

T'ai Chi and Qigong for Health: Patterns of Use in the United States

Gurjeet S. Birdee, M.D., M.P.H.,¹ Peter M. Wayne, Ph.D.,¹ Roger B. Davis, Sc.D.,²
Russell S. Phillips, M.D.,² and Gloria Y. Yeh, M.D., M.P.H.¹

Abstract

Background: Little is known in the United States about those who practice *t'ai chi* and *qigong*, two mind–body techniques that originated in Asia.

Objective: The objective of this study is to characterize use of *t'ai chi* and *qigong* for health with regard to sociodemographics, health status, medical conditions, perceptions of helpfulness, and disclosure of use to medical professionals.

Methods: We analyzed associations of *t'ai chi* and *qigong* use for health using cross-sectional data from the 2002 National Health Interview Survey (NHIS) Alternative Medicine Supplement ($n = 31,044$). The 2002 NHIS estimated the number of *t'ai chi* and *qigong* users for health to be 2.5 and 0.5 million persons, respectively. We collapsed *t'ai chi* and *qigong* use into a single category (TCQ) for analysis, representing 2.8 million individuals.

Results: We found that neither age nor sex was associated with TCQ use. TCQ users were more likely than nonusers to be Asian than white (odds ratio [OR] 2.02, 95% confidence interval [CI] 1.30–3.15), college educated (OR 2.44, 95% CI 1.97–3.03), and less likely to live in the Midwest (OR 0.64, 95% CI 0.42–0.96) or the southern United States (OR 0.51, 95% CI 0.36–0.72) than the West. TCQ use was associated independently with higher reports of musculoskeletal conditions (OR 1.43, 95% CI 1.11–1.83), severe sprains (OR 1.65, 95% CI 1.14–2.40), and asthma (OR 1.50, 95% CI 1.08–2.10). Half of TCQ users also used yoga for health in the last 12 months. Most TCQ users reported their practice to be important to maintain health, but only a quarter of users disclosed their practice to a medical professional.

Conclusions: In the United States, TCQ is practiced for health by a diverse population, and users report benefits for maintaining health. Further research is needed to establish efficacy and safety for target populations, including those with musculoskeletal and pulmonary disease, as well as for preventive health.

Introduction

T'AI CHI (also called *t'ai chi chuan* or *taiji*) and *qigong* (also called *chi kung*) are mind–body practices originating from China that have migrated to the United States. On the basis of the National Health Interview Survey (NHIS), Barnes reported that in the United States an estimated 2,500,000 and 500,000 individuals used *t'ai chi* or *qigong*, respectively, for health reasons.¹ *T'ai chi chuan* originated from Chinese martial arts and healing traditions. The literal translation of *t'ai chi chuan* from Mandarin is: "Supreme Ultimate" (*t'ai chi*), a reference to the philosophical bipolar concept of *yin* and *yang* that also underlies Traditional Chinese Medicine, and "Fist or Boxing" (*chuan*). As an "internal" martial art, *t'ai chi* cultivates the flow and balance of the practitioner's *qi* (vital energy).²

The closely related practice of *qigong* is also a historical derivative of Chinese healing practices and manipulates *qi* through mind–body exercises. The exact historical origins of *t'ai chi* and *qigong* are controversial and a topic of scholarly debate. Though substantial variation within and between these practices exists, generally speaking, *t'ai chi* and *qigong* are meditative exercises that coordinate gentle movements with mental focus, breathing, and relaxation for physical, mental, and/or spiritual cultivation.³ Many current styles of *t'ai chi* retain their original martial arts applications.

Despite the popularity of *t'ai chi* and *qigong* in the United States, along with a growing body of evidence for clinical effectiveness,^{4–6} little is known about those who practice *t'ai chi* and *qigong*, and for what reasons. Identifying current trends

¹Osher Research Center, Harvard Medical School, Boston, MA. ²Division of General Medicine and Primary Care, Beth Israel Deaconess Medical Center, Boston, MA.

on the use of *t'ai chi* and *qigong* may help identify populations and medical conditions that warrant further research. To characterize sociodemographic and health factors associated with *t'ai chi* and *qigong* practice in the United States, we conducted a secondary analysis of *t'ai chi* and *qigong* users from a nationally representative survey, the 2002 NHIS.

Methods

Data source

Data from the 2002 NHIS were analyzed, which obtains health information from the civilian, noninstitutionalized, household population in the United States. The survey was conducted face-to-face in English and/or Spanish utilizing a multistage stratified design with random selection of households. For a randomly selected adult within each household, data were collected on sociodemographics, medical conditions, and health care utilization. The final adult sample had an overall response rate of 74% ($n = 31,044$).

