

Education Professionals' Salient Perceptions Of The Health Benefits Of T'ai Chi Chih® Discipline

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Abstract

One hundred seventeen (N=117) education professionals completed a 15 hour T'ai Chi Chih® (TCC) professional development experience followed by four weeks of individual practice. Qualitative data of salient perceptions of health benefits were collected from participants after four weeks of practice. One hundred ninety one pages of narrative were reduced by commonality statements into five major themes. Themes included: (1) general physical benefits, (2) psychological/mental benefits, (3) physical ailments benefits, (4) spiritual awareness benefits, and (5) social benefits. A discussion of TCC as a powerful method of eliciting the Relaxation Response is proposed as one explanation for these benefits. Implications are stated in terms of future directions for quantitative investigations into the benefits of TCC as a behavioral intervention of school personnel.

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Introduction

In a previous article in the Californian Journal of Health Promotion (Detert, Derosia, Caravella, & Duquette, 2006), the results of a pilot research study using 23 educational professionals who learned T'ai Chi Chih® (TCC) movements as part of an on-going professional development workshop were presented. The purpose of that study was to examine whether teachers who participated in a professional development workshop to learn TCC, and then independently practice TCC discipline for four weeks, would report changes in self-reported physical symptoms of stress and general well-being. The data from that study were both quantitative and qualitative and used with supporting literature to triangulate the results. It appeared from the pilot study that TCC was efficacious in mediating symptoms of stress while significantly increasing general well-being. Specifically, the results of the qualitative data of the initial study were the emergence of four benefit themes, with each theme supported by response statements and sample quotes. The salient perceptions of this initial group piqued our interest. We wanted to know if these perceptions would emerge with other education professionals. Thus, the purpose

of the present qualitative study was to examine the most salient perceptions of the health benefits reported by education professionals in six additional professional development workshops held in six different locations.

Methods

Subjects

The sample for this study was 117 education professionals who participated in and completed one of six T'ai Chi Chih: Joy thru Movement professional development workshops over an 18 month period. Each workshop included teachers from the elementary, middle, and high school levels. They represented content areas of language arts, math, science, social studies, foreign language, music, art, health, and physical education, as well as social workers, school psychologists, and guidance counselors.

Professional Development Workshop

The professional development workshops consisted of 15 hours of TCC practice and other mindfulness strategies taught by an accredited TCC teacher. In a two-day format, subjects were taught and practiced 15 of the 19 movements and one closing posture. *Mindfulness strategies*

were introduced and practiced to provide periods of rest from the TCC movements. The mindfulness strategies included mindful breathing, mindful eating, mindful sensory awareness, and mindful walking utilizing the book *Moment by Moment* (Braza, 1997). These strategies were selected because they reinforce key aspects that are embodied in TCC discipline. Following the two day workshop, subjects were asked to independently practice the TCC movements 15-20 minutes each day for four weeks. Fifteen to 20 minutes was chosen as the practice time each day for two reasons. First, that is the minimum recommended time by TCC originator, Justin Stone. Second, that is the daily average time that elicited significant positive changes as noted by Detert, Derosia, Caravella, and Duquette (2006) in their pilot study.

Data Collection

Participants were asked to keep either a log or journal of the movements, time practiced, and feelings noted before, during, and after each practice session. At the end of the four weeks, they were instructed to examine their journals and use narrative to summarize any benefits they perceived that might be attributed to their TCC practice and mail it to the researchers. It was explained to the participants prior to workshop completion that if they did not want the researchers to include their summary in the data analysis to note that on their paper. Otherwise, they were granting their permission to analyze their data as part of a study. All participants gave permission to use their benefit summaries for this purpose.

Data Analysis

Data for this study consisted of 191 pages of perceptions. All 191 pages were reviewed and coded by two graduate students trained by the researchers to code qualitative data. Randomly selected data were then reviewed by the researchers to establish internal consistency. There was 100% consistency between the graduate students and the researchers.

The coding consisted of four steps. Step one identified the specific benefits noted by subjects. Step two grouped similar comments and were titled "Response Statements." Once this was

completed, step three involved creating a title for the theme that best reflected the response statements. In step four, the researchers extracted direct quotes from the data that supported the response statements and theme.

