Healing, Intention and Energy Medicine

Science, Research Methods and Clinical Implications

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EDINBURGH LONDON NEW YORK OXFORD PHILADELPHIA ST LOUIS SYDNEY TORONTO 2003

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Qigong clinical studies

Michael Mayer

Drs Yan, Kiang and Lu summarized the laboratory research on qigong in Chapter 9. In this chapter Dr Mayer summarizes the clinical research on qigong with a focus on the studies of hypertension.

There are two primary forms of qigong – internal and external. Internal qigong involves using the mind, breath and physical exercises to circulate qi within the body. It is similar in execution to meditative and exercise techniques known to be healthful in the West. External qigong involves projection of qi outside the body to influence another. While the laboratory studies evaluated in the last chapter involve external qi, clinical qigong often involves cultivation of internal qi through daily practice. Internal qigong is not conceptually difficult, but external qigong is conceptually very difficult for most conventional scientists.

The clinical research conducted on therapeutic effects of qigong is extensive. The vast majority of this research is done in China and reported in Chinese journals not accessible to the West. Michael Mayer selected a sample of qigong research on hypertension in order to assess the quantity and quality of research on this condition. While over 70 studies on the effects of qigong on hypertension were found, only 33 could be evaluated for quality. Of these, none was considered of adequate quality to say definitively that qigong improves hypertension. While it is likely that the combination of meditation and exercise involved in qigong can be beneficial for

those with high blood pressure, this effect has not yet been adequately demonstrated. WBJ

INTRODUCTION

We are in the midst of a revolution in health care where age-old healing methods from other cultures are now being integrated into the Western health care system (Eisenberg et al 1998, Ornish 1990, Zinn 1990). Among the treatment methods being researched is qigong, a practice that has existed for several thousand years and that invokes awareness, intention, breath, posture, movement, touch, and sound to cultivate *qi*, understood as the vital energy of life.

This chapter first briefly reviews selected research on hypertension and the practice of qigong to evaluate its potential efficacy as a treatment for hypertension. Second, methodological issues are discussed to guide future researchers in the field.

Hypertension affects 20% or more of the adult population in Western societies and is a significant risk factor for stroke, myocardial infarction, and congestive heart failure. Together, these account for more than 50% of deaths in the United States (Wollam et al 1988). It is estimated that about 50 million Americans have elevated blood pressure (BP) which is defined as systolic BP of 140 mmHg or greater, or diastolic BP of 90 mmHg or greater (Joint National Committee on Detection, Evaluation and Treatment of High BP (JNC-V) 1993).

The disadvantages of conventional treatments that use medication include high costs and negative side-effects in mood state, cognitive functioning, and sexual performance (Polare et al 1989, Medical Research Council Working Party 1985, Kostis et al 1990). Therefore, a growing body of research in the West has focused upon lifestyle modification as an alternative to hypotensive drugs. According to the Joint National Committee report (JNC-V 1993), lifestyle modification can provide multiple benefits at little cost and minimal risk and may be used as a first step therapy for hypertension or as a means of reducing the number and doses of hypotensive medications required (Little et al 1991).

REVIEW OF LITERATURE ON QIGONG AND HYPERTENSION

To survey the field, the Qigong Institute of San Francisco's computer database was searched (Sancier 1997). Seventy-three studies on hypertension were reviewed. These came mostly from conference proceedings. It should be emphasized that even though this is one of the best sources of data available in the West, making judgements about the efficacy of qigong from this source may create a bias against qigong. Since these conference reports are often in the form of abstracts, the limited information may be incomplete, so that one cannot determine whether the original studies addressed significant research methodology issues.

Other reviewed sources include various journal articles (Shih et al 1998, Kuang et al 1991, Wang et al 1995, Sukuki et al 1993), books (Cai 1986, Chia 1990, Chuen 1991, McGee & Chow 1994, Cohen 1997, Johnson 2000, Sha 2000), write-ups from qigong institutes (Xu & Wang 1993), journals (Kuang et al 1991, Wang et al 1995) and reports from peer-reviewed scientific journals (Sancier 1996a, 1996b; Yasutami 1999). Of the 73 studies, 33 representative studies were selected for review. The selection process was based upon first choosing the best designed studies, i.e. studies which were randomly assigned, or appeared in journals preferably which were peer reviewed. Since the purpose of our review was to illustrate and discuss methodological problems in the literature in the field, other representative studies were chosen to meet this heuristic goal. Presenting the studies in a table was considered, along the lines of a meta-analytic design, but rejected on the grounds that it would tend to concretize and reify potentially unreliable data.

In total, approximately 3409 subjects were represented by our original research of 33 studies (Mayer 1999). In this follow-up report, Wen (1998) adds a reported 2114 subjects, Yasutami et al (1999) add four, and Zdravkovic and colleagues (1998) 18 subjects. Thus, a grand total of approximately 5545 subjects are represented.

Blood Pressure

Almost all of the studies suggest that qigong lowers BP to various degrees over various time

periods (Bornoroni et al 1993; Huang 1990; Jing 1988; Kuang et al 1989, 1991; Li et al 1988; Pan & Zhang 1990; Qu 1990; Shih et al 1998; Tainjin Research Institute 1988; Wang et al 1994, 1995; Wu & Liu 1993; Xu & Wang 1994; Young et al 1998; Yuan et al 1996). The most in-depth of these studies is the Kuang study (Kuang et al 1991, updated by Wang et al 1994), which took place over 20 years. The basic design involved 204 patients with hypertension, randomly assigned to qigong practice and control groups. Age of subjects was not mentioned. Both groups were given antihypertensive drugs. The qigong group of 104 patients reportedly practiced 30 minutes twice per day, over 20 years.

During the first 2 months, the BP of all patients dropped in response to the hypotensive drug. Subsequently, and consistently over the period of 20 years, the BP of the group practicing qigong stabilized while that of the control group increased ($P < 0.01$). Due to the stabilized BP, 48% of those in the qigong practice group reduced the hypotensive dosage, and for 30% in this group, the BP medication was eliminated. In contrast, 31% in the control group increased the hypotensive dosage (Kuang et al 1991).

Other studies report that patients suffering from various degrees of hypertension can withdraw from their medication, and that BP reduced over various time periods: after one session (Li et al 1988, Tianjin Research Institute 1988), 14 days (Wu & Liu 1993), 2 months (Jing 1988, Tainjin Research Institute 1988, Shih et al 1998, Yuan et al 1996), and 1 year (Huang 1990). In a group of 18 borderline hypertensive males with a group mean value of 142/92 mmHg who practiced Chow qigong bi-weekly there was no significant change of blood pressure over the course of each session or after 2 months of training. However, after 2 months of training there was a slight reduction (139/90) of BP in 70% of the subjects. This slight reduction was noted in 78% of the 18 subjects (Zdravkovic et al 1998). Jing (1988) reports that for patients with a long history of hypertension and no satisfactory results with medication, BP stabilized within 2 months and was maintained in a follow-up study 3 years after starting to practice qigong.

Other Blood Measures

In studies that were not specifically described as randomly assigned control group studies, significant differences were reported between qigong and control groups on eight blood flow measures (Chu et al 1988), in 10 indices of microcirculation ($P < 0.05$–0.01) (Wang C et al 1995). At three major laboratories in China, Wang and colleagues (Wang B et al 1990), using a photoelectric earlobe sphygmograph that measures blood volume, reported a 30% increase in the group practicing qigong versus ordinary state ($P < 0.01$). Chai & Wang (1990) used a laser microcirculation blood flow meter to measure blood flow, and found an increase in experimental versus control group ($P < 0.001$). Qu et al (1998) found blood flow resistance and vascular tension reduced in the group practicing qigong versus the control group ($P < 0.001$) even after an hour and a half of rest.

