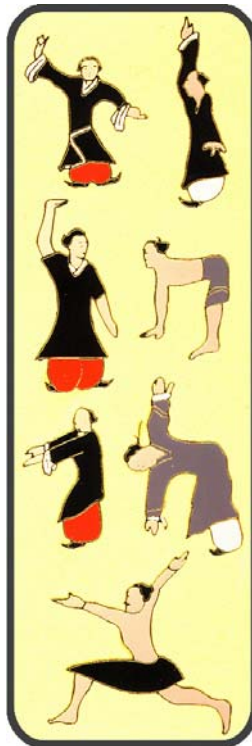


# Qigong in Daily Life

## Motivation and Intention to Mindful Exercise

To my wife Eva and my sons  
Filip and Rickard who  
energize my daily life



Original drawings of daoyin,  
physical exercise chart (168 B.C.)



*Doctoral Dissertation*

## Qigong in Daily Life

Motivation and Intention to Mindful Exercise

John Jouper  
Sport Science

Örebro Studies in Sport Sciences



## ABSTRACT

In many countries physical inactivity and a sedentary lifestyle are identified as major public health problems. A general health goal is therefore to promote an active lifestyle throughout the entire life span. The reasons given for not adopting a physically active lifestyle and/or taking part in vigorous exercise include old age, negative social and physical environments, physical disability and other health related issues. Qigong exercise, a low-intensity Chinese self-care method, has therefore been suggested as an alternative activity to vigorous exercise. There is, however, little knowledge about leisure-time qigong exercisers and their reasons for adherence. The general aim of this thesis was therefore to explore leisure-time medical qigong and those practicing it, and to examine how individuals' motivation and intention to exercise are related to their actual exercise in daily life. Behavioural changes towards an active lifestyle will be discussed from both medical qigong and exercise psychology perspectives. Suggestions are then summarized into a qigong-based Wellness Coaching Model. Participants were recruited from a qigong association and introductory qigong courses. Data were collected by questionnaires and were analysed using both descriptive and inferential statistical methods. The reasons given for leisure-time medical qigong exercise were to aid recovery from illness and to preserve health. Participants in the low-intensity qigong exercise group studied were somewhat older, and their main reason for participating was to achieve a general feeling of wellness. As a group they had mainly low-stress levels and were highly energized. Concentration on qi-flow during exercise correlates positively with improved health feelings, and exercise is performed with deep mindful concentration three to six times per week for an average of thirty minutes. Perceived stress correlates negatively with health, energy and exercise behaviour suggesting that stress has to be managed in order for wellness to emerge. Intrinsically motivated exercisers are more concentrated, and perceive their stress as lower than that of their more externally motivated counterparts. Strong behaviour intentions are significantly correlated with actual exercise frequency. When exercise is performed in a qigong state, with a heightened level of concentration, adherence is higher than otherwise is the case. Results suggest that health-professionals aiming to secure qigong exercise adherence should stimulate feelings of wellness as an intrinsic motive for exercise, strengthen the individuals' intention to exercise, and promote a calm energy state (low-stress and high energy) before commencement of exercise.

Key words: Qigong exercise, mindfulness, adherence, motivation, intention, stress



This dissertation is based on the following three publications, which are referred to in the text by their Roman numerals:

- I. Jouper, J., Hassmén, P., & Johansson, M. (2006). Qigong exercise with concentration predicts increased health. *The American Journal of Chinese Medicine*, 34, 949-957.

Re-produced with permission from The American Journal of Chinese Medicine.

- II. Jouper, J. & Hassmén, P. (2008). Intrinsically motivated qigong exercisers are more concentrated and less stressful. *The American Journal of Chinese Medicine*, 36, 1051-1060.

Re-produced with permission from The American Journal of Chinese Medicine.

- III. Jouper, J. & Hassmén, P. (2008). Exercise intention, age and stress predict increased qigong exercise adherence. *Journal of Bodywork and Movement Therapies*, doi:10.1016/j.jbmt.2008.08.002.

Re-produced with permission from Elsevier.

## **List of abbreviations**

HMM	Hierarchical Model of Motivation
M <sub>3</sub>	Mindfulness Meditation Movement
PBQ	Planned Behaviour Questionnaire
SES	Stress Energy Scale
SMS	Sport Motivation Scale
TACT	Target, Action, Context, Time
TEM	Tense Energy Model
TPB	Theory of Planned Behaviour
TTM	Transtheoretical Model
WCM	Wellness Coaching Model

## **List of Figures**

F1	Tense-energy model adopted from Thayer (2001).
F2	Self-Determination Theory adopted from Deci and Ryan (1985a).
F3	Theory of Planned Behavior (Ajzen & Madden, 1986).
F4	How beliefs affect ageing and recovering processes.
F5	Support of self-determination and planned behaviour in preparation stage.
F6	Support of self-determination and planned behaviour in action stage.
F7	Support of self-determination and planned behaviour in maintaining stage.
F8	Wellness Coaching Model by John Jouper.

## **List of Tables**

T1	Qigong exercise and eliciting relaxation response (Benson et al., 1974).
T2	Description of questionnaire variables used in studies, number of questions (q), response scale, and Cronbach's alpha.
T3	Frequencies, means, and standard deviation between brackets among participants sex, age, exercise behaviour, and level of stress, health, and energy.
T4	Means, standard deviations (SD), and correlations between health-now, concentration, session-time, years of practice, courses, and other exercise (n=253), in Study I.

# TABLE OF CONTENTS

<b>INTRODUCTION</b> .....	<b>11</b>
<b>QIGONG</b> .....	12
<i>Philosophy</i> .....	12
<i>Relaxation and expectation mechanisms</i> .....	14
<i>Qigong studies</i> .....	16
<i>Literature summery</i> .....	18
<b>BEHAVIOUR CHANGE</b> .....	19
<i>Transtheoretical Model</i> .....	20
<i>Tense-Energy Model</i> .....	21
<i>Hierarchical Model of Motivation</i> .....	23
<i>Self-Determination Theory</i> .....	23
<i>Theory of Planned Behaviour</i> .....	26
<i>Stress and energy moods</i> .....	27
<i>Behaviour change summary</i> .....	28
<b>AIM</b> .....	<b>29</b>
<b>STUDY I</b> .....	29
<b>STUDY II</b> .....	29
<b>STUDY III</b> .....	30
<b>STUDIES</b> .....	<b>31</b>
<b>PARTICIPANTS</b> .....	31
<b>DATA COLLECTION</b> .....	31
<i>Demographic profile</i> .....	32
<i>Previous physical activity behaviour</i> .....	32
<i>Qigong exercise behaviour</i> .....	32
<i>Performed exercise</i> .....	32
<i>Outcome experiences related to their practice</i> .....	32
<i>Sport Motivation Scale</i> .....	33
<i>Planned Behaviour Questionnaire</i> .....	33
<i>Stress-Energy Scale</i> .....	33
<b>ETHICAL CONSIDERATIONS</b> .....	36
<b>DATA ANALYSIS</b> .....	36
<b>RESULTS</b> .....	<b>37</b>

<b>DISCUSSION .....</b>	<b>45</b>
<b>GENERAL .....</b>	<b>45</b>
<i>Qigong exercise.....</i>	<i>45</i>
<i>Exercise and health.....</i>	<i>47</i>
<i>Recovery.....</i>	<i>48</i>
<i>To be or to do mindful exercise?.....</i>	<i>51</i>
<i>Qigong adherence .....</i>	<i>52</i>
<b>WELLNESS COACHING MODEL.....</b>	<b>59</b>
<b>FUTURE STUDIES.....</b>	<b>64</b>
<b>CONCLUDING REMARKS .....</b>	<b>65</b>
<b>SWEDISH SUMMARY/SVENSK SAMMANFATTNING .....</b>	<b>67</b>
<b>ACKNOWLEDGMENTS.....</b>	<b>69</b>
<b>REFERENCES .....</b>	<b>71</b>

## INTRODUCTION

Physical inactivity and a sedentary lifestyle are identified as major public health problems in many countries around the world (Biddle & Ekkekakis, 2005; Bouchard, Blair, & Haskell, 2007; WHO, 2002, 2004). A general public health goal is therefore to promote an active lifestyle throughout the life span. Regular physical exercise promotes quality of life and wellness, and supports rehabilitation from illness (Pedersen & Saltin, 2006; Warburton, Nicol, & Bredin, 2006; White, Drechsel, & Johnsson, 2006). Despite this, approximately 25% of all adults in the Western world are sedentary, and another 30-35% do not exercise sufficiently to enjoy health benefits (Kruger, Carlson, & Buchner, 2007; Seefeldt, Malina, & Clark, 2002). Reasons given for not adopting a physically active lifestyle include old age, negative social and physical environments, too vigorous exercise, physical disability and other health related issues (Seefeldt et al., 2002). Fear of falling and inertia are also mentioned (Lees, Clark, Nigg, & Newman, 2005). Low-intensity exercise methods such as mind-body techniques, have been suggested as alternatives to vigorous exercise (Epstein, Roemmich, Paluch, & Raynor, 2005; Kemp, 2004; NCCAM, 2007). Older adults who perform low-intensity exercise has also shown higher cognitive functions compared with those who perform more intensive exercise (Lindvall, Rennemark, & Berggren, 2008). Qigong exercise is a Chinese low-intensity movement and meditative self-care method, and was recently categorised as meditative movement exercise (Larkey, Jahnke, Etnier, & Gonzalez, in press). Mindfulness meditation is a modern term for old exercise traditions such as yoga, qigong, tai chi, mantra meditation (AHRQ, 2007; Blom & Bremberg, 2008; Åberg, Whalberg, Sköld, & Nygren, 2006), and denotes a safe health promoting activity (Arias, Steinberg, Banga, & Trestman, 2006). Qigong is used throughout this dissertation to illustrate the origin of this mindfulness meditation exercise. Qigong exercise may act as an alternative to vigorous exercise when striving to improve health, quality of life and wellness (Cohen, 1997).

There is little knowledge about leisure-time medical qigong exercise and peoples' reasons for performing it. The present dissertation therefore explores Qigong exercise in daily life (Study I), as a self-care performed leisure-time activity, and the Motivation to qigong exercise (Study II) and Intention for qigong exercise (Study III) are investigated. Behavioural changes towards an active lifestyle will be discussed from medical qigong and exercise psychology perspectives, and suggestions are summarized into a qigong-based Wellness Coaching Model.

## *Qigong*

The originality of qigong exercise philosophy and possible health improvement mechanisms are introduced below as an overview. The qigong literature is reviewed in more detail from an exercise frequency and outcome perspective. Reported findings are summarized into limitations and areas of research interest.

### *Philosophy*

Qigong is a modern term for Chinese low-intensity self-care exercise methods and a branch of traditional Chinese medicine. Several different terms have been used to label these forms of exercise for thousands of years, and Dao-yin “leading and guiding energy” seems to be the original term for qigong (Chen, 2007; Cohen, 1997). When King Ma’s (168 B.C.) tomb in Changsha, Hunan province was explored 1973, the earliest drawings of Dao-yin exercise postures were found. The painted figures (44 are illustrated in the dissertation) represented nearly all the major categories of modern qigong. How to bend, move, breathe, stand, and perform Dao-yin exercise are examples. Various qigong styles are named after animals, whose movements were imitated, or by the founder’s name, or by the purpose of the exercise (e.g. heart qigong). As early as 168 B.C. there were prescriptions and instructions how to preserve health and use exercise in the rehabilitation after illness. The term qigong was not used in its present form until the twentieth century (Cohen, 1997).



The central part in traditional Chinese medicine is *qi*, which translates to life-force or life-energy in the Western world. Qi can also be discussed from other angles, as qi in philosophy and cosmology, qi in arts (music, dance, painting, songs), qi in martial arts, and qi in daily life (Zhang & Rose, 2001). Medical text describe how: “qi and blood circulate in meridians (energy channels) and give life to organisms. If qi and blood stagnate illness will occur” (Chen, 2007; Zhang & Rose, 2001). The main purpose of traditional Chinese medical methods is then to gain strength and circulate qi and blood in meridians. Qi and blood, life-energy, can be manipulated physically (acupuncture, acupressure, and massage), chemically (herbs, foods, and liquid) and mentally by mind focusing (qigong exercise).

Gong, in qigong, means the work or skill to cultivate qi and can be performed in different ways. The most common form is dynamic exercise; circulating qi and blood by slow and gentle movements, focusing on relaxing joints and tissues. This is the first step for people when they learn qigong and most studies are made on dynamic qigong exercise (e.g. Fan, 2000). Contemplation or static exercise is done without external movements, with a strong mind focusing on circulating qi and blood in meridians. This strong mind focusing can include sounds, imageries and self-talk, all with the purpose of strengthening and circulating qi and blood (Chen, 2007; Cohen, 1997).

A number of different qigong methods exist in Sweden, although the Biyun method is probably the most common and is therefore in focus in this dissertation. Since 1992 the Biyun method has been introduced as medical qigong to more than 90,000 people in Sweden, which correspond to almost one percent of the Swedish population (Green Dragon, 2008). The purpose of the Biyun method is to “restore the power of life” and “regenerate the life-force and improve health” (Fan, 2000). Characteristics of the Biyun method are simple body movements that are easy to learn and can be practiced as a basic exercise, dynamic exercise and as contemplation and meditation. According to the theory, the best results are achieved in a “qigong state”, when the person is calm, relaxed and concentrated on the movements, or when a feeling of qi (electric force, shiver, warm sensation, swelling or numbness) can be perceived (Fan, 2000; Kerr, 2002).

To avoid negative side effects (deviation syndromes) three exercise levels are recommended: adjusting joints and tendons, circulating qi and blood flow in meridians, and cultivating qi by contemplation. Or as it is expressed in ancient texts: “There are three different levels of qi exercise – Heaven, Earth, and Human. The Human level relaxes the sinews and vitalizes your blood; the Earth level “opens the gates” so that the qi can reach the joints; and the Heaven level exercise the sensory function. Each level has three degrees. The first degree of Human level relaxes the tendons from shoulder to the fingers. The second degree relaxes your tendons from the hip joint to the “bubbling well” (acupuncture point, kidney 1). The third degree relaxes your tendons from the sacrum to the top of head. The Earth level first degree sinks the qi to Dan-Tian. The second degree moves the qi into the bubbling well. The third degree circulates the qi so that it reaches the top of the head. The Heaven level first degree is listening to intrinsic power. The second degree is understanding intrinsic power. The third degree is omnipotence. These are the three levels and nine degrees” (Zhang & Rose, 2001, p 158-159).

As a general recommendation qigong should be performed correctly and learned from a master instructor (cf. Fan, 2000). Individuals with symptoms of psychological dysfunction and individuals who practice qigong to rehabilitate from chronic illness should do this under supervision from a medical doctor. Qigong exercise performed in a correct way is a key function for good healthy results (Chen, 2007; Cohen, 1997). This low-intensity exercise is suggested as preferable for older adults (Kemp, 2004).

### *Relaxation and expectation mechanisms*

According to qigong theory, optimal effects are obtained in a “qigong state”, that is a state of contemplative quietness and harmony where life-energy is cultivated and assisted by a concentrated mind (Chen, 2007; Cohen, 1997; Kerr, 2002).

The qigong state is similar to the situation when a Relaxation Response (Benson, Beary, & Mark, 1974; Benson, Greenwood, & Klemchuck, 1975) is elicited. Elicitation of a relaxation response is suggested to reduce sympathetic nervous system activity and to increase parasympathetic activity, and thereby support the human self-healing capacity (Benson et al., 1974). Clinical application of the relaxation response and mind-body interventions (NCCAM, 2007) has shown good effect in several areas such as: surgical complications, insomnia, diabetes, arthritis, pain, infertility, premenstrual syndrome and mood (Berger, Friedmann, & Eaton, 1998; Brown et al., 1995; Jacobs, 2001; Keefer & Blanchard, 2001; Mandle, Jacobs, Arcari, & Domar, 1996). Regular exercise is needed to maintain the short-term benefits of relaxation response (Berger, Friedmann, & Eaton, 1988). In a speculative review, Esch and colleagues (2003) discuss the therapeutic efficiency of using relaxation response for stress-related diseases. They suggest that mind-body techniques are important strategies for dealing with stress-related diseases, and as a part of healthy life-style modifications may serve as primary prevention. Four basic elements are usually necessary to elicit the relaxation response: (1) a mental device, such as a constant stimulus of a sound, word, or imagery, gazing at an object. (2) Passive attitude, focusing on techniques, not on worrying thoughts. (3) Decreased muscle tonus, staying in relaxing and comfortable postures. (4) Quiet environment, with decreased environmental stimuli (Benson et al., 1974). When performed in line with those elements, qigong exercise has been effective on stress related symptoms (e.g. Lee et al., 2000a; Lee et al., 2004a), Table 1.

Table 1. Relaxation response and qigong exercise (Benson et al., 1974).

<b>Elements</b>	<b>Related to qigong</b>
Mental device	constant stimulus of a sound, word, imagery, self-talk.
Passive attitude	focusing on qi-flow and movements.
Low muscle tonus	stay in relaxing and comfortable postures.
Quiet environment	in qigong state.

Beliefs and expectation effects, have probably been the most powerful healing mechanism in ancient medical systems, and may constitute the most powerful effect in mind-body therapies today (Eisenberg & Kaptchuk, 2002). Beliefs and expectations effects can also be named placebo, which translates to “I shall please” in Latin (Brown, 1998). In modern medicine, placebo is sometime referred to as the “sugar pill effect” and on average provides 35% of the healing effect in conditions such as pain, high blood pressure, seasickness, headache, common colds, angina pectoris, asthma, and duodenal ulcers (Beecher, 1955; Benson et al., 1979; Price, Finiss, & Benedetti, 2008). More recently, expectation effects were discussed and explained in the same way as the mechanism of relaxation response (Benson et al., 1974); that is, they reduce sympathetic nervous system activity and increase parasympathetic activity (Stefano, Fricchione, Slinsby, & Benson, 2001). Beliefs and expectations have an emotional mood component and may as such trigger stress reactions as well as relaxation reactions in the body. Using “beliefs” in a positive way may therefore enhance healing processes. Stefano and colleagues (2001) suggest that human organisms have a silent memory for wellness. When wellness is threatened, a stress response results, and conversely, when relaxation response results wellness is supported. Striving for wellness, beliefs and expectations may then be the proactive recovering process, the body’s own healthy processes, which promotes long healthy lives (Stefano et al., 2001).

From a traditional Chinese medicine qigong perspective, *qi* (life-force) is more of a “physical energy” that flows in meridians and give life to the organism. Qigong exercise strengthens qi, open the meridians, whereby qi circulates smoothly (Cohen, 1997). Qi can be guided by strong mind focusing (Zhang & Rose, 2001) to specific tissues, but if qi flows freely it automatically travels to the most needed tissue or organ, it goes to the “root” of the disturbance (Chen, 2007). This disturbance can be different from Western diagnosed diseases, and could lead to different levels of recovery among people with the same diagnosis.

## *Qigong studies*

The scientific qigong literature is young and limited when compared to that of the exercise and medical sciences. There are relatively few studies available and these are mainly non-randomized trials with small samples. The link between exercise frequency and outcome is rarely described thus making it impossible to draw causal conclusions. This can be explained by the old Chinese tradition of keeping knowledge inside the family and by their long (thousands of years) practical empirical knowledge, and by the fact that Western societies were introduced to qigong as late as towards the end of the 20<sup>th</sup> century (Chen, 2007). The reviewed literature introduces qigong from a public health perspective, and investigates exercise frequency in relation to outcome such as acute effects, health preservation, health recovery, and rehabilitation from chronic illness. This is done with a purpose to illustrate how difficult it is to draw causal conclusions between exercise frequency and outcome (cf. Larkey et al., In press).

