

Title

Prevalence, patterns, and predictors of T'ai Chi and Qigong use in the US: Results of a nationally representative survey

Running Head

Prevalence of T'ai Chi and Qigong in the US

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Abstract

Objectives This study examined the prevalence, patterns, and predictors of T'ai Chi and Qigong use in the US general population.

Design Cross-sectional survey

Methods Data from the 2012 National Health Interview Survey (NHIS) (n=34,525), with weighted frequencies were used to analyze lifetime and 12-month prevalence and patterns of use. Independent predictors of practice were analyzed using logistic regression models. Analyzes were conducted in 2015.

Results The lifetime and 12-month prevalence of T'ai Chi/Qigong practice were 3.1% and 1.2%, respectively. 12-month prevalence was associated with age above 30 years; being African American, Asian or of other ethnic origin; living in the West, being college educated, single and light to heavy alcohol consumer. 38.6% of users attended formal classes. T'ai Chi/Qigong was practiced for wellness/disease prevention, to improve energy, immune function, or athletic performance and memory/concentration. Stress, arthritis and joint problems were the most frequent specific health problems for practice.

Conclusions Despite an only marginal increase of T'ai Chi/Qigong practice in the US over the past 10 years, the proportion of minorities among practitioners has increased significantly. Gaps between clinical application and research are discussed.

Key words

T'ai Chi; Qigong; Prevalence; Nationally representative survey; Predictors; Public Health

Introduction

T'ai Chi is a low-impact, mind-body exercise originating in China that has become increasingly popular in the West ¹. T'ai Chi integrates musculoskeletal training (e.g. strength, flexibility, and coordination), breath training, and a variety of cognitive skills (e.g. body awareness, focused mental attention, and relaxation). A large and growing body of evidence support T'ai Chi's potential efficacy and safety for a range of health conditions including cardiovascular disease ^{1,2}, balance and neuromuscular conditions ³⁻⁵, cognition, and emotional well-being ^{6,7}. In the United States, this research has contributed to national organizations such as the Center for Disease Control (<http://www.cdc.gov/Features/OlderAmericans/>), the American Heart Association (<http://heartinsight.heart.org/August-2014/The-Benefits-of-Tai-Chi-Healthy-Body-Strong-Heart/>), and the National Parkinson Foundation (<http://www.parkinson.org/Parkinson-s-Disease/Treatment/Exercise/Exercise-Tips.aspx>) to endorse T'ai Chi for health maintenance and rehabilitation, and is likely responsible for a growing number of T'ai Chi training programs offered in both academic medical centers and community adult programs. Qigong is another mind-body practice originating in China sharing many of the principles of T'ai Chi, but typically limits movements to more simplistic and repetitive choreographed movement routines. Research on the health benefits of qigong is underway ^{8,9}, but compared with T'ai Chi, far fewer studies have been conducted.

Data on the prevalence of T'ai Chi and Qigong utilization in the West are very limited. A 2002 survey ¹⁰ estimated that approximately 2.8 million people in the US use practiced T'ai Chi/Gigong; and many of them would practice both. The study also found that Asian, higher educated and Midwestern residents and those suffering from musculoskeletal disorders, severe sprains or asthma being significantly were more likely to practice than the remaining population.

The current report updates these findings of the use of T'ai Chi/Qigong based on the 2012 NHIS survey. This report examined the lifetime and 12-month prevalence of T'ai

Chi/Qigong practice in the US general population; its predictors and patterns of use as well as reasons for use, sources of information and observed subjective changes in health and wellbeing. Findings will be discussed in the context of how changes in prevalence and patterns of use of T'ai Chi/Qigong track changes in research evidence, and how relevant data from clinical trials are to the specific populations practicing T'ai Chi/Qigong, the health conditions T'ai Chi/Qigong is being practiced for, and the modalities through which it is being learned (e.g. classes vs. DVD).

Methods

Data source

Data were collected from the National Health Interview Survey (NHIS) in 2012, a nationally representative survey monitoring the health of the US population. More information on the sampling strategy can be found online (http://www.cdc.gov/nchs/nhis/about_nhis.htm). All analyses were conducted in 2015.

The Sample Adult Core collected data on sociodemographic characteristics such as age, gender, ethnicity, region, marital status, education, employment status, and annual household income. It also includes questions on the general health status, health behavior and medical conditions.