The response statements and four themes identified in the earlier pilot study became the foundation for coding in this study. The four major themes that emerged in the initial pilot study, and used as a starting point for coding the data in the present study, again surfaced with regularity. The initial four themes were: (1) General Physical Benefits, (2) Physical Ailment Benefits, (3) Psychological/Mental Benefits, and (4) Spiritual Benefits. In this study, any new responses, including sample quotes, were identified and added to the original pilot study's analysis. This was done to create a greater understanding of each benefit theme. The researchers present these categories, response statements, and sample quotes as the actual evidence of the benefits of learning and regularly practicing TCC movements. It is important to note that the researchers were interested only in the specific benefits mentioned in the summaries. As such, the context in which these benefits were noted were not of interest and not coded for analysis. This means that the accident, injury, chronic pain, divorce, dysfunctional relationship, prior use of meditation, chronic and acute psychosocial stressors, etc. are not presented. For example, one subject wrote:

"I must tell you I went into this class and practice very much a skeptic; but I have had some rather unbelievable (at least for me) results. In order to explain I must provide some personal history. In 1990, I herniated a disc in my lower back which required a laminectomy. But my body scars so easily that I developed scar tissue that almost completely compressed a nerve in my left leg and I had lost most of the use of my leg before the doctors decided to do another surgery. The surgery was successful but I was left with some minor nerve damage. This nerve damage manifested itself in an "achy" pain in my left leg from the hip to the toes that would wake me at 3:30 or 4:00

A.M. every morning. The only way I could get back to sleep was to get up, take several ibuprophen and walk around a bit. For the last week or so I haven't had the "achy" feeling. The only thing different in my life is my practicing the T'ai Chi Chih."

The assistant who coded this paragraph noted the reduction of "achiness" (participant response) and placed it under the theme, Physical Ailments Benefits. All benefits were coded in this manner to save space and to allow the reader to develop a general "feeling" tone of the specific benefits, without having to note the diverse contexts in which benefits occurred.

Results

In this study, six additional responses were added to the General Physical Benefits theme; five were added to the Psychological/Mental Benefits theme; seven were added to the Physical Ailments theme; four were added to the Spiritual Awareness theme; and four responses that didn't fit the previous four themes were used to create one additional theme, (theme 5), Social Benefits. These data not only expanded the number and type of response statements for the four existing themes from the pilot study, but further added depth from the sample quotes. The themes are presented here along with the responses and sample quotes taken directly from participants' written summaries.

Theme 1: General Physical Benefits

The response statements identified under this benefit included increased energy, vitality, rejuvenation and cheerfulness; better circulation, breathing, posture, physical balance, flexibility, strength, and coordination; better sleep, and increased contentment; increased sensory awareness and relaxation; and weight loss. Sample quotes from participants were:

"I feel my circulation is improving. Usually my hands are cold almost all the time. Now they are warm like the rest of my body."

[I have] "a notable improvement in circulation to my extremities!...When I

practice T'ai Chi Chih later in the day, my extremities are comfortable, even with air."

"I felt almost like I had a lightness in my chest. It seemed like my lungs really opened up, and I could breathe very easily. Along with this feeling of lightness came a sense of peace and relaxation."

"I have been on blood pressure medication for 8 years, and I take my blood pressure daily...my blood pressure was lower than it has been since I started my medication. It's amazing what T'ai Chi Chih has done for me in such a short time."

"I did have my annual checkup with my doctor...She said I was doing really well, and my blood pressure had never been so good."

"I've experienced...improved balance and coordination, enhanced sensory awareness, increased inner calmness and concentration."

"I have noticed some benefits including being more relaxed at night which leads to better sleep and I have been more energetic in the day."

"I began sleeping better through the night...and feeling rested in the morning."

Theme 2: Psychological/ Mental Benefits

The response statements for this benefit included less irritability, inner calmness and more peacefulness; an increased sense of self-acceptance; increased awareness and concentration level; increased happiness, joy, and love; decreased stress; increased control over self or life events; increased feeling of well-being; and increased patience, contentment, and empowerment. Sample quotes from participants were:

"An inner calmness overtakes me in doing T'ai Chi Chih. When I do the closing position, I breathe deeply and feel as

if...virtual bands of steel that have encircled my chest for years snap off.”