The Korean retrospective study explored qigong from a public health perspective (Lee, Hong, Lim, Kim, Woo, & Moon, 2003b) and concluded that qigong can be used as a self-healing method for psychosomatic and physiological health. Participants (n=768) in that study were motivated to exercise by the wish to heal diseases (81.5%) and prevent (18.5%) illness. The most reported symptom improvements were related to physical health (66.9%), psychological health (40.2%), pain level (43.1%), fatigue level (22.1%), and insomnia state (8.7%). Which type of exercise was performed, and when and where participants exercised were not, however, reported.

Additional literature is reviewed from an exercise frequency perspective, and shows mainly clinical effect studies reporting multifaceted health benefits. Acute effects have mostly been measured on healthy experienced qigong practitioners after one single session of 30 to 60 minutes. Findings show psychological effects such as improved mood and reduced anxiety (Johansson, Hassmén, & Jouper, 2008; Lee, Kang, Lim, & Lee, 2004a), hormonal changes as decreased levels of cortisol and adrenaline, increased levels of growth hormone and beta-endorphin (Higuchi et al., 1997; Lee, Kim, & Ryu, 2005; Ryu et al., 1996). Immune activity changes as increased T lymphocyte, response to antigens and a general increased immune activity have also been reported (Higuchi et al., 1997; Lee et al., 2003c; Ryu et al., 1995a; Ryu et al., 1995b) as well as reduced plasma glucose levels without increased heart rate (Iwao, Kajiyama, & Oogaki, 1999). Decreased blood pressure and heart-respiratory rate are also found (Lee et al., 2000). In 2002, Lee et al. reported an acute increased cardiac parasym-

pathetic tone and long-term stabilizing of the autonomic nervous system. All acute effects are more or less connected to changes in the psycho-neuro-immunological systems, changes that support the self-regulating and self-healing process activated in mind-body activities. Repeated acute effects support long-term effects.

Exercising two to three sessions per week for approximately 30 minutes per session may support health preservation. The literature shows that when school children practice for 20 minutes twice a week for six months, improved social behaviour and stable grades are detected (Witt, Becker, Bandelin, Soellner, & Willich, 2005). Other findings were reduced blood pressure, increased respiratory function, enhanced self-efficacy and changed lipid metabolism to benefit health (Lee, Lee, Choi, & Chung, 2003a; Lee, Lee, & Kim, 2004b; Lee, Lim, & Lee 2004c). Reduced pain, reduced feelings of anxiety and depression, reduced stress and improved aerobic capacity have been reported (Lan, Chou, Chen, Lai, & Wong, 2004; Linder & Svärdsudd, 2006; Tsang, Fung, Chan, Lee, & Chan, 2006; Wu et al., 1999). Individuals who have developed minor symptoms of high blood pressure, stress and anxiety may perform qigong two to three times a week to reduce their symptoms.

Daily practice, five to seven sessions per week, for 30 to 60 minutes over two to six months seems to have a beneficial recovery effect and a generally improved feeling of health has been reported (Tsang, Mok, Yeung, & Chan, 2003). Also a global lowering of negative mood states, decreased feelings of depression and fatigue (Gaik, 2003; Jiang, 1991; Mills, Allen, & Morgan, 2000), decreased level of cortisol hormone and an improved immune function have also been reported (Jones, 2001; Manzanque et al., 2004). Improvements in ventilatory efficiency and recovery effects on heart rate after vigorous physical exercise have been found (Jiang, 1991; Lim, Boone, Flarity, & Thompson, 1993). Qigong intervention in combination with acupuncture has resulted in reduced symptoms of migraine and headaches (Liao & Liao, 1997), and in combination with external qigong reduced symptoms of fibromyalgia (Haak & Scott, 2008). After a short period of two to six months, of daily practice, it is possible to improve feelings of health and reduce illness symptoms.

In the literature, there is a notably higher number of sessions and session time reported when qigong exercise is performed for rehabilitative reasons such as from chronic illnesses. Daily practice, in sessions of one to four hours over one to three months is reported more as single case studies than clinical experiments and demonstrates recovery from multiple chronic symptoms such as high blood pressure, reduced symptoms on asthma and allergy, and reduced oedema (Chen & Turner, 2004). Qigong in combination with chemo- and drug therapy enhances recovery, reduces anxiety and has detoxification effects (Li, Chen, & Mo, 2002;

Loh, 1999; Sancier, 1999). Even if the diseases cannot be cured, qigong can be used as a psychosocial intervention and for improving the quality of life (Hui, Wan, Chan, & Yung, 2006; Oh, Butow, Mullan, & Clarke, 2008; Rosenbaum et al., 2004; Tsang, Cheung, & Lak, 2002; Wenneberg, Gunnarsson, & Ahlström, 2004). There is little knowledge of rehabilitation from chronic illnesses and specific diseases, but there is an indication that more exercise time is spent for rehabilitation than health preservation purposes.

Some studies focused on using qigong exercise to rehabilitate from chronic illness have been designed with Master instructions for exercise once a week over 8 to 14 weeks and with little self practice beside the instructions. Findings show low health effects or similar to placebo effects, and they also report a higher number of drop-outs (Astin, Berman, Bausell, Lee, Hochberg, & Forsy, 2003; Mannerkorpi & Arndorw, 2004; Reuther & Aldrige, 1998; Wenneberg et al., 2004). Daily (instructed) practice over a long period of months or years seems to be important for qigong adherence and health outcome when the exercise purpose is rehabilitation from chronic illness.

Some of the articles above are summarized in reviews to illustrate how qigong exercise can benefit general medical applications and have therapeutic benefits (Sancier, 1996, 1999; Sancier & Bingkun, 1991; Tang 1994). More specific reviews are available for hypertension (Gou, Zhou, Nishimura, Teramuka, & Fukushima, 2008; Mayer, 1999), diabetes (Xin, Miller, & Brown, 2007), anxiety disorders (Chow & Tsang, 2007), and neurobiological and psychological mechanisms underlying the anti-depressive effect of qigong exercise (Tsang & Fung, 2008). When practiced incorrectly however, qigong exercise may lead to negative side effects such as abnormal psychosomatic reactions and mental disorders (Chen, 2007; Ng, 1999). The collected literature nevertheless shows multifaceted health benefits from qigong exercise. It is not possible to draw any causal conclusions between exercise frequency and health outcomes from reviewed literature.

### *Literature summery*

The Korean retrospective study reports symptom improvements on physical and psychological health, pain level, fatigue level, and insomnia state after qigong exercise, and that the main reasons for continuing qigong exercise are related to health (Lee et al., 2003b). The collected body of qigong research, described above, confirm in part these symptom improvements in clinical studies. Reported symptom improvements between one single exercise session and several exercise sessions per week are similar to each other, and the body of research is still

too limited for specific exercise generalisations (Larkey et al., In press). The main reason for continuing with qigong exercise is health improvement (Lee et al., 2003b). If people recover from diseases and improve their feeling of health, do they adhere to qigong exercise or can there be several other motives for qigong adherence? Other reasons for qigong adherence have to be investigated. The national expert meeting on qigong and tai chi (2006) identified, beside effect studies on specific diseases, four major subjects for further research and development: (1) program for traditional exercise adherence, (2) guidelines for frequency and duration of practice to achieving goals, (3) exploring mechanism, and (4) identification of meaningful outcome measurements.

## **Behaviour change**

A general public health goal is to promote an active lifestyle throughout the lifespan in with the purpose of enjoying a long and healthy life (Biddle & Ekkekakis, 2005; Fletcher et al., 1992; Kohl, Nichaman, Frankowski, & Blair, 1996; Pate et al., 1995). The evidence for regular physical exercise in promoting health and well-being is considerable, both for the prevention and rehabilitation of chronic diseases (Pedersen & Saltin, 2006; Warburton, Nicol, & Bredin, 2006; White, Drechsel, & Johnsson, 2006). Paffenbager and colleagues (1986) found that men who expended 2000 kcal/week or more in leisure-time physical activity lived an average of 2.15 years longer than men who expended less than 500 kcal/week. Evaluating dose-response relationship between cardio respiratory fitness and all-cause mortality show that men and women who have the highest levels of fitness have the lowest age-specific all-cause mortality rates (Myers, Prakash, Frelicher, Partington, & Atwood, 2002). Reviewed qigong literature shows that it is possible to reach similar health benefits with low-intensity exercise, for example, qigong. In order to improve their health, people have to be motivated for exercise and for lifestyle changes.

Health and fitness improvements are the usual contextual reasons for individuals to change their lifestyle (e.g. Bouchard et al., 2007) but from a theoretical and evidence perspective behavioural changes are more complex. Recent reviews in the field of applied psychology stress the importance of theories and evidence when stimulating health behaviour and health behaviour changes (Lippke & Ziegmann, 2008a, 2008b). The new behaviour has to fulfil the individual's social needs, and intrinsic or extrinsic motives (driving forces for the new behaviour, Deci & Ryan, 1985a), and be undertaken with good intentions (good: attitude, subject

norm and behaviour control towards the desired behaviour) to actually perform it, otherwise the expected behaviour will not be adopted (Ajzen & Madden, 1986). Changing from a sedentary lifestyle to a physically active lifestyle can be seen as a stage process where motivation, intention and activation change between stages (Prochaska & DiClement, 1983; Prochaska & Marcus, 1994). Mood motivates our behaviour and people self-regulate to improve moods, and from a behaviour changing, exercise adherence perspective, the primary purpose of healthy exercise should be mood improvement (Thayer, 2001). Life-stress can act as the trigger or cause a relapse from an active lifestyle, and life-stress theories should be incorporated in behaviour changing models (Nigg, Borelli, Maddock, & Dishman, 2008). How exercise psychology theories and models describe the behaviour changing process, from a sedentary life into a physically active life are presented below. The following theories and models are introduced: the transtheoretical model (TTM; Prochaska & DiClement, 1983, 1986), the tense-energy model (TEM; Thayer, 2001), the hierarchical model of motivation (HMM; Vallerand, 1997), self-determination theory (SDT; Deci & Ryan, 1985a), and the theory of planned behaviour (TPB; Ajzen & Madden, 1986). How stress interferes with exercise behaviour is also described.

### *Transtheoretical Model*

The transtheoretical model (TTM; Prochaska & DiClement, 1983, 1986; Prochaska & Velicer, 1997) is the most common behaviour change model and is used in this dissertation to illustrate how motives, intentions and moods affect exercise adherence between stages of behaviour change. The transtheoretical model proposes that an exercise behavioural changing process goes through five stages. Someone who is sedentary and has no intention of starting to take exercise is considered to be in the (1) *precontemplation stage*. When they start thinking about the pros and cons of exercise, and the intention to exercise begins to emerge, they are considered to be in the (2) *contemplation stage*. When they start planning exercise (what, where and when) and when they intend to try some activities, they are in the (3) *preparation stage*. A person who has been active on a regular basis for less than six-month, is in the (4) *action stage*. Finally, when having exercised regularly for more than six month and the intention is to continue exercising, the (5) *maintenance stage* applies. Specifically, participants included in this dissertation were considered to be at the *contemplation stage* when thinking but before having applied for a beginners' course in qigong. When having applied, they were

at the *preparation stage*, when learning and adopting qigong this was considered the *action stage*, and when using qigong in daily life the *maintenance stage*.

### *Tense-Energy Model*

Mood motivates our behaviour and people self-regulate to improve moods (Thayer, 2001). Roughly, moods that most people associate with are tension and energy. Really good moods such as happiness and enjoyment have high energy and low tension, bad moods such as anxiety and depression have high tension and low energy according to the tense-energy model (TEM; Thayer, 1996, 2001). Dixon, Dixon, and Hickey (1993) found that the psychological feeling of energy is at the core when people describe their own health, and the energy level may act as the single overall barometer for measuring people's health.

In correspondence with the purpose of “restoring the power of life” and “regenerating the life-force and improve health” through qigong exercise (Fan, 2000), *health* in this dissertation is defined as the individuals subjective self-rated feeling of health and well-being. Energy may be seen as a physical energy, or life force, in qigong terminology (e.g. Cohen, 1997). In this dissertation *energy* is defined as the psychological subjective feeling of vitality and vigour (Kjellberg & Wadman, 2002) and tension is defined as *stress*. Human stress is now viewed as negative feedback loops among stressors, eliciting activation of the sympathetic nervous, adrenomedullary hormonal, hypothalamic-pituitary-adrenocortical system. A disrupted system, repeated negative feedback loops without recovery, may lead to a variety of acute and chronic diseases (Goldstein & Kopin, 2007). It is suggested that even relatively low-stress, chronic “medium” allostatic load, increases the organism's aging processes and leads to diseases (McEwen, 1998, 2000; McEwen & Stellar, 1993).

The tense-energy model divides tension and energy into dichotomies; tension – calmness and energy – tiredness. Combining dichotomies produces four sub-categories: *tense energy* (high tension and high energy), *calm energy* (low tension and high energy), *tense tiredness* (high tension and low energy), and *calm tiredness* (low tension and low energy), see Figure 1. The *calm energy* state is associated with being in the “zone” or in “flow”, being engaged in normal daily activities with perfect calmness. In this state nothing bothers the individual and he/she is ready to act without feelings of stress or anxiety. There are no time limitations for activities, physical activities are not avoided, and exercises are performed with focused attention. Individuals prefer to be in the calm energy state and strive towards it, they

self-regulate to it. *Tense energy* is a busy and productive state where a lot of work might be achieved in short periods of time, while the individual is still healthy with good sleep. Tense energy is sometimes born out of fear of failure, even though the stress perceived is not overwhelming.

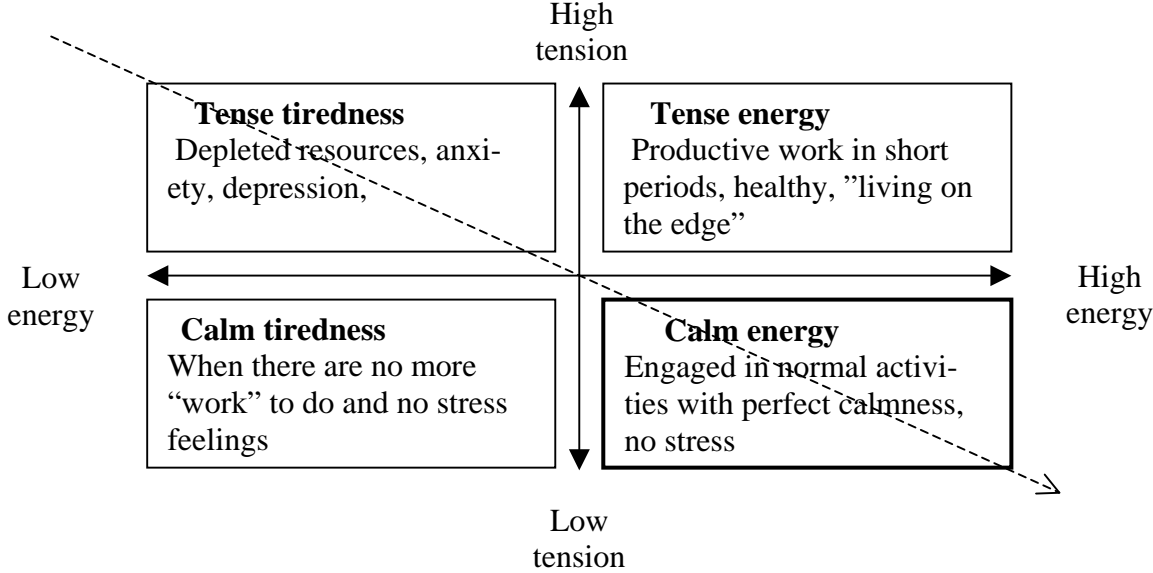


Figure 1. Tense-energy model adopted from Thayer (2001).

The *tense tiredness* state occurs when resources are depleted in combination of feeling tense, anxious or nervous. Chronic stress may lead to depression, exhaustion, and bad health with poor sleep. Tense tiredness is also associated with low productivity. The *calm tiredness* state exist when there is no more “work” to do and no stress feelings. It may develop towards the end of the day before going to sleep, or during a relaxed weekend. If tension remains, even moderately, it may lead to insomnia and unsatisfying sleep, poor health and poor recovery.

According to the tense-energy model, the purpose of healthy exercise is to reach the Calm energy state and a psychological feeling of wellness (mood improvements). Thayer (1996) suggest that exercise, both more vigorous physical activities such as jogging and swimming as well as low intensity exercise as yoga and tai chi may be used to reduce tension and increase energy, to reach a state of calm energy. A major strategy is to reduce tension with exercise, and this can be achieved with five to ten minutes vigorous walking when the tension curve peaks.

### *Hierarchical Model of Motivation*

The hierarchical model of motivation (HMM; Vallerand, 1997) suggests that individuals are motivated on *Global*, *Contextual* and *Situational* levels. An individual's motivation assumes flow top-down from global motives to situational motives, and behavioural changing motives may alter through a stage of changes (TTM; Prochaska & DiClement, 1983, 1986). As example in contemplation stage (TTM) a global motive could be "to use leisure-time physical activities for health improvements", contextual motives could be "daily exercise", and situational motives could be "mood improvements" (TEM; Thayer, 2001).

The hierarchical model of motivation (HMM), self-determination theory (SDT; Deci & Ryan, 1985a), and theory of planned behaviour (TPB; Ajzen & Madden, 1986) are integrated to a trans-contextual model (Hagger & Chatzisarantis, 2007) as complementary explanations of motivational processes towards behaviour changes. The self-determination theory (SDT; Deci & Ryan, 1985a), and theory of planned behaviour (TPB; Ajzen & Madden, 1986) are presented below.

### *Self-Determination Theory*

In modern societies people choose voluntarily how to use their leisure-time. In adherence and exercise motivation studies, increasing attention is given to self-determination theory (SDT; Deci & Ryan, 1985a; Hagger & Chatzisarantis, 2008; Ryan & Deci, 2000b; Wilson, Mack, & Grattan, 2008). Self-determination theory is a meta-theory based on four sub-theories: organismic integration theory, causality orientations theory, basic need theory and cognitive evaluation theory (Deci & Ryan, 1985b; see also Hagger & Chatzisarantis, 2007). The self-determination theory assumes that exercise implementation relies on multiple motives, *intrinsic*, *extrinsic* and *amotives* that interact simultaneously (Ryan & Connell, 1989). Humans have social needs, described as *competence*, *relatedness* and *autonomy*. These must be fulfilled at least in part before behaviour adherence can be seen.