The Adult Complementary and Alternative Medicine questionnaire gathered data on the use of complementary and alternative medicine (CAM) therapies, including T'ai Chi and Qigong. T'ai Chi and Qigong practices were collected separately but by otherwise identical questions: Lifetime prevalence of T'ai Chi practice was queried with the question: *Have you ever practiced Tai Chi?* Those who indicated prior use were presented with an additional question on T'ai Chi practice during the past 12 months: *During the past 12 months, did you practice Tai Chi for yourself?* Those who had practiced T'ai Chi in the past 12 months then were presented with further questions regarding details of T'ai Chi use, formal training or class

attendance, costs of classes and learning material. Further questions concerned reasons for T'ai Chi practice including medical conditions; and perceived health-related effects.

A total of 42,366 households were eligible and 34,525 adults provided data (response rate: 79.7%)¹¹. Population-based estimates were calculated using weights calibrated to the 2010 census-based population estimates for age, gender, and ethnicity of the US civilian non-institutionalized population.

Statistical analysis

Lifetime and 12-month prevalence of T'ai Chi and Qigong use were analyzed descriptively, as were information on practice such as practice format and cost of practice, reasons for practice and outcomes. Results were reported as weighted frequencies and distributions.

For the purpose of the following analyses T'ai Chi and Qigong were combined into one category; thus including all persons who had practiced T'ai Chi or Qigong or both.

Sociodemographic characteristics were compared between those who had practiced T'ai Chi/Qigong ever in their life/within the prior 12 months and those who had not using chi square tests. Independent predictors of T'ai Chi/Qigong use in a lifetime/in the prior 12 months were identified using multiple logistic regression analysis. The following sociodemographic predictors were considered: age (categories: 18-29; 30-39; 40-49; 50-64, 65 or older), gender (categories: female; male), ethnicity (categories: non-Hispanic White; Hispanic; African American; Asian; Other), region (categories: West; Northeast; Midwest; South), marital status (categories: not in relationship; in relationship), education (categories: less than college; some college or more), and annual household income (categories: less than \$20,000; \$20,000 to \$34,999; \$35,000-\$64,999; \$65,000 or more). Additionally, health related factors such as general health status (categories: poor or fair; good, very good or excellent), BMI (categories: <18.5; 18.5-25; 25-30; 30 or more), medical conditions, and health behaviors such as smoking (categories: non-smoker, smoker); alcohol consumption (categories: alcohol abstainer; light drinker; regular or heavy drinker) and exercise behaviors

(categories: sedentary, moderate exercisers (at least 150 min. moderate exercise or 75 min. vigorous exercise during the week), high level exercisers (at least 300 min./150 min. resp.)) were also used as potential predictors.

A backward stepwise procedure with a LR statistic p-value of ≤ 0.05 was chosen, and adjusted odds ratios with 95% confidence intervals were calculated. Only those associated with T'ai Chi/Qigong use at a p-value of ≤ 0.10 (χ^2 -test) were included in the regression analyses.

Statistical analysis was performed using the Statistical Package for Social Sciences software (IBM SPSS Statistics for Windows, release 22.0. Armonk, NY: IBM Corp.).

Results

Prevalence of T'ai Chi and Qigong use

The lifetime prevalence of T'ai Chi use was 2.9%, indicating 6.90 million US adults having practiced T'ai Chi. Qigong was used by 0.7% of the population, representing 1.60 million US adults. The vast majority of Qigong users also practiced T'ai Chi, resulting in a total of 7.38 million US adults (3.1%) practicing T'ai Chi or Qigong or both.

12-month prevalence of T'ai Chi and Qigong use

The 12-month prevalence of T'ai Chi and Qigong were 1.1% (2.6 million) and 0.3% (0.79 million) respectively, the combined 12-month prevalence indicated 2.88 million users within the prior 12 months (1.2%).

Predictors of T'ai Chi/Qigong use

Significant differences for lifetime prevalence of T'ai Chi/Qigong were found for age, gender, ethnicity, region, education, employment, BMI, several medical conditions and smoking or alcohol consumption. For 12-month use, age, ethnicity, region, education, employment, marital status and BMI, several medical conditions and alcohol consumption were significantly different between users and non-users.

Regression analysis showed that the following factors were predictive of *lifetime T'ai Chi/Qigong practice*: Being older than 30 years, female, living in the Western regions; being higher educated, employed and suffering from medical conditions (other heart disease, spinal pain, arthritis and rheumatoid arthritis, fibromyalgia, other joint problems, headache, other mental health disorders, neurological diseases, asthma) as well light to heavy alcohol consumption and moderate to high level exercises were associated with higher likelihood of practice, while being Hispanic or non-Hispanic White was associated with decreased likelihood (Table 1). The explained variance was $r^2=0.068$.

