

Effects of SuperBrain Yoga exercise on the behavioral indicators leading to Attention Deficit with Hyperactivity Disorder (ADHD): a pre-post comparative study

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Abstract

Finding effective interventions to improve behaviors that signal the onset of ADHD in childhood is of critical importance to support mental health throughout the entire life cycle. There is also a need to gather empirical evidence of energy-based therapeutic practices derived from cross-cultural ancient traditions. Claims concerning the ability of Superbrain Yoga exercise, an offspring of Pranic Healing©, to improve behavior by enhancing cognitive development and emotional self-regulation skills have yet to be confirmed by the gathering of further supporting evidence obtained by scientific methods. Theoretical background, the dynamics of life energy circulation and transformation, the psychological functions of the energy vortexes known as chakras and the auriculotherapy principles of reflex points in the earlobes, involves a paradigm shift towards integrative medicine that requires sound research practices. Classroom behavior of a group of 117 subjects in a state-run school in Uruguay, school children ages 6-11, was rated via the Spanish version of the Abbreviated Conners Teachers Rating Scale (CTRS-HI). Each grade teacher rated her class immediately prior to learning and starting the practice of the exercise (baseline), then also after two months of daily practice and after 5 months of daily practice. It should be noted that the exercise takes less than one minute a day and may evidence a high benefit-to-cost ratio. Results are encouraging: overall 47% reduction in the CTRS-HI score. This percentage increases to around 80% improvement in children ages 8-9. These two classes (3rd grade and 4th grade) were the only ones where proper execution of the practice was assured and checked by the researchers. Safety of the practice was partly evidenced by no changes in students who scored “zero” in the first measurement and sustained this score in the two subsequent measurements. Areas for improvement in further editions of this study should include proper quality assurance of the practice of the exercise and teachers’ bias control through having the auxiliary teachers (English language, physical education, computing) also rate the children (and weighting the scores according to time spent weekly with the child).

Key words: Superbrain Yoga – Pranic Healing – Energy Psychology – ADHD – Brief Interventions – Energy Therapies – Integrative Medicine

INTRODUCTION

An astounding portion of adult mental illness (80%) has roots in disorders appearing in childhood. Acting upon the mental health of children in the window of development ranging from ages 6-11, the school years that impact future sense of agency, self-esteem and access to higher education, can contribute significant improvements in mental health throughout the full life cycle of individuals. Viola, Garrido & Varela (2008) base their epidemiological study of the mental health of children and teenagers in Uruguay on these premises. This study underscores that there is high direct correlation between learning challenges and the presence of emotional and behavioral problems. The prevalence of Attention Deficit with Hyperactivity Disorder in Uruguay reaches 7.6%. Many of the children who suffer from this condition, belong to a lower social and economic environment that does not resort to psychiatric or psycho-pedagogic interventions. There is need for brief and low-cost modes of treatment. We may resort to the growing body of techniques provided by the emerging field of energy psychology, that is gathering strong evidence of efficacy through high quality scientific research (Stapleton, 2018).

An exercise used in India since ancient times for correcting disruptive behavior in children, was studied by M. Choa Kok Sui, the developer of Pranic Healing, with scanning techniques meant to analyze the energy dynamics mechanism involved. He also checked the proper practice to maximize its positive impact for correcting imbalances in the biofield and the bioenergy vortexes (aka chakras) that influence the different aspects of consciousness and psychological functions (Choa, 2005; Choa, 1990; Choa, 1993).

New forms of intervention that do not fit into the current mainstream paradigms (belief in what is possible and what is not) need not be discarded on grounds of being too simple or too effective within brief periods of application –the “too good to be true” fallacy. On the contrary, they should rather be tested on whether they can eventually be labeled as “evidence based”, especially if they are clear, easy to learn, and take few resources of time, money and energy, as it is the case with Superbrain Yoga. As stated in the first paragraph of this introduction, there is too much at stake here.

OBJECTIVE

To gather quantitative evidence on the efficacy of the SuperBrain Yoga exercise in improving those classroom behaviors involved in Attention Deficit with Hyperactivity Disorder (ADHD) among school children ages 6-11 in a state-run school of Uruguay.