In randomly assigned controlled group studies, Kuang reports, in his 20 year study, fewer cardiovascular lesions ($P < 0.05$), decreased blood viscosity, improved platelet aggregation, decreased triglycerides, and increased high density lipoprotein cholesterol (HDL-C, good cholesterol) in the groups practicing qigong. Beneficial changes were reported in total peripheral vascular resistance, plasma cholesterol, and in two messenger cyclic nucleotides (cAMP and cGMP) in the qigong compared to the control group (Kuang et al 1991). Xian (1990) reports that after 6 months of practice, the blood of the group practicing qigong, compared to the control group, showed less tendency to form abnormal blood clots and contained significantly higher levels of high density lipoprotein cholesterol (HDL-C).

Wen (1998), in a conference proceeding, reported that during a 4 year research project, the Shanghai Institute of Hypertension repeatedly tested 2114 cases. Qigong increased the volume of blood flow in the limbs and the cardiac index of the heart. The capacity of blood vessels in the fingertips was raised 20%, and improved blood circulation was measured in the brain.

Other Cardiovascular Outcome Measures

A wide variety of other cardiovascular measures are reportedly improved by practicing qigong. Less congestive heart failure and acute myocardial infarction was reported ($P < 0.001$) by Xing & Li (1991), but the existence of control groups was not mentioned. A shorter comparative study (Kuang et al 1991, p. 157) was done on a randomly divided subgrouping of 98 cases of hypertension accompanied by coronary heart disease. There was a comparable control group based upon age, gender, and course of disease. Significant improvement was reported in the group practicing qigong compared to the control group in retinopathy ($P < 0.05$) and fewer cardiovascular lesions were found ($P < 0.05$).

In the latest update of the research of Kuang by Wang et al (1995), significant differences were reported in subjects who reportedly practiced qigong for 30 years, with sessions of 30 minutes twice a day. The accumulated mortality rate was 25.41% in the qigong group and 40.8% in the control group. The incidence of strokes was also significantly different in the qigong practice groups as compared to the control group, with 20.5% and 40.7%, respectively. The death rate due to strokes was 15.6% and 32.5% respectively ($P < 0.01$) (Wang 1993, cited in Sancier 1996a).

Wang et al (1995, in Sancier 1996a, p. 41) reported that after 1 year, many significant changes took place in a subset of 80 elderly hypertensive patients with Heart Energy Deficiency (a Chinese medical diagnosis), which often presents as a weakened function of the left ventricle and a disturbance of microcirculation. Researchers evaluated the results of qigong exercises on patients through measurements done by ultrasonic cardiography and indices of microcirculation. Subjects were divided into three groups: hypertensive patients with Heart Energy Deficiency, without Heart Energy Deficiency, and with normal BP. Left ventricular function (LVF) improved in the group practicing qigong compared to the normal BP group ($P < 0.05$–0.01), and other cardiac measures increased including 10 indices of abnormal clinical blood conditions, for example blood flow and petechiae (fragile capillaries creating red dots on the skin) ($P < 0.05$). This study exemplifies problems related to regression to the mean, discussed in a later section.

Other Symptoms Reduced

Reports suggest qigong practice affects other chronic diseases and physical complaints associated with hypertensive states. Aching, distention, dizziness, and insomnia were reduced in a hypertensive group practicing qigong compared to a control group (Jing 1988). In a group of chronic renal failure patients, swelling disappeared, and fatigue was reduced (Suzuki et al 1993), attributed to qigong exercises. In the Kuang et al (1991) study, a subgrouping of 16 male patients with hypertension associated with diabetes reportedly had, after 6 months of practice, significant reduction ($P < 0.01$) in symptoms of polydipsia (excessive thirst), polyphagia (overeating), polyuria (excessive urination), fatigue, weakness, blurred vision, and hyperesthesia (skin sensitivity); and when 40 patients from the qigong group were examined by ultrasound, they were found to have better left ventricular function (Wang et al 1995; Cohen 1997, p. 58).

RESEARCH CRITIQUE: METHODOLOGICAL ISSUES AND PROBLEMS

Inadequate design makes the scientific validity of these studies difficult to determine. However, faulty methodology does not mean that the phenomenon under study is not worthy of further research. The methodological inadequacies of each individual study above will not be analyzed but rather, the focus of the next section is general themes, for illustrative purposes. The Kuang study (Kuang et al 1991) has been selected as an example since it is one of the longest qigong studies and the methodology has been clearly described.

Source of Studies

The bulk of the studies reviewed have been collected from the San Francisco Computerized

Database and, for the most part, come from proceedings from various qigong conferences. Some relevant data is missing, particularly from secondary reports. Many of the journal articles, reports from various qigong institutes, and books reviewed are difficult to assess methodologically, since these reports generally have not appeared in peer reviewed journals that adhere to accepted scientific standards of reporting.

Random Assignment

Of the many studies surveyed, only five authors (Huang 1990, Kuang et al 1991, Li et al 1990, Wang et al 1994, Yuan et al 1996) explicitly state in the source material that they used randomly assigned control groups. These studies contain a total of 778 subjects. All of these studies to one degree or another report positive effects of qigong on hypertension in the area of blood pressure, various other blood measurements, other cardiovascular measurements and other health related measures. Without such random assignment, outcome measures are open to other interpretations, including habituation, seasonal effects, placebo response and changes in instrumentation.

Even in the randomly assigned control group studies, there can be other potential explanations for the reported results, for example not including all subjects who were assigned in follow-up measures, isolating causes of reported treatment effects, patient's biases that arise because of expectancy of treatment effect, and lack of blinded outcome assessment.

Selection Biases

Even in studies where there was a randomly assigned control group, methodology of the selection process may be problematic. In the Kuang study, for example, although it is reported that patients with hypertension were randomly divided into qigong and control groups, specific relevant factors of the recruitment process were not mentioned. For example, we do not know how many people refused to participate, nor do we know when or how the random assignment was made. This makes it difficult to determine whether the two groups were similar at baseline.

These questions may affect the ability to generalize to the larger population and the external validity of the study. This problem may reflect a population selection bias. If some people selected for the qigong group refused to enter into the 30-minute twice a day practice, and were eliminated from the study, this could be because they were too sick, busy, or tense. This could bias the results by eliminating the most unhealthy people from the treated group, and falsely increase the qigong practice group's health outcomes. Likewise, if some of the subjects initially selected for the control group wanted to practice qigong and were eliminated, this could eliminate the healthier controls.

Treatment Effects

What are the results of the various studies actually measuring? In virtually all of the studies reviewed, including the Kuang et al (1991) study, we do not know whether the improved health of the qigong practice group was a function of qigong exercises, or some epiphenomenon associated with qigong practice, such as general physical exercise. In most of the studies (e.g. Huang 1990, Kuang 1991) there is not sufficient information to determine whether measurements took place shortly after qigong practice, and therefore whether improvements in BP or other blood flow measurements were lasting effects of qigong or a temporary result of movement and exercise.

Physical exercise is a possible source of explanation in the Wang B et al (1990) sphygmograph blood volume study, which showed a 30% increase in qigong *versus* ordinary state ($P < 0.01$), and Chai & Wang's (1990) finding of a significant increase in blood flow in experimental versus control group ($P < 0.001$). Other studies state that BP reductions and other blood flow measures were maintained between 2 months and 3 years (Jing 1988), and 1 to 3 years (Li & Zhang 1988) of practice. However, reports do not specifically

mention how long after qigong practice measures were taken. In the Shih et al (1998) study it is stated that BP measures were taken after the study; but it was not stated how long after or whether qigong was practiced before measures were taken. A study that did take this variable into account was that conducted by Qu et al (1998), who found that blood flow resistance and vascular tension were reduced in qigong versus control ($P < 0.001$) groups, even after an hour and a half of rest.

