

# Tai Chi and Mindfulness-Based Stress Reduction in a Boston Public Middle School

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## Abstract

This article provides a description of a clinical project that used combined Tai Chi and mindfulness-based stress reduction as an educational program. The 5-week program demonstrated that sustained interest in this material in middle school-aged boys and girls is possible. Statements the boys and girls made in the process suggested that they experienced well-being, calmness, relaxation, improved sleep, less reactivity, increased self-care, self-awareness, and a sense of interconnection or interdependence with nature. The curriculum is described in detail for nurses, teachers, and counselors who want to replicate this type of instruction for adolescent children. This project infers that Tai Chi and mindfulness-based stress reduction may be transformational tools that can be used in educational programs appropriate for middle school-aged children. Recommendations are made for further study in schools and other pediatric settings. *J Pediatr Health Care.* (2005). 19, 230-237.

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0891-5245/\$30.00

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doi:10.1016/j.jpedsbc.2005.02.006

Tai Chi (TC) and mindfulness-based stress reduction (MBSR) are among many popular alternative stress-reduction modalities beneficial for adults as evidenced by their widespread use in the United States (Eisenberg et al., 1998; Eisenberg et al., 1993; Wayne et al., 2003; Wolf, Coogler, & Tingsen, 1997; Yeh et al., 2003). However, the use of these approaches together has not been widely studied with children. This article is a description of a clinical project that used participant observation to teach stress-reduction skills that derive from TC and MBSR in a group of six 6th-grade girls and a group of five 8th-grade boys in a Boston inner-city middle school with a population of 800 students.

## BACKGROUND

Traditionally a martial art such as TC has not been taught to children, probably because of the requisite capacity for sustained concentration, precision, mechanical exactness, and the essential slow execution of movements that children find less interesting once the novelty wears off. Generally, more active martial arts (eg, Tae Kwon Do, Karate, or Kung Fu) keep children's attention better. The mid-teen years are often a time when adolescents may take up the study of TC in the context of an adult class (Loupos, 1994).

MBSR has been used beneficially with children, but the literature on its use is limited (Ott, 2002a). MBSR tends to have broad flexibility and can be adapted to various age groups. TC is not as flexible. It requires steps to be learned in sequence with postural techniques that are subtle. Both approaches propose similar subjective outcomes of greater confidence, stress hardiness, and greater ability to modulate emotional triggers. These outcomes are of potential benefit for middle school-aged children. The problem explored by this project is whether a TC curriculum, when augmented by

age-appropriate MBSR, can sustain the interest of two groups of middle school-aged boys and girls and impart outcomes of benefit to them. Subjective statements made by the students in process during the 5-week program suggested they experienced well-being, calmness, relaxation, increased self-care, self-awareness, and interconnection or interdependence.

## IMPLEMENTATION

The groups were selected by the school nurse and faculty. The students selected did not have serious behavioral issues. The teachers believed that the children with behavioral issues received enough special programming. Once introduced to the idea of the educational group, the voluntary participants obtained written permission from their parents/guardians through the school nurse. The project did not identify the participants nor the school in recording and describing the program. No institutional review board was necessary outside of school administrative approval that the student's identities were protected in the context of an educational health promotion program.

The groups met 1 hour per week. The project utilized a system of teaching TC that breaks down the fluid movements into smaller component pieces. Each piece was taught as a precise stationary posture (Chia, 1986). These nonordinary postures were taught in short skill lessons. Once learned, they form the inner structure of the TC movement. Like any new skill, the lessons were variably difficult to learn based on each person's strength, kinetic sense, and capacity for concentration.

MBSR skills used in the project were adapted from various sources (Cohen, 1997; Kabat-Zinn, 1994; Nhat Hanh, 1991). Teaching MBSR is to show someone how to self-regulate their feelings and the triggers that arouse feelings. Anecdotal reports claim that children who learn mindfulness meditation show reduc-

tions in stress and pain perception. The only criteria for children to learn this are the children's ability to follow instructions and their willingness to explore possibilities that are new (Ott, 2002a).