Answer the following scientific questions: Does regular practice of Superbrain Yoga positively affect the behaviors involved in Attention Deficit with Hyperactivity

Disorder? Is it a safe practice? How long does it take to produce significant effects?
Do effects continue after the practice has stopped?

THEORETICAL BACKGROUND

The SBY exercise is based on the principles of the emerging discipline of Energy Psychology, the area of Energy Healing that deals with psychological issues. This is the set of intervention modalities based on affecting the *biofield* (generic scientific name assigned to what may be known by different names in different cultures, namely, the *aura*) to enhance the natural inbuilt self-healing feature of living organisms. A key element of the *biofield* is the construct “*life force*”. An essential aspect of self-healing is in the balanced flow of this life force within the organism and in its exchange of this energy with the environment –the intake of fresh energy and the expelling of used up energy, analogous to what takes place in breathing. Pranic Healing© is one of such energy healing modalities, a form of external medical *qigong* (Choa, 1990). We could also include this self-healing exercise among the 4th wave of psychotherapeutic interventions (Stapleton, 2018), that involve body-based approaches.

BIOFIELD RESEARCH

Formal scientific research on the definition and dynamics of the *biofield*, *bioenergy*, *biophotons* and *biofield therapies* is in its early stages. Rubik, Mueshsam, Hammerschlag and Jain (2015) have compiled the state of the art concerning this construct. The term *biofield* provides a unified concept for the phenomena observed throughout the ages and across cultures, that point to the existence of “a complex organizing energy field engaged in the generation, maintenance and regulation of biological homeodynamics”, upon which biofield therapies are based. This biological form of low level light or bio-energy has received many names: *prana* in India, *chi* in China, *ki* in Japan, *mana* in Polynesia, and so forth. Scientists have developed devices to photograph this energy emitted by living systems, the flow of which can be increased by applying intention. Rubik et al. (2015) point at the elements of the paradigm shift currently under way, a transition beyond “molecular reductionism ... that is based on an inherent belief that complex systems can be understood by identifying their components”. They propose that “conventional biomedicine is giving way to an expanded, integrative medical model that emphasizes healthcare as well as illness care, treats people not just diseases, and incorporates multiple therapeutic approaches, old and new, to offer patients greater choice.”.

High and medium quality research is being produced and published in peer-reviewed journals. There are now over 90 publications: 50 RTC, 40 pre-post outcome, where 98% of them gave evidence of efficacy of energy psychology techniques (Stapleton, 2018). It is relevant to mention here that critics could not yet find flaws in methodological or statistical elements, and rather focused their criticism on an axiomatic dismissal of the life energy construct as “pseudoscience” regardless of EEG

and EKG widely used in medicine and scientific research to observe processes in the brain and heart (Jain, 2018). Oschmann (2018) denounces “scientism: the misuse of science to advertise, rather than to find out what is going on.” Critics based on prejudice against the bioenergy concept rather than methodological or statistical flaws would seem to fall into this category.

Oschmann (2018) argues in favor of these potentially very brief interventions through developing and reviewing research of CAM (complementary and alternative medicine) therapies. He claims that they are becoming increasingly part of mainstream science and medicine, despite many people being “confused, skeptical and even fearful” of acknowledging the phenomenon of energy. The rising acceptance may well be because much more is known about how these interventions work than what is known about why conventional medicine works. These therapeutic interventions are sometimes dismissed because effects seem to happen too soon. When underlying mechanisms are yet unknown, results could even seem as belonging to the realm of the miraculous. Thus, this author contributes the view that physics helps demystify the bioenergy phenomenon (electromagnetic and other frequencies produced by living organisms). His teasing proposal –that the science of energy healing can give you lots of thoughts to entertain, let them entertain you, accept them if they seem to work, and be ready to let them go if they do not seem to work—coincides with the first teaching of the Basic Pranic Healing course (Choa, 1990). The recommendation is to adopt the scientific attitude in observing phenomena, developing hypotheses and diligently gathering evidence to confirm or refute them.