A central part of the self-determination theory is that individuals are active in their leisure-time in order to satisfy the basic social needs: *autonomy*, *competence* and *relatedness*. Goal-directed behaviour is likely to result when satisfying these needs (Frederick & Ryan, 1993) are defined as nutrients essential for growth, integrity, and well-being (Deci & Ryan, 2000). *Competence* refers to feeling effective in interactions with the social environment and experiencing opportunities to exercise and express capacities. The need for competence leads

individuals to seek challenges that are optimal for their capacities and maintain exercise to enhance those skills and capacities. Among social needs competence is found to be the main predictor for exercise adherence (Vlachopoulos & Neikou, 2007). *Relatedness* refers to feeling connected and belongingness both with other individuals and community and having a sense of caring for and being cared for by others. *Autonomy* refers to being the source of one's own behaviour (Deci & Ryan, 2002). Individuals who experienced support for relatedness, autonomy, and competence showed more vitality, higher self-esteem, less negative effects, and higher well-being (Gagné, Ryan, & Bargmann, 2003). The more individuals feel autonomy, competence, and relatedness the more vitality is reported, and subjective feelings of vitality and energy may be a marker of health and wellness (Ryan & Fredrick, 1997). Pelletier and colleagues (1995) describe the self-determination continuum from amotivation (lowest autonomy) over seven levels to intrinsically motivated (highest autonomy). The lowest grade of autonomy is *amotivation*, followed by three extrinsic motives: *external regulation*, *introjected regulation*, *identified regulation*. *External regulation* refers to behaviour that is targeting material rewards, is controlled by external sources, and suffers from constraints imposed by others. *Introjected regulation* refers to internal pressure such as guilt, anxiety for example for health reasons. *Identified regulation* refers to achieving personal goals and judging the behaviour as important and therefore performing it. This is followed by three intrinsic motives: *knowing*, *accomplishment*, and *experiencing stimulation*. *Experiencing stimulation* refers to sensory pleasure, fun and excitement. *Accomplishment* refers to the pleasure and satisfaction experienced when creating or accomplishing something. *Knowing* refers to the pleasure and satisfaction experienced while learning, exploring or trying to understand something new. The individual's strongest motivational drive for exercise will act as a goal-directed behaviour, Figure 2.

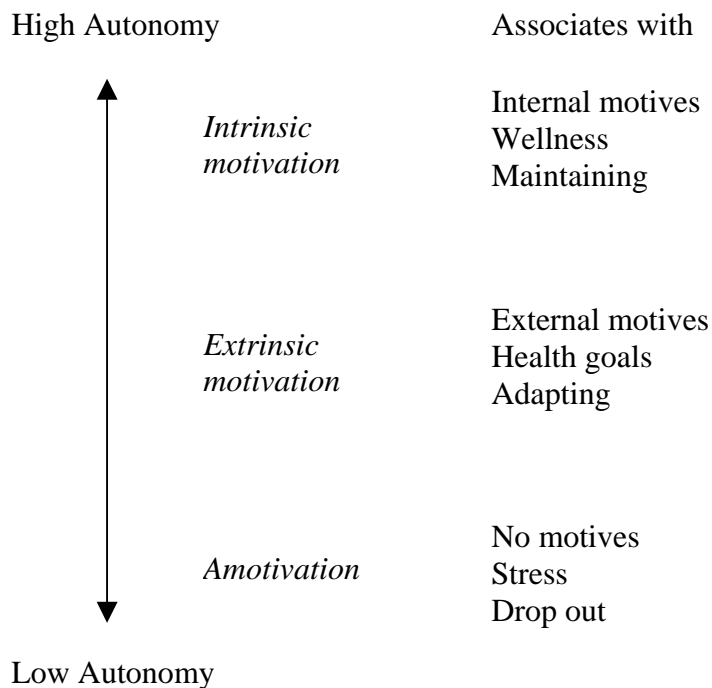


Figure 2. Self-determination theory adopted from Deci and Ryan (1985a).

The relative strength of intrinsic or extrinsic motives to exercise change differs across stages (TTM; Prochaska & Marcus, 1994). Extrinsic motives are stronger in the precontemplation stage, and less marked in the contemplation stage, and in the preparation stage they disappear. In the action stage extrinsic dominate over intrinsic motives, and in the maintenance stage, intrinsic dominate motives over extrinsic motives (Ingledeu, Markland, & Medley, 1998). Among those who had exercised for less than six months, extrinsic motives were positively related to somatic symptoms, anxiety, social dysfunction and depression, and negatively related to self-esteem. Among those who had exercised for more than six months, intrinsic motives were positively associated with self-esteem, and negatively related to somatic symptoms, anxiety, social dysfunction, and depression as well as to time pressure and health concerns (Maltby & Day, 2001). Individuals who start exercising because of extrinsic motives (health reasons), and do not reach their health-goal or do not enjoy the activity are less likely to persist (Ryan, Fredrick, Lepes, Rubio, & Sheldon, 1997; Wankel, 1993). Intrinsic goal settings have been found to increase long-term adherence (Vansteenkiste, Simons, Soenens, & Lens, 2004). Autonomous motivational orientations also improve coping capability, reduce stress and increase well-being (Brown & Ryan, 2003). Both intrinsic and extrinsic motivation

increase across stages, and both remain important throughout the adoption and maintenance process (Buckworth, Lee, Regan, Schneider, & DiClemente, 2007).

### *Theory of Planned Behaviour*

Behaviour intentions, according to the theory of planned behaviour (TPB; Ajzen, 1991; Ajzen & Madden, 1986), are frequently used to predict perceived behaviour in exercise and health interventions (Downs & Hausenblas, 2005; Godin & Kok, 1996). The theory of planned behaviour concept is based on behaviour beliefs and designed to explain and predict human behaviour in specific contexts. The theory assumes that behaviour is a function of salient information or beliefs relevant to the behaviour. Three salient beliefs predict *behaviour intention*: behavioural beliefs influence *attitudes* towards the behaviour, normative beliefs influence the underlying construct of *subjective norms*, and control beliefs influence perception of *behavioural control*. *Behaviour intention* and perceived *behavioural control* are the strongest predictors for achieved behaviour, Figure 3.

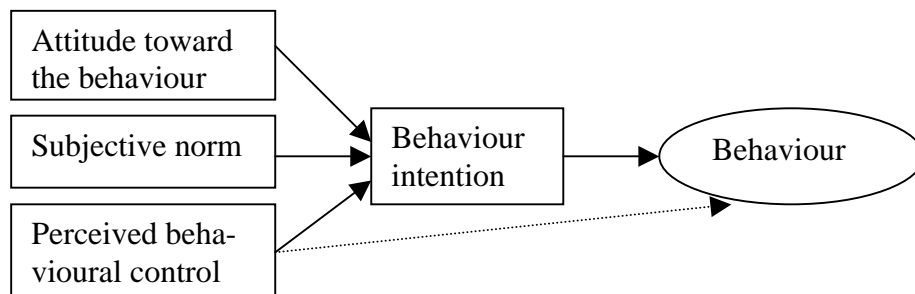


Figure 3. Theory of planned behaviour (Ajzen & Madden, 1986).

Some conditions have to be fulfilled before *behaviour intention* and perceived *behavioural control* are reliable behaviour predictors. Measurements of *behaviour intention* and *behavioural control* must be compatible and correspond to predicted behaviour, and remain stable between assessments of the behaviour. *Behaviour intention* and perceived *behavioural control*, is expected to vary across different behaviours. Skår and colleagues (2008) point out that the planned behaviour concept predicts behaviour and not behaviour changes.

The theory of planned behaviour defines behaviour by *Target, Action, Context, and Time* (TACT). A practical example clarifies the meaning of constitutes: “try to walk at a moderate pace, for 30 minutes on most days in the week, near your home, during the coming three months, to reduce your weight”. The *target* could be the individual’s weight reduction, *action* relates to walking 30 minutes most days in the week, *context* the near home, and *time* the coming three months. If instead exemplified with leisure-time qigong exercise: *target* could be health improvements, *action* qigong exercise for 30 minutes every day, *context* at home, and *time* for three months. *Behaviour intention* and *behavioural control* must then be compatible and correspond to TACT definitions as reliable predictors.

There is a connection between behaviour intentions, based on attitude, subject norms and control beliefs, (TPB) and stage of changes (TTM: Prochaska & DiClement, 1983, 1986). Changing behaviour from a sedentary life to a physically active life is a process over stages according to TTM, and the behaviour intention has to be changed before entering into a new stage. Predicted behaviour may then be stable only within the stage, and not across stages. Even if behaviour intention (TPB) was strong in the preparation stage (TTM) and individuals went into action, the process may now go further into the maintaining stage or return into the preparation or contemplation stages depending on how behaviour beliefs change.

There is also a clear connection between the theory of planned behaviour (TPB; Ajzen & Madden, 1986) and self-determination theory (SDT; Deci & Ryan, 1985a). Intrinsic motives (SDT; high autonomy) to exercise are associated with maintaining exercise (Ingledeew et al., 1998). Perceived autonomy support (SDT) in physical education has been shown to promote leisure-time physical activity intentions (TPB) and actual behaviour (Hagger, Chatzisarantis, Culverhouse, & Biddle, 2003). Autonomy support in combination with strengthening exercise behaviour belief seems to be important for exercise adherence.

### *Stress and energy moods*

A life full of stress and weak energy may be the reason to include exercise in a person’s daily life, to initiate a behaviour changing process. If health professionals prescribe physical activity to a stressed client without considering other factors in the client’s life situation, the new activity could be “just another thing he or she must do”. The unwanted result might be increased stress followed by weaker energy and decreasing mood states (cf. Thayer, 2001). Perceived stress reduces activity adherence (King, Kiernam, Oman, Kreamer, Hull, & Ahn,

1997), as well as reduces exercise sessions and session time per week (Stetson, Rahn, Dubbert, Wilner, & Mercury, 1997). Major life events are also found to reduce exercise behaviour, and the influence is stronger in maintaining stage (TTM; Prochaska & DiClement, 1983, 1986) than in the preparation stage (Oman & King, 2000). There are indications that male students with high-stress levels tend to use physical activity as a stress reduction strategy and thereby adhere more to an exercise regime (Johnson-Kozlow, Sallis, & Calfas, 2004). Lifestyle changes incorporating exercise activities have to be well prepared before being put into action, in order to secure exercise adherence.

### *Behaviour change summary*

The idea that "beliefs and expectations" affect humans' natural recovery processes, in which individuals self-regulate to satisfy a "silent memory of wellness" (Stefano et al., 2001) is in line with psychological theories and models. Thayer (TEM; 2001) suggested that "mood motivates our behaviour, and individuals self-regulate to improve moods", for example feelings of calm energy and wellness. Some individuals want a quick fix to improve moods and therefore use alcohol, drugs and snacks instead of physical exercise. The abuse of alcohol, drugs and snacks are major public health problems. When the pros are stronger than the cons (beliefs), there might be a behavioural change, a change between stages (TTM; Prochaska & DiClement, 1983). The stronger behaviour beliefs (attitude, subject norm and behavioural control) towards the behaviour, the stronger behaviour intentions, and thereby perceived behaviour (TPB; Ajzen & Madden, 1986). Intrinsic motives to exercise and experienced support for relatedness, autonomy, and competence (beliefs) (SDT; Deci & Ryan 1985a) are associated with exercise adherence, and with higher feelings of vitality, self-esteem and well-being (Gané et al., 2003). Performers should focus on strengthening psychological feelings of energy and wellness (qi and life-force in qigong philosophy) rather than concentrating on exercise perfectionism and reducing disease in order to improve qigong adherence (e.g. Cohen, 1997). Qigong performed in this way could be a method that stimulates human natural recovery processes (cf. Stefano et al., 2001).

## AIM

There is limited knowledge about leisure-time medical qigong exercise and peoples reasons for performing it. The knowledge about the motivational drive for leisure-time medical qigong exercise, if exercisers are low-stressed and high energized, and whether perceived stress reduce health, energy and exercise behaviour are limited. The impact of intrinsic versus extrinsic motivation, intention to exercise, and how levels of stress and energy are related to qigong exercise adherence are not known.



The general aim of this thesis was to explore leisure-time medical qigong and how the individuals' motivation and intention to exercise were related to their actual exercise in daily life. From a more specific exercise psychology perspective, I investigated qigong exercise adherence and the motives and psychological drive needed for performing qigong exercise regularly, and also how behaviour intention is associated with exercise behaviour. Three separate studies were carried out to answer the questions posed:

### Study I

Study I focuses on the limited knowledge of leisure-time medical qigong exercise and people's reasons for performing qigong. The aim of the first study was therefore to describe a sample of qigong exercisers in Sweden and specifically, how they practice qigong and their reasons for initiating and maintaining their exercise behaviour in daily life.

### Study II

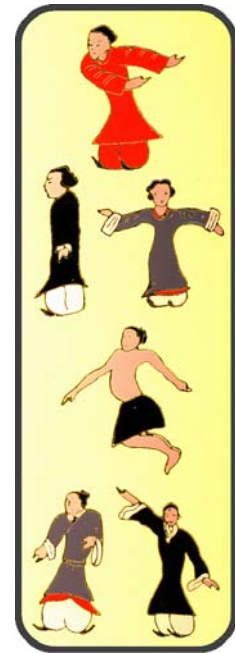
Study II addresses the limited knowledge of motivational drive for leisure-time medical qigong exercise, whether exercisers are low-stressed and highly energized, and whether perceived stress reduce health, energy and exercise behaviour. The aim of the second study was therefore to investigate whether leisure-time qigong exercisers are in the calm energy state, whether leisure-time qigong exercisers are mainly driven by internally originating motives, and whether perceived stress reduces health, energy and exercise behaviour.

### **Study III**

Study III reports the limited knowledge of intrinsic versus extrinsic motivation, intention to exercise, and how the levels of stress and energy are related to qigong exercise adherence. The aim of the third study was therefore to investigate how exercise motives, exercise intention, stress and energy correlate with qigong exercise over time.

## STUDIES

*Study I* is a cross-sectional retrospective investigation to explore and describe the regular qigong exerciser, and to identify possible adherence motives. *Study II* is a cross-sectional survey to investigate qigong adherence motives, and *Study III* is a longitudinal survey to investigate qigong adherence intentions.



### Participants

Study I and II. Participants were recruited from Green Dragon, a qigong association in Stockholm, that practices the Biyun method. At the time for Study I, Green Dragon had 1126 registered and fee-paying members. A total of 372 members (33%) were randomly selected and mailed a questionnaire, 253 of these responded (68%), 38 men and 215 women. Their mean age was 58 years (SD=13), and their average height 168 cm (SD=8) and body mass 67.5 kg (SD=10).

At the time of Study II, there were 1408 fee-paying members and 450 questionnaires were randomly distributed. A total of 340 questionnaires were returned (76%); four of these were incomplete and 57 respondents declined to participate, leaving 279 questionnaires for analysis (62%). Of the 279 qigong exercisers 25 were men and 254 women. Their mean age was 60.1 years (SD=11.6).

Study III. Eighty-seven individuals (6 men and 81 women) with a mean age of 36.5 years (SD=17) were recruited from introductory qigong courses. The average height for the group was 168 cm (men 184 cm, women 167 cm), and their body mass 65 kg (men 81 kg, women 64 kg).

### Data collection

Participants responded to questionnaires showing their (1) demographic profile, (2) previous physical activity behaviour, (3) qigong exercise behaviour, (4) outcome experiences related to their practice, (5) Sport Motivation Scale, (6) Planned Behaviour Questionnaire, (7) Stress-Energy Scale.

### *Demographic profile*

The demographic variables assessed were sex, age, height, body mass, living conditions, education, occupation, the number of qigong courses completed and whether or not they were instructors. How well they could select their time for exercise, find a place for exercise, and how often they felt undisturbed when exercising were also assessed.

### *Previous physical activity behaviour*

Respondents were asked to list any other physical activities performed regularly, including sessions per week and time per session.

### *Qigong exercise behaviour*

The exercise behaviour assessed were: reasons for beginning with regular qigong exercise, years of practicing qigong, sessions per week, time per session, whether they practiced alone or in a group, the most common place and time of day for their practice, and level of concentration during exercise. Their motivation to try (start) and continue with qigong exercise was assessed. In Study II, the participant's motivation for trying (starting) and continuing qigong was examined by four variables: rehabilitation, health preservation, feeling of wellness and other reasons.

### *Performed exercise*

During Study III, and after completion of the qigong-course, respondents were asked to keep an exercise diary detailing the number of qigong sessions performed per week, and their level of concentration on qi-flow and movements during the qigong exercise.

### *Outcome experiences related to their practice*

Outcome experiences from their qigong practice were assessed as perceived health-now, and retrospectively as health perceived before they started practicing qigong (health-before). They were also asked to describe their feelings of qi during practice, difficulties associated with regular practice, positive and negative feelings of the qigong movements, and positive and negative health effects associated with their qigong practice.

### *Sport Motivation Scale*

Self-determination was measured using a modified version of the 28-item Sport Motivation Scale (SMS; Pelletier et al., 1995). The modification entailed changing “sport” into “exercise” to allow qigong exercisers to relate to the questions. The SMS includes 7 subscales each with four items, rated from 1 (Not at all) to 7 (Very much). Three of the subscales measure different forms of intrinsic motivation (to know, to accomplish, and to experience stimulation), three different forms of regulation for extrinsic motivation (external regulation, introjected regulation, identified regulation), and one measure of amotivation. The three intrinsic subscales formed one measure of *Intrinsic motivation*, the three extrinsic subscales one measure of *Extrinsic motivation*, along with *Amotivation*. Cronbach alphas ranged between .78 and .88.

### *Planned Behaviour Questionnaire*

Exercise intension was measured using the Theory of Planned Behaviour questionnaire (Francis et al., 2004). Twelve items measured behaviour beliefs, rated between 1 (not at all) to 7 (very much), with four items per subscale labelled: Attitude, Subject norm and Behaviour control. Internal consistency (Cronbach alphas) for Attitude: .81, Subject norm .73, and Behaviour control .60. Exercise intention (intended exercise sessions per week) was measured from 0 (sessions per week) to 7 (sessions per week).

### *Stress-Energy Scale*

The level of stress and energy was measured by the twelve-item Stress – Energy Scale (Kjellberg & Wadman, 2002), with six items for each subscale. Scores range from 0 (Not at all) to 5 (Very much). Internal consistency (Cronbach alphas) for Stress was .84 and for Energy .72. The neutral point has been determined to be 2.4 on the Stress subscale and 2.7 on the Energy subscale (Kjellberg & Iwanowski, 1989). The instrument has been validated in strain studies (Kjellberg & Bolin, 1974; Kjellberg & Iwanowski, 1989).

Table 2. Description of questionnaire variables used in studies, number of questions (q), response scale, and Cronbach's alpha-values.