## DEVELOPMENTAL THEORY AND THE PLACE OF MBSR AND TC

Children at the middle school age (11 to 13 years) are cognitively completing the transition from concrete to formal operational thinking as identified by Piaget (Ginsburg & Oppen, 1969; Hockenberry & Wong, 2003). Principally they can think abstractly. This means symbols can stand in for concepts, and they can compare what they think to what they observe. They can think about the future and imagine themselves in it instead of the present moment of childhood. By virtue of these abilities, the young adolescent will benefit from learning strategies for coping with stress. The later adolescent is likely to seek out a mentor or role model for coping strategy. At the early adolescent age, thoughts about emotionally laden subjects tend to be less sophisticated. When aroused by a topic or a provocative situation, the capacity for abstract reasoning erodes quickly (Saewyc, 2003). Without concrete strategies, early adolescents will fall back on their previously learned coping strategies, shaped as they are by a pervasively arousing environment.

Mindfulness and TC practice teach strategies that heighten awareness of the mind-body as an organic whole that can be trusted for feedback (Chia, 1986; Kabat-Zinn, 1994). Both practices condition students to regulate their emotional reactivity to stimuli feeding in from the environment and develop the capacity to step back from one's own emotional triggers (Benson, 1975). Consequently, daily practice provides concrete strategies to contain emotion-laden stress through compassionate awareness of self and others (Ott, 2002a).

Bion (1959) first proposed the idea that children need adults to "hold" or maintain a stable and safe environment in order for the child to internalize this stability. Winnicott followed Bion and furthered this idea of a "holding" and "containing" environment, such as a stable school, family, and community, and found that it promotes personal competence and decreases the fragmentation that leads to aggression (Twemlow, Fonagy & Sacco, 2002). TC and MBSR directly address the nexus where the student's drive for a safe and stable environment plays itself out in school. TC and MBSR provide strategies for children to react less to emotional cultural triggers, increase their awareness of self and others, and establish confidence in self-defense. The use of other martial arts disciplines in the pediatric population generally has been used for self-defense skills. These disciplines are known to increase confidence and decrease risk of injury, particularly in children who must deal with hostile environments. Martial arts (Tae Kwon Do and Karate taught in middle and elementary schools) have been reported in the literature as an important component of comprehensive anti-violence, social systems-based, psychodynamic programs (Twemlow, Fonagy, & Sacco, 2001; Twemlow & Sacco, 1998; Twemlow, Sacco, Gies, Evans, & Ewbank, 2001). This suggests that a martial art like TC could also fit as an effective modality for the middle school age group within a wider anti-violence program.

## THE TWO GROUPS PROCESS

The following description is recorded by the author (group leader) in the first person as both observer and participant. The separate boys' and girls' group process is compressed. The material in this article is presented as two separate strands of curricula, although they were woven together in the actual instruction. The MBSR exercises and TC techniques are labeled to indicate the

sessions in which they were taught.

MBSR curriculum is described in detail and was used in counterpoint to the TC lessons. MBSR practices are diverse. The ones used in this project were chosen to support TC and engage the students' attention and augment their interest. The TC curriculum is described in detail so as to be accessible to nurses, teachers, and counselors who want to replicate this kind of instruction for middle school-aged children.

### Mindfulness-based Stress Reduction

#### Class rules (MBSR session 1).

At the start of any group, the goals, agreed-upon rules, times of meeting, and termination must be clear (Yalom, 1975). Classes were voluntary; one could participate, observe, or leave. There was no judgment made regarding choice. Teaching this way involves exemplifying equanimity (Glassman, 1998; Munhall, 1993). As an example, practicing equanimity as part of the group process means the group leader at the start of each session offers each group member the freedom to participate or drop out. The leader does not know what will happen and practices equanimity regardless of a student's choice. In this way the group leader creates a nonjudgmental holding space that engenders the instruction being taught.

The students were not used to having choice presented like this. They expected to be told what to do and then comply or resist. Practicing not-knowing implied that I drop expectations of compliance and engage the students' choice to either participate or not at each new group session. Once they chose to participate, it meant they chose to stay for the entire session. Once they dropped out, they could elect to participate in the next session.