DESCRIPTION AND PRIOR RESEARCH OF THE INDEPENDENT VARIABLE:

The Superbrain Yoga exercise (Choa, 2005) stems from a millenary practice promoted by ancient Rishis in India as correction to disruptive behavior in children. It was known as the *Ganesh* (aka *Ganapati*) exercise, in reference to the Indian deity with child body and elephant head that symbolically alludes to a child with high intelligence and ability to listen carefully. In Southern India this traditional exercise is also known by the name of *Thoppukaranam* (Chandrasekaran, Rajesh & Srinivasan, 2014). It consists of 7-14 (a maximum of 21 daily) repetitions of squatting while gradually inhaling, and standing back up while gradually exhaling, keeping tip of tongue against palate, and gently squeezing the earlobe between thumb and forefinger of the opposing-side-hand, thumb outside, right arm crossing over left arm.

Pranic healing techniques (Choa, 1990; Choa, 2005) have enabled observation of how life energy (bioenergy, prana, chi, ki) is apparently absorbed by the Basic Chakra (located at the base of the spine) while descending to the squatting position during inhalation. Most of this energy is then pumped up the spine, while returning to the standing position during exhalation. The quality and frequency of the energy undergo changes upon rising up the spine through the different energy centers (*chakras*), that act as energy transformers, to the Crown Chakra and the brain, causing this organ to double

or triple the extent of its biofield. Another effect is more balanced energy between left and right hemispheres of the brain.

The changes in the quality of the energy are the result of the different functions of consciousness that each chakra rules according to the Pranic Healing model of 11 main chakras (Choa, 2010). Below, we provide a Table of the *chakras*, the Chinese Medicine acupuncture points to which the main *chakras* described in Pranic Healing correspond, and their respective psychological functions, as well as the glands each *chakra* regulates. We also present a hypothesis of correspondence of the chakras with personality function-attitudes of consciousness, described in Jungian Analytical Psychology (Beebe, 2008) and measured through the Myers-Briggs Type Indicator. Through this correspondence, scanning of the chakras with Pranic Healing techniques may reveal the personality types in different subjects (Garcia, 2015).

Table 1: Psychological Functions of the Energy Centers (Chakras) and their correspondence to acupuncture points and Jungian Personality Theory and the Function-Attitudes of Consciousness

Chakras	Acupoints	Glands	Psychological Functions	Personality Function-Attitude
Basic	GV1	Adrenals	Survival instinct (aggression/fear), dynamic action, protects physical integrity, consciousness of separation through the classical five senses	Sensation-Introverted
Sex	CV2	Gonads	Sexual instinct (pleasure, sexual drive, lower creativity)	Sensation-Extroverted
Meng-Mein	GV4	Adrenals	Upward flow of pranic energy from basic chakra	
Navel	CV8		Instinct of knowing (gut feelings), storage of life energy for self healing	
Solar Plexus Front and Back	Front SP CV12 Back SP GV7	Pancreas	Self-orientation and lower emotions, positive and negative (ambition, daringness, self-esteem, courage, drive to move forward, perseverance, strength, righteous indignation, justice, fairness, anger, irritation, hate, envy, greed, violence, resentment, worry, anxiety, tension, selfishness)	Feeling-Introverted
Spleen, front and back	Front SP16 Back BL50		General well-being. Affects the overall energy level, strength and health.	
Heart Front and Back	Front CV18 Back GV10	Thymus	Others-orientation and higher emotions (peace, serenity, joy, compassion, kindness, gentleness, tenderness, sensitivity, caring, patience, considerateness, transmutation of lower emotions: anger, sadness, guilt, fear, anxiety)	Feeling-Extroverted
Throat	CV23	Thyroid Parathyroid	Concrete, analytical mind, lower mental, higher creativity, art, nurtured by the sex chakra	Thinking-Introverted
Ajna	M-HN3	Pituitary	Abstract, synthetic mind, higher mental, willpower, leadership, emotional self-regulation	Thinking-Extroverted
Forehead	GV24	Pineal	Intuition with form, inner vision, memory	Intuition-Introverted
Crown		Pineal	Cosmic consciousness, will to do good, loving kindness for all (sense of safety through experiencing immortal, eternal, transcendent realms of being)	Intuition-Extroverted

