit to social deficits. This correlates well with the theory established by the study utilizing Qigong Sensory Training demonstrating improved social ability in children with ASD⁽¹³⁾. It is possible that by reducing stress, the child's sensory tolerance is increased, thereby allowing an extension of social opportunities. By treating the sensory impairment, it is plausible that the severity of autism may decrease⁽¹⁾. In addition, as tolerance to touch increases,

bonding opportunities for parents may arise. Due to parental touch being the most effective means for helping a child self-regulate⁽²⁾, training opportunities for parents to learn basic Zen Shiatsu techniques may be beneficial in carrying out long-term treatment. Also notable is this child's post-treatment Total Score on the PEDS QL 4.0 which approached the cutoff point for at-risk status⁽²²⁾. Such a change in status could have profound effects for families of an autistic child. While crossover in risk status did not occur during the course of this case study, the possibility that continued treatment could have provoked such a crossover should not be disregarded. Future research designs could consider change in risk status as an outcome when examining Zen Shiatsu effects on stress and HRQoL in children with autism.

Because minimal research studies exist connecting stress reduction in children with ASD with Zen Shiatsu, these findings stand relatively alone. It is important that further research be conducted in order to determine if Zen Shiatsu is a sustainable complementary therapy for these children. Correlation to meridian theory would also be beneficial, to compare if acupuncture and Zen Shiatsu achieve similar results in restoring balance to the child with ASD⁽²⁵⁾.

The discussion presented in the case study is based on one client with autism. It is important to note that children with ASD have varying needs and are all unique. To increase validity, a wider sample of the population should be assessed to determine if similar results are found. Furthermore, this study was conducted in six weeks. A longer duration of assessment would be beneficial in determining the long-term effects of Zen Shiatsu in stress reduction and HRQoL for children with ASD.

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CONFLICT OF INTEREST NOTIFICATION

The authors declare there are no conflicts of interest.

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