<b>Variable</b>	<b>Study</b>	<b>Questions &amp; scales</b>	<b>Cronbach's alpha</b>
<i>Demographic</i>			
Sex	I, II, III		
Age	I, II, III		
Height	I, II, III		
Body mass	I, , III		
Living condition	I		
Education	I		
Occupation	I		
Qigong courses	I		
Instructors	I		
Set time	II	1q, 1-10 very difficult – not difficult at all	
Find place	II	1q, 1-10 very difficult – not difficult at all	
Undisturbed	II	1q, 1-10 very difficult – not difficult at all	
<i>Physical activity</i>			
Activity	I, II, III		
Sessions per week	I, II, III		
Session time	I, II, III		
<i>Qigong exercise</i>			
Beginning	I, II		
Continuing	I, II		
Years of practice	I, II		
Sessions per week	I, II		
Session time	I, II		
Concentration	I, II, III	1q, 1-10 very low - very high	
Alone or group	I		
Time of day	I		

Variable	Study	Questions & scales	Cronbach's alpha
<i>Exercise diary</i>			
Sessions per week	III		
Concentration	III	1q, 1-10 very low - very high	
<i>Outcome experiences</i>			
Health effects (pros-cons)I			
Health-before	I, II	1q, 1-10 very low - very high	
Health-now	I, II	1q, 1-10 very low - very high	
Feeling of qi	I		
Practice difficulties	I		
Movements (pros-cons)	I		
<i>Sport Motivation Scale</i>			
To know	II, III	4q, 1-7 not at all – very much	0.72
To accomplish	II, III	4q, 1-7 not at all – very much	0.82
Experience stimulation	II, III	4q, 1-7 not at all – very much	0.64
External regulation	II, III	4q, 1-7 not at all – very much	0.64
Introjected regulation	II, III	4q, 1-7 not at all – very much	0.75
Identified regulation	II, III	4q, 1-7 not at all – very much	0.75
Amotivation	II, III	4q, 1-7 not at all – very much	0.74
<i>Planned Behaviour Questionnaire</i>			
Attitude	III	4q, 1-7 not at all – very much	0.81
Subject norm	III	4q, 1-7 not at all – very much	0.73
Behaviour control	III	4q, 1-7 not at all – very much	0.60
Exercise intention	III	1q, 0-7 sessions per week	
<i>Stress-Energy Scale</i>			
Stress	II, III	6q, 0-5 not at all – very much	0.84
Energy	II, III	6q, 0-5 not at all – very much	0.72

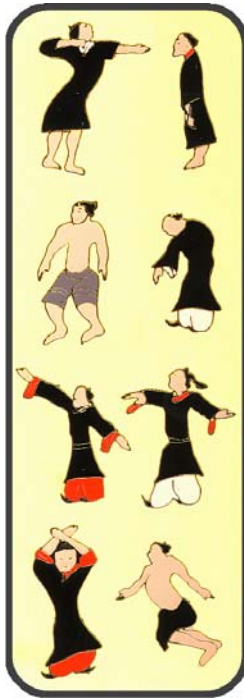
## **Ethical considerations**

The American Psychological Association ethical standards have been followed in the studies. All participants were informed about the study, the voluntary and anonymous participation, and that the result were to be published in scientific journals; by answering questionnaires they provided their written informed consent to take part in the studies.

## **Data analysis**

In Studies data were categorised and coded into SPSS (Statistical Package for the Social Sciences). Calculations and statistical analysis were performed using SPSS for Windows, version 11.5 to version 14.0. Data were calculated into frequency, percentage, means, and standard deviations. Pearson correlation coefficient was used to analyse correlations between variables. Stepwise multiple regression analyses were also used where applicable, as was t-tests to compare means.

## RESULTS



Qigong exercisers in Study I were predominantly older women (85%, with a mean age of 58 yr,  $SD=13$ ). Age in Study III, also proved to correlate with qigong exercise adherence ( $r = .40$ ,  $p < .001$ ). The majority lived with a partner (67%) and had a university degree (57%). At the time of the study, 44% were employed, 45% had retired and 11% were students, job seekers or working at home. On average, participants had completed four qigong courses ( $SD=4$ ), and 77 (30%) of the respondents were instructors. On average, rated on the 10-point scale in Study II, there were no difficulties in setting the time for exercise 6.8 ( $SD=2.4$ ), in finding an exercise place 9.0 ( $SD=1.5$ ), or problems concerning disturbance during exercise 8.5 ( $SD=1.6$ ).

Most of the respondents in Study I, preferred to exercise alone (65%), at home (90%), and the majority preferred to exercise in the morning (59%), while the remaining exercisers were divided equally between mid-day (20%) and evening/night (21%). On average, respondents had practiced qigong for five years ( $SD=3$ ) with 4.8 sessions per week ( $SD=1.9$ ). Their previous week included 4.3 sessions ( $SD=2.3$ ) lasting an average of 37 minutes ( $SD=15$ ), and performed with a deep level of concentration (rated as 6.9,  $SD=1.7$ , on a 10-point Likert scale). During practice, qi was perceived by 47% of the respondents as an internal force (heat, light, stream, flow, electricity), as an emotional state by 41% (a state of nice calmness and relaxation) and by 12% as primarily enhancing body awareness (focusing on the internal tissues). The following comments were made in relation to the Biyun method and the movements: “The concept is smart and systematically works over the whole body”, “movements are calm and soft”, “simple to learn and promotes enhanced body awareness”. Participants stressed the importance of performing “the movements slowly and with a focused mind”. Sometimes the movements were perceived as boring, exacting and prone to cause some physical and emotional discomfort. All participants were engaged in other physical activities (on average 4.2 sessions per week,  $SD=2.9$ ) such as walking their dog, cycling to work, jogging, dancing, golf, etc. for an average of 49 minutes per day ( $SD=19$ ).

Table 3. Frequencies, means, and standard deviation between brackets among participants: sex, age, exercise behaviour, and level of stress, health, and energy.

Variable	Study		
	I	II	III
<i>Participants</i>	n = 253	n = 279	n = 87
Sex, females	85%	91%	93%
Age (years)	58 (13)	60 (11)	37 (17)
Qigong courses	4 (4)	---	---
<i>Physical activity</i>			
Sessions per week	4.2 (2.9)	---	3.8 (1.8)
Session time (min)	49 (19)	---	53 (23)
<i>Qigong exercise</i>			
Years of practice	5 (3)	7 (3)	---
Sessions per week	4.8 (1.9)	4.2 (2.1)	2.3 (2.1)
Session time (min)	37 (15)	37 (17)	30
Concentration	6.9 (1.7)	7.2 (1.4)	5.9 (1.6)
<i>Outcome experiences</i>			
Health-before	4.8 (2.3)	5.0 (2.2)	---
Health-now	6.9 (1.9)	6.8 (1.8)	---
<i>Stress-Energy Scale</i>			
Stress	---	1.8 (0.8)	2.6 (1.0)
Energy	---	3.6 (0.7)	3.1 (0.8)

Multifaceted health improvements were reported, in Study I, such as general calmness and relaxed feelings both physically and emotionally, an increased mobility and a feeling of smoother joints, less stress, better sleep, a feeling of harmony and more energy together with improved concentration. When compared with their life before practicing qigong, respondents mentioned that they now suffered from fewer common colds and infections, perceived their breathing to be easier, enjoyed quicker recovery, gastro-intestinal improvements, and a better maintenance of the body-mind balance. In addition, fewer pains, migraines, and headaches, less dizziness, and increased blood circulation was also reported. Individual reports also mentioned improvements related to fibromyalgia, burnout, incontinence, drug abuse, allergies, medicine use, tinnitus, blood pressure, depression and recovery after cancer treatment. A general feeling of improved spirit and timelessness was also mentioned in the questionnaires together with increased self-esteem.

Respondents' Health-before starting with qigong exercise, rated on the 10-point scale, was 4.8 (SD=2.3), and Health-now was 6.9 (SD=1.9), in Study I. Health-now was significantly higher than Health-before ( $t [248] 32.3, p < .05$ ), with a meaning that participants felt healthier after having started with qigong exercise. The strongest correlation with improved feeling of Health was Concentration level during exercise ( $r = .30, p < .01$ ); those practicing with the highest degree of concentration perceived their health to be the best. Improved Health was also positively correlated with Session-time ( $r = .17, p < .01$ ), Years of practice ( $r = .15, p < .05$ ) and Number of qigong courses ( $r = .14, p < .05$ ). Significant correlations with Health-now (Concentration, Session-time, Years of practice and Number of qigong courses, Table 4) were analyzed in a Stepwise multiple regression, and Concentration correlates positively with Health level ( $R^2 = .092$ ). In addition, neither the number of sessions performed per week, the respondents' education, being an instructor, nor performing other forms of exercise was correlated to Health-now (all  $ps > .10$ ). This indicates that frequency (quantitative exercise) is less important than concentration during exercise (qualitative exercise).

Table 4. Means, standard deviations (SD), and correlations between health-now, concentration, session time, years of practice, courses, and other exercise (n=253), in Study I.

Variables	Mean	SD	1	2	3	4	5	6
1. Health-now	6.9	1.9	---	.30**	.17**	.15*	.14*	.10
2. Concentration	6.9	1.7			.24**	.32**	.23**	.02
3. Session time	37	15				.28**	.43**	.10
4. Years	5	3.0					.50**	.09
5. Courses	4	4.0						.12
6. Other exercise	4.2	2.9						---

\* $p < .05$ , \*\*  $p < .001$ .

The main reason in Study I for beginning with qigong was curiosity (48%), when introduced to qigong by a friend or colleague. A smaller group (9%) had actively sought a low-impact activity that is gentle to the body. Other reasons given were: to promote health (19%) or to recuperate from some illness (24%). The main reason for not practicing every day was an inability to find the right motivation (other activities could be more interesting) and to allocate the necessary time (63%). Other reasons mentioned were related to difficulties encountered while travelling or working shifts (21%), and in finding a place for peaceful practice (12%). A smaller problem was related to a temporary unhealthy state or absent instructor (4%). The main reason, given by 52% of the participants, for continuing to practice qigong was a feeling of psychological well-being (feeling more relaxed, happier, more energized, etc.); 24% also mentioned physical health preservation, and the remaining 24% said they were using qigong to recuperate from illness (and then remain healthy).

Participants performing qigong in daily life (Study II) displayed scores for Intrinsic motivation (4.4) was higher than their Extrinsic motivation score (3.0) ( $t [183] 15.9, p < .001$ ), and their Amotivation score (1.5), suggesting them to be intrinsically motivated. Correlations between the variables show that scores relating to Intrinsic and Extrinsic motivation were positively correlated with both the average number of exercise sessions performed per week and sessions performed the previous week. Amotivation ( $r = -0.17, < .05$ ) was also significantly correlated with sessions performed, but negatively so, indicating that the less motivated respondents performs less exercise than their more motivated counterparts.

The newcomer participants (Study III) mean scores and standard deviations for the seven self-determination subscales were: (intrinsic motives) to Know 3.7 (SD=1.5), to Accomplish 4.4 (SD=1.6), and to Experience stimulation 4.4 (SD=1.5), (extrinsic motives) External regulation 3.2 (SD=1.3), Introjected regulation 5.2 (SD=1.4), Identified regulation 2.2 (SD=1.3), and Amotivation 1.8 (SD=1.1). Extrinsic introjected regulation was significantly higher than the other motivation variables ( $t [86] 5.2, p < .001$ ), which means that the participants were primarily extrinsically motivated when they signed up for the qigong course. There were no significant correlations between any of the self-determination subscales and exercise sessions per week (all  $ps. > .05$ ).

Mean scores and standard deviations (Study III) for the four planned behaviour variables were: Attitude 6.0 (SD=1.1), Subject norm 4.8 (SD=0.9), Perceived behaviour control 5.3 (SD=1.1), and Exercise intention 4.4 (SD=1.5). The strongest correlation was found between Exercise intention and Exercise sessions per week ( $r = .40, p < .001$ ); those with the highest intention performed the most exercise.

Perceived Stress (Study II) correlates negatively with Health-now, Energy, and all exercise behaviour variables (all  $ps. < .001$ ), indicating that perceived Stress reduces both health and exercise behaviour. Baseline Stress (Study III) was negatively correlated with Exercise sessions per week ( $r = -.22, p < .03$ ), participants with a high stress level exercised fewer times per week than participants with lower stress. As a group they can all be considered as being in the calm energy state (Stress below 2.4 and Energy above 2.7). Energy level (Study II) was measured to 3.6 (SD=0.7). This is significantly higher ( $t [270] 19.2, p < .001$ ) than the norm value of 2.7, and stress-level was measured to 1.8 (SD 0.8), which is significantly lower than the norm value of 2.4 ( $t [271] -12.8, p < .01$ ). Suggesting them to be in calm energy state where stress is low and energy high.

The qualitative aspect, concentration during exercise, was found to have the strongest correlation with feeling of health (Study II). Stress, energy and ability to set the time for exercise correlate significantly with concentration on qi-flow (all  $ps. < .001$ ). These variables were tested in a regression analysis, and Stress, Energy and ability to Set the time for exercise correlates with Concentration ( $R^2 = .13$ ). This means that qualitative qigong exercise is best performed in calm energy state where stress is low and energy high.

Stress (Study II) was negatively correlated with Intrinsic motivation ( $r = -.19, p < .05$ ). No statistically significant correlations were, however, detected involving either Extrinsic motivation or Amotivation in relation to the Stress or Energy variables. Concentration was positively correlated with Intrinsic motivation ( $r = .24, p < .001$ ), but negatively with Amoti-

vation ( $r = -0.17, < .05$ ) whereas no statistically significant correlation was detected with Extrinsic motivation. Participants who satisfy intrinsic motives with qigong exercise are less stressful and more concentrated during exercise.

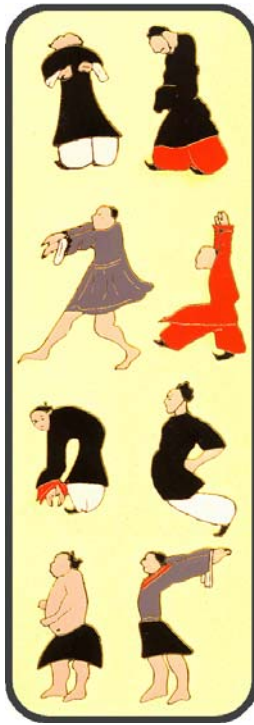
Out of the 87 participants (Study III) who completed their course requirements, 64 (74%) performed regular qigong exercise with a mean of 2.3 (SD=2.1) sessions per week over the 10 weeks. Their mean level of Concentration was 5.9 (SD=1.6), as measured on the 10-point Likert scale. Besides qigong, the exercisers also performed a number of other physical activities, such as: walking, jogging and swimming (72.4%), strength training (5.7%), aerobic, fitness, dancing (5.7%), biking, cross-country skiing (2.3%), and other activities (13.8%). The individuals as a group ( $n=64$ ) performed these activities 3.8 times a week on average (SD=1.8), for 53 minutes (SD=23) and had done so for more than 6 months (Maintenance stage according to transtheoretical model, Prochaska & DiClement, 1983, 1986). The exercisers age ( $r = .40, p < .001$ ) and level of concentration ( $r = .44, p < .001$ ) was significantly correlated with number of sessions per week. Specifically, older adults exercised more than younger adults, as did participants with higher concentration levels. No significant correlations with qigong exercise were found between other demographic and exercise variables.

In Study III, mean scores and standard deviations for the Stress and Energy variables were: Stress 2.6 (SD=1.0) and Energy 3.1 (SD=0.8). Stress level of the group was significantly higher than the norm value of 2.4 ( $t [86] 2.3, p < .05$ ); their Energy level was also significantly higher than the norm value of 2.7 ( $t [86] 4.7, p < .001$ ) (Kjellberg & Iwanowski, 1989). Exercise sessions per week was negatively correlated with Stress ( $r = -.22, p < .03$ ) one tailed: participants with a lower stress level exercised more times per week than participants with higher stress. Stress correlates negatively with Energy ( $r = -.36, p < .001$ ), showing that higher stress levels reduce energy. There was no significant correlation between Exercise sessions per week and Energy. Dividing participants according to the Calm energy and Tense tiredness state (Study III) show that participants belonging to the Tense tiredness state ( $n=19$ ) displayed the lowest level of Qigong adherence: 42% did not exercise at all. Participants belonging to the Calm energy state ( $n=33$ ) adhered to a higher degree to qigong exercise, with 79% exercising after 10 weeks. Significant correlations, between Stress, Age and Exercise intention, and Exercise sessions per week, were analyzed in a multiple regression. The analysis revealed that Exercise intention, Age, and Stress together predict increased number of Exercise sessions per week ( $R^2 = .29$ ). If Concentration (a non-baseline measure) is included in the regression analysis, Exercise intention, Age, Stress, and Concentration increases the strength of the predictions ( $R^2 = .38$ ).

Respondents' (Study II) reasons for starting qigong exercise were: Rehabilitation 87 (31%), Preserving health 65 (23%), Creating wellness 86 (31%), and Other reasons 41 (15%). Their reasons for continuing with qigong exercise were: Rehabilitation 27 (10%), Preserving health 164 (59%), Creating wellness 77 (27%), and Other reasons 11 (4%). Almost 86% continue exercise to stay healthy and preserve their feeling of wellness. Among the participants, there were 27 individuals (10%) who continued to exercise to rehabilitate their health. Comparing the individuals who practice for *rehabilitation* with those who practice for *wellness* shows some differences. Specifically, the *wellness* group score higher on Health-now and Energy, lower on Stress, and they exercised more during the investigated week (all  $ps < .05$ ). The *rehabilitation* group had only marginally improved their health during the six years of qigong exercise, but they had preserved it: Health-before 4.1 (SD=2.7), Health-now 4.5 (SD=1.9); ( $t [25] -7.2, p > .05$ ). The wellness group had a significantly lower Stress level (*wellness* Stress 1.7 (SD=0.7); *rehabilitation* Stress 2.4 (SD=1.1); ( $t [76] -8.6, p < .001$ ), and higher energy level (*wellness* Energy 3.6 (SD=0.8); *rehabilitation* Energy 3.0 (SD=1.0); ( $t [76] 6.5, p < .001$ ), compared to the rehabilitation group. The *rehabilitation* group reported being more Disturbed during exercise ( $t [77] 2.1, p < .05$ ). This indicates that the rehabilitation group has a higher life-stress with increased allostatic load.



## DISCUSSION



The general aim of this thesis was to explore leisure-time medical qigong and investigate how motivation and intention to exercise are related to actual exercise in daily life. In the first section, qigong exercise in daily life, and motivation and intention to exercise are discussed. In the second section, the implication of the results on exercise and health are discussed. The third section reflects on the modern and ancient perspectives on qigong exercise and recovery. The fourth section discusses the difference between “to be or to do” mindful exercise. In the fifth section, the practical implications of the results on qigong exercise adherence are discussed. These reflections are summarized into a qigong-based Wellness Coaching Model. The discussions finish with methodological issues, suggestions for future studies, and finally concluding remarks.

### General

#### *Qigong exercise*

Many people use medical qigong exercise for mood improvements and to retain energy and health. Participants in the three studies included in this thesis are regular leisure-time medical qigong exercisers, who are generally low-stressed and highly energized, which suggests that they are in the calm energy state (Thayer, 2001). Qigong exercise enables them to reach a state of wellness, which is their main objective in performing healthy exercise. As a group, they report multifaceted health benefits from qigong exercise that are similar to the findings by Lee et al. (2003b), and similar to findings in the qigong literature, and also similar to health benefits from more vigorous exercise (cf. Pedersen & Saltin, 2006; Warburton, Nicol, & Bredin, 2006). This suggests that qigong exercise can be used as a complement or alternative to vigorous exercise when striving for health improvements and calm energy. The improved feeling of health correlates positively with concentration on qi-flow or movements during exercise; concentration (a quality exercise aspect) seems to be a key function for health improvements. The concentration level during exercise also correlates positively with qigong

exercise adherence. It is suggested that the deep concentration attained during exercise is suggested to take individuals into the “qigong state” (Cohen, 1997; Fan, 2000) and thereby facilitates a relaxation response (Benson et al., 1974) that supports recovery from stress. It seems that those who can concentrate on qi-flow or movements during exercise receive more benefits from it, and that they thereby adhere to the exercise to a greater extent.