There has been some research since Superbrain Yoga was systematized and presented by Choa Kok Sui in 2002 (Choa, 2005). Koterba & Mendoza (2007) presented case studies in a population of children with autism and ADHD, concluding that with the use of regular SBY, “the children are calmer and more focused and overall improvement is shown in all areas including function and behavior, interacting with the environment with more success”. Standardized tests showed one subject to make an overall improvement in development of three years and five months in only one year with the use of regular Superbrain Yoga. Siar & Mendoza (2007) conducted a quantitative 3-year study of academic performance, enhancement with control group resulting in 83% improvement using the Gates-MacGinitie Reading Inventory as a measurement tool in a population of teenage students. Qualitative observations in this same study rendered an obvious improvement of social skills, emotional responses, self confidence and self-esteem. Ramesh (2007) experimented brain mappings using EEG with a control and measured significant increases in brain activity, especially alpha wave in the frontal and occipito-parietal regions, after the practice of this exercise. Jois, D’Souza & Moulya (2017) researched beneficial effects on short-term memory and selective attention in students ages 11-12. There is need for further research to gather evidence meeting APA research design quality criteria, namely (for this study) sufficient sample size, valid and reliable measurement tools and well described treatment features.

Superbrain Yoga is based on the principles of auriculotherapy (acupressure of the ear). More research on this technique is necessary, but significant beneficial outcomes in psychological and physical symptoms have been observed (Rabischong & Terral, 2014; Hmwe, Subramanian, Tan and Chong, 2014; Asher, Jonas, Coeytaux, Reilly, Loh, Montsinger-Reif & Winham, 2010).

Feinstein (2018) reviews high-quality studies that provide strong evidence of efficacy of acupoint stimulation in successfully treating one of the most challenging conditions: post traumatic stress disorder. He reports that PTSD is the one condition in DSM-V that may be the result of brain changes generated by just one traumatic experience, generally involving death (one’s own or someone else’s), physical trauma or sexual violence. Energy Psychology brief interventions have been seen to correct those brain changes. Current pervasiveness of PTSD as a result of man-made or natural disasters is providing opportunities for gathering evidence to support the biofield therapies paradigm.

METHODS

RESEARCH DESIGN: Quasi-experimental, pre-post test of efficacy of the exercise.

PROCEDURE: First baseline measurement taken prior to learning the exercise and starting the practice (1st week of May), a second measurement taken after two months of practice (1st week of July) and a third and last measurement taken after five months of

practice (1st week of October). The first measurement (baseline) is taken two months after the commencement of the academic year, so the teacher who assesses the students has had enough time to familiarize herself with their behavior. In Uruguay, the academic school year starts in March and ends in December.

DOSE: Daily practice on school days (5 days a week) 14 times in the morning at the beginning of the class and 7 times after lunch, before starting the afternoon class period. Overall study covered a period of five months.

MEASUREMENT TOOL: The dependent variables (behaviors considered when screening for Attention Deficit Disorder / Hyperactivity) were measured using an abbreviated version of the gold standard in screening for ADHD: the Conners Teachers Rating Scale – Hyperactivity Index (CTRS-HI, Spanish Version calibrated for Spanish-speaking populations by Arias Martinez, Arias Gonzalez and Gomez Sanchez (2012).

Description of behaviors observable by the teachers were:

1. Constantly fidgeting.
2. Temper outbursts, explosive, unpredictable behavior.
3. Inattentive, easily distracted.
4. Disturbs other children.
5. Appears as angry or withdrawn.
6. Mood changes quickly and drastically.
7. Restless or overactive.
8. Excitable, impulsive.
9. Fails to finish things he starts.
10. Easily frustrated.

Teachers had to rate these behaviors according to the following scale (scores not provided to the teacher, only descriptors):

- Not at all (Score=0);
- Just a little (Score=1);
- Pretty much (Score=2);
- Very much (Score=3).

SAMPLE DESCRIPTION:

Inclusion Criteria:

- Informed consent signed by parents
- Willingness of the teacher to participate in the study and invest 5-10 min per student to assess the classroom behavior three times throughout the whole

academic year (running from March to December in the Uruguayan school system)

- Willingness of the child to participate in the study and perform the exercise as instructed.
- Correct practice of the exercise for at least 2 months.