In future research, it would be useful to add a control group who exercise but do not practice qigong. If this exercise group has fewer beneficial health results, a useful step would be made in ruling out exercise as a confounding variable. Also, it should be more clearly stated how long after qigong practice measures are taken to determine how long lasting the results are.

Two studies are of interest in this regard. First, the Journal of the American Medical Association recently reported on a study that Taiji, the most popular form of qigong, helped to reduce falls among the elderly more than seven other different forms of physical exercise measured at eight different medical facilities (Province et al 1995). Second, Johns Hopkins University researchers exploring whether exercise lowers BP needed a control group that did not exercise. They picked Taiji because they thought it was so slow that it would not affect BP (Young et al 1998, unpublished). To their surprise, by the end of the 12 week study, BP of both groups dropped nearly the same amount. This latter study is important in factoring out certain expectancy biases inherent in studies done by Taiji advocates.

Finally, in terms of other alternative explanations for results, even in controlled studies the validity of qigong could be better determined by giving both groups a questionnaire addressing diet, exercise regimens, possible differences in setting between the qigong and the control group, occupation, adherence to treatment (taking medication and practicing qigong), personality measurements, or other significant variables. The authors in the Kuang study did not report measuring differences with regard to such possible confounding variables between the two groups at the beginning, middle, or end of treatment. Since there was reportedly a random division into experimental and control groups at the beginning of the study, this might mean that such variables were controlled; however, a questionnaire could help determine the extent to which differences in health were related to qigong.

Placebo Response: Expectancy Biases and Double Blind Issues

In behavioral research with humans, unlike in animal or drug research, it is difficult to have a double blind study since the subjects usually know the group to which they belong and the therapist knows which group is receiving treatment. With qigong research, qigong practitioners are aware that they are practicing a specific healing technique, and the qigong teacher/therapist knows that the qigong students are being treated. Thus, results of many of the studies cited could be based on placebo response rather than upon qigong *per se*.

A placebo response is a type of expectancy bias based upon the belief of the patient, the belief of the therapist, and the interaction between the two. A well designed study attempts to tease out how much expectancy biases and the treatment effects cause reported differences between the treatment and control groups. For example, if the qigong students had a teacher who showed them positive regard, or if students had a sense of mission and purpose to prove the efficacy of qigong as compared to a control group, these factors rather than qigong itself could have caused the reported differences. The Kuang study and others in the review of the literature (e.g. Chai & Wang 1990, Huang 1990, Jing 1988, Qu et al 1998) did not address this in the discussion section, nor did they attempt to control for these potential sources of bias.

Blinded Outcome Assessment

It was not reported in the Kuang study, nor in other studies reviewed, whether the data collectors were blinded to group assignment. This source of potential bias could be a source of

conscious or unconscious skewing of measurements. In subsequent research, it should be reported whether the data collectors were blinded to group assignment.

The one study in our review which did address this issue was a Master's degree thesis from Columbia University's Program in Physical Therapy (Shih et al 1998). To the credit of this study, the investigators taking measurements were blind to group affiliation, and baseline measurements were taken on each subject before treatment establishing a greater chance of validity of BP measurements. This study involved subjects who practiced qigong twice a week during an 8 week period. Subjects reportedly showed significant decreases in systolic and diastolic BP, mean arterial pressure, and respiratory rate. In this study a quality-of-life questionnaire and a subjective self-report questionnaire indicated improvements in many areas such as relief of chronic back pain, migraine headaches, and insomnia, better ability to cope with life stresses, decreased anxiety, and increased peace and contentment. However, since the control group was taken from drop-outs of the study, the positive results could be explained by differences between groups in such variables as personality characteristics or health rather than qigong. Also, it cannot be determined whether the treatment group's positive results are due to other variables such as exercise in general, group support, or general expectancy biases.

Adherence and the Dose–Response Effect

The dose–response effect – i.e. that a greater dose of the experimental variable increases positive outcome – is important to consider in therapeutic studies. If we knew that people who practiced qigong for longer periods of time, or were more skilled, had increased health, this could increase our confidence in the effects of qigong.

In the Kuang et al (1991) study, how many in the qigong group actually practiced 30 minutes per day twice a day? The original research by Kuang did not specifically report how long the qigong practitioners practiced per day; however, Wang et al (1993; reported in Sancier 1996a, p. 41) report that the qigong group practiced 30 minutes twice a day. Still, from this report we cannot be certain specifically how many subjects practiced this long. Among the people who died in the qigong group, did they practice more or less, or were they more or less skilled than those who lived longer? Were members of the qigong group eliminated from the analysis if they did not practice? How was adherence to the practice regimen assured? Since qigong in China is practiced by many millions of people, and is as common as aerobics in our culture, how did the researcher ensure that the control group did not practice any qigong over a 20 year period?

An important part of an analysis of a clinical trial is called the intention to treat principle, which means that to maximize validity, every patient assigned to a group must be analyzed, including those who dropped out at the beginning or during the course of the study. To the authors' credit, and adding to the study's validity, they did address the issue of drop-outs during treatment. It was reported that 204 of the 218 cases (93.58%) were included in the study over the 20 year time line, and were continuously monitored and analyzed. The inclusion of this impressive percentage in the analysis lessens the potential of this selection bias.

Most of the studies reviewed do not mention how many subjects actually adhered to the practice regimen, and therefore it cannot be determined whether there was a dose–response effect. If we knew this then it would be more likely that the qigong practice contributed to the treatment effects, rather than expectancy effects from being involved in a qigong group.

Chai & Wang (1990) did report a direct relationship between blood flow and the subjects' length and level of qigong training ($P < 0.001$), which is a dose sensitive relationship, but these researchers did not randomly assign a control group. Likewise Shih et al (1998) report a dose–response effect, but due to the problems with the selection of control group from drop-outs described earlier, alternative explanations could be posited for reported treatment effects.

Problems with Reliability of Blood Pressure Measurements

There are general difficulties in establishing reliable BP measurements in terms of establishing a stable baseline for any researcher. A subject's BP may fluctuate for a variety of reasons at different times, making analysis difficult. Many studies in our review do not adequately address this problem, though some studies have given attention to establishing stable baseline BP measures, and monitoring BP continuously over the course of the study, for example Shih et al (1998). However, even in this study, it was not reported whether such measures were taken at times other than directly after the qigong meditation period. Such measures would help to determine whether meditative exercise itself is a confounding variable (i.e. whether qigong versus control groups temporarily reduces BP after exercise) or if qigong produces longer lasting effects.

Regression to the Mean

Studies which select subjects by extremely high or low levels of any variable have the methodological problem of follow-up measures having a general tendency to move toward the center. In the earlier cited Wang study (Wang et al 1995; Wang et al 1993, in Sancier 1996a, p. 41), 80 elderly hypertensive patients were divided into three groups: hypertensive patients with Heart Energy Deficiency (HED), without Heart Energy Deficiency, and with normal BP, and were given treatment targeted to decrease Heart Energy Deficiency. Left ventricular function (LVF), other cardiac measures, and 10 indices of abnormal clinical blood conditions improved ($P < 0.05$) in the qigong group versus both control groups. However, the non-random division into groups of greater and lesser heart deficiency at the outset allows for regression to the mean to explain the positive results.

Regression to the mean could be a confounding variable in Xu & Wang's (1993) use of a pre- and post-test design in reports regarding patients with degeneration of the heart, brain and kidney functions, and senility, and their improvements in these functions.

Publication Bias

Any field of research is subject to publication biases. Studies that support a given treatment are published, while those that do not lend support tend not to be published. Studies coming from China are suspect in the West for being influenced by political and cultural factors which could bias scientific methods and data. Thus there is a need for replication of the work in the West.