**Relaxation response (MBSR sessions 1 and 2).** I started the first two sessions by having the students lie on their backs with knees up, feet on floor, and begin a form of

**FIGURE 1. Iron Shirt Chi Kung, lower structure, session 1. Correct stance: Feet are shoulder-width apart, with knees slightly bent. The groin is open by pressing out with the upper thigh, initiating a spiral force down the legs, counterclockwise on the left leg, and clockwise on the right leg. The knees are gently torqued out. The feet spiral out, pressing against the inside of the shoe that remains in place. Photo by Miranda Wall.**



meditation that Benson (1975) has termed the "Relaxation Response." There is a hypnagogic quality to guided meditation that derives from following one's breath and the guide's voice. The instructions, when paced right, should match the hypnagogic state. I began focusing on the breath. I pointed out to them within a few seconds that they should notice thoughts, ideas, past and future conversations, or music intruding and eroding their concentration on their breath. Focusing on the breath teaches the participant to use one thing (like breath) to let all other things be held in abeyance for a period of time. The result often evokes relaxation (Benson, 1975). To augment concentration, the students can practice abdominal breathing. I instructed them to place their palms on either side of the navel and, when exhaling, to press downward, and when inhaling, to breathe into and expand the lower abdomen like a

balloon, pushing the hands outward. Abdominal breathing increases oxygen perfusion and decreases perceived anxiety (Cohen, 1997).

**Use of koans (MBSR sessions 2 and 3).** This age group (12 years) is at the beginning of being able to manipulate concepts. Abstract thinking is directly challenged by the use of paradox through koans: short nonlinear stories or questions. Koans are used extensively for increasing awareness or mindfulness in the Japanese Zen tradition. The boys particularly responded to the intellectual conundrum of the koan, "What is the door which is no door?" This was taken from the 13th-century Chinese master Ekai, also called Mu-mon (1183-1260). His collected koans are part of a compilation called *The Gateless Gate*. "The great path has no gates, thousands of roads enter it. When one passes through this gateless gate, he walks freely between heaven and earth."

**FIGURE 2. Lower structure push, sessions 1 and 2.** Student: Feet are shoulder-width apart; knees are slightly bent and torqued out. Partner: A firm steady horizontal push is applied against mild resistance by the student at the lateral collateral ligament of the knee. With no strain on the knee, the student should feel the steady push go through the lower leg and foot, into the earth. Photo by Miranda Wall.



**FIGURE 3. The Rooting Form: lower structure, sessions 2, 3, and 4.** Student: Just as in Figure 2, the student tucks in the sacrum, straightening the lower back. The knee is torqued outward gently. Partner: A firm steady horizontal push is applied at the knee and the iliac crest of the pelvis or the trochanter of the femur. The force is directed effortlessly into the earth. Photo by Miranda Wall.



(Ekai, as cited in Reps and Senzaki, n.d., p. 88). The boys were intrigued by the nonordinary standing posture called "The Rooting Form" that used their kinesthetic senses for insight into this ancient koan (Figure 3). The *effortlessness* felt in the rooting form exercise, where a partner tests the postural structure for solidity, is an aspect of "the Gateless Gate"; "the door which is no door."

**Sitting and use of a bell (MBSR sessions 3 and 4).** In these sessions I introduced the students to sitting on a zafu or cushion and the importance of keeping the back straight. I briefly reviewed the physiology of breathing, perfusion, and the relaxation response that has a cascade effect of benefits for the immune system and mood. Then I introduced a sonorous bell that helped focus the mind on sounds. Like the breath, sounds can be held with equanimity and nonjudgment. I led a guided meditation in being mindful of their breath and the sounds all around them. Both girls and boys were interested in the use of a zafu, or sitting cushion, for its novelty, and because it offered a way of sitting that was comfortable and conducive to learning the material. Similarly, the use of a sonorous bell assisted induction to a hypnogogic state, and it connected them to a larger context of the suffering and nonviolent (Tibetan) tradition that produced this kind of bell. The depth of the student's connection was unexpected.