It is mainly elderly (mean 58 years), and well-educated (57% have studied at university) females (85%), who perform Biyun medical qigong exercise in Sweden, and increasing age is likewise associated with qigong adherence (0.40,  $p < .001$ ). Results indicate that qigong exercise is suitable for elderly people, as also was suggested by Kemp (2004). This can be explained by the low-intensity of the activity, and that individuals have more time for themselves with increasing age (e.g. after retirement). They are motivated to start and try qigong out of curiosity and for health reasons, and they maintain exercise over the years due to health improvements and a general feeling of wellness. Participants self-regulate with qigong exercise to a state of wellness. Striving for wellness was suggested as a self-regulating goal according to Tense-Energy Model (Thayer, 2001) that motivates behaviour changes. They exercise on average 4.8 sessions per week for a mean of 37 minutes. They exercise mainly at home (90%), in the morning (59%), and have done this for an average of 5 years. This is slightly less than the general qigong recommendation (cf. Fan, 2000), and more in line with clinical recovering studies (see introduction section), which may indicate the necessary amount of exercise for staying in calm energy state.

Beside qigong exercise, respondents in Study I engage in other physical activities such as walking and jogging 4.2 sessions per week for an average of 49 minutes. The extent of other kinds of exercise is in line with general recommendations for healthy exercise (cf. Haskell et al., 2007) and it therefore seems reasonable to expect them to express a feeling of wellness, but they did not. This is also shown in the non-significant correlation between other physical activities and improved health, indicating that qigong exercise has some stabilizing function in daily life.

The qigong exercisers practice voluntarily with high autonomy, are members of a qigong association and feel closely related to the qigong master who founded the style, and have high qigong competence with a mean of four qigong courses. They seem to fulfil human social needs with the activity. Fulfilling these needs would be beneficial for exercise adherence, in line with Self-Determination Theory (Deci & Ryan, 2000; see also Vlachopoulos & Neikou, 2007), and also for promoting a psychological feeling of wellness (Ryan & Fredrick, 1997). Intrinsic motives act as a driving force, silent goals, for exercise is associated with

maintaining, improved stress coping and increased well-being (Brown & Ryan, 2003; Vansteenkiste et al., 2004). Being in the calm energy state (low-stress and high energy, Thayer, 2001). Participants are mainly intrinsically motivated, and more concentrated and less stressful during exercise. The stimulation of high autonomy and intrinsic motives to exercise seem to be vital for long-term adherence.

Perceived stress correlates negatively with qigong adherence in the same way as for other physical activities (King et al., 1997; Stetson et al., 1997). Increased stress reduces health, energy, concentration and exercise frequencies. Perceived stress should be reduced before qigong exercise takes place in order to achieve high quality exercise, and thereby promote time for exercise, high concentration levels, and health improvements.

Participants with strong behavioural beliefs, i.e. exercise intentions at baseline, performed more exercise sessions than those with lower exercise intention. This is in line with earlier findings (Armitage, 2005) and the theory of planned behaviour (Ajzen & Madden, 1986). Behavioural beliefs (attitude, subject norms, and behavioural control towards the behaviour) and self-expectation effects are precursors for mood states (Stefano et al., 2001), and individuals self-regulate to improve moods (Thayer, 2001). This indicates how important it is to strengthen individual beliefs for increasing exercise adherence and promoting healthy recovery.

### *Exercise and health*

Participants had a relative low health level before starting with qigong exercise. Their relative balanced Body Mass Index, BMI 24, (height 168 cm, body weight 67.5 kg) indicates a normal healthy recommended body mass, and the frequency of physical activity, 4.2 sessions per week for 49 minutes, is thought to be sufficient for maintaining good health compared to general activity recommendations (cf. Haskell et al., 2007), but the participants did not perceive good level of health. Participants improved their health level after qigong exercise. There were no significant correlations among other physical activities, qigong exercise frequency and health improvements (all  $p$ s > .05). There was significant correlation between concentration level during qigong exercise (a qualitative exercise aspect) and health improvements ( $p$  < .05). This indicates that exercise frequency is less important for psychological feelings of health and wellness, which does not correspond with the positive correlation assumption between exercise frequency and health improvements. This is more in line with Lindvall and

colleagues' (2008) suggestions that low intensity exercise is associated with mental health improvements.

After qigong exercise the health of the participants improved except for a minority group who still needed to rehabilitate health. Those who did not improve their health and still needed to recover had significantly higher stress levels than those who managed to recover their health ( $t [76] -8.6, p < .001$ ). Stress correlates negatively with energy, health and exercise variables independent of activity (King et al., 1997; Stetson et al., 1997). Perceived stress seems to be the “big issue” in daily life. To struggle with energy, health and exercise behaviour, and prolonged stress may lead to acute health implications or chronic diseases (Goldstein & Kopin, 2007). Long-term increased allostatic load with insufficient recovery periods could be the reason why organisms do not recover and thereby develop illnesses (McEwen, 1998, 2000; McEwen & Stellar, 1993). The strategy must therefore be to reduce stress and increase energy to make it possible for qualitative qigong exercise adherence and health recovery.

When participants were asked about their life situations (unpublished material) before they started with qigong, their lives were described as hectic and stressful in several aspects and becoming unbalanced with declining health as a result. With increasing age (started with qigong at mean of 53 years) they had more time to spend for themselves, trying to “balance” life again. Participants succeeded to balance their daily life with qigong exercise and when asked to explain why, they mention a stop to a hectic lifestyle, an increased self-esteem, better self-knowledge, becoming more relaxed, more confident and with time to just be. Some even mention that they “can not live without qigong exercise”. This indicates that qigong exercise is used as a resource for balancing daily life (which explain their adherence) after recovering from un-health; qigong is thereby more of a tool than a target or goal in itself.

### *Recovery*

Modern qigong is performed almost in the same way as the original Dao-yin exercise (leading and guiding energy) prescriptions, which are more than 2000 years old (Cohen, 1997). Probably, at that time, qigong was developed to enhance human recovery through strengthening the life-force, and to focus on the “weakest link, the root of disturbance” first, not the manifestation (symptom) of disturbance (Chen, 2007). Perhaps this is illustrated by the missing causal

link between the reported multifaceted health benefits and qigong exercise frequency (see introduction).

The human organism is suggested to have a silent memory of wellness, and humans subconsciously self-regulate to stimulate wellness (Stefano et al., 2001). The subconscious striving for wellness is suggested to be part of peoples proactive recovering processes, which allow a long healthy life (Stefano et al., 2001). Beliefs about wellness influence the body's allostatic load (McEwen, 1998, 2000; McEwen & Stellar, 1993) and affect stress or relaxation responses (Benson et al., 1974; Stefano et al., 2001), Figure 4. Beliefs are generally considered important for enhancing recovery when using mind-body therapies (NCCAM, 2007; Price et al., 2008).

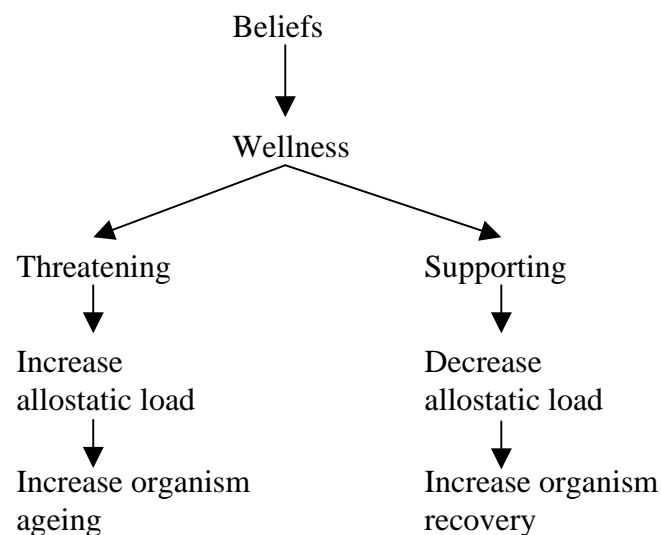


Figure 4. How beliefs affect ageing and recovering processes

Qigong exercise was probably developed, thousand of years ago, as a subtle mind-body therapy aimed at activating proactive recovery processes (Stefano et al., 2001). This was achieved with silent contemplation, slow movements, sounds, imageries, and self-talk (Arias, 2006; Chen, 2007; Cohen, 1997; Fan, 2000). A main reason to continue with qigong exercise is a psychological feeling of wellness; the majority of qigong exercisers in Study II are also intrinsically motivated, which is in line with Self-Determination Theory (Deci & Ryan, 1985a). Ancient texts suggest that the performer is “listening to intrinsic power” and focusing on “understanding intrinsic power” both considered as demonstrating the highest level of qigong exercise (Zhang & Rose, 2001).

According to qigong philosophy, the best effects from qigong exercise are achieved when in “the qigong state” (Chen, 2007; Cohen, 1997), a state similar to when a relaxation response is elicited (Benson et al., 1974). Study I also shows a positive correlation between concentration (on silent contemplation, slow movements, qi, sounds, imageries or self-talk) and improved health and energy levels. Concentration ability, as a qualitative aspect in exercise, is the single most important skill in qigong exercise. Concentration also correlates positively with feelings of increased energy levels and the ability to set the time for exercise; suggesting that qigong should be practiced when there is a calm situation at hand (cf. calm energy state; Thayer, 2001) in order to produce the best effects.

Qigong exercise is frequently suggested as an effective stress management technique (Chen, 2007; FYSS, 2008; Lee et al., 2004a; Linder & Svärdsudd, 2006). This is debatable, if the intention is to perform qigong exercise when stress levels are high. Results from Study II shows that perceived stress correlates negatively with health, energy and all exercise variables (all  $p$ s > .001). It seems particularly difficult to stay concentrated during exercise if feeling stressed, and the effectiveness of qigong exercise is thereby most likely reduced, making it less effective for stress management purposes. Qigong has shown to be effective on stress related symptoms (cf. Lee et al., 2000a; Lee et al., 2002), and is probably effective in recovery after a stress reaction. Qigong exercise is probably a subtle mind-body therapy activating human’s proactive recovering processes (Stefano et al., 2001), and should be used to recover body functions when it is possible. This is also suggested in qigong philosophy (e.g. Zhang & Rose, 2001), Dao-yin exercise (leading and guiding energy) or qigong exercise (working with life-force or life-energy).

When using qigong exercise for proactive recovering processes, how much exercise is needed to reach a general feeling of wellness over time? The answer is highly individual and probably also fluctuates during the year for the same individual. If the exercise goal is to reach a general feeling of wellness when in the calm energy state (Thayer, 2001), individuals first have to rehabilitate into a state of low-stress and high energy. As indicated in the Introduction, individuals with major diseases should practice one to three times per day for several months, or until they reach the calm energy state. To keep balance in daily life and maintain a calm energy state, exercisers should probably perform qigong approximately three to six times per week for 30 minutes. Exercising three to six times per week is in line with clinical findings for good recovery effects (introduction literature), and there seems to be no difference in mood stabilisation (eliciting relaxation responses) between 30 or 60 minutes exercise bouts (Johansson & Hassmén, 2008). This could indicate that several shorter, 30 min, exercise

bouts per day are more effective than few longer exercise bouts. It is probably important with higher quality exercise, maintaining concentration during exercise, with shorter exercise bouts, to achieve recovery effects. Instead of frequency (quantitative) recommendations from health-professionals, it may be more effective with mood and concentration (qualitative) recommendations, so that exercise is performed in the calm energy state (Thayer, 2001) until wellness is perceived.

### *To be or to do mindful exercise?*

In Eastern cultures when people feel ill they often ask “how to be” to improve health, or as the philosophy saying, “seize the day” (carpe diem). To be here and now without evaluating thoughts is the core in Mindfulness Meditative Movement exercise (M<sub>3</sub>; AHRQ, 2007; Blom & Bremberg, 2008; Åberg, Whalberg, Sköld, & Nygren, 2006), this is also the core in qigong exercise (Chen, 2007). As soon as the evaluating process starts, the mindfulness cease to exist, and thereby reduces recovery effects (cf. eliciting the relaxation response, Benson et al., 1974; and above sections). “To be” is thereby the aim to strive for in mind-body exercise.

In Western cultures when people feel ill they often ask “what to do”, what drugs or foods should be taken? Sometimes even asking what exercise to perform to improve health? “To do that to reach that” is the evaluating core when striving for exercise benefits such as increased oxygen uptake or muscular strength. The general attitude in Western societies when performing physical activities is to evaluate “to do”, and when doing so the mind is occupied with evaluating exercise results. This evaluating behaviour seems to counteract the benefits of mindful meditation.

The difference in general attitude towards exercise behaviour between the two cultures could be the causal differences when studying mindful exercise and recovery effects (cf. above sections). When health and exercise professionals recommend mind-body exercise today, do they recommend, “to be” state or “to do” exercise? If they are recommending one, but expect results associated with the other, disappointing conclusions can be predicted. According to this discussion, health and exercise professionals are suggested to encourage “to be” as the motivation and intention “goal” in qigong exercise.

### *Qigong adherence*

Moods associated with feeling stressed out and lacking energy may be the reason why individuals need to change their lifestyle and include qigong exercise in their daily lives. Comparing results and the above discussion with psychological theories and models may improve prescriptions and adherence to qigong exercise. Behaviour change, including qigong into daily life, is a process over several stages of change (Prochaska & DiClement, 1983). It may start in a clinical situation, when an individual is stressed out and lacks energy (tense tiredness state, Thayer, 2001), and given a qigong prescription to perform *self-care leisure-time medical qigong exercise for wellness*.

The sedentary individual is then assumed to be in the *contemplation stage*, reflecting over prescriptions, qigong behaviours pros and cons. When the advantages are stronger than disadvantages, the individual progresses into the *preparation stage* where he or she prepares, learns and starts to adopt the new behaviour. The behaviour is adopted in *the action stage* and after a period of regular exercise it is integrated into daily life, *the maintenance stage* (Prochaska & DiClement, 1983). Motivation towards the behaviour, *self-care leisure-time medical qigong exercise for wellness*, can be seen in three motivational dimensions, global, contextual and situational motives according to the hierarchical model of motivation (HMM; Vallerand, 1997). The *global* motive is to learn self-care for health reasons (motives for starting with qigong are curiosity, friends etc. 48%, low-intensity activity 9%, health promotion 19%, health recovery 24%; Study I). *Contextual* motives are health recovery with daily leisure-time exercise (three to six sessions per week for 30 minutes; Study I), and *situational* the exercise bout (with deep concentration on qi flow in qigong state, feeling wellness; Study I). The hierarchical model of motivation assumes that individuals transform, top down, from global to situational motives for the behaviour. The, top-down motives also alter across the stage of changes (TTM), and thereby affect the consideration of pros and cons. How global, contextual and situational motives change through stages, and how self-determination motives, planned behaviour intentions interact with qigong exercise and tense-energy model are described below.

*The global motives (HMM) in the preparation stage (TTM)* are motives to change habits for health reasons (Lee et al., 2003b, Study I, III). Mood motivates our behaviour and individuals self-regulate to improve moods (Thayer, 2001). The purpose of this stage is therefore to learn self-care strategies and qigong exercise as a way to improve moods, Figure 5.

Those who are stressed out and lack energy are in the tense tiredness state and those who feel wellness are in the calm energy state (Thayer, 1996, 2001). People who had applied for a beginner's course (being in preparing stage, TTM) are spread in the four high-low tense energy fields, and those in a tense tiredness state had the lowest grade of adherence and those with low stress and high energy had the highest grades of adherence (Study III). The goal of self-care is to enter calm energy state in which it is possible to exercise and feel wellness (Study II). When stress levels decrease energy levels increase and vice versa (Study II, III). Stress levels have to be reduced before wellness occurs. Thayer (2001) illustrates how a "normal" individual's energy curve fluctuates during the day. A normal energy curve increases until lunch, decrease during the afternoon, and has a small rise in the early evening, and thereafter declines during sleep. A tense curve follows the energy curve until lunch and then rises during the afternoon above the normal energy curve, and thereafter decline during sleep. Problems occur when the tension rises and energy decreases, because if this continues, one enters the tense tiredness state. In Study II and III energy is shown to correlate positively with concentration and concentration correlates with health improvements. This suggests that qigong exercise should be used when energy is high in order to secure the qualitative aspect of concentration during exercise and thereby eliciting a relaxation response. This can be difficult when tension is high as stress correlates negatively with concentration (Study II, III). The strategy is therefore to perform qigong when energy is high and deal with the tense curve in the afternoon with other physical activities. Thayer (2001) suggests exercise as walking for 5 to 10 minutes is enough to decline tense levels in the afternoon. The mechanism of walking is not to increase energy expenditure it is more of a "time out or distraction" from tense thoughts.

Extrinsically introjected motives (SDT; Deci & Ryan, 1985a), such as health improvements, are the dominating psychological drive for qigong exercise in preparation stage (TTM, Study III) and have to be dealt with as global (HMM) extrinsic motives for behaviour change. If learning exercise (qigong) skills is "just another thing to do", it might increase stress levels and thereby reduce behaviour adherence. It is therefore important to stimulate social needs as supporting autonomous choice for the individual tense-energy curve and the way to use exer-

cise and to create a self-identity and relatedness to others, and promote behaviour competence (setting of time for exercise, finding an exercise place etc., SDT, Study I) to secure qigong exercise adherence.

One can define global behaviour according to the theory of planned behaviour (TPB; Ajzen & Madden, 1986) and TACT (Target, Action, Context, and Time): striving for a *Tense-energy strategy*, learning to manage tense-energy curves and medical qigong exercise skills, every day, at home or in the clinic, (with deep concentration on movements), for several weeks. Whereas *Target* is striving for a Tense-energy strategy, *Action* is learning how to manage tense-energy curves and medical qigong exercise skills, *Context* (global) is at home or in clinic, (with deep concentration on movements), *Time* is several weeks.

Summing up *global* motives and *preparation* stage, Figure 5. Behaviour, according to TACT, learning self-care (tense-energy strategies and qigong exercise) and to secure continuing behaviour, individual should constantly and *autonomously* work with the *attitude*, *subject norm* and *competence* towards the behaviour and put it into *relatedness* in community. These motives and beliefs should be fulfilled before entering into the action stage.

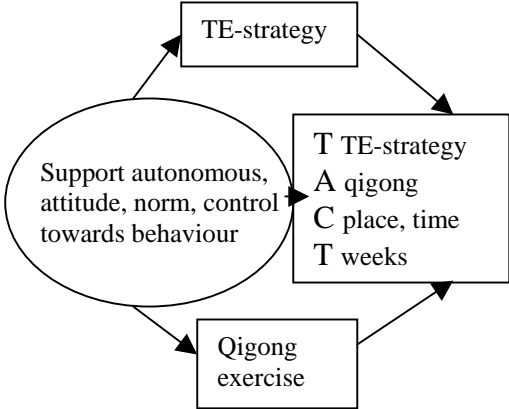


Figure 5. Support of self-determination and planned behaviour in preparation stage.

*Contextual motives* (HMM) in *the action stage* (TTM) are motives to rehabilitate and recover health using qigong exercise and other physical activities (Lee et al., 2003b; Pedersen & Saltin, 2006; Study I, II). The purpose at this stage is to recover into the calm energy state (TEM) and develop a qigong exercise competence, Figure 6.

The low moods in the tense tiredness state are reasons to change behaviour but do not support behaviour adherence (Study III), and motives to rehabilitate and recover into calm energy (TEM) must overcome the obstacle of low mood in order to attain behaviour adherence. Qigong literature suggests that individuals should exercise twice a day in order to rehabilitate health (e.g. Chen & Turner, 2004; Fan, 2000) and this should be done when energy is high (TEM, Study II). Individuals should also perform other physical activities when the tense curve peaks (Thayer, 2001). This exercise behaviour should be developed and done according to individual's tense-energy curves.