All the sources reviewed on hypertensive patients (except Zhang & Hou 1993) report that the practice of qigong positively affects BP, other blood flow measures, cardiovascular outcome measures, and other aspects of health to varying degrees.

Zhang & Hou (1993), in a study that addresses qigong practice problems, report that a qigong group that thought they could open their 'third eye,' 'emit qi' and develop natural gifts had worse systolic and diastolic BP and heart rates after treatment. The article warns that patients with hypertension must be careful when practicing qigong to concentrate their minds on the lower abdomen (*'tan tien'*). Regarding the believability of the studies on the reduction of BP, the various studies cited report different rates of reduction over time from one session to 1 year. In the Zdravkovic (1998) study it was reported that there was no significant change of BP in up to 2 months of training. If there was extreme publication bias, the varied reports of time to decrease hypertension and studies reporting limited effects would be absent.

LACK OF CONSISTENCY OF MEASUREMENT

Many Types of Hypertension and Many Styles of Qigong

Further research needs to be conducted on the varied qigong traditions to determine which particular type or sequence of qigong movements may be most beneficial to a given patient at a given time. In any sample of the many qigong traditions (Cohen 1997, Johnson 2000), each may focus upon various combinations or types of

self-healing qigong exercises (SHQE) such as qigong healing internal organs, stretching muscles, dispersing stagnant qi, tapping, breathing, making sounds, using pulsing movements, animal like movements, self-massaging, visualization techniques, and spiritual awareness exercises. Qigong also uses non-movement, called static qigong, such as standing meditation, to activate qi (Cai 1986, Chuen 1991, Diepersloot 1995, Ha & Olsen 1996, Johnson 2000, Mayer 1997c, Wen 1998). As well, external qigong (EQ) is used where the practitioner does not touch the patient, or the practitioner may touch specific points on the patient's body such as acupressure points or vital zones.

We should also be aware that qigong practices are not so easily oriented towards Western notions of prescribing a single pill or movement. Such an approach provides ease of scientific measurement, but does not fit into holistic Chinese medical philosophy which includes disease categories that do not conform to nomothetic categories.

For example, the Western diagnostic category of hypertension in Chinese medicine may be due to a wide variety of energetic imbalances such as 'an imbalance of the Yin and Yang functional aspects of Deficient Kidney Yin and Excess Liver Yang, and/or an overabundance of phlegm and dampness within the body' (Johnson 2000). Two different people with the same Western diagnosis of 'hypertension' are treated differently depending upon specific diagnostic considerations that come from such general categories and from tongue and pulse analysis. Ideographic factors related to the unique patient and the background of the particular qigong healer/Chinese doctor are also part of the decision about what treatment or combination of treatments is chosen. Unique combinations of herbs, acupuncture, and a wide variety of qigong movements are prescribed based upon what is suited to the individual whole person.

OVERVIEW OF QIGONG TREATMENT FOR HYPERTENSION

Each different system of qigong has its own self-healing qigong exercises for disorders of the heart, including hypertension. Sometimes these treatments use the same or similar methods; at other times they use different ones. The recently published 'comprehensive clinical text' on qigong (Johnson 2000) is an English translated source that gives a compendium of the variety of qigong treatments used for different types of hypertension in China today. We will use this text to exemplify the depth and breadth of the tradition of 'medical Qigong therapy.' This text describes a variety of qigong techniques including breathing exercises, self-healing qigong exercises (SHQE), healing sounds, acupressure, self-rubbing techniques, static qigong, visualizations, and external emission qigong (EQ) where the practitioner does not touch the patient. The techniques may be used in particular combinations in clinical practice with different patients.

Johnson states that 'scientific studies confirm that 90% of hypertensive patients practice *Reverse Breathing* chronically.' However, no reference is given for the research behind this claim. Reverse breathing involves contracting the abdomen when inhaling and expanding the abdomen upon exhaling. Various breathing techniques are given to the patient to restore normal abdominal breathing such as Abdominal Breathing where the patient's stomach expands on the in-breath and expands on the out-breath. A wide variety of other breathing techniques are used, for example Deep Exhalation Method, Abdominal Breath Holding Method, and Microcosmic Orbit Breathing.

SHQE exercises may be prescribed. For example, the patient may be instructed to move his or her hands with palms downward along the front and side of the body to purge and guide toxic qi so that it descends down the liver and gall bladder channels, or down the torso to the hips. Specific points such as acupuncture point GB30 may be focused upon. Self-rubbing techniques are prescribed and sometimes combined with vocalization of healing sounds suited to a specific type of hypertension. Other SHQE are used for different situations including static postures where the patient lies, sits or practices standing meditation. The text advises first practicing sitting, and later both sitting and standing

meditations to direct qi downward. Intricate imaginal techniques, including the visualization of colors, may be practiced in conjunction with assuming such postures. For example, the patient may be instructed to imagine and feel warm water pouring down over the head. Beating a bag filled with rice to expel excess anger may be practiced, similar to cathartic methods of Western psychotherapy.

Regarding EQ versus SHQE exercises, Johnson states that EQ techniques are employed if the person is 'sensitive to energy.' For example, the EQ technique called the Extended Fan Palm Technique (EFPT) may be used; the practitioner moves his hands up and down over the center line in the back and front of the body with fingers extended like a fan for 'Cleaning the Conception and Governing Vessels (*Ren Mai and Du Mai*).' While working with a patient the practitioner may also use intentionality techniques such as visualizing two streams joining. In cases with Excess Liver Fire, acupressure points such as Lv 13–14 may be touched to direct the energy to the earth leading the qi down the right gall bladder meridian. When treating hypertensive patients with Kidney Yin or Yang deficiency, the qigong therapist may focus the treatment differently, using EFPT and moving the hands to direct energy to the belly (*Tan Tien*) or the lower back (*Ming Men*). Johnson says that for patients 'not sensitive to energy,' a 'Sword Finger Technique (the thumb holds the ring and small fingers while the middle and pointer fingers are outstretched)' is used touching the patient on the crown of his head (*Bai Hui*), while the practitioner's other hand is on the patient's lower back. Different acupressure points are used; these patients are touched on both sides of the body using points such as Li 11, St 26, Lv 2 and Sp 6. Some EQ techniques and Energy Point Therapy such as the Invisible Needle Technique are reportedly contraindicated for hypertensive patients in acute stages.

In this clinical text (Johnson 2000), scientific studies that lie behind the assumptions of clinical efficacy with the various techniques are not stated, nor is the reliability and validity of the diagnostic categories. The evidence for the specific treatments cited in the text presumably comes from centuries of empirical evidence and on acupuncture and qigong theory and practice, not scientific evidence *per se*. It is difficult to determine how much placebo and other factors discussed in our critique of the research relate to the success of treatment. How 'sensitive' patients are differentiated from 'non-sensitive' ones is not made clear. Further research could investigate if they correlate with 'highly hypnotizable subjects' (Wickramasekera 1998), or examine what other criteria could be used to measure those 'sensitive to energy.'

From a Western viewpoint, once diagnostic criteria are reliably established for sensitive/insensitive, Excess Liver Yang and Kidney Yin and Yang Deficiency, groundwork is laid for research designs using mock treatments on the subjects who are controls, and comparing it to the qigong treatment group to determine efficacy of treatment. However, as will be discussed further below, the attempt to isolate a specific treatment and separate it from ideographic dimensions of a patient, and holistic dimensions of Chinese medicine, is itself problematic. Finding a general prescription is difficult due to unique clinical situations. For example, a subject in a group of Excess Liver Yang who normally might be given a visualization SHQE of imagining a river flowing down the body to lower qi to the feet might have a water phobia, and the treatment might be detrimental or not work. Likewise, as can be seen from the discussion above, a researcher who wanted to investigate EQ might choose a method of EQ that could be detrimental to a patient, or not work, due to the particularities of the patient's situation.