“Its focus [T'ai Chi Chih] on slowing down and patience have proven helpful in my managing stress.”

“My crabbiness seemed to melt away and was replaced by patience and an overall sense of positivity.”

“I have become a more patient person. I am mindful of my own actions, and I am less judgmental of others. The only life I own, and am in charge of, is mine. The people I come into contact with are expressing their own life; I am a visitor in their perceptions.”

“A better awareness of my surroundings. I love my flower gardens and I am taking the time to really examine their appearances and their colors. I am looking more closely at my children's and husband's faces...I have never been more aware of the birds and owls.”

“As a school counselor I believe that it is easy for me to say the words to others that can assist them to be patient and work on quiet approaches to life's situations. However, actually feeling this for long periods of time has eluded me. The reduction of this dissonance is being realized as I continue daily practice” [of T'ai Chi Chih].

“I feel like I am taking control of my life and mental state.”

“No matter where my mind is on any particular day, when I begin a series of movements...I reach that 'place' that is SO peaceful. It seems every session brings something new to me...enlightenment, relaxation, insight, energy.”

“...I feel that T'ai Chi Chih has helped me know and understand myself better.”

“I have noticed...relief from most emotional stress and anxiety. Once again, I feel more relaxed and less frantic.”

Theme 3: Physical Ailments Benefits

For this benefit, the response statements included decreased need for health care; fewer tension headaches or migraines; decreased soreness or cramps; decrease in TMJ — a stress related syndrome; less back, neck, or shoulder pain, facial muscular tension, joint pain, and nervous stomach; fewer PMS symptoms; fewer anxiety attacks; and lowered blood pressure. Sample quotes from participants were:

“I have stopped taking antibiotics on a daily basis and have felt wonderful. I had one relapse since I stopped taking them...I believe there was something blocking the way my chi flowed through my body, causing the bladder infections.” [This after six years on medication].

“...since I have been practicing the movements of T'ai Chi Chih, it has reduced my migraines and I don't have so much anxiety.”

“I have noticed a significant improvement in my muscles. There is almost no soreness in my neck, and I no longer have leg cramps in the middle of the night. My muscles are no longer sore — for the first time in over a year!”

“I hold a lot of tension in the muscles (TMJ) due to grinding and clenching...I have noticed less pain in the joint and chewing carrots and apples is easier.”

“Since the initiation of T'ai Chi Chih practice the pain seems to feel muffled, as though it is through a pillow.”

“15 years ago I suffered some lower back problems. These problems are disk related and occasionally flare up, sometimes for no apparent reason. I usually have [had] some degree of back pain every morning when I got up. Now I have noticed a lessening of

discomfort, particularly after morning practice.”

“I suffer from what the doctor says is a ‘nervous stomach.’ There isn’t a physical reason as to why this happens, but when I am stressed, I often have abdominal pain and sometimes get physically ill.... I have suffered with this ‘condition’ for about 4 years.... Since class, I haven’t had even a tinge in my stomach, which is exciting.”

“I have arthritis, and the movements seem to help dissipate pain which is amazing because I expect to have to do this T’ai Chi [Chih] a much longer time to get any effect like that.”

“I had been seriously injured in an automobile accident two years ago.... I have noticed an increase in flexibility in my right leg as a result of T’ai Chi Chih. I have also noticed a decrease in the pain that I usually deal with daily....Even when the weather changes, I have noticed less pain and stiffness.”

“I had a lot of pain that radiated to my shoulders and down behind my shoulder blades.... despite the efforts of a chiropractor and then a physical therapist I just couldn’t get rid of the tightness and pain. Since [T’ai Chi Chih] this has just about disappeared.”

My hands...due to carpal tunnel syndrome are cold, swollen, sore, and gripping objects is no easy task. [T’ai Chi Chih] makes my hands feel warm and normal...for several hours.”

“After running routinely for the past two years I often experience shin splints and other leg problems. After doing T’ai Chi Chih.... I have found myself now being free from shin splints....”

“I am one to carry a lot of stress in my neck and shoulders and suffered with a stiff neck and aching shoulders. I have experienced relief from some muscular aches and pains

that occurred in my neck, shoulders and lower back.”

