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Research Paper

Physical and psychological effects of Qigong exercise in community-dwelling older adults: An exploratory study

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ABSTRACT

Older adults need exercise programs that correspond to age-related changes. The purpose of this study was to explore preliminary effects of an 8-week Qigong exercise intervention on the physical ability, functional and psychological health, and spiritual well-being of community-dwelling older adults. Forty-five community-dwelling adults with the mean age of 74.8 years participated a 1-h Health Qigong exercise session twice weekly for 8 weeks. The majority were female (84%) and white (91%), and lived with their spouse (49%). Physical ability ($p < 0.001$), functional health ($p = 0.001$), balance ($p < 0.001$), functional reach ($p < 0.001$), depression ($p = 0.005$), and spiritual well-being ($p = 0.004$) improved significantly after the 8-week intervention. Most participants perceived physical ability, mental health, and spiritual well-being benefits. No adverse events were reported. A twice weekly Qigong exercise program over 8 weeks is feasible and has potential to improve physical ability, functional health, balance, psychological health, and spiritual well-being in older adults.

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Introduction

Older adults constitute 13.3% of the United States (US) population.¹ Approximately 58% of older adults report having limitations with physical ability, including walking, grasping, or carrying.² Nearly 90% of adults older than 80 years have balance impairment.³ Diminished physical ability and impaired balance adversely affect daily functioning and compromise independent living.^{2,4}

Depression and anxiety are commonly experienced by people older than 75.⁵ They are strongly associated with physical disability and diminished well-being.^{6,7} Depressive symptoms may impede engagement in regular physical activity and lead to physical

disability.⁸ Spiritual well-being plays a role in older adults' psychological health, as it has been found to be associated with fewer depressive symptoms and to moderate the influence of frailty on psychological health in older adults.⁹

Exercise is beneficial to the health of older adults.¹⁰ Older adults need exercise programs that correspond to age-related changes.¹¹ Qigong exercise, a Chinese traditional medicine exercise, is comprised of breathing exercise, meditation, and body movements with minimal musculoskeletal strain and can be performed by people at an advanced age.¹² The theory of Chinese traditional exercise proposes that there is vital energy "Qi" inside the body. Disturbance of vital energy flow can lead to illness or can occur as a result of illness or injury. Qigong exercise can bring the vital energy circulation back into harmony through gentle body movements, breathing exercise, and meditation, thus promoting health. Qigong exercise has demonstrated promising effects on physical function and psychological health of Chinese older adults with comorbidities.¹³ Yet, the effects of Qigong on physical ability, balance, depression, anxiety, and spiritual well-being in US community-dwelling older adults are unknown. The objective of this study was to explore the preliminary effects of a structured Qigong exercise program on physical ability, functional and psychological health, and spiritual well-being in a sample of community-dwelling older adults in the US.

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Methods

Study design

This study employed a one-group pretest-posttest design to explore the preliminary effects and feasibility of an 8-week Qigong exercise intervention on physical ability, balance, functional health, depression, anxiety, and spiritual well-being. The Yale University Human Investigation Committee approved the study protocol, and written informed consent was obtained from all participants.

Participants and setting

Participants were recruited from two senior centers in the greater New Haven, Connecticut area from April to October of 2015. Eligibility criteria included age 65–85 years; English speaking; stable medical condition with a primary care provider's clearance to participate (not admitted to hospital emergency department in the 3 months before the study); a baseline 6-min walk test (6MWT) of less than 554 m for males and 530 m for females; a Mini-Mental State Examination score of at least 25; and no severe bone, joint, or other health conditions that would limit exercise training. Exclusion criteria were current participation in a Tai chi or Qigong class in the last 6 months, unstable cardiovascular disease in the last 6 months, baseline performance of more than 240 min of moderate-intensity exercise weekly, use of an assistive device, or the inability to give informed consent.

Sample size

Sample size calculations were based on a 1-group repeated measures design using a paired t-test, assuming 80% power, alpha of 0.05, effect size of 0.53, and 2-tailed test for significance. The effect size was obtained from a Qigong study where the 6MWT was used as the outcome measurement.¹⁴ The sample size needed to detect a significant difference in physical ability was 31. Forty-five subjects were enrolled to allow for attrition.