In 2002, additional questions were asked regarding the use of 21 complementary and alternative therapies including *t'ai chi* and *qigong* in an Alternative Medicine Supplement of NHIS. Respondents were asked if they ever practiced *t'ai chi* or *qigong* for their "own health or treatment," and if they practiced "during the last 12 months." Individuals who practiced *t'ai chi* or *qigong* for health in the last 12 months were asked if they practiced "to treat a specific health problem and condition." They were also asked how important their use was "in maintaining... health and well-being." Disclosure was ascertained by asking respondents if they "let any conventional medical professionals know of... use."

Statistical Analysis

T'ai chi and *qigong* use for health in the last 12 months was selected as the main outcome of interest. The number of *qigong* users was too few to perform a separate statistical analysis from *t'ai chi* users. Given the similarity of *t'ai chi* and *qigong* (TCQ), based on common cultural derivation and philosophy, both groups of practitioners were collapsed into a single category for analysis. Individuals who practiced both *t'ai chi* and *qigong* were considered as a single TCQ user. Descriptive statistics were used to characterize TCQ users versus nonusers. To further characterize TCQ users, possible factors were examined for associations with practice including the following: age categories (18–29, 30–39, 40–49, 50–64, ≥ 65), sex, race (white, black, other), household income ($\leq \$19,999$, $\$20,000$ – $\$34,999$, $\$35,000$ – $\$64,999$, $\geq \$65,000$), region (Northeast, South, Midwest, West), education (less than college, any college, or more), and insurance status (insured, uninsured). Two health behaviors were analyzed: current alcohol intake (abstainers, light, moderate, or heavy) and current smoking status (nonsmokers, smokers). As important covariates of health, self-reported health status (good, very good, or excellent versus poor or fair) and body mass index (< 18.5 , 18.5 – 24.9 , 25 – 29.9 , ≥ 30 kg/m²) were included. Medical conditions into multiple categories were collapsed for analysis using a previously described algorithm:⁷ (1) musculoskeletal (arthritis, rheumatoid arthritis, gout, lupus, fibromyalgia, joint pain); (2) severe sprains in the last year; (3) mental health (depression, anxiety); (4) asthma; (5) chronic obstructive pulmonary disease (chronic bronchitis, emphysema); (6) cardiovascular

(myocardial infarction, coronary heart disease, angina, congestive heart failure, other heart condition); (7) hypertension; and (8) neurologic (seizure, stroke, Parkinson's, multiple sclerosis, neuropathy). Severe sprains were categorized separately from musculoskeletal conditions to capture individuals with acute musculoskeletal injuries. Practice of yoga, another common mind–body technique, among TCQ users was also examined. Categories with fewer than 30 respondents were excluded from the analysis. The number of respondents who used TCQ to treat a specific medical condition was insufficient for analysis.

Sociodemographic factors, health status, health behaviors, and weight were compared among TCQ and non-TCQ users with χ^2 tests of independence. Utilizing multivariable logistic regression analysis, factors independently associated with TCQ practice were identified selecting covariates of interest that had a p -value of ≤ 0.20 in bivariable analyses. A model was developed using a backward elimination strategy retaining covariates with a p -value of ≤ 0.05 . We performed a separate analysis of *t'ai chi* users alone to determine whether the final model, which combined *t'ai chi* and *qigong* users, was substantially different from a model with *t'ai chi* users alone. Descriptive statistics were used to analyze the importance of TCQ use for health maintenance and well-being (somewhat and very important versus little or none), and conventional provider disclosure. Analyses were performed with SAS-callable SUDAAN version 8.1 (Research Triangle Institute, Research Triangle Park, NC) to account for the complex sampling design. Results are weighted to represent national estimates. The Harvard Medical School Institutional Review Board exempted the study from full board review.

Results

In 2002, there were over 2,500,000 *t'ai chi* users and 500,000 *qigong* users in the United States.¹ Combining *t'ai chi* and/or *qigong* users into a single category, there were more than 2.8 million individual TCQ users in the United States. Among *qigong* users, 70% also reported practicing *t'ai chi*. The characteristics of TCQ users compared to non-TCQ users are shown in Table 1. The age and gender distribution of those who reported practice of TCQ reflected the general population. A large number of Asians practiced TCQ, though a majority of users were white and reported attaining a higher education. TCQ users as compared to non-TCQ users predominately lived in the West and Northeast. Income and insurance were not significantly different between groups. Light alcohol consumption was higher in TCQ users, but smoking rates were similar to those of non-TCQ users. Though TCQ users reported more favorable health status, and in comparison to non-TCQ users, they also reported higher rates of musculoskeletal conditions, asthma, and severe sprains. Rates of mental health and cardiovascular conditions were similar among TCQ users compared to the rest of the population. Rates of COPD and neurologic conditions were too small for analysis. One (1) of every 2 TCQ users also reported yoga practice within the last 12 months. Only 25% of TCQ practitioners disclosed their use to a medical professional. A majority of TCQ users (59%) felt that their practice was important for maintaining their overall health.