The following predictors were identified as being associated with having practiced *T'ai Chi/Qigong within the prior 12 months*, being older than 30 years, being African American, Asian or of other ethnic origin, having a higher education, living in the Western regions, not being in a relationship; not being abstinent from alcohol consumption and moderate to high level exercise behavior (Table 2). The explained variance was $r^2=0.113$.

Patterns of T'ai Chi/Qigong use

Among individuals who had practiced T'ai Chi/Qigong in the past 12 months, 38.6% attended formal classes or received other formal training. The average number of attended formal classes in the past 12 months was 19.9 ± 19.1 (range: 1-52; median 10); at an average cost per unit of US\$ 24.2 ± 24.7 (range: \$0-60; median \$14.9).

Many participants retrieved information about T'ai Chi/Qigong from sources such as DVD's and CDs (27.8%), the internet (25.8%), and books, magazines or newspapers (22.2%) among others (Figure 1a), scientific articles on the other hand were used by less than 10% of respondents. Participants who had bought learning material such as books and CDs (23.5% of all users) spent on average $\$14.7\pm 12.8$ (range \$0-60; median \$14.9). Only 7.4% of T'ai Chi/Qigong participants reported coverage by their health insurance, while the majority (92.6%) paid for the lessons out-of-pocket. The majority of classes included breathing exercises (98.0%) and meditation (56.3%).

Most respondents reported practicing T'ai Chi/Qigong for general wellness or disease prevention (74.2%), to improve their energy (67.2%), or to exercise more regular (50.8%). Approximately 40% expected improvements of their immune function (40.5%), their athletic or sports performance (40.6%), or their memory or concentration (38.1%) (Figure 1b). Frequent stress, arthritis and joint problems (13.3% each) were the top three specific health problems for which people practiced T'ai Chi/Qigong; and 47.1% and 44.1% reported that T'ai Chi/Qigong had helped a great deal or some to address these health problems respectively.

Most participants reported positive outcomes due to their practice, such as reduced levels of stress (83.2%), improved overall health and wellbeing (74.1%), emotional status (74.2%), and sleep (67.0%) (Figure 1c).

T'ai Chi/Qigong practice was disclosed to the personal health care provider by 42% of practitioners. Those who did not disclose their practice did so because the provider did not explicitly ask about it (63.3%) or they did not think they needed to know (38.8%). Negative concerns or recommendation not to use T'ai Chi/Qigong were anticipated by 13.8% each; and 12.7% of respondents had already received negative comments regarding the use of T'ai Chi/Qigong by their health care providers.

Discussion

Summary of findings

In 2012 2.6 million adults practiced T'ai Chi and 0.8 million Qigong (2.9 million combined). Users were more likely to be older than 30 years, African American, Asian or of other ethnic origin, single, higher educated and living in the West, and not being abstinent from alcohol, compared to non-users. Lifetime prevalence of T'ai Chi/Qigong practice was further associated with female gender, not being Hispanic, and suffering from a severe medical condition such as rheumatic diseases, musculoskeletal and neurological diseases, mental

health disorders and asthma. T'ai Chi/Qigong users were also more likely to be physically active, as moderate to high level exercises were important predictors of use.

About two in five practitioners had attended classes or received formal training, the average number of classes being around 20 in 2012. The majority of users paid the classes out of their own pocket; with average costs per class of 24\$. Most important reasons for practice were wellness and disease prevention and exercising, but also health problems such as stress and arthritic problems.

Prevalence of T'ai Chi/Qigong practice

The prevalence of T'ai Chi/Qigong use in a US adult sample have been analyzed before¹⁰ referring to the 2002 NHIS survey data. The present survey, which has been conducted ten years later, showed that the 12-months prevalence only slightly increased by 0.1 million users (+4%). Interestingly prevalence of use of another mind-body exercise, yoga, has increased significantly from 5.1% (10.4 million) to 9.5% (21.0 million) from 2002 to 2012¹²⁻¹⁴. There is likely no single explanation for the markedly lower rates of increase in prevalence of T'ai Chi vs. yoga use. One possible explanation is that yoga has been publicly advertised much more aggressively in the press. This is supported by the number of published books, articles in newspapers and magazines, in the past 10 years. Recent bibliographic analyses of the scientific literature for yoga and T'ai Chi also reveal several distinct differences regarding the targeted demographics and content of published trials^{15, 16}. For yoga, most trials have been conducted on relatively younger healthy subjects across India and the US, while for T'ai Chi/Qigong most trials have been conducted with relatively older ill people in China and the US. And while yoga research focused on stress and musculoskeletal pain, T'ai Chi has largely been promoted for patients with hypertension, arthritis and osteoporosis, and as fall prevention. Research supporting the benefits of T'ai Chi for age related conditions^{3, 4, 7, 17} might explain increasing prevalence with age in the current sample.