Exclusion Criteria:

- Lack of consent of parents (2 children in 3rd Grade did not participate because parents were biased against “Yoga” due to their religious beliefs).
- Refusal of the child to participate
- Prior exposure to the Superbrain Yoga exercise
- Unwillingness of the teacher to assess the students (2nd Grade Teacher rejected the added workload)

Size: 117 children, ages 6-11, from which one dropped out and 20 did not score any points in the baseline measurement and were separated as a reference group to check the safety of the practice. Quantitative results stem from the remaining 95 subjects.

Demographics: Students of a state-run public school of medium to low social-economic extract, representative of the overall population that attends public schools in Uruguay. Medium to high social and economic extract students mostly attend private schools.

QUANTITATIVE OUTCOME FINDINGS

The overall CTRS-HI scores show an improvement of 47% after 5 months of practice, vs. the baseline. Results after two months of practice were better (52%), mainly because 5th grade did not practice regularly during the second half of the academic year. The two classes that practiced the exercise properly for 5 months (3rd and 4th grade) showed overall improvement of around 80%. The two classes that only practiced the exercise properly for about half the period (First Grade Group A and Fifth Grade), showed an improvement of around 30%. A class that could not be checked for quality assurance of the practice of the exercise (First Grade Group B), showed an overall score after 5 months (3rd measurement vs. 1st measurement) that was around 30% worse than baseline. Further inquiry on potential extraneous variables revealed the teacher used to teach older children and was required to teach 6-year old children against her preference. Fifth Grade practiced the exercise properly from June to August, then the teacher was absent frequently during the second half of the academic year and substitutes were not trained to lead the SBY exercise. This may be why the scores of the second measurement are better than those of the third measurement.

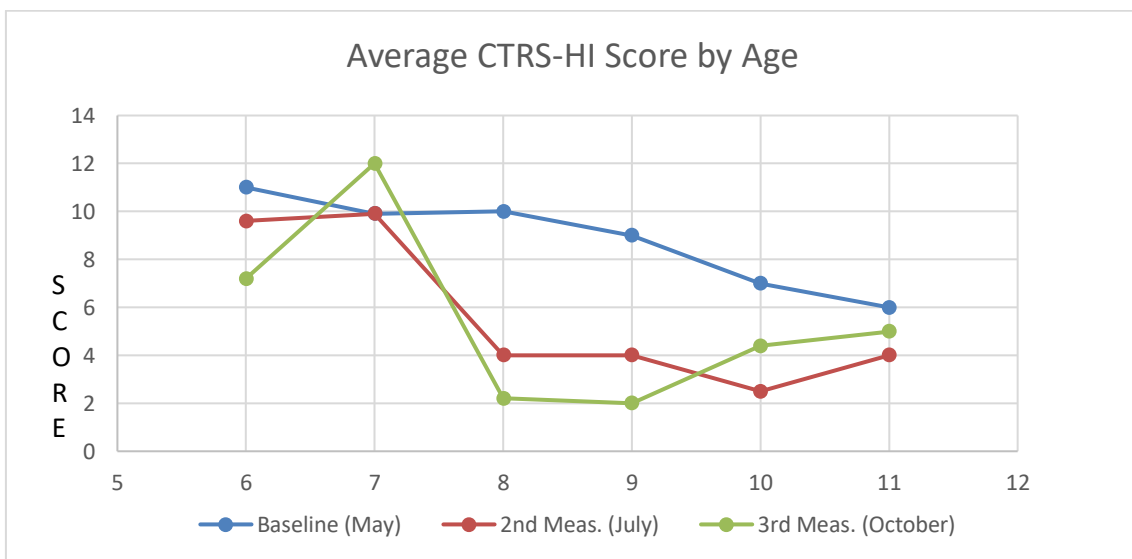
One child in third grade dropped out because he did not want to do the exercise. Two children in this same class could not participate because parents reject “yoga” for

religious reasons. Children in general would ask the teacher to practice the exercise, in the event she would forget. They seemed to like it.

From a gender perspective, higher baseline scores of the problem behaviors were found in boys than in girls.

