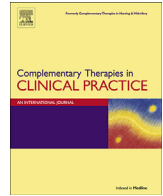




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Sit, breathe, smile: Effects of single and weekly seated Qigong on blood pressure and quality of life in long-term care



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A B S T R A C T

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Long-term care (LTC) facilities house individuals with diverse combinations of cognitive and physical impairments, and the practice of Seated Qigong eliminates common exercise barriers. This study hypothesized: 1) a single session would lower blood pressure (BP) and improve quality of life (QOL) in a generalized LTC population, and 2) these responses would be attenuated with chronic (weekly) Seated Qigong practice. Ten residents (6 female; 86 ± 7 years) participated in 1X/week Seated Qigong sessions for 10-weeks. BP and QOL were assessed pre- and post-session at baseline and following 5- and 10-weeks of Qigong. Systolic BP was significantly reduced immediately post-session after 10-weeks of Qigong ($P = 0.03$), yet unchanged at baseline and after 5-weeks (all $P > 0.05$). Diastolic BP and QOL remained unchanged ($P > 0.05$). A session of Seated Qigong elicits a hypotensive response with exposure, supporting the notion that repeated sessions may provide advantageous health benefits.

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1. Introduction

The ageing population in North America is increasingly living in residential, long-term care facilities [1,2], and current estimations indicate continuing growth in this population [3]. Population projections indicate that by the year 2031, over 700,000 Canadians will rely on such facilities for living needs [4]. Long-term care facility populations are very diverse, and comprise individuals with multiple combinations of cognitive, physical and/or other health-related impairments. Facility residents often have Alzheimer's disease, dementia and/or symptoms of depression [1,5], as well as common chronic illnesses and/or physical ailments such as rheumatoid arthritis, osteoarthritis, osteoporosis, diabetes and/or high blood pressure (hypertension) [1].

It is well established that exercise training elicits a plethora of health benefits, including improvements in cognitive and physical

functioning in widespread populations of long-term care residents, and contributes to improved overall quality of life [6–12]. For many of the concomitant chronic illnesses described above, exercise is a proven means of achieving non-pharmacologic, disease-related benefits [12]. As such, the collective goal of many in-facility group exercise programs is to maintain or improve disease-related profiles (e.g., reduce blood pressure, improve blood glucose control), flexibility, range of motion, walking ability, balance, strength, psychological function and cognitive ability [7,8,13]. In order for an exercise program to be effective in long-term care facilities, it must: 1) appeal to and accommodate a diverse group of ageing seniors [14,15] with unique psychological (personality, psychological and/or cognitive impairments, likes and dislikes) and physical (comorbidities, physical limitations, necessary accommodations such as walkers, canes and wheelchairs) needs, and 2) be readily accessible to and supported by community living staff.

Qigong (pronounced Chee-Gong), an ancient Chinese method of fitness and health promotion, focuses on the cultivation of internal energy through physical exercises [16,17]. Although Qigong is practiced in many forms, a gentle and easily practiced form is that of Seated Qigong [16]. Seated Qigong is a thorough, non-stressful and low impact form of exercise where participants follow the direction of a trained Qigong teacher, and is commonly and easily performed in group settings. This form of Qigong practice

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eliminates balance, memory and fatigue issues, thus accommodating a wide range of special needs, while stimulating the mind and body in a socially supportive environment.

Long promoted by Eastern practitioners for its health benefits in older individuals [18], Qigong practice has only recently gained attention in the West with multiple studies supporting its use with detoxification of heroin addicts, treatment of complex regional pain syndrome, cancer treatment, and stress reduction [19–22]. In the East, work involving middle-aged individuals with hypertension provides evidence to support decreases in resting blood pressure after 10-weeks of training with a 3-times per week frequency. The hypotensive effects were significant and observed as a continuing decreasing trend over the 10-week period [23]. Other studies focussing on elderly populations in geriatric hospitals support the implementation of chronic exercise for reductions in overall perceived dependence from caregivers, decreased anxiety, and increased quality of life [15].

Although the effects of Qigong in residential facilities for the elderly are relatively understudied, work in community-living settings support Qigong-induced improvements in perceived and objective measurements of general health following 12-weeks of 60-min training sessions, 2-times per week [5]. In addition, Qigong training 5-times per week for 12-weeks elicited resting blood pressure reductions and improved quality of life in a population of elderly wheelchair-bound residents of a long-term care facility cognitively able to assess psychological health [17].