“A clearing of past chronic pains from sports injuries (e.g., I-T band, hamstring, arch and ankle, shoulder, tendonitis of the knee, lower back pain).”

Theme 4: Spiritual Awareness

Response statements that were a part of this theme included increased connectedness to the environment, nature, self, or the spirit; increased inner peace and serenity; and an increased spirit-filled attitude or awakening to life. Sample quotes from participants were:

“I feel connected to God during T’ai Chi Chih, not particularly the fatherhood of God, but the creator and creating aspect.”

“The wind is a welcome partner...and I feel at one with the natural surroundings.”

“I am discovering and more aware of the inter-related nature of the world.”

“...for the first time in 49 years I have felt the presence of my soul—that part of me that is not really part of me but part of everything in existence...not defined by words, ideas, or answers.”

“T’ai Chi Chih has strengthened my relationship with God by increasing my inner peace and serenity.”

“It is an overall calmness and a feeling of inner balance. Through practice, the movements have begun to flow and with that I am enveloped in peacefulness.”

“T’ai Chi Chih is truly a process of being awakened to life. In a sense, I feel I have become ‘re-spirited’.”

“...enhanced spiritual enlightenment. My praying is clearer and less apt to ramble.”

“It feels almost like a prayer. I feel in touch with the Creator.”

“I have noticed an increase in overall sensory awareness...an intuitive knowing within and outside of myself. It is as if, ALL IS ONE.”

“A strong feeling of love toward all living things, even those individuals I have felt uncomfortable with...this I feel is the most beautiful gift I’ve been given.”

Theme 5: Social Benefits

This is a new theme derived from the additional teacher response statements included increased awareness of spoken words; increased politeness to others; improved communication and expression to others; and spending less time on the telephone and more face-to-face contact. Sample quotes from participants were:

“[I’ve] become less reactive with my words and take a minute to think before I speak.”

“I don’t associate myself with people that always complain and react to situations.”

“I am more patient with my children and am more aware of negative people and forces around me.”

“I’m able to express myself without any confusion or hesitation on my part.”

“I do less talking on the telephone. Instead, friends within walking distance are visited and met with face-to-face.”

“I’m able to express myself completely without any confusion or hesitation on my part.”

“I have definitely become more patient in my relationships with all members of my family, as well as friends and acquaintances.”

Finally, although not identified as a theme of direct benefits, there was a very noticeable trend in these data that focused on gratitude. Many participants mentioned gratitude in reference to the practice itself, and that they discovered the practice through the professional development

experience in which they participated. Others expressed gratitude for the specific benefits they noted during the weeks following the instruction. Usually, gratitude was expressed with the qualifier, “in such a short time.” Many expressed gratitude for the renewed sense of “health” they experienced and for the psycho-physiological complexity of the body. In some cases, this was expressed as how little is really known about health, healing, and wholeness. Still, others expressed gratitude for discovering the need to give one’s self the time to focus, to grow, and to experience joy through TCC movements. Stone (2004) has stated that “nonpractitioners would be astounded at how much gratitude is generated by TCC practice” (p. 6). Sentiments of gratitude were generously expressed in these data. To highlight gratitude, this is how one professional summed up her reflection:

“I am thankful that I now have a beginners knowledge of how to circulate and balance the Intrinsic Energy so that I may experience the rewards through good health, serenity, peace and joy. Although we have now entered the third millennium, it is interesting to note that we are still trying to access the same life rewards as the ancient Chinese — peace and joy in the midst of disturbances. Even though the physical world around us continues to change, we as humans remain connected to the universal energy flow.”

Discussion

Those who learned T’ai Chi Chih in the format noted earlier were encouraged to practice the movements each day for four weeks. During these days and weeks participants were encouraged to journal four items: (a) their comfort level with the movements, (b) length of time practiced for each session, (c) general reflections, and (d) specific reflections on any noticeable benefits they attributed to their TCC practice. Relative to the time practiced, participants noted the length of their practice time anywhere from five to seven minutes to 40-45 minutes on most days. When a day was missed participants’ general comments centered around how much they missed doing the movements, and how they looked forward to

doing them the very next day. This may be a novelty affect or some kind of an internal motivation that is activated by these movements. We speculate that the quick onset of health benefits may serve as motivation and that when practice is missed for a day or two, many individuals seem to “miss it” and return to it quickly.