Extrinsic motives start to change into more intrinsic motives during transition through the stages (Ingledeu et al., 1998; Study III). Participants in the calm energy state (TEM) are mainly intrinsically motivated, more concentrated and less stressful during exercise. It is thus important to stimulate intrinsic motives to qigong exercise (Study II) and fulfil social needs. This will reinforce autonomous choice in dealing with the individual tense-energy curve and exercise behaviour. Create relatedness to others, and secure behaviour competence (set of time for exercise, find an exercise place etc.) to promote adherence (SDT, Study I).

It is important to define contextual behaviour according to TPB and TACT: Strive (rehabilitate) for *Calm energy*, perform 30 to 60 minutes leisure-time medical qigong exercise, twice per day all week, at home in the morning and evening, with deep concentration on qi-flow in qigong state, for months (clinical literature). Where the Target is Calm energy, the *Action* is 30 to 60 minutes leisure-time medical qigong exercise, twice per day all week, *Context* at home in the morning and evening, and *Time* is the coming months.

Summing up *contextual* motives and *action* stage, Figure 6. Behaviour. According to TACT, to improve mood (health) and recover calm energy and to secure behaviour adherence, the individual should constantly and *autonomously* work with *attitude*, *subject norm* and *competence* towards the behaviour in *relatedness* to his community. These motives and beliefs should be fulfilled before entering into the maintaining stage.

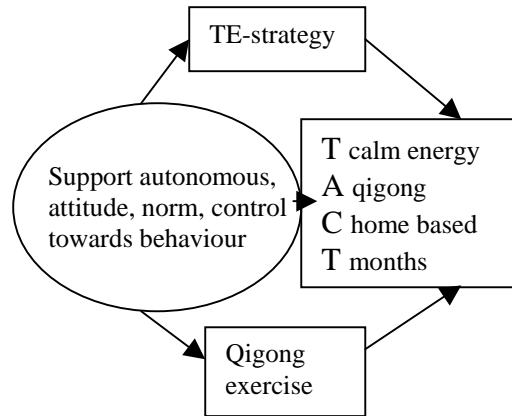


Figure 6. Support of self-determination and planned behaviour in action stage.

*Situational* (specific) motives (HMM) in *maintaining* stage (TTM) are motives to perform exercise bouts with deep concentration on movements and qi-flow, in qigong state, to eliciting relaxation responses (Benson et al., 1974), and attain feelings of wellness, Figure 7.

In this situation individuals are recovered into the calm energy state (Study II), know how to reduce stress and increase energy (TEM). They are able to perform self-care with leisure-time medical qigong exercise for wellness (Study I, II). This self-care could be the bodies' own healing process, the silent memory of wellness (Stefano, 2001), and the feeling to strive for.

Intrinsic motives (SDT), such as psychological feelings of wellness, are the dominating psychological drive for qigong exercise in the maintaining stage (Study II). Stimulating intrinsic motives to qigong exercise may improve stress coping, concentration abilities (Brown & Ryan, 2003), and health outcomes. Also satisfying social needs such as autonomy, relatedness and competence with qigong exercise may improve feelings of vitality and well-being (Gagné et al., 2003) in daily life. Intrinsic motives such as psychological drive for qigong exercise may also support the “silent memory of wellness and recovery processes” (Stefano et al., 2001) and the self-regulation towards improved moods.

The specific behaviour that can be defined according to TPB and TACT is: striving for *Wellness* in daily life, performing 20 to 40 minutes leisure-time medical qigong exercise, three to six sessions per week, with deep concentration on qi-flow in qigong state, for years (Study I, II). When the *Target* is *Wellness*, *Action* is performed 20 to 40 minutes qigong exercise, three to six sessions per week, *Context* (specific) with deep concentration on qi-flow in qigong state, and *Time* is several years.

Summing up *situational* motives in the *maintaining* stage, Figure 7. Behaviour according to TACT, creates wellness, and in order to secure behaviour adherence, individual should constantly and *autonomous* work with the *attitude*, *subject norm* and *competence* towards the behaviour and put it into *relatedness* in community, to support an active lifestyle.

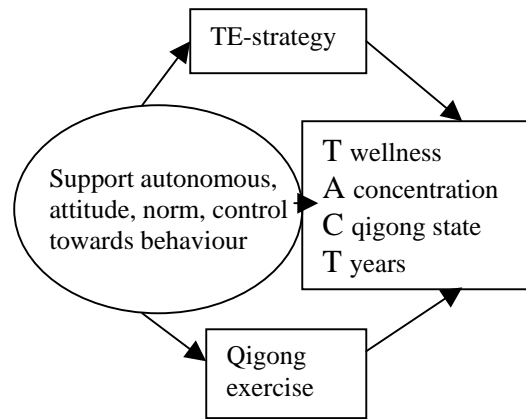


Figure 7. Support of self-determination and planned behaviour in maintaining stage.

## Wellness Coaching Model

Based on previous research, relevant psychological theories, and results from the three studies included in this thesis, a number of qigong exercise adherence suggestions are summarized into a Wellness Coaching Model (WCM). Three assumptions are essential for supporting behaviour changes in relation to the Wellness Coaching Model. The first assumption is that behaviour is motivated by moods, and that human self-regulate to improve moods (Thayer, 2001). The second assumption is that humans have a silent striving after wellness and self-regulate towards wellness in order to stimulate recovery functions (Stefano et al., 2001). The third and final assumption is that the suggested lifestyle change, exercise in this thesis, must render wellness to secure long-term adherence (Brown & Ryan, 2003; Vansteenkiste et al., 2004).

The Wellness Coaching Model is presented in Figure 8. The model suggests a *tense-energy strategy*, *exercise* (physical activities as qigong), *autonomous support* (SDT; Deci & Ryan, 1985a) towards the behaviour, and strengthening *behaviour intention* (TPB; Ajzen & Madden, 1986). The *perceived behaviour* is an active lifestyle, in calm energy state, supporting wellness. *Tense-energy strategy* is to understand the individual's stress-energy curve fluctuations, and self-regulating strategies to reduce stress and increase energy. It is suggested that the concept of "life-stress" should be incorporated in behavioural changing models (Nigg et al., 2008). Strategies in behaviour changing processes are important self-regulating mechanisms that may improve physical exercise behaviour (Zieglmann & Lippke, 2007). *Exercise* is the adoption of an activity that creates wellness. *Autonomous support* is a coaching process to stimulate intrinsic exercise motives. It is vital that activities fulfil the social needs of autonomy, relatedness, and competence. *Behaviour intention* means further coaching of strengthening attitudes, subject norms, and actual controls towards defined behaviour (TACT; target, action, context, time). It has been observed that perceived autonomy support assists the social influences on intentions and perceived exercise behaviour (Chatzisarantis, Hagger, & Brickell, 2008). The theory of 'planned behaviour construct' is more powerful in predicting exercise behaviour than a physically active lifestyle changes, indicating that behaviour definition according to TACT is important for the model (Bellows-Riecken, Rhodes, & Hoffert, 2008).

Behaviour changes across stages (TTM; Prochaska & DiClement, 1983) are more of a coaching process than a training (exercise) process, and different steps may be in stronger focus depending on profession. This seems to be especially effective among older adults

(Burbank, Reibe, Padula, & Nigg, 2002; Findorff, Stock, Gross, & Wyman, 2007; Muse, 2005; Resnick & Nigg, 2003). Health professionals may focus on health improvements, and prescribe physical activities to recover and rehabilitate from diseases. Exercise professionals may focus on teaching exercise skills where the activity itself is target. Lifestyle coaches may have a more holistic view on the life situation and target on behaviour change, to support a physical active lifestyle, and attain an overall feeling of wellness. The three professions have different “skills”, and main focuses, but should nevertheless be aware of behaviour changing theories and should “target” on the client’s adherence to a physically active lifestyle. If this is not the case, the single professions could sub-optimize the changing process according to presented theories.

Copyright © John Jouper

## Wellness Coaching Model

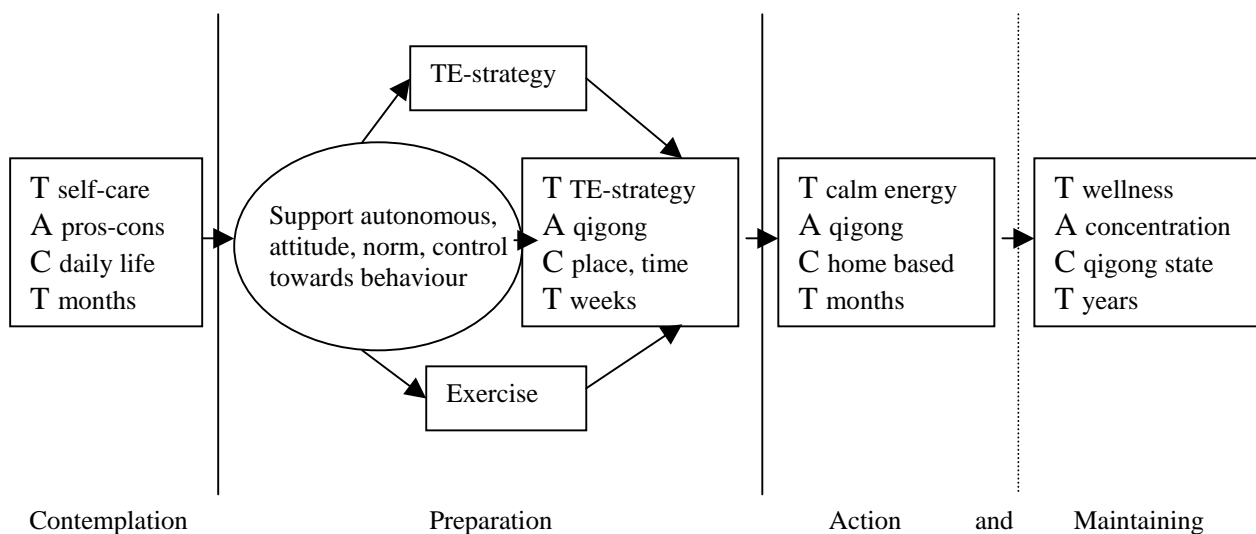


Figure 8. Wellness Coaching Model by John Jouper.

The following suggestions may help the three professions in their attempts to attain behaviour changes and qigong exercise adherence. Health professionals may prescribe the four different behaviours described in Figure 8. Exercise professionals should focus on creating a “qigong state”, enhance concentration on qi-flow, and striving for wellness, instead of focusing on movement perfectionism, and exercise frequencies. Lifestyle coaches may focus on how, when and where to exercise according to stress and energy fluctuations (TEM), support the behaviour to satisfying social needs (SDT), and strengthening behavioural beliefs (TPB).

## **Methodological issues**

This section is a discussion about the research process and the validity and reliability of results. The discussion starts with the aims and limitations in the literature, and continues with a selection of qigong exercisers and ethical considerations, weakness and strength in data collection, and concludes with some generalisations.

The aims are stated to explain the limitations in literature, and the limitations are described in the introduction section. It seems reasonable to first explore “if there was any regular qigong exerciser in Sweden” to investigate. This was done in Study I (qigong in daily life). After this knowledge had been added to the literature the question about motivation drive for this behaviour seemed important, and Study II was conducted (motivation to exercise). The next problem was the behaviour changing process. The intentions to adopt the new behaviour have to change before the actual behaviour is changed. How behaviour intention is associated with qigong exercise adherence is investigated in Study III (intention to exercise).

Participants included in the studies were recruited from a medical qigong association and from beginners' courses in medical qigong. Participants are therefore representative for the investigated population. Sample sizes can be deemed satisfactory for statistical analysis (Francis et al., 2004). All participants were informed about the studies, the voluntary and anonymous participation, and that the result were to be published in scientific journals, and by answering questionnaires they also provided their written consent to take part in the studies. The American Psychological Association ethical standards have thereby been followed. The data material is subjective self-reported data from individuals who are dedicated to qigong exercise and probably have a favourable attitude towards qigong, and thereby answers in a positive way. Systematically overrating could result in overestimated effect results. This is not so critical in longitudinal studies where the relation between two variables are the same independent of over or underestimation; it is more critical in cross-sectional studies such as Study I and II. Analysis and conclusions were made with this in mind.

Health and Concentration variables were measured with a single item, 10-point Likert scale. This could reduce variable validity and reliability; using more items per variable would strengthen variable validity and reliability in future studies. Energy level correlates positively with Health. The concept of Energy is essential when people describe their own health, and energy level may act as the single general barometer for people's health (Dixon, Dixon, & Hickey, 1993). Energy level is also suggested as a precursor to feelings of wellness, vitality and good health (cf. Thayer, 2001) and could thereby be used as an indicator for health in-

stead of one single health-item. On the other hand self-rated health with a single item have been found as a stable predictor of mortality among elderly (Mossey & Shapiro, 1982). Measuring Concentration with a several item questionnaire immediately after a qigong session could turn the focus to the questionnaire instead of catching the feeling during exercise. When measuring Concentration capability, as a baseline predictor, one should use a multi-item questionnaire to improve validity and reliability.

The Sport Motivation Scale (SMS; Pelletier et al., 1995) measures motivation to sport, not to exercise or qigong. The scale was modified by changing sport into exercise (Study III) and qigong (Study II) to allow respondents to relate to the questions. Here it had been possible to choose a validated exercise scale and validate a qigong scale that corresponds to motivation concept in self-determination theory. The conceptual framework of intrinsic, extrinsic, and amotivation were not changed among scales using exercise and qigong instead of sport, and thereby the theory is not affected. This was the reason for using a modified Sport Motivation Scale. It could be an advantage to use the same scale in a longitudinal study, changing substituted words (sport, exercise, qigong) among stages (cf. TTM; Prochaska & DiClement, 1983) instead of changing scales between stages.

The theory of Planned Behaviour questionnaire, PBQ, was developed as suggested (Francis et al., 2004) from clinical observations and the general recommended exercise behaviour. Every single item was tested and revised on a minor qigong group to increase validity. The final PBQ was reliability tested by a test-re-test and Cronbach alpha was found to be .87. One problem is that clinical observation or general exercise recommendations are valid only in one specific context, and behaviour changes as a process crosses several contexts and motivational levels. This suggests that the planned behaviour questionnaire should be developed for contexts during prediction from stage to stage (Prochaska & DiClement, 1983) in order to secure good validity and reliability in future studies.

Adherence to qigong exercise is in focus in this dissertation. A weakness in design is the missing longitudinal adherence follow-up (Study III) and thereby also possibilities to measure effects. Study III had that possibility, but participants were spread all over Sweden and the research process interrupted, according to the instructors', their "pedagogic educational process", and some felt they did not achieve the right "qigong feeling" during the course, and the longitudinal follow-up was therefore hampered. In longitudinal effect studies and in order to observe behaviour changes across stages, an experimental randomized controlled design is preferable. It is not possible to draw causal conclusions from a cross-sectional study, the use

of “prediction” in Study I is therefore not correct. “Associated with” is a better term illustrating the correlation between variables.

The Stress and Energy Scale (Kjellberg & Wadman, 2002) was chosen to fit into the Tense-Energy model (Thayer, 2001), and for adherence analysis. A weakness is the missing possibility to compare qigong exercisers levels of stress, energy and health (quality of life) with general population studies. This could be done with a more common scale as SF-36 (Sullivan & Karlsson, 1994). This is recommended in future studies.

The advantage of cross-sectional design is the large sample of experienced participants expressing their exercise behaviour (Study I) and their motives for carrying out the exercise behaviour (Study II). The relative large sample in Study III also made it possible for acceptable correlation and prediction conclusions. Concentration, the qualitative aspect in qigong exercise, correlates positively with health and indicates a key function in qigong exercise. Concentration as a key function to attain health effects in qigong exercise has been mentioned in anecdotic literature but never (as I know) measured and discussed in scientific literature. As concentration seems to be a major predictor for exercise quality, an important challenge for future research will be to develop an instrument for measuring this.

Participants were mainly well-educated older females who were physically active. Results cannot be generalised to the male population, or to children and youth.

## Future studies

The evidence for making recommendations for qigong exercise for health promotion purpose is acceptable, but the same does not apply for recommending qigong exercise for specific diseases and therefore has to be further investigated. The major areas for qigong research are still (1) clinical effect studies on specific diseases, (2) exercise guidelines to reach specific goals, (3) qigong adherence, (4) qigong exercise mechanisms, and (5) meaningful outcome measures (cf. introduction). In a way it is understandable why it is so confusing among (2) guidelines for (1) specific diseases, (3) outcome measures, and (4) mechanisms. Outcome measures should be comparable to specific diseases and the amount of exercise, but if the results, effects, are more general (multifaceted) than specific, it is difficult to establish causal effects between exercise frequency and effects on specific disease. The art of qigong exercise with mechanisms as eliciting relaxation responses (qigong state), expectation effects (psychological beliefs), qi (physical energy), mechanical movements, and general multifaceted recovering effects may explain the confusion.

Some studies using qigong exercise to rehabilitate from chronic illness have been designed with instructions from a Master instructor once a week over 8 to 14 weeks and with little self practice beside the instructions. Findings show low health effects with increasing drop out over time (e.g. Astin et al., 2003; Mannerkorpi & Arndorw, 2004; Reuther & Aldrige, 1998; Wenneberg, Gunnarsson, & Ahlström, 2004). If the instructions, given once a week, are provided by a physiotherapist who is solely focusing on external movements, thereby failing to encourage the desired qigong state, concentration on qi-flow, and strengthening psychological beliefs, the results are probably poor with no measurable effects.








Using qigong exercise to rehabilitate chronic conditions may be designed with Master instructions twice a day over several months, focusing on qigong state, qi-flow and attaining a feeling of wellness. The recovery process should be followed with both general multifaceted health variables and specific variables for chronic diseases, as well as performed exercise behaviour.

For the qigong adherence investigations the hypothesised concept above, Wellness Coaching Model, has to be tested in future clinical longitudinal studies, both in environment and contexts of physical education, leisure-time exercise, clinical chronic conditions and among professional athletes. Special attention should be given to behaviours in different stages during development of the planned behaviour questionnaire.

## Concluding remarks

A sedentary lifestyle with physical inactivity is identified as a major public health concern in many Western societies. The reasons given for not adopting an active lifestyle include old age, negative social and physical environments, too vigorous exercise, physical disability and other health related issues. It is possible to perform this low intensity qigong exercise in old age, at home, with physical disabilities, and with poor health. The ability to concentrate on qi-flow or movements during exercise and the ability to elicit a relaxation response, seem to be beneficial skills in qigong exercise to attain health benefits. The main reason for adopting and maintaining a regular qigong exercise regime is related to health improvements and a general feeling of wellness. Performing qigong exercise twice daily is probably beneficial for health rehabilitation, aiming for a state of calm energy with a general feeling of wellness. Exercising three to six times per week with deep concentration on qi-flow, and striving for wellness helps to maintain a low-stressed and high-energized life. Regular qigong exercise in daily life has the potential to support healthy ageing.

### *Conclusions*

-  Leisure-time medical qigong exercise is suitable for older adults, and may be used as a complement or an alternative to other physical activities when striving for wellness and health benefits.
-  Improved feelings of health and wellness are positively associated with qigong exercise adherence.
-  Concentration level during qigong exercise is positively associated with improved feeling of health and qigong exercise adherence.
-  Exercise frequency is less important for improved feelings of health as compared with concentration level during exercise (mindful exercise).
-  Perceived stress is associated with reduced levels of health, energy, concentration and amount of exercise.
-  Intrinsically motivated individuals performing leisure-time medical qigong exercise are more concentrated and less stressful during exercise.
-  Strong behaviour intentions before qigong intervention increase qigong exercise adherence.