It is interesting to note that the magnitude of growth in the prevalence of use of T'ai Chi does not track the growth in the evidence base for T'ai Chi¹⁶. This may be explained by the fact

that only a minority of practitioners retrieve information about T'ai Chi/Qigong from scientific literature, reflecting limited translation of science into practice.

Predictors of use

Predictors of lifetime prevalence had not been reported in an earlier publication; however, 12-month prevalence was ¹⁰. Several differences have been found compared to the survey from 2002. In the present analysis, not only Asians but also African American and other ethnic groups, were more likely to have practiced T'ai Chi/Qigong in the prior 12 months compared to non-Hispanic Whites. Since T'ai Chi/Qigong originated in Asia, its use in the Asian community might be expected. This was also reported in the former analysis ¹⁰. However, we found that the use of T'ai Chi/Qigong is now also associated with being African American or a member of other ethnic groups, which is quite surprising given that African American are frequently reported to be less physically active than Caucasians ^{18, 19}. This might point at changes in health care utilization. For example minorities have been targeted for several health care interventions in the past decade ²⁰⁻²³. There are limited data available on promotion of T'ai Chi programs for minorities or economically disadvantaged people, but according to our survey findings, not all T'ai Chi/Qigong classes were for fee and thus may have been accessible. Further studies are warranted to determine if and how the use of T'ai Chi is changing, in order to provide the basis for future clinical research of high relevance. Interestingly none of the diseases had any predictive value for the use of T'ai Chi/Qigong. A possible explanation for the latter might be that diseases were not combined to categories as in the prior analysis ¹⁰. The authors considered the possibility at first; but since disease categories were inquired differently at each survey they decided to determine the influence of each disease separately. A condition that has been frequently targeted in clinical trials of T'ai Chi/Qigong is falls in older people ^{3, 4, 24}. T'ai Chi has been shown to increase balance in older people ^{3, 4}; and it seems likely that improving balance and reducing the risk of falls might have been a main reason in older people to use T'ai Chi. However, balance or falls prevention was not included as a possible reason for using T'ai Chi/Qigong in the NHIS.

While open questions were additionally asked, no participant named balance or falls prevention as a reason for using T'ai Chi/Qigong.

For health behaviors results seem inconclusive. While no association with smoking was found, those drinking alcohol were more likely to use T'ai Chi/Qigong compared to abstainers. On the other hand those who at least moderately exercise were also more likely to practice T'ai Chi/Qigong, possibly because T'ai Chi itself can be considered some form of physical exercise.

Method of T'ai Chi training

Regarding the patterns of use, several findings should be considered for future research. Firstly, more than half of the practitioners did not attend classes or receive a formal training in the past 12 months. While those might include participants who had received training before the 12-months survey, it might also indicate that some practitioners will never receive formal training. They might instead have gotten their information from CDs and DVDs, books or the internet. Even though T'ai Chi has been considered safe by a recent review²⁵, such unsupervised practice may decrease its efficacy or be associated with different profiles of adverse events. Researchers should design studies to specifically determine the comparative efficacy and safety of informal DVD- or book-based learning compared to in-personal group based learning²⁴.

Clinical use of T'ai Chi/Qigong

There are significant discrepancies between the health reasons people report using T'ai Chi for and the current evidence base for T'ai Chi, revealing important gaps in research knowledge. Most practitioners reported use of T'ai Chi/Qigong for general wellness and disease prevention. In contrast, most clinical trials to date focus on clinical topics, such as fall prevention and age-related disease management. It must be emphasized that traditionally T'ai Chi was not developed or practiced to cure specific diseases, or to treat specific medical symptoms. Rather, T'ai Chi was developed as martial arts and holistic exercise, with benefits