It is interesting to note in these data that there was a greater development and expression of the response statements, as well as the expression of the benefits. This is particularly true of the Physical Ailments Benefits. There is a disproportionate number of responses and quotes that have to do with healing or the reduction of pain with physical ailments or old injuries. We chose not to reduce the supportive quotes to illustrate this occurrence.

The emergence of the social benefits theme, albeit not as well developed as the original four themes, further illustrates a new dimension perceived by participants. Sample quotes seem to indicate greater awareness or insight to one’s verbal expression including greater patience and clarity of verbal expression. One might conclude that many participants developed sensitivity to the impact that their words have on others.

Not clearly as evident in the original pilot study is that the expressions provided in many of the sample quotes in this study could easily be justified being placed in a different theme — in spite of the mutual exclusiveness of the coding system. This brings to mind the concept of “wholism” vs. “dualism.” To organize the response statements and themes presented here, and to tease out certain aspects of our total being because on the surface it fits nicely in a theme, suggests a dualistic nature to our being; i.e., that humans are the sum of many parts with each part having a separate function that is independent of other parts. In reality, however, humans are a single whole being where every aspect of this being affects, and is affected by, every other aspect in a series of seamless and complex neurophysiological and chemical processes. The only reason for using and presenting these responses and themes is to bring clarity to how TCC discipline has benefited participants –

without comment on how a benefit could: (a) be placed in more than one theme (or aspect of one’s wholeness), or (b) affect other aspects (or be acted upon by other aspects), of one’s being. Although these artificial response categories and themes may provide for better understanding of the health benefits, they only approximate how humans actually experience life.

The primary purpose of this study was to expand upon the perceived benefits from practicing TCC discipline, at least 15 minutes per day over a four week period. As in the initial pilot study, participants’ perceptions as noted in many of the response statements seem to indicate that TCC discipline reduces symptoms of stress while enhancing all dimensions of general-well being. One theoretical perspective emerges to possibly help explain these perceived outcomes.

Because TCC is a moving meditation with rhythmic flow, this practice may be a powerful vehicle of eliciting the relaxation response, a term coined by Herbert Benson in the 1970s. The relaxation response is a lowered metabolic state of reduced mental and physical arousal where the body mind has an opportunity to off set the wear and tear that comes from too much stress. In speaking about this calming affect, Dr. Herbert Benson, cardiologist, researcher, and author, wrote:

“The body responds to techniques that elicit the relaxation response by down shifting your metabolism, by allowing your internal perpetual-energy machine to ease off working so hard. Much less fuel is needed to sustain the body in the hypometabolic state.... Your heart need not beat so quickly, your blood need not be pumped as forcefully. Your breathing can be slower and deeper, and your muscles relaxed and requiring less blood. The ever-vigilant and active organs of your body, which are often forced to spring into maximum speed and production at a hint of trouble, can relish for a few moments a less demanding schedule of outputs and requirements.” (1997, pp. 31-32)

Readers interested in further discussion of the medical effects of the relaxation response are encouraged to read *Timeless Healing* by Benson (1997, pp. 146-147). There, one can find an amazing similarity to the benefits noted by participants in this study.

According to Benson, the relaxation response can be evoked in many ways, including meditation, prayer, autogenic training, progressive muscular relaxation, jogging, swimming, yoga, tai chi ch'uan, qi gong, and knitting and crocheting. The practices of yoga, tai chi ch'uan, and qi gong are found in Benson's writings after his trip to China in the early 1980s. On that trip Benson noted the physiological studies of qi gong practitioners were nearly identical to the investigations he conducted with the relaxation response. Eisenberg (1995) who was with Benson during that trip, mentioned in *Encounters with Qi: Exploring Chinese Medicine*, "the odd thing was that neither group had known of the other's existence. Benson was struck by the uncanny similarities" (p. 200). The key elements to evoking this calming response is to repeat a word, sound, prayer, phrase, or muscular activity, and when extraneous thoughts intrude on one's focus to passively disregard them and return to the repetition.