**Mindful eating and interconnection (MBSR sessions 4 and 5).** Mindful eating meditation uses food, in this case an apple, to reveal the interconnection and decrease separateness (Nhat Hanh, 1991). I placed an apple on a bare table. Both groups described it concretely: shape, color, and name. I introduced the idea that the apple is made up of non-apple elements like the sun, rain, apple tree, nutrients, migrant farm worker, etc. We explored all the nonapple elements that make the apple possible. Some students identified with the earth science and bi-



ology. Others aligned with the work involved in producing it. When the apple was tasted in this light, some said it was sweet, and they understood that having one slice and one bite at a time is to have the whole apple because the apple and all the non-apple elements are present in one bite. I explained that meditation in this sense is to expand one's awareness of things. I cut the apple into segments. We heard the crunch sound and smelled its fragrance. Passing out the slices, we were surprised by the coolness wafting out with the sweet smell. One boy found a vein in the apple and saw the similarity between it and human veins. All these elements were held in the mind with each bite. This type of insight seems to diminish isolation and separateness as a result of seeing the interconnection between things; in this case, seeing the non-apple elements that make up the apple (Nhat Hanh, 1996). According to Nhat Hanh, this insight is a source of compassion. Particularly poignant was the keen understanding of the human suffering that is to some degree involved in the production, transport, and purchase of food (an apple). If they could understand the elements that are involved in one apple, how much more is involved in one person who is also made of elements that are not them (parents, nutrients, air, light, suffering, etc). We considered, from this vantage, that another person is made up of more than meets the eye. I drew an analogy between the apple being made of non-apple elements and myself as their teacher. Present in what I have taught them are all my teachers from elementary school, middle school, college, and beyond. What has stayed with me is in the memory of my body. Those teachers are the non-elements that make me who I am. If an apple is a subject for this type of meditation, how much more so is a person.

Increasing awareness of the complexity of others through such insights is presumed to diminish aggression. I believe this is impor-

**FIGURE 4. The Rooting Form, upper structure, sessions 2, 3, and 4. Student lower structure:** The knees are slightly bent and torqued out, the groin is open, and the sacrum is tucked in. The feet are relaxed and pointing straight ahead. **Upper structure:** The spine is erect and the chin is gently tucked in. Scapulae are rounded and arms are extended forward. **Partner:** The partner places one hand on the student's shoulder and the other hand on the hip with a steady horizontal push. Photo by Miranda Wall.



tant when one considers that Twemlow and Sacco (2000) found that the middle school age had the lowest empathy for victims and the highest aggression toward others because children become conditioned to see violence as positive and have less empathy and distress for victims and involvement with them.

**Intention and completion (MBSR session 5).** In this session I included a demonstration connecting the structural components of the closed fist being representative of destructive martial application. Then, opening the fist, I used the same structure to demonstrate how an open hand expressed caring. Whether open hand or closed fist, the underlying nonordinary posture and rooting structure is the same. What is different is the intention that gives rise to the open hand or the fist.

Intention was discussed as a

choice that can be creative or destructive. Posture in TC is related to intention. Right posture and structure is at the basis of right technique in any martial art. But it is also the underlying basis of caring for self. Right posture becomes a basis for caring when the open hand is connected with awareness to the whole body and a mind that intends well for others. This is creative intention.

### Iron Shirt Chi Kung

**Standing structure (TC).** I focused on helping the students gain a felt sense of their own posture by showing them how to configure their lower torso, legs, and feet in a nonordinary but comfortable posture that leverages tendon and bone with less muscular effort (Chia, 1986; Chia & Li, 1996; Loupos, 1994). These nonordinary stationary postures and their corresponding tests for correct stance and root

**FIGURE 5. Two-hand press, sessions 3, 4, and 5. Student: Shift weight to right leg and extend left leg forward. Partner: Take the opposite stance. Upper and lower structure for both are the same in in Figures 3 and 4. Stance remains at shoulder-width. Knees are torqued out gently, the sacrum is tucked, hips are squared toward the partner, the scapula is rounded, arms are torqued with armpits open, and the chin is tucked in. Two-hand press: The palm of one hand covers the back of the other hand. Both student and partner press palms together. Taking turns, one partner slowly pushes and the other receives the push, directing the force down into the ground through the nonordinary structure. Photo by Miranda Wall.**



form the basis for the kinesthetic sense of “grounding” that is at the heart of TC; they are called “Iron Shirt Chi Kung” (Figures 1-5).