that translated to healthy aging. Yet today, T'ai Chi is mainly investigated in clinical areas, and even despite its original intent, there is growing evidence for clinical efficacy. For example the Center for Disease Control and prevention (<http://www.cdc.gov/Features/OlderAmericans>) announced that T'ai Chi was highly cost effective for preventing falls based on current evidence,²⁶ and T'ai Chi also seems to be effective in rheumatic disorders, such as osteoarthritis of the knee,⁸ fibromyalgia²⁷⁻²⁹ or rheumatoid arthritis^{30,31}; or in cancer treatment related arthralgia³². Evidence related to primary disease prevention and healthy aging have not been researched very extensively for several possible reasons. Clinical trials on prevention require long periods of observation and are cost-intensive, and for studies of prevention of specific conditions³³, many other (lifestyle) factors have to be controlled. However this is exactly the kind of research necessary given that people use T'ai Chi/Qigong primarily for prevention. Although biased, well-designed cross sectional observational studies comparing long-term T'ai Chi/Qigong experts to matched T'ai Chi naïve controls can contribute to this knowledge³⁴⁻³⁷, as can large scale epidemiological cohort studies including data on the impact of T'ai Chi on mortality.

Limitations

The data are part of a cross-sectional survey; therefore the results can only indicate correlations instead of causal effects. The interpretations which can be drawn from the findings are strengthened, however, by the regression analysis which controls for confounding variables. The survey relies on self-report and as such is at risk of recall bias. This might be especially relevant for T'ai Chi/Qigong which is used by older adults in particular. Finally combining T'ai Chi and Qigong may increase the statistical power of the comparisons, however despite their similarities it might be worthy analyzing them separately.

Conclusion

This survey found that the 12-month prevalence of T'ai Chi and Qigong use did only marginally increase over the past 10 years, however the characteristics of practitioners have changed. Not only Asians, but also African Americans and those of other ethnic origin were

now more likely to practice T'ai Chi/Qigong. Given that minorities are less likely to participate in health promoting activities, T'ai Chi and Qigong might be specifically attractive in this population. The analysis also highlighted gaps between clinic and research in areas of balance and fall prevention, and primary prevention, where research does not seem to match utilization patterns.

Conflict of interest statement:

The authors declare no conflict of interest.

Disclosure statement:

Romy Lauche has no financial disclosures.

Peter Wayne is the founder and sole owner of the Tree of Life Tai Chi Center. Peter Wayne's interests were reviewed and managed by the Brigham and Women's Hospital and Partner's HealthCare in accordance with their conflict of interest policies.

Holger Cramer has no financial disclosures. Gustav Dobos has no financial disclosures.

References

1. Yeh GY, Wang C, Wayne PM, Phillips R. Tai chi exercise for patients with cardiovascular conditions and risk factors: A SYSTEMATIC REVIEW. *J Cardiopulm Rehabil Prev* 2009;29(3):152-160.
2. Lan C, Chen SY, Wong MK, Lai JS. Tai chi chuan exercise for patients with cardiovascular disease. *Evid Based Complement Alternat Med* 2013;2013:983208.
3. Hackney ME, Wolf SL. Impact of Tai Chi Chu'an practice on balance and mobility in older adults: an integrative review of 20 years of research. *J Geriatr Phys Ther* 2014;37(3):127-135.
4. Leung DP, Chan CK, Tsang HW, et al. Tai chi as an intervention to improve balance and reduce falls in older adults: A systematic and meta-analytical review. *Altern Ther Health Med* 2011;17(1):40-48.
5. Taylor-Piliae RE, Hoke TM, Hepworth JT, et al. Effect of Tai Chi on physical function, fall rates and quality of life among older stroke survivors. *Arch Phys Med Rehabil* 2014;95(5):816-824.
6. Wang F, Lee EK, Wu T, et al. The effects of tai chi on depression, anxiety, and psychological well-being: a systematic review and meta-analysis. *Int J Behav Med* 2014;21(4):605-617.
7. Wayne PM, Walsh JN, Taylor-Piliae RE, et al. Effect of tai chi on cognitive performance in older adults: systematic review and meta-analysis. *J Am Geriatr Soc* 2014;62(1):25-39.
8. Lauche R, Langhorst J, Dobos G, Cramer H. A systematic review and meta-analysis of Tai Chi for osteoarthritis of the knee. *Complement Ther Med* 2013;21(4):396-406.
9. Zeng Y, Luo T, Xie H, et al. Health benefits of qigong or tai chi for cancer patients: a systematic review and meta-analyses. *Complement Ther Med* 2014;22(1):173-186.
10. Birdee GS, Wayne PM, Davis RB, et al. T'ai chi and qigong for health: patterns of use in the United States. *J Altern Complement Med* 2009;15(9):969-973.
11. Blackwell DL, Lucas JW, Clarke TC. Summary health statistics for U.S. adults: national health interview survey, 2012. *Vital Health Stat* 10 2014(260):1-161.
12. Barnes PM, Bloom B, Nahin RL. Complementary and alternative medicine use among adults and children: United States, 2007. *Natl Health Stat Report* 2008(12):1-23.
13. Clarke TC, Black LI, Stussman BJ, et al. Trends in the use of complementary health approaches among adults: United States, 2002-2012. *Natl Health Stat Report* 2015(79):1-16.
14. Cramer H, Lauche R, Ward L, et al. Prevalence, Pattern and Predictors of yoga use in the US: Results of a representative survey. *Am J Prev Med* 2015;in press.
15. Cramer H, Lauche R, Dobos G. Characteristics of randomized controlled trials of yoga: a bibliometric analysis. *BMC Complement Altern Med* 2014;14:328.
16. Yang GY, Wang LQ, Ren J, et al. Evidence base of clinical studies on Tai Chi: a bibliometric analysis. *PLoS One* 2015;10(3):e0120655.
17. Saravanakumar P, Higgins IJ, van der Riet PJ, et al. The influence of tai chi and yoga on balance and falls in a residential care setting: A randomised controlled trial. *Contemp Nurse* 2014;48(1):76-87.
18. Lavizzo-Mourey R, Cox C, Strumpf N, et al. Attitudes and beliefs about exercise among elderly African Americans in an urban community. *J Natl Med Assoc* 2001;93(12):475-480.
19. Siddiqi Z, Tiro JA, Shuval K. Understanding impediments and enablers to physical activity among African American adults: a systematic review of qualitative studies. *Health Educ Res* 2011;26(6):1010-1024.