Benson and Fryer (2005) state that molecular studies have now shown that the relaxation response releases little "puffs" of nitric oxide, which have been linked to the production of neurotransmitters like endorphins and dopamine. These neurotransmitters are known to enhance general feelings of well-being. They further note that "as the brain quiets down, another phenomenon that we call 'calm commotion' — or a focused increase in activity takes place in the areas of the brain associated with attention, space-time concepts, and decision making" (p. 4). Because TCC is likely to elicit the Relaxation Response, these little puffs of nitric oxide may be responsible for many of the perceived benefits by participants.

Finally, Benson (1997) further noted that there are cumulative effects of the relaxation response, just as Stone (2004) makes the same claim about

the cumulative effects of TCC. Stone (2004) noted that TCC movements do elicit relaxation, lessen stress, and induce a feeling of serenity (p. 6). The Detert et al. (2006) original pilot study with teachers supports Stone's idea.

Although we acknowledge the similarities in benefits between TCC discipline and the relaxation response, and that TCC discipline may be a powerful means of eliciting the relaxation response, we believe there is much more to the TCC discipline. This belief is based upon the personal energy experiences that are the direct result of TCC practice that were never experienced with other techniques of eliciting the relaxation response.

Progressive relaxation, standard autogenic training, meditation, imagery, walking and jogging have been taught to thousands of participants for over 25 years. In all of this time, and with many relaxation studies, no one has expressed the startling benefits or of feeling the increased energy flow that comes from the practice of TCC movements. These profound effects seem to reach well beyond the more traditional techniques associated with the relaxation response. The challenge for now is that current scientific instrumentation is ineffective in measuring the intrinsic energy called chi. This leaves researchers to study only correlate affects like blood pressure, heart rate, oxygen rate, metabolism, muscle tension, psychological well being, etc., of energy-based practices like TCC.

Implications

There are important implications from this study. The first is that we suggest a research agenda that examines physical and psychological correlates that can be assessed with a variety of psychological and physical instrumentation. The research design might include three groups; one group to learn and practice TCC movements, one group to learn and practice relaxation techniques, and one control group. All three groups would receive (a) pre- post assessments, and (b) some basic attention and instruction where participants would journal for at least one month relative to their assigned intervention. Randomly assigning

participants to a treatment group would further strengthen the design. Research designs of this nature will go a long way to help tease out real verses spurious effects from the interventions.

Second, there appear to be immense possibilities for using TCC as a behavioral intervention for stress reduction and general well being of school personnel. The results expressed from participants in this study clearly indicate the potential for this intervention in health and healing. Further study to explore the impact of this health enhancing behavior on absenteeism, collegiality, insurance costs to districts, greater

energy levels, and improved interaction with pk-12 learners is warranted.

In the conclusion, it seems clear that practicing the TCC discipline has valuable benefits to education professionals' health and well-being. How far reaching those benefits are is unknown at this time and indicates that further research in this area is warranted. To learn more about TCC, contact their website at www.taichichih.org. There one can find a certified TCC teacher who can provide in-services to education personnel or who is offering private classes in the community.

References

- Benson, H. (1997). *Timeless healing: The power and biology of belief*. NY: Fireside.
- Benson, H., & Fryer, B. (2005). Are you working too hard? *Harvard Business Review*. Retrieved November 8, 2005, from <http://harvardbusinessonline.hbsp.harvard.edu/hbrsa/en/issue/0511/article/R0511Bprint>
- Braza, J. (1997). *Moment by moment: The art and practice of mindfulness*. Boston: Tuttle Publishing Co.
- Detert, R. A., Derosia, C., Caravella, T., & Duquette, R. (2006). Reducing stress and enhancing the general well-being of teachers using T'ai Chi Chih movements: A pilot study. *Californian Journal of Health Promotion*, 4 (1), 162-173.
- Eisenberg, D. (1995). *Encounters with qi: Exploring Chinese medicine*. NY: W. Norton.
- Stone, J. (1996). *Teaching tips for t'ai chi chih teachers*. Albuquerque, NM: T'ai Chi Chih Association.
- Stone, J. (2004). The medical establishment begins to take notice of the Chi. *The Vital Force: Journal of the T'ai Chi Chih Community*, 21(1), 6-7.

Acknowledgements

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