## SWEDISH SUMMARY/SVENSK SAMMANFATTNING

### Qigong i vardagen, motivation och intention till njutbar träning

Qigongträning rekommenderas som en lågintensiv hälsofrämjande aktivitet och kan vara ett alternativ eller komplement i ett annars fysiskt inaktivt liv. Fysisk inaktivitet ses som ett folkhälsoproblem i många länder och ett generellt mål för folkhälsan är att främja en livslång fysiskt aktiv livsstil. Några orsaker till fysisk inaktivitet är att aktiviteterna är för ansträngande, hög ålder, negativa fysiska och sociala miljöer, handikapp och sjukdomar. Den lågintensiva qigongträningen har föreslagits som ett komplement och alternativ speciellt till äldre människor som har svårt med ansträngande träning. Kunskapen om qigong i vardagen och motiven till träning är dock begränsad. Syftet med denna avhandling är därför att undersöka qigong, samt hur motivation och intention till träningen är relaterad till faktisk qigongträning i vardagen. Deltagarna rekryterades från föreningen Gröna Draken och från nybörjarkurser. Data samlades in med frågeformulär och analyserade med korrelations, medelvärdes, standardavvikelser, t-tester samt regressionsanalyser. Resultaten visar att qigongträning är lämplig för äldre människor, och att de använder den för att rehabilitera och främja sin hälsa. Koncentrationen på qi-flödet under träning har ett positivt samband med upplevelsen av en förbättrad hälsa och ett ökat välmående. I strävan efter välmående tränar deltagarna i genomsnitt 30 minuter tre till sex gånger per vecka. Uppkommen stress minskar upplevelsen av hälsa, energi och träningsbeteende, därför måste stressen reduceras innan ett tillstånd av välmående uppnås. De som tränar för att tillgodose inre motiv är signifikant mer koncentrerade och mindre stressade under träningen. Träningsfrekvensen ökar med ökad träningsintention. Resultaten sammanfattas i en Wellness Coaching Model och föreslår att hälsoarbetare som vill stimulera till ett livslångt aktivt liv, ska stimulera känslan av välmående som inre motiv och intention till qigongträning. Stimulera en strategi som minskar stress och ökar energin för att underlätta träningen, samt att träningen genomförs i en qigong-state med djup koncentration på qi-flödet.

Nyckelord: Qigongträning, mindfulness, livsstil, motivation, intention, stress.



## ACKNOWLEDGMENTS

I would like to express my warm and sincere gratitude to all those who have contributed to this thesis. Specially in mind are:

Those who believed in my project and financed it. I finished my dissertation with economic support from *SparbanksStiftelsen Nya* and *Örebro University* (School of Health and Medical Sciences, Sport Science).

The qigong association, *Green Dragon*, that made it possible to come in contact with participants, and all *participants* for their patience with answering questionnaires.

My supervisor *Peter Hassmén* for his “classic pedagogic skills” that taught me many new things about my self and the research process. Also his family *Nathalie, Daniel, and Sophia* are in my mind for their warm support and care.

My friend *Hanna Arneson* who wanted to be a friend instead of assistant supervisor, she criticized my work “honestly and fairly” over several cups of coffee.

The survival groups: My colleagues *Henrik Gustafsson, Kerstin Norman, and Helena Ragnarsson* for their daily “work and sport” support. My mother *Gudrun Jouper* and my sister *Åsa Jouper-Jaan* for their “family academic” support, and my parents in law, *Jan-Erik and Ingalill Häglund*, for their never ending care of my family.

The academic group and my research colleagues: *Helena Andersson, Karin Andersson, Mattias Folkesson, Anders Hedén, John Hellström, Sören Hjälms, Jenny Isberg, Mattias Johansson, Jing Li, and Carolina Lundqvist* who shared my writings “blood, sweat and tears”.

To all other colleagues and friends who have encouraged me, you are in my mind.



## REFERENCES

- AHRQ. (2007). *Meditation practices for health: State of the research*. Agency for Healthcare Research and Quality, number 155.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Processes*, 50, 179-211.
- Ajzen, I., & Madden, T. J. (1986). Prediction of goal-directed behavior: Attitudes, intentions, and perceived behavioral control. *Journal of Experimental Social Psychology*, 22, 453-474.
- Arias, A. J., Steinberg, K., Banga, A., & Trestman, R. T. (2006). Systematic review of the efficacy of meditation techniques as treatment for medical illness. *The Journal of Alternative and Complementary Medicine*, 12, 817-823.
- Astin, J., Berman, B., Bausell, B., Lee, W-L., Hochberg, M., & Forsy, K. (2003). The efficacy of mindfulness meditation plus qigong movement therapy in the treatment of fibromyalgia: A randomized controlled trial. *Journal of Rheumatology*, 30, 2257-2262.
- Armitage, C. J. (2005). Can the theory of planned behavior predict the maintenance of physical activity? *Health Psychology*, 24, 235-245.
- Beecher, H. K. (1955). The powerful placebo. *Journal of the American Medicine Association*, 159, 1602-1606.
- Bellows-Riecken, K. H., Rhodes, R. E., & Hoffert, K. M. (2008). Motives for lifestyle and exercise activities: A comparison using the theory of planned behaviour. *European Journal of Sport Science*, 8, 305-313.
- Benson, H., Beary, J. F., & Mark, P. C. (1974). The relaxation response. *Psychiatry*, 37, 37-46.
- Benson, H., Greenwood, M. M., & Klemchuk, H. (1975). The relaxation response: Psychophysiological aspects and clinical applications. *International Journal of Psychiatry in Medicine*, 6, 87-98.
- Benson, H., & McCallie, D. P. Jr. (1979). Angina pectoris and the placebo effect. *The New England Journal of Medicine*, 300, 1424-1429.
- Berger, B. G., Friedmann, E., & Eaton, M. (1988). Comparison of jogging, the relaxation response, and group interaction for stress reduction. *Journal of Sport and Exercise Psychology*, 10, 431-447.

- Biddle, S. J. H., & Ekkekakis, P. (2005). *Physically active lifestyles and well-being*. In Hupert, F. A., Baylis, N., & Keverne, B. (Eds.). *The science of well-being*, 141-168. New York: Oxford University Press.
- Blom, E. H. & Bremberg, S. (2008). "Mindfulness"- effekter på stressymtom och depression. [In Swedish: "Mindfulness"- effects on stress symptoms and depression]. Statens folkhälsoinstituts webcite, [www.folkhalsa.com/templates/page\\_7140.aspx](http://www.folkhalsa.com/templates/page_7140.aspx).
- Bouchard, C., Blair, S. N., & Haskell, W. L. (2007). History and current status of the study of physical activity and health. In Bouchard, C., Blair, S. N., & Haskell, W. L. (Eds.) *Physical activity and health* (pp. 1-20). Champaign, IL: Human Kinetics.
- Brown, W. A. (1998). The placebo effect. *Scientific American*, 278, 90-95.
- Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology*, 84, 822-848.
- Brown, D. R., Wang, Y., Ward, A., Ebbeling, C. B., Fortlage, L., Puleo, E., Benson, H., & Rippe, J. M. (1995). Chronic psychological effects of exercise and exercise plus cognitive strategies. *Medicine and Science in Sport and Exercise*, 27, 765-775.
- Buckworth, J., Lee, R. E., Regan, G., Schneider, L. K., & DiClemente, C. C. (2007). Decomposing intrinsic and extrinsic motivation for exercise: Application to stage of motivational readiness. *Psychology of Sport and Exercise*, 8, 441-461.
- Burbanks, P. M., Reibe, D., Padula, C. A., & Nigg, C. (2002). Exercise and older adults: Changing behavior with the transtheoretical model. *Orthopaedic Nursing*, 21, 51-62.
- Chatzisarantis, N. L. D., Hagger, M. S., & Brickell, T. (2008). Using the construct of perceived autonomy support to understand social influence within the theory of planned behavior. *Psychology of Sport and Exercise*, 9, 27-44.
- Chen, K. (2007). Qigong therapy for stress management. In Lehrer, P. M., Woolfolk, R. L., & Sine, W. E. (Eds.). *Principles and practice of stress management* (pp. 428-448). New York: Guilford Press.
- Chen, K., & Turner, F. (2004). A case study of simultaneous recovery from multiple physical symptoms with medical qigong therapy. *Journal of Alternative and Complementary Medicine*, 1, 159-162.
- Chow, Y. W. Y., & Tsang, H. W. H. (2007). Biopsychosocial effects of qigong as a mindful exercise for people with anxiety disorder: A speculative review. *The Journal of Alternative and Complementary Medicine*, 13, 831-839.

- Cohen, K. S. (1997). *The way of qigong. The art and science of Chinese energy healing*. New York: The Ballantine Publishing Group.
- Deci, E. L., & Ryan, R. M. (1985a). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum Press.
- Deci, E. L., & Ryan, R. M. (1985b). The general causality orientations scale: Self-determination in personality. *Journal of Research in Personality*, *19*, 109-134.
- Deci, E. L., & Ryan, R. M. (2000). The “what” and “why” of goal pursuits: Human needs and self-determination of behaviour. *Psychological Inquiry*, *11*, 227-268.
- Deci, E. L., & Ryan, R. M. (2002). *Handbook of self-determination research*. Rochester, NY: University of Rochester Press.
- Dixon, J. K., Dixon, J. P., & Hickey, M. (1993). Energy as a central factor in self-assessment of health. *Advances in Nursing Science*, *15*, 1-12.
- Downs, D. S., & Hausenblas, H. A. (2005). Elicitation studies and the theory of planned behaviour: A systematic review of exercise beliefs. *Psychology of Sport & Exercise*, *6*, 1-31.
- Epstein, L. H., Roemmich, J. N., Paluch, R. A., & Raynor, H. A. (2005). Physical activity as a substitute for sedentary behavior in youth. *Annals of Behavioral Medicine*, *29*, 200-209.
- Esch, T., Fricchione, G. L., & Stefano, G. B. (2003). The therapeutic use of the relaxation response in stress-related diseases. *Medicine Science Monitor*, *9*, 23-34.
- Eisenberg, D. M., & Kaptchuk, T. J. (2002). The placebo effect in alternative medicine: Can the performance of a healing ritual have clinical significance? *Annals of Internal Medicine*, *136*, 817-825.
- Fan, X. (2000). *Qigong enligt Biyun. Låt livskraften återvända* [In Swedish: Qigong according to Biyun. Allow the life force to return]. Stockholm, Sweden: Svenska Förlaget.
- Findorff, M. J., Stock, H. H., Gross, C. R., & Wyman, J. F. (2008). Does the transtheoretical model (TTM) explain exercise behavior in a community-based sample of older women? *Journal of Aging and Health*, *19*, 985-1003.
- Fletcher, G. F., Blair, S. N., Blumenthal, J., Caspersen, C., Chaitman, B., Epstein, S., Falls, H., Froelicher, E. S., Froelicher V. F., & Pina, I. L. (1992). Statement on exercise. Benefits and recommendations for physical activity programs for all Americans. A statement for health professionals by Committee on Exercise and Cardiac Rehabilitation of the Council on Clinical Cardiology, American Heart Association. *Circulation*, *86*, 340-344.
- Francis, J. J., Eccles, M. P., Johnston, M., Walker, A., Grimshaw, J., Foy, R., Kaner, E. F. S., Smith, L., & Bonetti, D. (2004). *Constructing questionnaires based on the theory of*

- planned behavior*. Centre for Health Services Research. University of Newcastle, United Kingdom.
- Fredrick, C. M., & Ryan, R. M. (1993). Differences in motivation for sport and exercise and their relations with participation and mental health. *Journal of Sport Behavior*, *16*, 124-146.
- FYSS. (2008). *Fysisk aktivitet i sjukdomsprevention och sjukdomsrehabilitering* [In Swedish: Physical activity in the prevention and treatment of diseases]. Ödeshög, Sweden: AB Danagårds Grafiska.
- Gagné, M., Ryan, R. M., & Bargamann, K. (2003). The effects of parent and coach autonomy support on need satisfaction and well-being of gymnasts. *Journal of Applied Sport Psychology*, *15*, 372-390.
- Gaik, F. V. (2003). *Merging east and west: A preliminary study applying spring forest qigong to depression as an alternative and complementary treatment*. UMI dissertation service, Pro Quest Company.
- Godin, G., & Kok, G. (1996). The theory of planned behavior: A review of its application to health-related behavior. *American Journal of Health Promotion*, *11*, 87-98.
- Goldstein, D. S., & Kopin, I. J. (2007). *Evolution of concepts of stress*. Clinical Neurocardiology Section, national Institute of Neurological Disorders and Stroke, Bethesda, MD USA.
- Green Dragon. (2008). Based on number of sold CDs and cassettes to instructors.
- Guo, X., Zhou, B., Nishimura, T., Teramuka, S., & Fukushima, M. (2008). Clinical effects of qigong practice on essential hypertension: A meta-analysis of randomized controlled trials. *The Journal of Alternative and Complementary Medicine*, *14*, 27-37.
- Hagger, M. S., & Chatzisarantis, N. L. D. (2007). *Intrinsic motivation and self-determination in exercise and sport*. Champaign, IL: Human Kinetics.
- Hagger, M. S., Chatzisarantis, N. L. D., Culverhouse, T., & Biddle, S. J. H. (2003). The process by which perceived autonomy support in physical education promotes leisure-time physical activity intentions and behaviour: A trans-contextual model. *Journal of Educational Psychology*, *95*, 784-795.
- Haak, T., & Scott, B. (2008). The effect of qigong on fibromyalgia (FMS): A Controlled randomized study. *Disability and Rehabilitation*, *30*, 625-633.
- Hagger, M., & Chatzisarantis, N. (2008). Self-determination theory and the psychology of exercise. *International review of Sport and Exercise Psychology*, *1*, 79-103.

- Haskell, W. L., Lee, I-M., Pate, R. R., Powell, K. E., Blair, S. N., Franklin, B. A., Macera, C. A., Heath, G. W., Thompson, P D., & Bauman, A. (2007). Physical activity and public health: Updated recommendations for adults from the American College of Sport Medicine and the American Heart Association. *Medicine and Science in Sport and Exercise*, 39, 1423-1434.
- Higuchi, Y., Kotani, Y., Higuchi, H., Minegishi, Y., Itami, J., Uh, T., & Manda, Y. (1997). Endocrine and immune changes during Guolin new qigong. *Journal of International Society of Life Information Science*, 15, 320-325.
- Hui, P. N., Wan, M., Chan, W. K., & Yung, P. M. B. (2006). An evaluation of two behavioral rehabilitation programs, qigong versus progressive relaxation, in improving the quality of life in cardiac patients. *The Journal of Alternative and Complementary Medicine*, 12, 373-378.
- Ingeldew, D. K., Markland, D., & Medley, A. R. (1998). Exercise motives and stages of change. *Journal of Health Psychology*, 3, 477-489.
- Iwao, M., Kajiyama, S., Mori, H., & Oogaki, K. (1999). Effects of qigong walking on diabetic patients: A pilot study. *Journal of Alternative and Complementary Medicine*, 5, 353-358.
- Jiang, Z. (1991). *The effects of qigong training on post workout anxiety, mood state, and heart rate recovery of high school swimmers*. UMI. Dissertation service.
- Jacobs, G. D. (2001). Clinical applications of the relaxation response and mind-body interventions. *The Journal of Alternative and Complementary Medicine*, 7, 93-101.
- Johansson, M., & Hassmén, P. (2008). Acute psychological responses to qigong exercise of varying duration. *The American Journal of Chinese Medicine*, 36, 449-458.
- Johansson, M., Hassmén, P., & Jouper, J. (2008). Acute effects of qigong exercise on mood and anxiety. *International Journal of Stress Management*, 15, 199-207.
- Johnson-Kozlow, M. F., Sallis, J. F., & Calfas, K. J. (2004). Does life stress moderate the effects of a physical activity intervention? *Psychology and Health*, 19, 479-489.
- Jones, B M. (2001). Changes in cytokine production in healthy subjects practicing Guolin Qigong: A pilot study. *BMC Complementary and Alternative Medicine*, 1, 1-7.
- Jouper, J., & Hassmén, P. (2008). Intrinsically motivated qigong exercisers are more concentrated and less stressful. *The American Journal of Chinese Medicine*, 36, 1051-1060.
- Jouper, J., & Hassmén, P. (2008). Exercise intention, age, and stress predict increased qigong exercise adherence. *Journal of Bodywork and Movement Therapies*, doi:10.1016/j.jbmt.2008.08.002.

- Jouper, J., Hassmén, P., & Johansson, M. (2006). Qigong exercise with concentration predicts increased health. *The American Journal of Chinese Medicine*, *34*, 949-957.
- Keefer, L., & Blanchard, E. B. (2001). The effects of relaxation response meditation on the symptoms of irritable bowel syndrome: Results of a controlled treatment study. *Behaviour Research and Therapy*, *39*, 801-811.
- Kemp, C. (2004). Qigong as a therapeutic intervention with older adults. *Journal of Holistic Nursing*, *4*, 351-373.
- Kerr, C. (2000). Translating “mind-in-body”: Two models of patient experience underlying a randomized controlled trial of qigong. *Culture Medicine Psychiatry*, *26*, 419-447.
- King, A. C., Kiernan, M., Oman, R. F., Kreamer, H. C., Hull, M., & Ahn, D. (1997). Can we identify who will adhere to long-term physical activity? Signal detection methodology as a potential aid to clinical decision making. *Health Psychology*, *16*, 380-389.
- Kjellberg, A., & Bolin, B. (1974). Self-reported arousal: Further development of a multifactorial inventory. *Scandinavian Journal of Psychology*, *15*, 285-292.
- Kjellberg, A., & Iwanowski, S. (1989). *Stress/Energi-formuläret: Utveckling av en metod för skattning av sinnesstämning i arbetet*. [The Stress-Energy questionnaire: Construction of a method for assessment of mood state at work]. Solna, Sweden: Arbetsmiljöinstitutet, Undersökningsrapport 26.
- Kjellberg, A., & Wadman, C. (2002). *Subjektiv stress och dess samband med psykosociala förhållanden och besvär: En prövning av stress-energi-modellen* [Subjective stress and correlations with psychosocial factors: A test of the Stress-Energy Model]. Stockholm, Sweden: Arbetslivsinstitutet.
- Kohl, H. W., Nichaman, M. Z., Frankowski, R. F., & Blair, S. N. (1996). Maximal exercise hemodynamics and risk of mortality in apparently healthy men and women. *Medicine and Science in Sport and Exercise*, *28*, 601-609.
- Kruger, J., Carlson, S. A., & Buchner, D. (2007). How active are older Americans? *Preventing Chronic Disease*, *4*, 1-12.
- Lan, C., Chou, S-W., Chen, S-Y., Lai, J-S., & Wong, M-K. (2004). The aerobic capacity and ventilatory efficiency during exercise in qigong and tai chi chuan practitioners. *American Journal of Chinese Medicine*, *1*, 141-150.
- Larkey, L., Jahnke, R., Etnier, J., & Gonzales, J. (In press). Meditative movements as a category of exercise: Implications for research. *Journal of Physical activity & Health*.