20. Call KT, McAlpine DD, Garcia CM, et al. Barriers to care in an ethnically diverse publicly insured population: is health care reform enough? *Med Care* 2014;52(8):720-727.
21. de Freitas C, Martin G. Inclusive public participation in health: Policy, practice and theoretical contributions to promote the involvement of marginalised groups in healthcare. *Soc Sci Med* 2015;135:31-39.
22. Saper RB, Sherman KJ, Delitto A, et al. Yoga vs. physical therapy vs. education for chronic low back pain in predominantly minority populations: study protocol for a randomized controlled trial. *Trials* 2014;15:67.
23. Schneider RH, Grim CE, Rainforth MV, et al. Stress reduction in the secondary prevention of cardiovascular disease: randomized, controlled trial of transcendental meditation and health education in Blacks. *Circ Cardiovasc Qual Outcomes* 2012;5(6):750-758.
24. Wu G, Keyes L, Callas P, et al. Comparison of telecommunication, community, and home-based Tai Chi exercise programs on compliance and effectiveness in elders at risk for falls. *Arch Phys Med Rehabil* 2010;91(6):849-856.
25. Wayne PM, Berkowitz DL, Litrownik DE, et al. What do we really know about the safety of tai chi?: A systematic review of adverse event reports in randomized trials. *Arch Phys Med Rehabil* 2014;95(12):2470-2483.
26. Gillespie LD, Robertson MC, Gillespie WJ, et al. Interventions for preventing falls in older people living in the community. *Cochrane Database Syst Rev* 2012;9:CD007146.
27. Jones KD, Sherman CA, Mist SD, et al. A randomized controlled trial of 8-form Tai chi improves symptoms and functional mobility in fibromyalgia patients. *Clin Rheumatol* 2012;31(8):1205-1214.
28. Segura-Jimenez V, Romero-Zurita A, Carbonell-Baeza A, et al. Effectiveness of Tai-Chi for decreasing acute pain in fibromyalgia patients. *Int J Sports Med* 2014;35(5):418-423.
29. Wang C, Schmid CH, Rones R, et al. A randomized trial of tai chi for fibromyalgia. *N Engl J Med* 2010;363(8):743-754.
30. Lee MS, Pittler MH, Ernst E. Tai chi for rheumatoid arthritis: systematic review. *Rheumatology (Oxford)* 2007;46(11):1648-1651.
31. Waite-Jones JM, Hale CA, Lee HY. Psychosocial effects of Tai Chi exercise on people with rheumatoid arthritis. *J Clin Nurs* 2013;22(21-22):3053-3061.
32. Galantino ML, Callens ML, Cardena GJ, et al. Tai chi for well-being of breast cancer survivors with aromatase inhibitor-associated arthralgias: a feasibility study. *Altern Ther Health Med* 2013;19(6):38-44.
33. Hartley L, Flowers N, Lee MS, et al. Tai chi for primary prevention of cardiovascular disease. *Cochrane Database Syst Rev* 2014;4:CD010366.
34. Lu X, Siu KC, Fu SN, et al. Tai Chi practitioners have better postural control and selective attention in stepping down with and without a concurrent auditory response task. *Eur J Appl Physiol* 2013;113(8):1939-1945.
35. Wang N, Zhang X, Xiang YB, et al. Associations of Tai Chi, walking, and jogging with mortality in Chinese men. *Am J Epidemiol* 2013;178(5):791-796.
36. Wayne P, Hausdorff JM, Lough M, et al. Tai Chi Training may Reduce Dual Task Gait Variability, a Potential Mediator of Fall Risk, in Healthy Older Adults: Cross-Sectional and Randomized Trial Studies. *Front Hum Neurosci* 2015;9:332.
37. Wayne PM, Gow BJ, Costa MD, et al. Complexity-Based Measures Inform Effects of Tai Chi Training on Standing Postural Control: Cross-Sectional and Randomized Trial Studies. *PLoS One* 2014;9(12):e114731.