The results of the final multivariable regression model are reported in Table 2 for factors independently associated with

TABLE 1. CHARACTERISTICS OF STUDY POPULATION BY T'AI CHI AND QIGONG USE (%)

Characteristics	T'ai chi/qigong users (n = 429)% ^a	Non-t'ai chi/qigong users (n = 30,246)% ^a
Demographics		
Age (years)		
Less than 30	23.2	21.8
30–39	19.2	19.7
40–49	18.7	21.3
50–64	24.1	21.1
65 or greater	15.0	16.1
Gender		
Male	43.7	48.1
Female	56.3	51.9
Race ^b		
White	76.4	80.9
African American	9.3	11.5
Asian	8.1	3.4
Other	N/A	N/A
Income		
≤\$19,999	22.9	19.5
\$20,000–34,999	20.7	18.6
\$35,000–64,999	22.1	27.3
≥\$65,000	34.3	34.6
Region ^b		
West	29.5	19.1
Midwest	21.9	21.9
South	24.7	37.2
Northeast	23.9	19.2
Education ^b		
Less than College	55.4	76.1
College	44.6	23.9
Insurance		
Insured	85.0	84.5
Uninsured	15.0	15.5
Health behaviors		
Smoking		
Nonsmoking	81.3	77.7
Smoking	18.7	22.3
Alcohol ^b		
Abstainers	29.9	37.9
Light	53.3	42.6
Moderate/heavy	17.7	19.5
Health status^b		
Excellent, very good, or good	91.3	87.6
Fair or poor	8.7	12.4
BMI (kg/m ²) ^b		
<18.5 ^c	N/A	N/A
18.5–24.9	49.2	37.3
25–29.9	31.5	33.4
≥30	17.5	27.3
Medical conditions		
Musculoskeletal ^b	57.9	47.9
Mental health	20.0	15.6
Asthma ^b	16.2	10.5
Hypertension ^b	19.7	24.4
Severe sprain ^b	15.0	8.1
Cardiovascular	11.4	11.2
Yoga use^b		
Yes	49.3	4.2
No	50.7	95.8

BMI, body mass index; N/A, not applicable.

^aPercents are weighted to reflect national estimates.

^b $p \leq 0.005$ for differences between *t'ai-chi/qigong* users and non-*t'ai-chi/qigong* users.

^cDue to small numbers, BMI scores <18.5 not reported.

TCQ use in the United States. Of note, age and sex categories were not significant on univariate analysis, and not included in the model. TCQ use was more likely in Asians relative to whites and less likely in the South or Midwest compared to the West. While TCQ users were more likely to have a higher educational status, income and insurance were not correlated with use. TCQ users were more likely to be light consumers of alcohol. A regression model for factors associated with *t'ai chi* users alone, rather than combined with *qigong*, did not significantly alter odds ratios. Self-reported musculoskeletal conditions, severe sprains, and asthma were each associated with practice of TCQ.

Discussion

In 2002, according to the NHIS survey, there were 2.8 million individuals who practiced TCQ for health.¹ TCQ users relative to nonusers were more likely to be Asian, educated, and live in the West or Northeast; however, TCQ use spanned all ages and genders. Musculoskeletal conditions, severe sprains, and asthma were associated with TCQ use, but it is unknown whether these conditions led to TCQ use or were a result of TCQ use. Despite a large percentage of respondents reporting the importance of TCQ practice for health maintenance, only a quarter disclosed their practice to their medical professional.

As mind-body practices have grown in popularity in the United States, there has been a concurrent increase in evidence-based clinical research for TCQ.^{4–6} These findings suggest the potential need to investigate TCQ practice among individuals who have musculoskeletal conditions and asthma. Existing research suggests positive benefits of *t'ai chi* for balance and postural control,^{8–11} osteoarthritis,¹² rheumatoid arthritis,¹³ and osteoporosis.¹⁴ However, there are limited data on the use of *t'ai chi* or *qigong* for pulmonary conditions including asthma.¹⁵

TCQ has also been examined for various other medical conditions or applications including the following: stress management,^{16,17} general mental health,^{18–20} depression,^{21,22} immune system modulation,^{23–25} and cardiovascular applications such as cardiorespiratory fitness,^{26,27} hypertension,²⁸ cardiac rehabilitation,²⁹ and diabetes.³⁰ There is also suggestive, but limited, data for *qigong* in hypertension³¹ and diabetes.³²