Another example of treatment application of qigong to hypertension is the work of Dr Zhi Gang Sha (Sha 2000). His system of healing combines standing meditation, hand postures, sound and visualizations. The theoretical basis for his method is based upon energy in the body naturally moving from high to low intensity fields, and using the aforementioned elements to facilitate such movement of energy. In a case of excess, the patient puts one hand closer to the area of excess and their other hand further away from another body part to move the excess away

from the area of high intensity. In cases of deficiency, the patient places one hand further away from the deficient area of the body and the other hand closer to another body part to bring the energy from the high intensity, strong area to low intensity, deficient area. For high systolic and high diastolic hypertension the near hand is placed over the crown of the head or facing the forehead; the far away hand is by the lower adbomen. The patient visualizes light flowing from the head to the lower adomen as he or she repeats the sound *yi* (for the head) and *jiu* (for the abdomen). He has other hand postures and sounds for normal systolic and high diastolic blood pressure, and for hypotension. Group ritual, where the whole group chants sounds together, amplifies the placebo effect, and perhaps increases the healing dimensions of the 'energy field' itself. Many anecodotal reports exist of the healing effects of his method. Dr Sha does many large demonstrations in the United States; however, to my knowledge, there have not been any scientific studies documenting the efficacy of his methods along the lines suggested in this chapter.

INTERNAL VERSUS EXTERNAL QIGONG

In terms of scientific studies on external emission techniques of qigong (EQ) and internal qigong, also called self-healing qigong movement exercises (SHQE), of the studies reviewed, two involved external emission (Huang 1993, and Pan & Zhang 1990). Huang's study was not stated as being with hypertensive patients, but with 'male intelligensia.' For the first 3 months of his study, Huang's subjects received emitted qi twice a week in addition to SHQE twice a day. In the next 9 months the trainees practiced by themselves without emitted qi. After 3 months, various heart measurements showed no significant difference. However, after 1 year of practice many heart measures improved including electrocardiogram, carotid artery pulse, systolic and diastolic pressure. Due to design problems, no determination can be made about the efficacy of internal versus external qigong from this study. Positive changes in heart measures in the longer term internal practice qigong group could be due to time itself and its concomitant attributes such as the amount of time of doing exercise in general, group cohesion, expectancy biases, etc.

Pan & Zhang (1990) used a single group of 32 hospitalized hypertensive patients with renal insufficiency and divided them into three groups: simple sitting, emitted chi qi by a qigong master and imitated emission by a mock qigong master. BP decreased significantly in both the qigong and mock qigong group, but the decrease was significantly greater in the real qigong master group ($P < 0.01$); no changes in BP were found in the simple sitting group ($P > 0.05$). Since this article was in abstract form it cannot be determined whether confounding variables were controlled. For example, there was no report regarding whether there was blinded outcome assessment, and we do not know whether the sham qigong master was obvious in being a sham. Because of this single and non-double blinded design, the sham practitioner may have consciously or unconsciously given off nonverbal cues (such as an obviously non-healing movement or facial expression); and the real qigong master may have given off higher levels of empathy that would indicate whether the treatment was real or mock. This confounding variable could be controlled for by asking the participants in a questionnaire afterwards whether they thought the treatment was real or mock, or by covering the eyes of the subjects.

Another study (Yasutami et al 1999) did control for this variable, even though it was not a hypertension study *per se*. Subjects lay on a reclining chair with their eyes covered by an eye-mask and ears plugged by ear-stoppers in a soundproofed room so that they could not be aware of the beginning and end of qigong practice. Sham and external emission qigong were measured in terms of EEG and peripheral blood measurements. The major problem with this study was that there were only four subjects. Conclusions regarding efficacy are therefore difficult to make even though an increase in alpha waves was reported in three out of four subjects in the right occipital region, and there were no changes in sham qigong. There were changes in peripheral

blood in two out of four experimental group subjects, whereas no changes were observed in the sham qigong group. The Yasutami study needs replication with a larger number of subjects.

DISCUSSION

Although many of the studies of qigong practice and hypertension have methodological flaws, controlling for the methodological biases listed above represents high expectations in any behavioral or clinical research. The methodological problems addressed may account for some unknown portion of improved health outcome measures, but we should be circumspect before fully discounting positive effects reported in mortality rates, incidence of strokes and retinopathy (Kuang et al 1991), and other positive outcome measurements in patients who have suffered from long-term hypertension (e.g. Jing 1988, Wu & Liu 1993), or chronic renal failure (Suzuki et al 1993). These represent significant numbers of long-term sufferers of severe hypertension. Even if methodological flaws such as expectancy biases and placebo effects contributed to positive results, the results need to be considered seriously in an area that has such significant health ramifications.

Complementary and alternative medical (CAM) methods often have associated with them a high level of belief and preference that may be part of the 'cure' (Roberts et al 1993). Further examination needs to take place regarding whether potentially effective treatments such as qigong may be unduly discarded if proportions of treatment are attributable to non-specific concomitants of the treatment such as exercise, group bonding, and empathy from the instructor.

Separating one form of treatment from others to experimentally measure it apart from others fits with a Western reductionistic need to isolate variables to measure. This notion is difficult to apply to the ideographic and holistic dimensions of Chinese medicine and qigong treatment.

Recently there has been advocacy in CAM research for a 'systems model' that attempts to identify 'the web of etiological influences' that contribute to a healing, and then with a 'holistic model' the patient's reactions are examined to multiple etiological agents and influences (Jonas & Levin 1999b). An analogy with research in plants elucidates the point that the multiple chemical agents that exist in nature, along with the active ingredient, may serve to have a positive synergistic effect, and naturally balance against side-effects. Pharmaceuticals, on the other hand, isolate the active chemical, take it out of its natural environment, perhaps increasing the strength of the treatment; this, however, may increase risk for adverse side-effects (Dey & Harbourne 1990, Dey et al 1997). Similarly, trying to isolate the active ingredient of qigong and take it away from the whole of Chinese medical treatments used, the varieties of qigong methods used, and such 'confounding variables' as the empathy of the qigong teacher may remove the natural synergistic mix that makes qigong work.

An often cited problem in CAM and behavioral research is that the practitioner's intentionality may be contributing to healing rather than the technique itself. This has led some researchers (Dossey 1997) to suggest experiments on animals or bacteria for better control of such variables. In the area of energy medicine in general, there has been research that points in the direction of intentionality effecting healing (Wirth 1990, Wirth et al 1998); and in the area of qigong there has also been much research (Cohen 1997, Subtle Energies 1990–2000) that points in this direction. Trying to control for the confounding variable of intentionality with diseases of the heart such as hypertension creates a unique problem. The human heart differs from bacteria or an animal heart. A treatment that effects the latter may not heal the former. Occam's razor may cut out the heart of the cure.

From the discussion above we can see why CAM in general is examining the research methodology issues of balancing rigor and relevance (Linde & Jonas 1999). In general, Western hypertension research (COTA 1978; Cohen 1997, p. 345), as well as Chinese qigong studies, suffer from problematic research design. In an overview of hypertension studies, Rosen states, methodological problems such as small sample sizes and lack of experimenter-blind assessment have

limited the generalizability of results from most studies (Rosen et al 1998, Kaufmann et al 1988, TOHP Collaborative Research Group 1992).

Taken as a whole, many studies on hypertension do not address the criteria outlined above for reasons as varied as difficulties inherent in behavioral and CAM research itself, lack of adequate training in research methodology, general issues cited above in BP measurements, lack of funding, and the orientation of the clinician to heal rather than measure.