Table 1: Predictors independently associated with lifetime use Tai Chi/Qigong among US adults.

	Adjusted Odds Ratio (95% Confidence Interval)	p-Value
Age		
18 to 29	1.00 (Reference)	
30 to 39	1.34 (1.06; 1.68)	0.015
40 to 49	1.38 (1.09; 1.74)	0.006
50 to 64	1.76 (1.42; 2.17)	<0.001
65 or greater	2.62 (2.04; 3.37)	<0.001
Gender		
Male	1.00 (Reference)	
Female	1.16 (1.02; 1.33)	0.028
Ethnicity		
Non-Hispanic White	1.00 (Reference)	
Hispanic	0.59 (0.45; 0.76)	<0.001
African American	0.99 (0.78; 1.25)	0.921
Asian	1.39 (1.07; 1.81)	0.013
Other	1.34 (0.72; 2.52)	0.356
Region		
West	1.00 (Reference)	
Northeast	0.62 (0.51; 0.72)	<0.001
Midwest	0.51 (0.43; 0.62)	<0.001
South	0.52 (0.44; 0.61)	<0.001
Education		
Less than college	1.00 (Reference)	
Some college or more	2.69 (2.25; 3.22)	<0.001
Employment		
Not employed	1.00 (Reference)	
Employed	1.40 (1.18; 1.67)	<0.001
Medical conditions		
Other heart disease	1.50 (1.15; 1.95)	0.003
Spinal pain	1.50 (1.30; 1.72)	<0.001
Arthritis	1.38 (1.17; 1.63)	<0.001
Rheumatoid arthritis	1.79 (1.28; 2.50)	0.001
FMS	1.78 (1.24; 2.55)	0.002

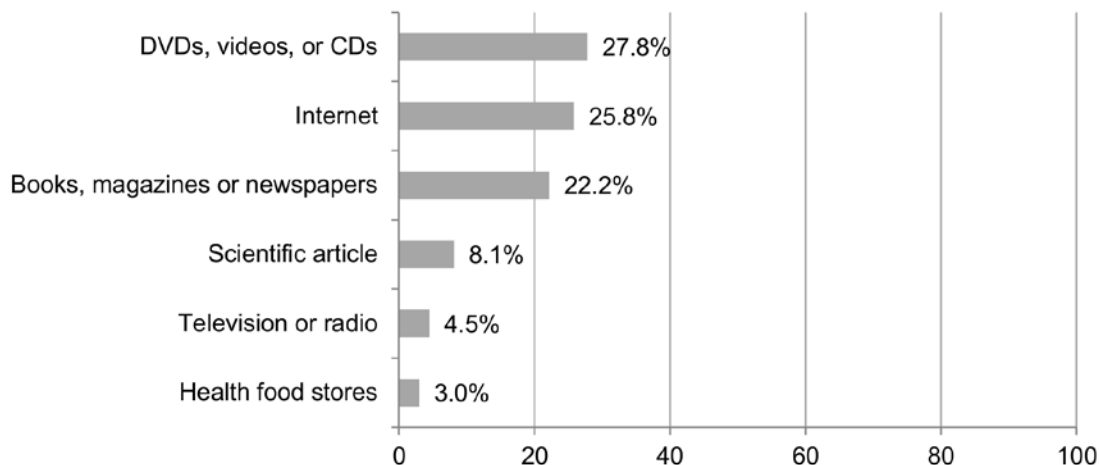
Other joint problems	1.83 (1.26; 2.67)	0.002
Headache	1.32 (1.11; 1.58)	0.002
Other mental health disorders	1.80 (1.32; 2.45)	<0.001
Neurological diseases	1.44 (1.09; 1.91)	0.010
Asthma	1.36 (1.11; 1.66)	0.003
Health behavior		
Alcohol consumption		
Abstainers	1.00 (Reference)	
Light	1.51 (1.28; 1.78)	<0.001
Moderate to heavy	1.49 (1.22; 1.81)	<0.001
Exercise behavior		
Sedentary	1.00 (Reference)	
Moderate exercisers	2.41 (1.99; 2.92)	<0.001
High level exercisers	2.64 (2.25; 3.09)	<0.001