While the effects of a single Qigong session (Seated or otherwise) have yet to be elucidated, immediate reductions in resting blood pressure (post-exercise hypotension) have been observed in a variety of populations following single sessions of more traditional exercise (e.g., aerobic, resistance). For example, post-exercise hypotension has been observed for up to 22 h following a single bout of aerobic exercise [24–27], and is more marked in those with elevated resting blood pressure [28]. Evidence supporting a post-resistance training hypotensive effect (traditional resistance exercise and more novel isometric exercise) is equivocal, as some studies observe a post-bout hypotensive response, while others do not [29–33]. In a study examining acute autonomic modulation in healthy older persons with experience in Tai Chi Chuan practice, systolic blood pressure, diastolic blood pressure, mean arterial blood pressure and pulse pressure were decreased following a 40-min Tai Chi Chuan session, and still persisted 60-min post-exercise [34].

Despite this collective, positive evidence supporting Qigong practice, including its efficacy to lower blood pressure and improve quality of life in a *homogeneous* population of *cognitively-able* long-term care residents, it is unknown (in the East or the West) if benefits exist to psychological and/or physical function, immediately following a single Qigong session, or if weekly Qigong practice alters these responses in relation to a single Seated Qigong session. In addition, no study has been performed in a more generalizable, heterogeneous long-term care population with an array of ailments and a mix of cognitive and physical limitations. This population warrants investigation, as it is representative of many long-term care facilities, and thus in-house group exercise programs [1,5].

1.1. Purpose

The overall objective of the current investigation was to better understand the effects of Seated Qigong in a diverse (i.e., with cognitive and/or physical impairments) yet representative group of individuals living in long-term care. Specifically, the research team aimed to test the prospective hypotheses that: 1) a single Seated Qigong session would lower blood pressure and improve quality of

life immediately post-exercise in older adults living in long-term care [24–28,30,31,33,34], and 2) the acute (immediately post-session) blood pressure response would be attenuated with 10-weeks of once weekly Seated Qigong sessions [30].

2. Methods

2.1. Participants

Sixteen participants were recruited from a residential, long-term care facility in Windsor, Ontario, Canada. Inclusion criteria were residency in a long-term care facility and health care provider clearance for exercise participation. Six participants were excluded from the final analyses due to extenuating circumstances (e.g., >1 complete data collection session missed, sleeping while data was being collected). The University of Windsor Research Ethics Board approved the investigation, and all participants provided written informed consent or respective power of attorney written informed assent where applicable. All work was conducted in accordance with the ethical standards of the Declaration of Helsinki (1975).

2.2. Study design

This study employed a within-subject repeated measures design to assess changes in acute responses to Seated Qigong over time, whereby participants acted as their own control. All Seated Qigong sessions, inclusive of testing procedures, were conducted in a quiet, standardized area of the long-term care facility at the same time of day.

Upon establishment of eligibility, participants were familiarized to Seated Qigong itself, and to all testing procedures. In brief, blood pressure, heart rate and quality of life were measured in all participants before and after a Seated Qigong session (described below). One week following the familiarization session, all participants underwent baseline testing, which was identical to the familiarization session. Participants then completed one Seated Qigong session per week for 10-weeks. Testing procedures were repeated following 5- and 10-weeks of Qigong practice.

2.3. Qigong session protocol

Each Seated Qigong session lasted approximately 40-min, and involved a series of 5 linked, seated exercises (e.g., Lotus Flower Opening, Petals Floating on the Water), which focused on breathing patterns, physical posture and coordination. Each session was performed with tranquil music playing in the background, and was led by an experienced Seated Qigong teacher and supported by trained assistants interspersed among the participants [16]. In an effort to reduce the stress associated with learning new tasks and to help participants relax while exercising, the Seated Qigong teacher consistently encouraged them to “breathe and smile”. This smiling aspect was further emphasised by the Seated Qigong teacher telling amusing stories and singing while leading the class through the Qigong sessions. Encouragement, rather than correction, was also stressed throughout.

2.4. Experimental protocol

2.4.1. Resting blood pressure

Resting blood pressure was measured in the brachial artery of the participants' upper arm using automated brachial oscillometry (Dinamap Carescape v100, Critikon, Tampa, Florida, USA), following 5-min of seated rest. Participants rested with the selected arm supported at heart level and the blood pressure cuff was placed

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