The treatment effects of qigong on hypertension are worthy of note and are potentially profound in their implications. Qigong fits well into the guidelines stated by a National Institutes of Health panel (NIHTAP 1996) which concluded that integrating behavioral and relaxation therapies with conventional medical treatment is imperative for successfully managing these conditions. The panel did not endorse a single technique, but stated that a variety of techniques worked in 'lowering one's breathing rate, heart rate and BP' as long as they included two features: 'a repetitive focus of a word, sound, prayer, phrase or muscular activity, and neither fighting nor focusing on intruding thoughts.'

Eastern and Integrative Methods

Many Eastern methods of stress reduction have been used successfully with hypertension. Transcendental meditation (TM) has been shown in well designed randomly assigned studies to positively affect the BP of hypertensives (Schneider et al 1995, Alexander et al 1996). Other TM studies demonstrated that significant changes in BP were even measured at times other than during the meditation period (Benson et al 1973). Positive results have been claimed in combining Vipassana meditation and stress reduction techniques at the University of Massachusetts Medical Center (Zinn 1990). When yoga was integrated into an intensive multifaceted lifestyle change program with a low fat, low cholesterol vegetarian diet, daily meditation, moderate aerobic exercise and group support, hypertension and coronary disease were reduced (Ornish 1990, Ornish et al 1990).

Since Eastern methods such as these have been shown to positively affect hypertension, it is 'plausible' (Linde & Jonas 1999) that qigong may do so also.

Like yoga (Ornish et al 1990) and other Eastern relaxation methods which have reported beneficial results in treating hypertension, qigong is a tradition that combines relaxation, breathing, and a mindful relationship to body awareness. Further research could compare yoga, qigong, exercise, and other relaxation and/or meditative traditions. Each different Eastern meditation modality may have its own advantages and disadvantages for different patients. For example, yoga may be the most appropriate exercise for patients who cannot stand, while qigong may be more beneficial for Type A, sedentary office workers who would benefit from movement. For those who would most benefit from mantra yoga, TM may prove appropriate, while those who are overly intellectual and stressed may benefit from the bodily orientation of qigong.

Qigong has the advantage for elderly hypertensives of being low impact, and therefore potentially less dangerous compared to traditional aerobic exercise (Province et al 1995). In general, a variety of factors could be considered in a given patient's choice of exercise at a given time, such as physical limitations, availability, suitability of a given instructor, life circumstances, or basic beliefs.

Finally, whether qigong alone can affect hypertension is not necessarily the most important question to be answered. If the direction that Western research points to is correct, multifaceted programs (JNC-V 1993, Kostis et al 1992, Little et al 1991, Ornish et al 1990, Rosen et al 1998) which integrate diet, aerobic exercise, relaxation techniques, social, hypnotherapeutic, and psychological dimensions may be best in treating hypertension. For example, the Heartsavers Lifestyle Program (Rosen et al 1998) treated middle aged and elderly hypertensives and found the greatest improvements in middle-aged and elderly hypertensives who followed a multifaceted program as compared with a medication and placebo control group. Quality of life also improved based upon the patients' reports of increased energy levels and improved sexual

performance compared with both drug and placebo (Rosen et al 1998, p. 91).

Western psychotherapeutic and hypnotherapeutic methods have been used successfully with hypertensive patients (Benson 1983a, 1983b; Crasilneck & Hall 1985; Yanoviski 1962). The energetic dimension has long been advocated as a significant part of body–mind healing in the West (Reich 1942, Lowen 1958). It may be a useful next step to add qigong methods to this tradition. Further research has been suggested (Mayer 1994, 1996, 1997a, 1997b, 1997c, 1998) with hypertensive patients to explore and validate the integration of psychological methods such as hypnosis (Mayer 2001), self-soothing, visualization, psychodynamic interventions, and cognitive restructuring. Additional research recommendations include focusing on the felt meaning of one's hypertension (Gendlin 1978), qigong techniques such as microcosmic orbit breathing (Wilhelm 1962), and other Daoist qigong breathing methods, touching of acupressure points (Gach 1990), and belly massage from *chi nei tsang* (Chia & Wang 1990).

Qigong could have a positive role to play in multifaceted interventions in the unique way that it integrates relaxation, meditation, and exercise. Doctors (Maisel 1963) and medical hospitals, such as California Pacific Medical Center in San Francisco and Columbia Presbyterian Hospital in New York, are increasingly using qigong for their cardiology patients (Motz 1997).

CONCLUSION AND FURTHER RESEARCH RECOMMENDATIONS

The weight of evidence of 33 studies representing 5545 subjects suggests that practicing qigong has a positive effect on hypertension; however, due to inadequate addressing of methodological issues, it is difficult to determine exactly how effective qigong is, and what other factors may contribute to the positive effects reported in the studies reviewed.

We specifically recommend that future studies control for exercise as a confounding variable, report data on adherence to treatment, measure the dose–response effect to treatment, and use blinded outcome assessment. Questionnaires can be designed to further determine assessment of factors contributing to treatment effects such as lifestyle factors including diet and exercise, personality variables, belief in qigong, adjunctive treatments, and medications used by subjects.

We hope that Western researchers join hands with those in China who are investigating qigong, since all may benefit from further studies to establish whether or not qigong may provide a beneficial adjunct to other treatments.

ACKNOWLEDGMENTS

Much thanks go to Dr Kenneth Sancier, director of the Qigong Institute, for his thoughtful comments about this chapter and for his articles and Qigong Database. Great appreciation goes to Dr Larry Scherwitz, research director of the Institute for Health and Healing at the California Pacific Medical Center, for his feedback and assistance on this chapter. I am grateful for Dr Wayne Jonas's work as a leader in the field of complementary medicine, and his helping to pave the way for my contact with professionals in the field that helped to refine my work on research methodology issues. I would also like to express much gratitude to my qigong teachers who have been recognized as masters of their traditions: Fong Ha, Cai Song Fang, Han Xingyuan, Sam Tam, Ken Cohen, and Kumar Francis.

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REFERENCES

Alexander C A, Schneider R H, Staggers F et al 1996 Trial of stress reduction for hypertension in older African Americans. American Heart Association. Hypertension 28: 228–237

Benson H 1983a The relaxation response and norepinephrine: a new study illuminates mechanisms. Integrative Psychiaty, 1: 15–18

Benson H 1983b The relaxation response: it's subjective and objective historical precedents and physiology. Trends in Neuroscience July: 281–284

Benson H, Rosner B A, Marzetta B R 1973 Decreased systolic BP in hypertensive subjects who practice meditation. Journal of Clinical Investigation 52: 80

Bornoroni C, Genitoni V, Gori G, Gatti G, Dorigo A 1993 Treatment of 30 cases of primary hypertension by qigong techniques. 2nd World Conference for Academic Exchange of Medical Qigong, Beijing, China, p. 126 Ea

Cai S F, translated by Den M, revised by Shen T 1986 Wujishi breathing exercise. Medicine and Health Publishing, Hong Kong, China

Chai Z, Wang B 1990 Influence of qigong state on blood perfusion state of human microcirculation. 3rd National Academic Conference on Qigong Science, Guangzhou, China, p. 116 [reported in Cohen 1997, p. 61]

Chia M 1990, Chi nei tsang. Hunington, New York

Chu C 1988 Changes in blood viscosity and rheocardiogram in 44 cases with cardiovascular diseases after qigong. 1st World Conference for Academic Exchange of Medical Qigogn, Beijing, China, p. 57 E [from San Francisco Qigong Database, Sancier 1997]