Table 2: Predictors independently associated with Tai Chi/Qigong use in the last 12 months among US adults.

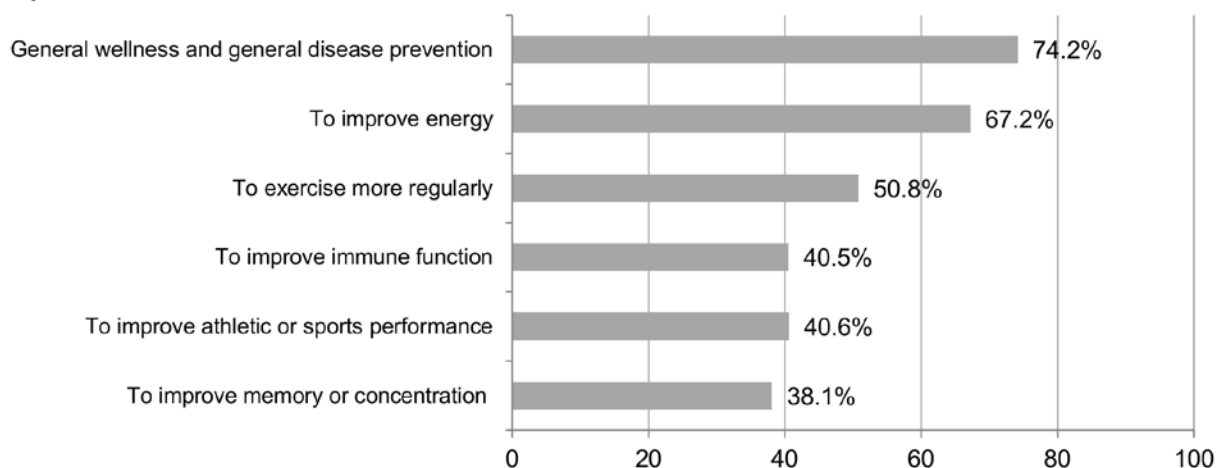
	Adjusted Odds Ratio (95% Confidence Interval)	p-Value
Age		
18 to 29	1.00 (Reference)	
30 to 39	1.79 (1.25; 2.56)	0.001
40 to 49	1.62 (1.12; 2.34)	0.010
50 to 64	2.34 (1.68; 3.25)	<0.001
65 or greater	2.58 (1.80; 3.72)	<0.001
Ethnicity		
Non-Hispanic White	1.00 (Reference)	
Hispanic	0.78 (0.52; 1.18)	0.247
African American	1.64 (1.18; 2.28)	0.003
Asian	1.85 (1.26; 2.73)	0.002
Other	2.36 (1.10; 5.08)	0.028
Region		
West	1.00 (Reference)	
Northeast	0.84 (0.84; 1.12)	0.237
Midwest	0.66 (0.50; 0.88)	0.004
South	0.57 (0.43; 0.74)	<0.001
Education		
Less than college	1.00 (Reference)	
Some college or more	2.15 (1.63; 2.84)	<0.001
Marital status		
Not in a relationship	1.00 (Reference)	
In a relationship	0.63 (0.51; 0.77)	<0.001
Health behavior		
Alcohol consumption		
Abstainers	1.00 (Reference)	
Light	1.38 (1.06; 1.80)	0.015
Moderate to heavy	1.49 (1.11; 2.01)	0.009
Exercise behaviors		
Sedentary	1.00 (Reference)	
Moderate exercisers	1.96 (1.43; 2.69)	<0.001
High level exercisers	2.59 (2.02; 3.32)	<0.001

Figure 1: Most frequently a) reported sources of information on Tai Chi/Qigong (% of respondents); b) reasons for practicing Tai Chi/Qigong (% of respondents); and c) reported changes as a result of Tai Chi/Qigong practice (% of respondents).

a)



b)



c)