**Moving structure.** We next put together the movements of the lower and upper body. The girls in particular picked it up quickly when they realized it was like any dance step. An historical precursor to TC are the exercises called Chi Gong (Qigong), which are linked to ancient shamanistic dances associated with various animals (Cohen, 1997). The girls acquired the “steps” and would repeat them sometimes without reference to the structural components that make the steps TC. Once these were acquired, the breath was integrated into each movement. The students asked me

to work with them in twos. This was effective for giving them more detailed instruction and getting a feel for the precise body mechanics. Teaching the group in dyads caused those who were not being taught to want to be in the next dyad. Although the girls might do something else while the facilitator worked with others, they were keenly aware that others not get ahead. The boys also worked well in the group following me. Students who were less athletic found that their legs tired more quickly if they were asked to hold a position when analyzing its parts slowly.

### Tai Chi Chi Kung

The traditional “segments” of the Yang-style Tai Chi Chi Kung form

that have been taught in this study are The Wu Chi Stance, Two-hand Push, Grasping Bird’s Tail, and Closing Tai Chi Hun Yuan Stance (Chia, 1986; Chia & Li, 1996) (photographs and descriptions available online at <http://www.jpmedhc.org>).

The students could see how the components of the standing postures of the lower structure (Figures 1-3), upper structure (Figure 4), two hand press (Figure 5), and abdominal breathing form the “inner structure” of the TC movement. They could see how the gentle torquing, spiraling, and mechanics worked together to change the way they felt. Both groups demonstrated the TC form for the school nurse and the counselor. The 6th-grade girls performed solo with my cueing, and then as a group following my lead. The nurse and counselor joined the group as they followed the girls. Both groups reported feeling “calmer,” and “feeling peaceful.” One member reported that using the relaxation skills helped her get to sleep at night. Another reported being more patient with siblings when provoked.

When asked, the girls told the school counselor they would like to continue to practice this along with the yoga that the counselor practices and teaches. They were willing to become a group that teaches other students the same skills. The 8th-grade boys took an approach that emphasized learning skills. This resulted in each boy working within the limits of his choice, motivation, and athletic ability. The boys interacted far less with one another than did the girls. The boys’ own process revealed moments of insight and use of body and self. For instance, one boy reported a sense of interconnection to nature as something of which he was a part. Another reported increased awareness of his posture and how he can use it to change his mood and better take care of his health. Another boy reported the acquisition of skill that revealed the inner mechanics of previously learned martial arts.

When asked about feelings, they were more circumspect and vague, reporting positive feelings of calmness after each session. They were noncommittal about continuing. I believe this is an observation about gender, age, and adolescent development.

## RECOMMENDATIONS

The teacher/facilitator should keep in mind that mastery of mindfulness training and TC skills are perhaps less necessary than a working command of the skills in providing children a facilitated experience similar to this study. A working command means that the facilitator personally practices these skills daily with an intention to see and experience life directly. Out of this personal practice arises a desire to apply what one discovers to the common mundane instances of life. It is this application that the facilitator teaches.

In this project I found that two facilitators were helpful in assisting the children to stay focused. This insight was based on the nurse observing at the final class, and on another occasion a nursing student simply observing the session. Their presence strengthened “containing” the class. This finding suggests that a facilitator who has experience in mindfulness but not TC could collaborate with a TC instructor or vice versa. Together they would provide strategies for stress reduction and sufficient holding of the space for acquiring these skills. Another suggestion in this line is to have a group of students and some faculty learning together. Added to the benefits of holding the space, curative factors arising from groups reported by Yalom (1975) are especially important for this age group: altruism, cohesiveness, universality, guidance, and instilling hope.