Yoga, a mind-body exercise from India, may be considered a parallel practice to TCQ. In a recent analysis, yoga users were characterized from NHIS,⁷ who differ from TCQ users with regard to specific sociodemographic factors. TCQ users were evenly distributed from young adult to the elderly. In contrast, yoga users tended to be younger. This may represent a broader appeal of TCQ to the elderly and that many popular types of yoga in the United States often cater toward a younger, more physically able population. As the elderly population grows in the United States, TCQ may increase in prevalence. In addition, TCQ appeared to be gender neutral, while yoga users were more likely to be women. Historically in India, yoga was practiced almost exclusively by men, while in the United States yoga has been feminized within contemporary popular culture.^{33,34} *T'ai chi* is perhaps perceived as more masculine, given its origin in martial arts. Asians were also more likely to practice TCQ for health, which was not observed among yoga users. Other socioeconomic

TABLE 2. FACTORS ASSOCIATED INDEPENDENTLY WITH *T'AI CHI* AND *QIGONG* USE AMONG ADULTS IN THE UNITED STATES

	<i>Adjusted odds ratio^a</i> (95% confidence intervals)
Demographics	
Race	
White	1.00
African American	1.14 (0.78–1.66)
Asian	2.02 (1.30–3.15)
Other ^b	N/A
Region	
West	1.00
Midwest	0.64 (0.42–0.96)
South	0.51 (0.36–0.72)
Northeast	0.85 (0.59–1.22)
Education	
Less than college	1.00
Any college or more	2.44 (1.97–3.03)
Health behaviors	
Alcohol	
Abstainer	1.00
Light	1.38 (1.04–1.82)
Moderate or heavy	1.01 (0.72–1.41)
Health conditions	
Musculoskeletal	
Absent	1.00
Present	1.43 (1.11–1.83)
Severe sprain	
Absent	1.00
Present	1.65 (1.14–2.40)
Asthma	
Absent	1.00
Present	1.50 (1.08–2.10)

BMI, body mass index.

^aOdds ratios have been adjusted for sociodemographic characteristics, health behaviors, BMI, and medical conditions with a *p*-value of ≤ 0.05 .

^bDue to small numbers, other races not reported.

patterns such as associations with region, educational level, and health status were similar to those of yoga users.

Generally, TCQ are considered safe practices, and there have been few published adverse events. However, there have been no systematic reviews on the risks of *t'ai chi*. Reviews of *qigong* have reported the potential negative psychiatric effects.^{35,36} While data on the safety profile of yoga are also lacking, there have been more published reports of adverse events,^{37–40} which may simply reflect the higher overall prevalence of yoga use. Of TCQ users, the results indicate that 1 of 2 users also practiced yoga. Therefore, the associations identified between *t'ai chi* and *qigong* use may also be partially explained by concurrent yoga use. For example, TCQ users were identified as having more severe sprains than non-TCQ users did. The same association was found with severe sprains among yoga users compared to non-yoga users. It is unclear whether the severe sprains seen among the *t'ai chi* users are related to yoga use or vice versa. There may be an underestimation of the potential risks of practice, reflecting underreporting of adverse events in studies and medical practice.

There are limitations to this study. Data were collected via questionnaires, and are therefore subject to recall bias. Given

the cross-sectional nature of NHIS, causal relationships cannot be determined. For example, the increased association of TCQ use with asthma does not mean that TCQ use causes asthma. NHIS did not capture details of the TCQ practice such as frequency, duration, style, school, or teacher. Variations in practice may play an important role in potential health benefits. Also, the analysis is based on data from 2002, which may not reflect current trends. Regardless of these limitations, this represents the first report and most current information available on the characteristics of TCQ users based on a national survey.

TCQ use for health in the United States is being practiced by a broad group of individuals. As research agendas for the clinical application of mind–body techniques are developed, patterns of TCQ use should inform future studies. The practice of TCQ for musculoskeletal and pulmonary conditions, as well as for preventive health and health maintenance, should be explored. TCQ, like other mind–body practices, are complex interventions with multiple components.² Research designs need to be sensitive to this complexity employing a variety of methodologies.⁴¹ The therapeutic role of TCQ will only be defined by thoughtful and rigorous research evaluating the feasibility, efficacy, cost, and safety of these practices.

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Address correspondence to:
 Gurjeet S. Birdee, M.D., M.P.H.
 Osher Research Center
 Harvard Medical School
 401 Park Drive Suite 22A-West
 Boston, MA 02215

E-mail: g2birdee@gmail.com