Chuen L K 1991 The way of energy. Gaia Books, London, England

Cohen K 1997 The way of qigong. Ballantine Books, New York

Congressional Office of Technology Assessment 1978 Assessing the efficacy and safety of medical technologies. [quoted by Cohen 1997, p. 346]

Crasilneck H, Hall J, 1985 Clinical hypnosis: principles and applications. Grune & Straton, New York, p. 178

Dey P M, Harbourne J B 1990 Methods in plant biochemistry: enzymes of primary metabolism. Academic Press, London

Dey P M, Harbourne J B, Waterman P G 1997 Methods in plant biochemistry: alkaloids and sulphur compounds. Academic Press, London

Diepersloot J 1995 Warriors of stillness. Center for Healing and the Arts, Walnut Creek, CA

Dossey L 1997 The return of prayer. Alternative Therapies in Health and Medicine 3(6)

Eisenberg D M, Davis R B, Ettner S L et al 1998 Trends in alternative medicine use in the United States 1990–1997. Journal of the American Medical Association 289(18): 1549–1640

Francis B K 1993 Opening the energy gates of your body. North Atlantic Books, Berkeley, CA

Gach M 1990 Acupressure potent points. Bantam Books, New York

Gendlin E 1978 Focusing. Bantam Books, New York

Ha F, Olsen E 1996 Yiquan and the nature of energy. Summerhouse Publications, Berkeley, CA

Huang X 1990 Clinical observation of 204 patients with hypertension treated with qigong. Proceedings of 1st International Conference, p. 101E. [record 3590, San Francisco Qigong Database, Sancier 1997]

Huang Z 1993 Effect of qigong on heart function. Paper presented at 2nd World Conference for Academic Exchange of Medical Qigong, Beijing, China. [from San Francisco Qigong Database, Sancier 1997]

Jing G 1988 Observations on the curative effects of qigong self adjustment therapy in hypertension. Proceedings from the 1st World Conference for Academic Exchange of Medical Qigong, Beijing, China, pp. 115–117

Johnson J A 2000 Chinese medical qigong therapy. International Institute of Medical Qigong, Pacific Grove, CA

Joint National Committee on Detection, Evaluation and Treatment of High BP 1993 Fifth report. Archives of Internal Medicine 153: 154–183

Jonas W B, Levin J S (eds) 1999a Essentials of complementary and alternative medicine. Lippincott, Williams and Wilkins, Philadelphia

Jonas W B, Levin J S 1999b Introduction: models of medicine. In: Jonas W B, Levin J S (eds) Essentials of complementary and alternative, medicine. Lippincott, Williams and Wilkins, p. 8

Kaufmann P, Jacob R, Ewart C et al 1988 Hypertension intervention pooling project. Health Psychology 7(Suppl.): 209–224

Kostis J, Rosen R, Holzer B, Randolph C, Taska L, Miller M 1990 CNS side effects of centrally-active anti-hypertensive agents: a prospective placebo-controlled study of sleep, mood state and cognitive and sexual function in hypertensive males. Psychopharmacology 102: 163–170

Kostis J B, Rosen R C, Brondolo E, Taska L, Smith D E, Wilson A C 1992 Superiority of nonpharmacological therapy compared to propranolol and placebo in men with mild hypertension: a randomized prospective trial. American Heart Journal 123: 466–474

Kuang A, Chen J, Lu Y 1989 Changes of sex hormones in female type II diabetics, coronary heart disease, essential hypertension and its relations with kidney deficiency. Chih (China), 9(6): 331–334. 323 ISSN 0254 9034 [from San Francisco Qigong Database, Sancier 1997]

Kuang A, Wang C, Xu D, Qian Y 1991 Research on 'anti aging' effect of qigong. Journal of Traditional Chinese Medicine 11(2): 153–158, 11(3): 224–227

Li Z, Zhang B 1988 Group observation and experimental research on the prevention and treatment of hypertension by qigong, Proceedings of the 1st World Conference for Academic Exchange of Medical Qigong, Beijing, China, pp. 113–114

Li W, Xin Z, Pi D 1990 Effect of qigong on sympathetico-adrenomedullary function in patients with liver yang exuberance hypertension. [from San Francisco Qigong Database, Sancier 1997]

Linde K, Jonas W 1999 Evaluating complementary and alternative medicine: the balance of rigor and relevance. In: Jonas W B, Levin J S (eds) Essentials of Complementary and Alternative Medicine. Lippincott, Williams and Wilkins, Philadelphia

Little P, Girling G, Hasler A, Trafford A 1991 A controlled trial of low sodium, low fat, high fiber diet in treated hypertensive patients: effect on anti-hypertensive drug requirement in clinical practice. Journal of Human Hypertension 5: 175–181

Lowen A 1958 The language of the body. Collier Books, New York

McGee C T, Chow E P 1994 Miracle healing from China. Medipress, Coeur d'Alene, ID

Maisel E 1963 Tai chi for health. Dell, New York, p. 55

Mayer M H 1994 Trials of the heart. Celestial Arts, Berkeley, CA

Mayer M H 1996 Qigong and behavioral medicine: an integrated approach to chronic pain. Qi: The Journal of Eastern Health and Fitness 6(4): 20–31

Mayer M H 1997a Psychotherapy and qigong, partners in healing anxiety: integrative depth psychotherapy. Psychotherapy and Healing Center, Berkeley, CA

Mayer M H 1997b Combining behavioral health care and qigong with one chronic hypertensive adult. Mount Diablo Hospital-Health Medicine Forum [unpublished study; video available from Health Medicine Institute Lafayette, CA]

Mayer M H 1997c Standing meditation: doing nothing and finding contentment in being alight. Bodymind Healing Center, 2029 Durant Avenue, Suite #202, Berkeley, CA, Tel: 510-849-2878 (mm@bodymindhealing.com)

Mayer M H 1998 Bodymind qigong: a manual of methods and healing secrets. Bodymind Healing Center, Berkeley, CA [with accompanying videotape, Bodymind healing qigong. 2000. Bodymind Healing (www.bodymindhealing.com)]

Mayer M H 1999 Qigong and hypertension: a critique of research. Journal of Alternative and Complementary Medicine 5(4): 371–382

Mayer M H 2001 Find your hidden reservoir of healing energy: A guided meditation for chronic disease (Audio type). Bodymind Healing Center, Berkeley CA MM@bodymindhealing.com

Medical Research Council Working Party 1985 MRC trial of treatment of mild hypertension: principal results. British Medical Journal 291: 97–104

Motz J 1997 Work at Columbia Presbyterian Hospital reported by Van Collie S. While they sleep. Pacific Sun, April 23, 1997

National Institute of Health Technology Assessment Panel 1996 Integration of behavioral and relaxation approaches into the treatment of chronic pain and insomnia. Reported in: Journal of the American Medical Association 276(4): 313–318

Ornish D 1990, Dr Dean Ornish's program for reversing heart disease. Random House New York

Ornish D M, Brown S E, Scherwitz L W et al 1990 Can lifestyle changes reverse coronary artheriosclerosis? Lancet 336: 129–133

Pan L B, Zhang Z F 1990 Qigong treatment for hypertension caused by renal insufficiency. 3rd Nat Academic Conference on Qigong Science, Guangzhau, China, p. 90 EB. [from San Francisco Qigong Database, Sancier 1997]

Pollare T, Lithell H, Selinus I, Berne C 1989 Sensitivity to insulin during treatment with atenolol and metoprolol: a randomised double blind study of effects on carbohydrate and lipoprotein metabolism in hypertensive patients. New England Journal of Medicine 321: 868–873

Province M A, Hadley E C, Hornbrook M C et al 1995 The effects of exercise on falls in elderly patients: a preplanned meta-analysis of the FICSIT trials. Journal of the American Medical Association 273(17): 1341–1347