Other alternatives to TC that should be explored for the middle school age group are the many TC-related forms of movement exercise called Chi Kung, Chi Gong, or Qigong (Cohen, 1997). These gentle movements are traditionally used to

enhance health, improve on aspects of TC, and increase awareness of self and others. Yoga has been the subject of research by a pediatric nurse practitioner for pain management (Ott, 2002b). Like TC, yoga, augmented by MBSR, should be investigated with this age group.

In the mindfulness practices, other approaches to breathing could be explored than time allowed in this study. Walking meditation (Cohen, 1997; Nhat Hanh, 1985) and direct exploration of the natural world outdoors would assist the children in connecting science knowledge with the interdependence of all things. Teaching the TC foot and hand sequence as a dance step, prior to integrating the precise mechanics, is suggested by the girls’ own manner of learning the sequence of movements.

## PEDIATRIC RESEARCH IMPLICATIONS

Combining TC and MBSR could be studied in schools to measure outcomes in the domains of stress, learning new strategies for reducing stress, changing self-concept, imparting cohesiveness with other students, and teaching alternative self-care behavior. To what extent are these protective or curative factors the result of the TC and MBSR curriculum or due to the group itself (Yalom, 1975)?

It is not within the breadth of this article to explore the intervention in the broader context of a comprehensive antiviolence program. However, the article suggests that nonviolence programs can utilize the TC and MBSR intervention. It would be worthwhile to compare and contrast this intervention with other martial training in “The Gentle Warrior” component of The Peaceful Schools Program (Twemlow & Sacco, 1998).

The TC and MBSR intervention is the first stage of skill development. The next stage is training traditionally called “push hands.” This skill set trains students in dyads. It teaches an individual to locate and maintain

awareness of their center of gravity against an opponent. The dyad learns formal sequences of movements done together. They are applied and executed slowly. The skill increases awareness of self and other. Push hands provides learning to negotiate an adversary nonviolently without becoming a victim. Extensions of this could be measured behaviorally in a school context.

TC and MBSR could be used in the juvenile justice system to teach self-care skills. Research could measure the impact that increased awareness of self and others has on juveniles. Likewise, TC and MBSR could be used in gang interventions. Children form gangs in response to a violent environment where compassion for victims is inhibited. This intervention emphasizes a nonsectarian sensibility that teaches awareness that has potential to elicit compassion. A study could be done to measure what impact such an intervention would have on gang identity.

The skills taught in the TC and MBSR intervention find their place in both a psychiatric inpatient and outpatient setting. In an inpatient setting, the skills could be taught to young adolescents for self-control and trust of body. They could form components of core mindfulness skills that are part of dialectical behavior therapy (Koerner & Linehan, 2000; Simpson et al., 1998).

In the outpatient setting, these types of skills would be appropriate in the context of supportive therapy (Winston, Rosenthal, & Pinsker, 2004). They could also form core mindfulness skills as a component of outpatient dialectical behavior therapy (Fox, 1998). Behaviors and strategies around self-care and stress reduction could be measured for efficacy.

Nursing theory and mindfulness are only beginning to be explored in the nursing literature. Besides parallels between mindfulness and Newman’s concept of Health as Expanding Conscious-



ness (Wall, 2002), mindfulness practice as taught by Zen Master Thich Nhat Hanh has been effectively integrated with Jean Watson's theory of human caring in a comparative study on understanding and applying the practice of caring (Sitzman, 2002). These associations need to be more fully tested.

## CONCLUSION

This project described practices learned by middle school students in the context of a ubiquitous urban backdrop of power and aggression to which the children are continuously exposed. Subjective statements the boys and girls made in the process suggested they experienced well-being, calmness, relaxation, improved sleep, less reactivity, increased self-care, self-awareness, and a sense of interconnection or interdependence with nature. It appears that combined TC and MBSR can sustain interest of middle school-aged children. These modalities are of potential benefit as transformational tools for this age group in this and other pediatric settings. They should be recommended for health promotion even as they are studied further.

*I dedicate this article to my mentor, Dr. Christine Bridges, RN, PhD, professor of nursing at MGH Institute, who died last year from non-Hodgkins lymphoma.*

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