The following chart shows the overall behavior improvement, as measured with the Conners Teachers Rating Scale / Hiperactivity Index:

Figure 1: Average Scored in the Conners Teachers Rating Scale / Hyperactivity Index by Students according to their Age (in years) at the Baseline (blue), 2nd measurement after 2 months of practice (red) and 3rd measurement after 5 months of practice

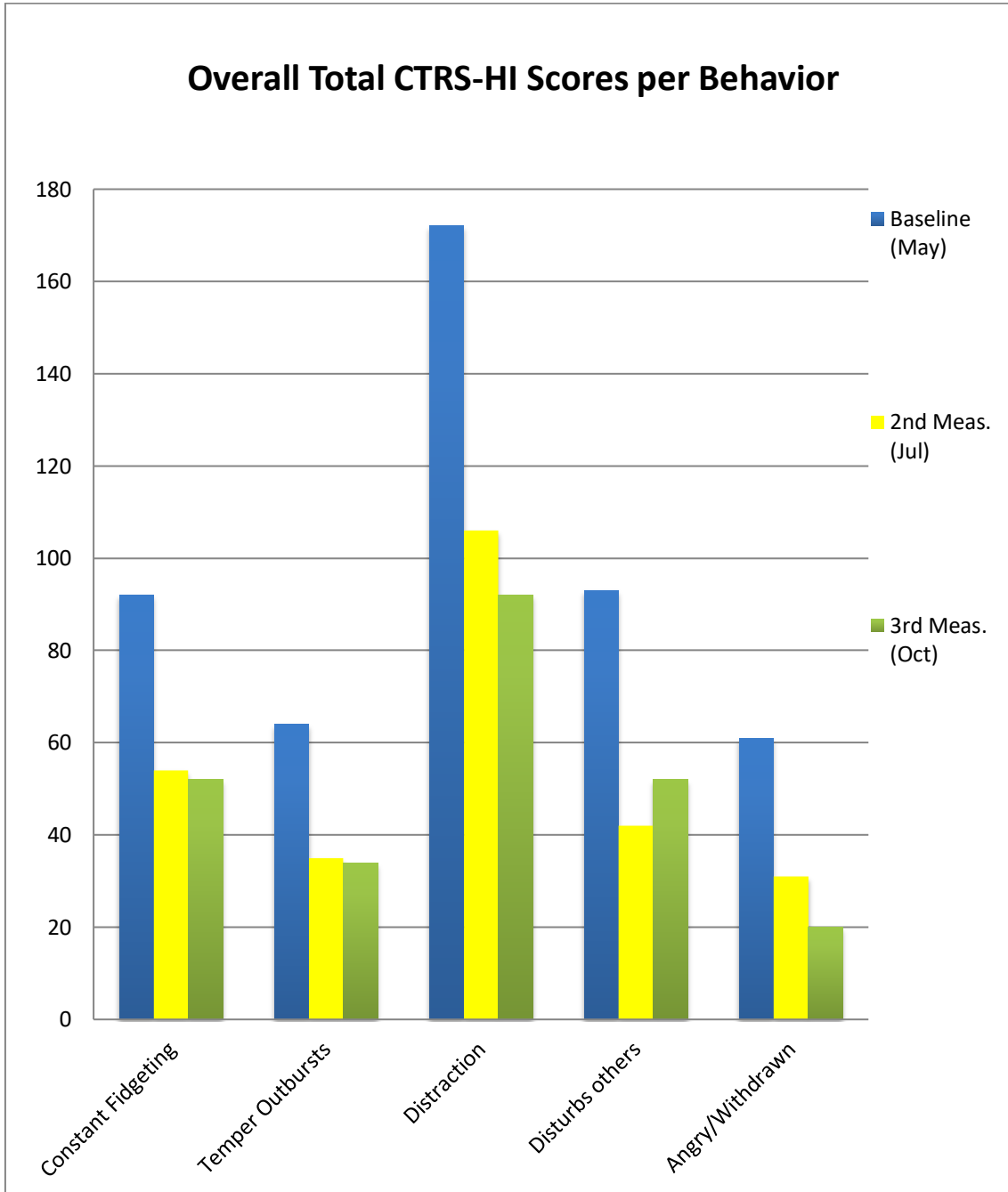


The instrument only validly and reliably measures children from 5 to 11 years of age. The most significant drop in disruptive behavior took place among children aged 8 to 10.