Qu M 1990 Taijiquan – a medical assessment. Martial Arts of China Magazine 1(5): 203–204 [reported in Cohen 1997, p. 59]

Qu Z, Wang C, Xu D, Qian Y 1998 Peripheral resistance variances and qigong therapy in hypertension of the heart-qi deficiency and blood stasis type. 7th International Symposium of Qigong, Shanghai, September 1998

Reich W 1942 Character analysis. Orgone Institute Press, New York

Roberts A H, Kewman D G, Mercier L, Hovell M 1993 The power of nonspecific effects in healing: implications for psychological and biological treatments. Clinical Psychology Review 13: 375–391

Rosen R C, Brondolo E, Kostis J B 1998 Non-pharmacological treatment of essential hypertension. In: Gatchel R J, Blanchard E B (eds) Psychophysiological disorders. American Psychological Association, Washington, pp. 85–86

Rubik B 1995 Energy medicine and the unifying concept of information. Alternative Therapies in Health and Medicine, 1(1): 34–39

Sancier K 1996a Medical applications of qigong. Alternative Therapies 2(1): 40–46

Sancier K 1996b Anti-aging benefits of qigong. Journal of the International Society of Life Information Science 14(1): 12–21

Sancier K 1997 San Francisco Qigong Database, Qigong Institute of San Francisco, Menlo Park, CA [updated May 1999] (qigonginstitute@healthy.net)

Schneider R H, Staggers F, Alexander C N et al 1995 A randomized controlled trial of stress reduction for hypertension in older African Americans. American Heart Association. Hypertension 226: 820–827

Sha Z G 2000 Zhi Neng medicine: revolutionary self-healing methods from China. Zhi Neng Press, Vancouver, BC

Shih T K, Zucker P, Ohrenstein N 1997 The effects of qigong on resting systemic BP and quality of life in hypertensive adults. Qi: the Journal of Traditional Eastern Health and Fitness 8(2): 31–33 [results reported by B Stone in Newsweek, July 28, 1997, p. 72]

Subtle Energies Journal 1990–2000 International Society for the Study of Subtle Energies and Energy Medicine, Goldco, Colorado

Suzuki M et al 1993 Clinical effectiveness of the AST Chiro method on chronic renal failure and hypertension. Japanese Mind Body Science 2(1): 15–22 [0918–2489, from San Francisco Qigong Database, Sancier 1997]

Tianjin Research Institute of Traditional Chinese Medicine 1988 Group observation and experimental research on the prevention and treatment of hypertension by qigong. Paper presented at 1st World Conference for Academic Exchange of Medical Qigong, Beijing, China, p. 113 [cited in Cohen 1997]

Trials of Hypertension Prevention, Collaborative Research Group 1992 The effects of non-pharmacologic interventions on BP of persons with high normal levels. Journal of the American Medical Association 267: 1213–1220

Wang B, Chia Z Shen X, Chai X 1990 The influence of qigong state on the volume of human peripheral vascular blood flow. 3rd National Academic Conference on Qigong Science, Guangzhou, China, November 1990, pp. 11–12 [reported in Cohen 1997, pp. 60–61]

Wang C, Xu D, Qian Y, Kuang A 1990 The beneficial effects of qigong on hypertension and heart disease. Proceedings from the 3rd International Symposium on Qigong, Shanghai Institute of Hypertension, Shanghai, China, p. 40

Wang C, Xu D, Qian Y, Shi W 1993 Effects of qigong on preventing stroke and alleviating the multiple cerobro-cardiovascular risk factors: a follow-up report on 242 hypertensive cases over 30 years. Proceedings from the 2nd World Conference for Academic Exchange of Medical Qigong, Beijing, China, pp. 123–124

Wang C, Xu D, Quian Y, Shi W 1994 Beneficial effects of qigong on the ventricular function and microcirculation of deficiency in heart-energy hypertensive patients. [private communication reported in Sancier 1996b, p. 15]

Wang C, Xu D, Qian Y, Shi W, Bao Y, Kuang A 1995 The beneficial effects of qigong on the ventricular function and micorcirculation of deficiency in heart energy hypertensive patients. Chinese Journal of Internal Medicine 1(1): 21–23

Wen D E 1998 Static qigong, cross-legged sitting posture and blood redistribution. 4th Conference for Academic Exchange of Medical Qigong, pp. 201–202 [from San Francisco Qigong Database, Sancier 1997]

Wickramesekera I 1998 Secrets kept from the mind but not the body or behavior. Advances in Mind-Body Medicine 14: 81–132

Wilhelm R 1962. The secret of the golden flower. Harcourt Brace Janovich, New York

Wirth D 1990 The effect of non-contact therapeutic touch on the healing rate of full thickness dermal wounds. Subtle Energies 1(1): 1–20

Wirth D P, Richardson J T, Martinez R D, Eidelman W S, Lopez M E 1998 Non-contact therapeutic touch intervention and full-thickness cutaneous wounds: a replication. Complementary Therapies in Medicine 4: 237–240

Wollam G, Hall W (eds) 1988 Hypertension management: clinical practice and therapeutic dilemmas. Yearbook Publishers, Chicago

Wu R, Liu Z 1993 Study of qigong on hypertension and reduction of hypotension: Proceedings of 2nd World Conference for Academic Exchange of Medical Qigong, Beijing, China, p. 125 [from San Francisco Qigong Database, record 7970, Sancier 1997; full article provided by author translated into English]

Xian B H 1990 Clinical observation of 204 patients with hypertension treated with Chinese Qigong. Paper presented at 5th International Congress of Qigong, Berkeley, California, p. 101 [reported in Cohen 1997]

Xing Z H, Li W 1997 Effect of qigong on blood pressure and life quality of essential hypertensive patients. [from San Francisco Qigong Database, Sancier 1997]

Xu D, Wang C A 1993 Study of the recuperation function of qigong on hypertension target organ impairment. Shanghai Insitute of Hypertension. 2nd World Conference on Medical Qigong, Beijing, China

Xu D, Wang C 1994 Clinical study of delaying effect on senility of hypertensive patients by practicing Yang Jing Yi Shen Gong. Proceedings from the 5th International Symposium on Qigong, Shangai China, p. 1994:109 [cited in Sancier 1996a pp. 15–16]

Yanovski A 1962 The feasibility of alteration of cardiovascular manifestations in hypnosis. American Journal of Clinical Hypnosis 4: 8–16

Yasutami T, Hisanobu S, Shigenori S 1999 Does suggestion change the effects of qigong? Journal of International Society of Life Information Science 17(2): 284–285

Young D R, Appel L J, Jee S H 1998 The effects of aerobic exercise and tai chi on BP in the elderly. Unpublished study, reported in Natural Health, September 1998, p. 21

Yuan S, Xia B, Wang Z, Shu Y, He W, Tang J 1996 The effect of qigong on BP and vascative substances in patients with chronic nephritic hypertension. 6th International Symposium on Qigong, Shangai, China, pp. 41–42 [from San Francisco Qigong Database, Sancier 1997]

Zdravkovic G, Marciniak Z, Trocyneka, Zdrekivic U, Vukaan V 1998 Sport Medicine and Rehabilitation Clinic Risk Modification Center, St. Michael's Hospital, Toronto, Canada. Reported at 2nd World Congress on Qigong, 1998, San Francisco

Zhang T, Hou S 1993 Patients of hypertension should exercise qigong carefully. Institute of Space Medical Engineering, Rehabilitation Hospital of Qigong. Presented at 2nd World Conference for Academic Exchange of Medical Qigong, Beijing, China, p. 126e

Zinn J K 1990 Full catastrophe living: using the wisdom of your body and mind to face stress, pain and illness. Bantam Doubleday, New York