Study protocol

Flyers were used to recruit participants at the senior centers. The principal investigator (P.C.) was also present at the centers weekly to approach potential participants. Interested people were able to contact the principal investigator via email or telephone.

Interested individuals were screened for eligibility. Eligible older adults were given a consent form, and demographic and baseline data were collected. Subjects were given the schedule of the Qigong sessions, a date to start, and appointments for data collection. Primary care providers were contacted to obtain permission for participation. Once the number of enrolled older adults reached at least 10, the Qigong intervention class started. Data were also collected at 8 weeks (end of the intervention).

Intervention

Health Qigong (Baduanji) was employed as the intervention after a consultation with a Qigong master, as it is easy to learn and perform without any challenging movements. The Health Qigong program consists of 8 gentle bodily movements, breathing exercises, and meditation (Fig. 1). Each Qigong exercise class was taught and led by the same experienced Qigong practitioner, along with musical accompaniment. The classes were run in groups of 10–15 participants and occurred in the afternoon. The subjects were instructed to perform Health Qigong to moderate fatigue and use movements to guide breathing patterns. All movements were performed in a standing position at a range within the subjects' comfort zone. Each

session started with a 5-min warm-up, followed by 40 min of Qigong exercise, and concluded with a 5-min relaxation. A 10-min break was provided during each session. The participants were asked to attend the session twice weekly for 8 weeks for a total of 16 Qigong sessions, and were encouraged to practice at home using a video provided. Strategies used to ensure the intervention fidelity included directly observing randomly selected sessions and documentation of classes and hours taught (Table 1).

Conceptual model

The Layers Model was used to guide the outcome measures of the current study. This model was created based on in-depth interviews of older adults who practiced Qigong exercise. It suggests five dimensions of Qigong exercise effects: physical, mental, emotional, social, and spiritual.¹⁵ The Layers Model is framed as a continuum representing four increasingly complex layers of Qigong practice experiences. As people practice Qigong more intensively and longer, they may perceive that the five dimensions of Qigong exercise effects evolve from Layer 1 (Simple Benefits), to Layer 2 (Complex Benefits), to Layer 3 (Immersion), and to Layer 4 (Complex Integration). In the Complex Integration layer, Qigong affects health in a holistic way where a complex integration of physical, mental, emotional, social, and spiritual effects occurs.¹⁵

Outcome measures

Baseline demographic data were obtained from participants and included age, gender, race, education, marital status, social-economic status, coexisting medical conditions, weekly physical activity, and home living status.

Physical ability was evaluated by the 6MWT, which measures the distance walked on a hard and flat surface in 6 min. A shorter distance covered in 6 min indicates worse physical ability. The test-retest reliability and validity of 6MWT in community-dwelling older adults were 0.94¹⁶ and 0.82¹⁷, respectively.

The SF-12 was used to measure functional health. It produced physical (PCS) and mental component summary (MCS) scores; higher scores indicate better functional health. The SF-12 consists of 12 items that assess physical functioning (2 items), role limitation because of physical health (2 items), social functioning (1 item), vitality or energy (1 item), bodily pain (1 item), mental health (2 items), role limitation because of emotional problems (2 items), and general health (1 item).¹⁸ The reliability and validity of the SF-12 have been established among older adults.¹⁹ Cronbach's alpha measure of internal consistency was reported as 0.85 for PCS and 0.76 for MCS in community-dwelling older adults.²⁰ The test-retest reliability of the PCS and MCS was 0.89 and 0.76, respectively.¹⁸

Balance was examined by the Berg Balance scale (BBS), which assesses an individual's ability to perform 14 tasks and includes a test for functional reach; higher scores indicate better balance. The functional reach test assesses the maximal length that an individual can reach forward with a fixed base of support in a standing position. The test-retest reliability was 0.91 in community-dwelling older adults.²¹ The internal consistency was 0.96 in community-living older people.²² The validity of the BBS was also established in older adults with Parkinson's disease.²³

The Hospital Anxiety and Depression scale (HADS) was used to evaluate depression and anxiety. This scale was divided into two 7-item subscales: Anxiety (HADS-A) and Depression (HADS-D) subscales. The total score is out of 42, 21 per subscale, with higher scores indicating greater levels of depression and anxiety. Validity and reliability have been established in general populations.²⁴ The internal consistency for HADS-A was 0.82 and 0.71 for HADS-D in people older than 65 years.²⁴

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