Extraneous variables relating to changes involved in puberty may be affecting older children and psycho-motor skills underdevelopment may be affecting the proper practice of the exercise in younger children. The latter may be confirmed in future editions of this research, where proper practice of the exercise can be ascertained.

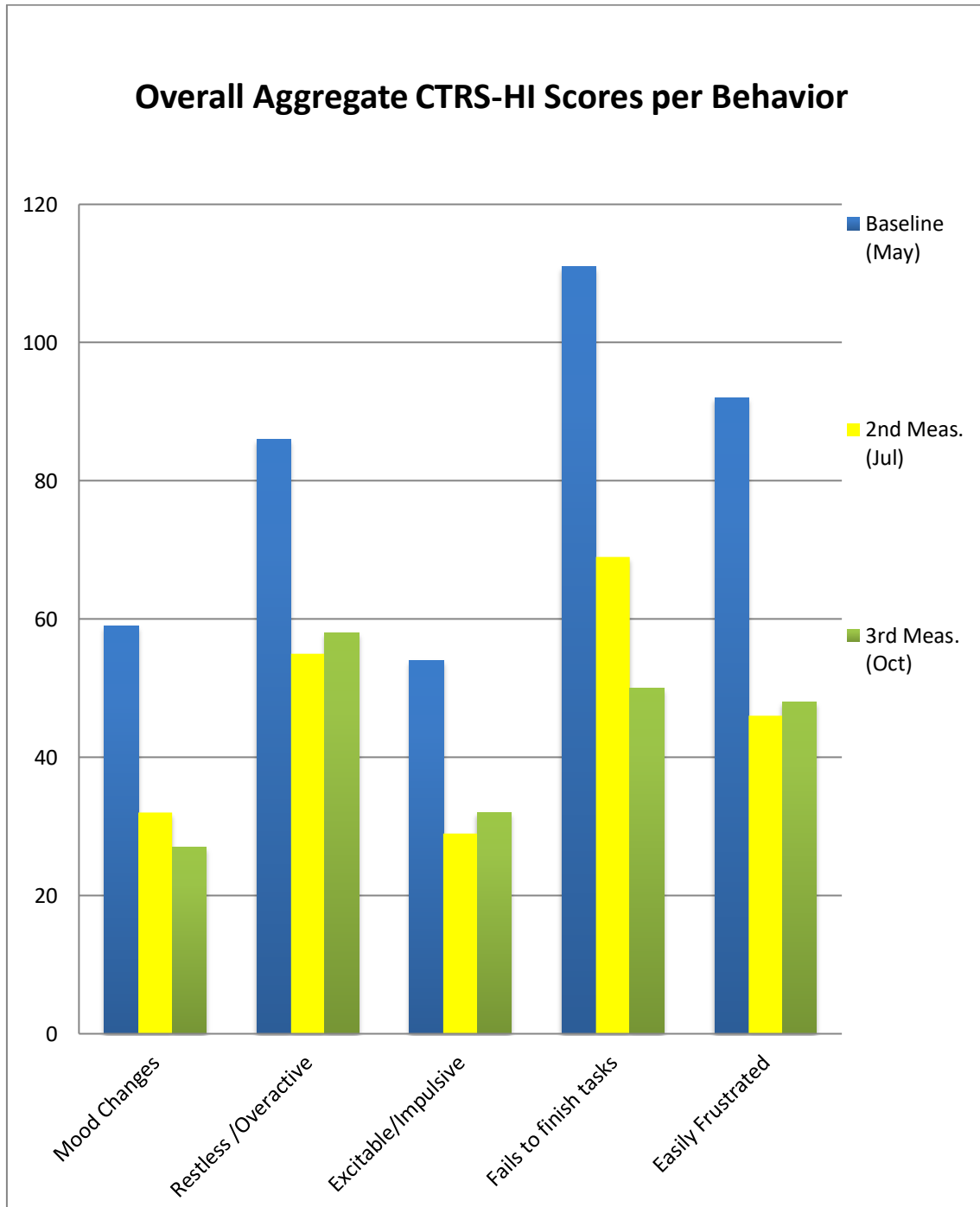
The next two charts provide a breakdown of the improvement in overall scores by type of behavior (first five and second five dependent variables described in the CTRS-HI).