- Lee, M., Hong, S-S., Lim, H-J., Kim, H-J., Woo, W-H., & Moon, S-R. (2003b). Retrospective survey on therapeutic efficacy of qigong in Korea. *American Journal of Chinese Medicine*, 5, 809-815.
- Lee, M., Huh, H., Jeong, S., Jang, H-S., Ryu, H., Park, J-H., Chung, H-T., & Woo, W-H. (2003c). Effects of qigong on immune cells. *American Journal of Chinese Medicine*, 2, 327-335.
- Lee, M., Huh, H., Kim, B., Ryu, H., Lee, H-S., Kim, J-M., & Chung, H-Y. (2002). Effects of qi-training on heart rate variability. *American Journal of Chinese Medicine*, 4, 463-470.
- Lee, M., Kang, C-W., Lim, H-J., & Lee, M-S. (2004a). Effects of qi-training on anxiety and plasma concentration of cortisol, ACTH, and aldosterone: A randomized placebo-controlled pilot study. *Stress and Health*, 20, 243-248.
- Lee, M., Kim, B., Huh, H., Ryu, H., Lee, H-S., & Chung, H-T. (2000). Effect of qi-training on blood pressure, heart rate and respiration rate. *Clinical Physiology*, 3, 173-176.
- Lee, M., Kim, M., & Ryu, H. (2005). Qi-training (qigong) enhanced immune functions: What is the underlying mechanism? *International Journal of Neuroscience*, 115, 1099-1104.
- Lee, M., Lee, M., Choi, E-S., & Chung, H-T. (2003a). Effects of qigong on blood pressure, blood pressure determinants and ventilatory function in middle-age patients with essential hypertension. *American Journal of Chinese Medicine*, 3, 489-497.
- Lee, M., Lee, M., & Kim H-J. (2004b). Effects of qigong on blood pressure, high-density lipoprotein cholesterol and other lipid levels in essential hypertension patients. *International Journal of Neuroscience*, 114, 777-786.
- Lee, M-S., Lee, M., & Kim, H-J. (2003b). Qigong reduced blood pressure and catecholamine levels of patients with essential hypertension. *International Journal of Neuroscience*, 113, 1691-1701.
- Lee, M-S., Lim, H-J., & Lee, M. (2004c). Impact of qigong exercise on self-efficacy and other cognitive perceptual variables in patients with essential hypertension. *Journal of Alternative and Complementary Medicine*, 4, 675-680.
- Lee, M., Ryu, H., & Chung, H-T. (2000a). Stress management by psychosomatic training: Effects of ChunDoSunBup qi-training on symptoms of stress: A cross-sectional study. *Stress Medicine*, 16, 161-166.
- Lees, F. D., Clark, P. G., Nigg, C. R., & Newman, P. (2005). Barriers to exercise behaviour among older adults: A focus-group study. *Journal of Aging and Physical Activity*, 13, 23-33.

- Li, M., Chen, K., & Mo, Z. (2002). Use of qigong therapy in the detoxification of heroin addicts. *Alternative Therapies, 1*, 50-59.
- Liao, M-N., & Liao, X-P. (1997). Acupuncture plus qigong in treating migraine: A clinical observation of 120 cases. *International Journal of Clinical Acupuncture, 1*, 65-67.
- Lim, Y., Boone, T., Flarity, J., & Thompson, W. (1993). Effects of qigong on cardio respiratory changes: A preliminary study. *American Journal of Chinese Medicine, 1*, 1-6.
- Linder, K., & Svärdsudd, K. (2006). Qigong har stressdämpande effekt. [In Swedish: Qigong has stress reducing effect]. *Läkartidningen, 24-25*, 1942-1945.
- Lindvall, M., Rennemark, M., & Berggren, T. (2008). Movement in mind: The relationship of exercise with cognitive status for older adults in the Swedish National Study on Aging and Care (SNAC). *Aging & Mental Health, 12*, 212-220.
- Lippke, S., & Ziegelmann, J. (2008a). Health behavior and health behavior change – Theories and evidence. *Applied Psychology: An International Review, 57*, 541-543.
- Lippke, S., & Ziegelmann, J. (2008b). Theory-based health behavior change: Developing, testing, and applying theories for evidence-based interventions. *Applied Psychology: An International Review, 57*, 698-716.
- Loh, S-H. (1999). Qigong therapy in the treatment of metastatic colon cancer. *Alternative Therapies, 4*, 110-111.
- Lox, C. L., Martin Ginis, K. A., & Petruzzello, S. J. (2006). *The psychology of exercise, integrating theory and practice*. Scottsdale, AZ: Holcomb Hathaway.
- Maltby, J., & Day, L. (2001). The relationship between exercise motives and psychological well-being. *Journal of Psychology, 135*, 651-660.
- Mandle, C. L., Jacobs, S. C., Arcari, P. M., & Domar, A. D. (1996). The efficacy of relaxation response interventions with adult patients: A review of the literature. *Journal of Cardiovascular Nursing, 10*, 4-26.
- Mannerkorpi, K., & Arndorw, M. (2004). Efficacy and feasibility of a combination of body awareness therapy and qigong in patients with fibromyalgia: A pilot study. *Journal of Rehabilitation Medicine, 36*, 279-281.
- Manzaneque, J., Vera, F., Maldonado, E., Carranque, G., Cubero, V., Morell, M., & Blanca, M. (2004). Assessment of immunological parameters following a qigong training program. *Medical Science Monitor, 10*, 264-270.
- Mayer, M. (1999). Qigong and hypertension: A critique of research. *The Journal of Alternative and Complementary Medicine, 5*, 371-382.

- McEwen, B. S. (1998). Stress, adaptation, and disease. Allostatis and allostatic load. *Annals of the New York Academy of Science*, 840, 33-44.
- McEwen, B. S. (2000). Allostasis and allostatic load: Implications for neuropsychopharmacology. *Neuropsychopharmacology*, 22, 108-124.
- McEwen, B. S., & Stellar, E. (1993). Stress and the individual. *Archives of International Medicine*, 153, 2093-2101.
- Mills, N., Allen, J., & Carey Morgan, S. (2000). Does tai chi/qigong help patients with multiple sclerosis? *Journal of Bodywork and Movement Therapies*, 4, 39-48.
- Mossey, J. M., & Shapiro, E. (1982). Self-rated health: A predictor of mortality among the elderly. *American Journal of Public Health*, 72, 800-808.
- Muse, T. (2005). Motivation and adherence to exercise for older adults. *Topics in Geriatric Rehabilitation*, 21, 107-115.
- Myers, J., Prakash, M., Froelicher, V., Do, D., Partington, S., & Atwood, J. E. (2002). Exercise capacity and mortality among men referred for exercise testing. *New England Journal of Medicine*, 346, 793-801.
- National Expert Meeting on Qigong and Tai Chi. (2006). *Consensus report*. University of Illinois at Urban-Champaign, Department of Kinesiology & Community Health.
- NCCAM. (2007). *Mind-body medicine: An overview*. National Center for Complementary and Alternative medicine, 1-6, National Institutes of Health, U.S. Department of Health and Human Services.
- Ng, B-Y. (1999). Qigong-induced mental disorders: A review. *Australian and New Zealand Journal of Psychiatry*, 33, 197-206.
- Nigg, C. R., Borelli, B., Maddock, J., & Dishman, R. K. (2008). A theory of physical activity maintenance. *Applied Psychology: An International Review*, 57, 544-560.
- Oh, B., Butow, P., Mullan, B., & Clarke, S. (2008). Medical qigong for cancer patients: Pilot study of impact on quality of life, side effects of treatment and inflammation. *The American Journal of Chinese Medicine*, 36, 459-472.
- Oman, R. F., & King, A. C. (2000). The effect of life events and exercise program format on the adoption and maintenance of exercise behavior. *Health Psychology*, 19, 605-612.
- Paffenbarger, R. S. Jr., Hyde, R. T., Wing, A. L., & Hsieh, C-C. (1986). Physical activity, all-cause mortality, and longevity of college alumni. *New England Journal of Medicine*, 314, 605-613.
- Pate, R. R., Pratt, M., Blair, S. N., Haskell, W. L., Macera, C. A., Bouchard C., Buchner, D., Ettinger, W., Heath G. W., King, A. C., Kriska, A., Leon, A. S., Marcus, S. E., Morris,

- J., Paffenbarger, Jr. R. S., Patrick, K., Pollock, M. L., Rippe, J. M., Sallis, J. F., & Wilmore, J. H. (1995). A recommendation from the Centers for disease control and prevention and the American College of Sports Medicine. *Journal of American Medical Association*, 273, 402-407.
- Pedersen, B. K., & Saltin, B. (2006). Evidence for prescribing exercise as therapy in chronic disease. *Scandinavian Journal of Medicine & Science in Sports*, 16, 5-65.
- Pelletier, L. G., Fortier, M. S., Vallerand, R. J., Tuson, K. M., Briere, N. M., & Blais, M. R. (1995). Toward a new measure of intrinsic motivation, extrinsic motivation, and amotivation in sports: The Sport Motivation Scale (SMS). *Journal of Sport & Exercise Psychology*, 17, 35-53.
- Price, D. D., Finiss, D. G., & Benedetti, F. (2008). A comprehensive review of the placebo effect: Recent advances and current thought. *The Annual Review of Psychology*, 59, 565-590.
- Prochaska, J. O., & DiClemente, C. C. (1983). Stages and processes of self-change of smoking: Toward an integrative model of change. *Journal of Consulting and Clinical Psychology*, 51, 390-395.
- Prochaska, J. O., & DiClemente, C. C. (1986). Toward a comprehensive model of change. In Miller, W.R. & Heather, N. (Eds.), *Addictive behaviours: Processes of change* (pp. 3-27). New York: Plenum Press.
- Prochaska, J. O., & Marcus, B. H. (1994). The transtheoretical model: Application to exercise. In Dishman, R. K. (Ed.), *Advances in exercise adherence*. Champaign, IL: Human Kinetics.
- Prochaska, J. O., & Velicer, W. F. (1997). The transtheoretical model of health behavior change. *American Journal of Health Promotion*, 12, 38-48.
- Resnick, B., & Nigg, C. (2003). Testing a theoretical model of exercise behavior for older adults. *Nursing Research*, 52, 80-88.
- Reuther, I., & Aldridge, D. (1998). Qigong Yangsheng as a complementary therapy in the management of asthma: A single-case appraisal. *Journal of Alternative and Complementary Medicine*, 4, 173-183.
- Rosenbaum, E., Gautier, H., Fobair, P., Neri, E., Festa, B., Hawn, M., Andrews, A., Hirshberger, N., Selim, S., & Spiegel, D. (2004). Cancer supportive care, improving the quality of life for cancer patients. A program evaluation report. *Support Care Cancer*, 12, 293-301.

- Ryan, R. M., & Connell, J. P. (1989). Perceived locus of causality and internalization: Examining reasons for acting in two domains. *Journal of Personality and Social Psychology*, 57, 749-761.
- Ryan, R. M., & Deci, E. L. (2000a). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology*, 25, 54-67.
- Ryan, R. M., & Deci, E. L. (2000b). Self-determination theory and the facilitation of intrinsic motivation, social development and well-being. *American Psychologist*, 55, 68-78.
- Ryan, R. M., Fredrick, C. M., Lepes, D., Rubio, N., & Sheldon, K. M. (1997). Intrinsic motivation and exercise adherence. *International Journal of Sport Psychology*, 28, 335-354.
- Ryan, R. M., & Fredrick, C. M. (1997). On energy, personality and health: Subjective vitality as a dynamic reflection on well-being. *Journal of Personality*, 65, 529-565.
- Ryu, H., Jun, C., Lee, B., Choi, B., Kim, H., & Chung, H-T. (1995a). Effect of qigong training on proportions of T lymphocyte subsets in human peripheral blood. *American Journal of Chinese Medicine*, 1, 27-36.
- Ryu, H., Lee, H-S., Shin Y-S., Chung, S-M., Lee, M-S., Kim, H-M., & Chung, H-T. (1996). Acute effect of qigong training on stress hormonal levels in man. *American Journal of Chinese Medicine*, 2, 193-198.
- Ryu, H., Mo, H., Mo, G., Choi, B., Jun, C., Seo, C., Kim, H-M., & Chung, H-T. (1995b). Delayed cutaneous hypersensitivity reactions in qigong (Chun Do Sun Bup) trainees by multitest cell mediated immunity. *American Journal of Chinese Medicine*, 2, 139-144.
- Sancier, K. (1996). Medical application of qigong. *Alternative Therapies*, 2, 40-46.
- Sancier, K. (1999). Therapeutic benefits of qigong exercise in combination with drugs. *The Journal of Alternative and Complementary Medicine*, 4, 383-389.
- Sancier, K., & Bingkun, H. (1991). Medical applications of qigong and emitted qi on humans, animals, cell cultures, and plants: Review of selected scientific research. *American Journal of Acupuncture*, 19, 367-377.
- Seefeldt, V., Malina, R. M., & Clark, M. A. (2002). Factors affecting levels of physical activity in adults. *Sports Medicine*, 32, 143-168.
- Skår, S., Sniehotta, F. F., Araújo-Soares, V., Molloy, G. J. (2008). Prediction of behaviour vs. prediction of behaviour change: The role of motivational moderators in the theory of planned behaviour. *Applied Psychology: An International Review*, 57, 609-627.
- Stefano, G. B., Fricchione, G., Slingsby, B. T., & Benson, H. (2001). The placebo effect and relaxation response: Neural processes and their coupling to constitutive nitric oxide. *Brain Research Review*, 35, 1-19.

- Stetson, B. A., Rahn, J. M., Dubbert, P. M., Wilner, B. L., & Mercury, M. G. (1997). Prospective evaluation of the effects of stress on exercise adherence in community-residing women. *Health Psychology, 16*, 515-520.
- Sullivan, M., & Karlsson, J. (1994). *SF-36 Health Scale. Swedish manual and interpretation guide*. Göteborgs universitet, medicinska fakulteten.
- Tang, K. C. (1994). Qigong therapy - its effectiveness and regulation. *American Journal of Chinese Medicine, 3-4*, 235-242.
- Thayer, R. E. (1996) *The origin of everyday moods*. New York: Oxford University Press.
- Thayer, R. E. (2001). *Calm energy: How people regulate mood with food and exercise*. New York: Oxford University Press.
- Tsang, H., Cheung, L., & Lak, D. (2002). Qigong as a psychosocial intervention for depressed elderly with chronic physical illnesses. *International Journal of Geriatric Psychiatry, 17*, 1146-1154.
- Tsang, H., & Fung, K. (2008). A review on neurobiological and psychological mechanisms underlying the anti-depressive effect of qigong exercise. *Journal of Health Psychology, 13*, 857-863.
- Tsang, H., Fung, K., Chan, A., Lee, G., & Chan, F. (2006). Effect of a qigong exercise programme on elderly with depression. *International Journal of Geriatric Psychiatry, 21*, 890-897.
- Tsang, H., Mok, C., Yeung, Y., & Chan, S. (2003). The effect of qigong on general and psychosocial health of elderly with chronic physical illnesses: A randomized clinical trial. *International Journal of Geriatric Psychiatry, 18*, 441-449.
- Vallerand, R. J. (1997). Toward a hierarchical model of intrinsic and extrinsic motivation. In Zanna, M. P. (Ed.), *Advances in experimental social psychology*. New York: Academic Press.
- Vansteenkiste, M., Simons, J., Soenens, B., & Lens, W. (2004). How to become a persevering exerciser: The importance of providing a clear, future goal in an autonomy supportive way. *Journal of Sport and Exercise Psychology, 26*, 232-249.
- Vlachopoulos, S. P., & Neikou, E. (2007). A prospective study of the relationships of autonomy, competence, and relatedness with exercise attendance, adherence, and dropout. *The Journal of Sports Medicine and Physical Fitness, 47*, 475-482.
- Wankel, L. M. (1993). The importance of enjoyment to adherence and psychological benefits from physical activity. *International Journal of Sport Psychology, 24*, 151-169.

- Warburton, D. E. R., Nicol, C. W., & Bredin, S. S. D. (2006). Health benefits of physical activity: the evidence. *Canadian Medical Association Journal*, *6*, 801-810.
- Wenneberg, S., Gunnarsson, L-G., & Ahlström, G. (2004). Using a novel exercise programme for patients with muscular dystrophy. Part II: A quantitative study. *Disability and Rehabilitation*, *10*, 595-602.
- White, J. A., Drechsel, J., & Johnsson, J. (2004). Faithfully fit forever: A holistic exercise and wellness program for faith communities. *Journal of Holistic Nursing*, *2*, 127-131.
- Wilson, P. M., Mack, D. E., & Grattan, K. (2008). Understanding motivation for exercise: A self-determination theory perspective. *Canadian Psychology*, *49*, 250-256.
- Witt, C., Becker, M., Bandelin, K., Soellner, R., & Willich, S. (2005). Qigong for schoolchildren: A pilot study. *Journal of Alternative and Complementary Medicine*, *11*, 41-47.
- World Health Organization. (2002). *The world health report 2002-Reducing risks, promoting healthy life*. Geneva: World Health Organization.
- World Health Organization. (2004). *Global strategy on diet, physical activity and health*. Geneva: World Health Organization.
- Wu, W-H., Bandilla, E., Ciccone, D., Yang, J., Cheng S-C., Carner, N., Wu, Y., & Shen, R. (1999). Effects of qigong on late-stage complex regional pain syndrome. *Alternative Therapies*, *1*, 45-54.
- Xin, L., Miller, Y. D., & Brown, W. J. (2007). A qualitative review of the role of qigong in the management of diabetes. *The Journal of Alternative and Complementary Medicine*, *13*, 427-433.
- Zhang, Y. H., & Rose, K. (2001). *A brief history of qi*. Brookline, Massachusetts, US: Paradigm Publications.
- Åberg, M., Whalberg, K., Sköld, C., & Nygren, Å. (2006). Mindfulness meditation – nygam-mal metod för att lindra stress. [In Swedish: Mindfulness meditation – old methods for alleviating stress]. *Läkartidningen*, *42*, 3174-3177.



**John Jouper** is a researcher in sport science at the School of Health and Medical Sciences at Örebro University. From the military service and from competing as an athlete in five world championships in military pentathlon, John obtained many physical and psychological performance experiences. John has developed a genuine interest in people and human performance, and has worked as a professional trainer and coach, both in physical and psychological performance skills, at both national and international levels. John realized that performance is about recovery capacities, and this insight stimulated to inquisitive investigations, experiments and studies. Among other projects, he has studied tai chi and qigong since 1990, and in 1995 he finished a three-year course in traditional Chinese medicine. Since 2004 at the university, he has given a twenty-week course in “Chinese Life-Cultivation”-how to work, eat, sleep/relax, and exercise to attain a balanced, healthy life.

Medical qigong exercise is a part of traditional Chinese medicine philosophy and the aim is to strengthen qi, the human life-force. Several studies report multifaceted health benefits from regular exercise, and this shows that qigong exercise supports organism recovery processes. The ability to stay relaxed and concentrated during exercise seems to be the most beneficial function for recovery. Participants who perform qigong exercise regularly have succeeded in balancing their lifestyle, and are healthy, low-stressed and highly energized. Perceived stress reduces health, energy and exercise behaviour so stress must thereby be managed to secure high-qualitative qigong exercise. Health improvements and general feelings of wellness are reasons for continuing exercise, and being motivated by intrinsic feelings of wellness and having high intentions to attain wellness stimulate long-term qigong exercise adherence. Health and exercise professionals are suggested to support wellness motives and intentions to qigong exercise, and they may use the qigong-based Wellness Coaching Model in their work. Qigong exercise in daily life has the potential to support healthy ageing.