Figure 2a: Table of changes vs. Baseline of the measurements taken after 2 months of practice and after 5 months of practice of Superbrain Yoga, broken down by item of class behavior descriptors (first set of five descriptors)



All dependent variables in this chart and in the next one, improved versus the baseline measurement. The third measurement yielded even more improvement than the second one. Extraneous variables intervened: absence of fifth grade teacher (28 subjects) and substitute did not follow up practice with usual regularity.

Figure 2b: Table of changes vs. Baseline (blue) of the measurements taken after 2 months of practice (yellow) and after 5 months of practice (green) of Superbrain Yoga, broken down by item of class behavior descriptors (second set of five descriptors)



QUALITATIVE OBSERVATIONS:

The school principal and auxiliary teachers (English Language, Physical Education, Information Technology), upon being interviewed in October, reported a significant positive change in the students' behavior compared to that prior to practicing SBY. Calmer, more interested in learning, showing more solidarity towards each other, lighter mood, joy and playfulness.

At the beginning of the academic year, the Principal was summoned to the class to bring order almost every day due to children restlessness, aggressive behavior, refusal to follow grade teacher's instructions. A child had even been given a separate chair on one end of the class in previous academic years to moderate his constant disturbance of class dynamics through aggressive behavior. This did not happen this year, after starting the practice of SBY; the child completely adapted to his classmates and teacher showing signs of care and good will towards others.

In 5th grade, a child (aged 11) presented neuromotor handicap that made him lose balance in the process of squatting. This issue disappeared after two weeks of daily practice.

An inspector from the Board of Elementary Education (ANEP) who assessed the improvement of children in Grade 4 reported surprise at the outstanding improvement of the behavior and academic performance of the children in this class, whom she tested in March and then again in September.

CONCLUSIONS

Regarding the first question posed in the objectives of this study on whether the regular practice of SBY has a positive effect on behaviors involved in Attention Deficit with Hyperactivity Disorder, results seem to indicate there is evidence that it does. An overall 47% improvement can be considered significant. The scores evolution of around 80% in children attending Grade 3 and Grade 4 may indicate that future editions of this research design, with improvements that exert greater control on teacher assessment bias by incorporating additional assessment of child behavior by auxiliary teachers, may yield more convincing overall results.

Regarding the second question posed in the objectives, we may infer the safety of the practice, from the results obtained from 20 children that did not score any points in the baseline measurement nor in any of the subsequent measurements, i.e. the practice did not induce any of the behaviors leading to ADHD included in the questionnaire of the CTRS-HI form used.

The answer to the third question would be that significant effects were evident in the second measurement taken after two months of practice (around 60% in three of the five classes and 53% overall).

Concerning the last question, evidence in this study (stemming from the results of 5th grade) would be seeming to point to the fact that if regular practice of the exercise is discontinued, the effects may gradually wear down. However, let's bear in mind that intervening to enhance attention skills, emotional self-regulation and cognitive abilities throughout a critical window of development in the overall life cycle (ages 6 to 11) can produce significant beneficial effects in life-long mental health.

AREAS FOR IMPROVEMENT

Future editions of this study should involve a quality control of the proper practice of the exercise approximately two weeks after it is taught to the children. An unexpected impediment emerged in this instance, that did not let the main researcher confirm the proper practice until two months after start-up and only for three of the classes: 3rd grade and 4th grade, who were doing the exercise well, and group A of 1st Grade, who were not practicing the exercise properly. The proper practice of the children in Group B of 1st Grade and in 5th grade could not be checked, due to teachers choosing to perform other activities with the class when the two main researchers visited the school to such effects.

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Authors disclosure of potential conflict of interest: all researchers practice Pranic Healing with the exception of the school principal, Maria Teresa Ferraz.