ECRONICON OPEN ACCESS

EC NURSING AND HEALTHCARE
Research Article

Qigong Exercise for Cancer-Related Symptoms in Cancer Care: A Systematic Review

Yong Tang*, Jing Cen, Qianwen Mo and Ying Zhang

Sociology Department, Law School, Shenzhen University, Guangdong, China, 518060

***Corresponding Author:** Yong Tang, Sociology Department, Law School, Shenzhen University, Guangdong, China, 518060.
E- mail: tangyong@szu.edu.cn

Received: March 14, 2020; **Published:** April 27, 2020

Abstract

Purpose: Qigong, as an alternative modality of traditional Chinese medicine, is often used by cancer patients to manage their symptoms and improve their quality of life. This systematic review aims to evaluate the effectiveness of qigong exercise in cancer care.

Methods: Various databases were searched from their inception through March 2019. All controlled clinical trials of qigong exercise among cancer patients were included.

Results: The review included eight original studies and analyzed data from a total of 1,866 patients. Among the reviewed studies on biomedical outcomes, a consistent tendency appeared to emerge, which suggests that the patients treated with qigong exercise in combination with conventional methods had significant improvement in immune function compared to the patients treated with conventional methods alone. The Cochrane risk of bias assessment tools were used for quality evaluation.

Conclusion: The analysis revealed a significant difference in treatment outcomes between patients who received qigong exercise and those who did not (standard mean difference (SMD) = 1.76, 95% confidence interval (CI) [1.95, 2.48], $p < 0.00001$). The review provides initial evidence to suggest that qigong benefits cancer patients concerning the treatment of anxiety, depression, fatigue, sleep difficulty and quality of life (QOL). Due to the high risk of bias and methodological problems in the majority of the included studies, it is still too early to conclude. Additional vigorously designed large-scale randomized controlled trials (RCTs) with validated outcome measures are needed.

Keywords: *Qigong Exercise; Cancer-Related Symptoms; Cancer Care; CAM; RCT*

Introduction

Description of the condition

The World Health Organization (WHO) estimates that 84 million people will die from cancer in the next ten years if action is not taken [1]. Most cancer patients experience multiple symptoms related to either cancer itself or late treatment effects. Cancer patients often turn towards complementary or alternative therapies [2]. Several surveys have reported a prevalence range of complementary and alternative medicine (CAM) use in cancer patients from 53% to 88% [3] and showed that CAM is usually combined with conventional treatments [4]. As a major chronic illness and one of the leading causes of mortality, cancer poses adverse impacts on the patients' functional capacity and quality of life (QOL). Cancer patients often experience painful symptoms and side effects following treatments such as surgery, chemotherapy, and radiotherapy. An increasing use of CAM by cancer patients as a supplement to mainstream Western medical interventions has been evident in the literature. Patients with cancer usually employ CAM for promoting health and managing symptoms experienced during active treatment and the period of survivorship.

Improvements in the treatment of cancer have resulted in an increasing number of cancer patients, with recent estimates predicting that there were over 20 million cancer patients living in China in 2015 [5]. However, many cancer patients are left with long-term physical and psychosocial morbidities. Consequently, treatment options for common cancer-related symptoms, such as anxiety, depression, fatigue, sleep difficulty, and QOL, are essential.

Description of the interventions

Qigong is a form of traditional Chinese medicine (TCM) practice with origins in Eastern medicine. The purpose of its practice is for healing. It is a general term for a large range of traditional Chinese energy exercises and is popularly practiced by a large number of people in Chinese communities. Basically, there are two categories of qigong: internal qigong and external qigong.

The gentle movements of the exercise are designed to achieve a harmonious flow of energy to improve overall well-being. Internal qigong or qigong exercise is self-directed and involves the use of movements, meditation, and the control of breathing patterns. External qigong involves the therapeutic transfer of energy from a skilled practitioner onto the patient's body in the diagnosis and treatment of various diseases.

Qigong exercise with cancer patients

Studies have revealed that the evidence is not convincing enough to suggest that qigong exercise is an effective supportive cancer treatment.

We identified three new issues through our literature review. First, one recent review of qigong exercise for cancer treatment did not critically examine the efficacy of qigong exercise on different health outcomes.

Second, most of the previous systematic reviews mentioned above explored the effectiveness of qigong exercise on only a single symptom or symptom distress in cancer patients. There is a lack of a review examining the benefit of qigong on a variety of symptoms in cancer patients.

Third, randomized controlled trials (RCTs) have shown efficacy for some TCM therapies, but the efficacy of other complementary and alternative modalities, particularly qigong exercise, remains uncertain despite its popularity among chronic patients.

Fourth, studies have established anxiety and depression as two types of emotional distress that most commonly accompany cancer, although few empirical trials have assessed the effects of qigong in cancer patients coping with sleep difficulty, fatigue and poor QOL.

The primary goal of the paper is to systematically review the state of evidence for qigong as an intervention in supportive cancer care using the Cochrane Handbook of Systematic Reviews of Interventions, to identify gaps in evidence regarding qigong for cancer care and to suggest directions for future research, with a particular focus on different cancer-related symptoms. Our study builds upon and extends several prior reviews by including a significant number of recently published clinical trials not considered in prior studies and by specifically focusing on cancer-related symptoms: anxiety, depression, fatigue, sleep difficulty and QOL.

Methods

Search strategies

We searched electronic databases, including MEDLINE/PubMed, Science Direct, Springer, ProQuest, SSCI, SAGE, EBSCO, Campbell Library, the Cochrane Central Register of Controlled Trials (CENTRAL) and the Qigong and Energy Medicine Database, for eligible studies published through March 2019. We searched Google Scholar for the gray literature and attempted to identify additional studies from

the references of studies cited therein. We also performed a search in Chinese in the following databases: China National Knowledge Infrastructure (CKNI), Chinese Biomedical Medicine Database, Chinese Scientific Journals Full-Text Database and Wan Fang Data, China Master Theses Full-text Database, and China Doctor Dissertations Full-text Database. The search terms used with CENTRAL were as follows: (cancer OR tumor) AND (qi gong OR qi-gong OR qigong OR chi gong) AND (clinical trial OR explanatory trial OR pragmatic trial OR randomized controlled trial OR RCT). Simplified Chinese translations of these terms were used in Chinese databases. The search terms used in different databases were slightly different.

All controlled clinical trials among cancer patients who received a qigong intervention alone or combined with other treatments, either on an individual basis or in group sessions, were included. RCTs were preferred and controlled clinical trials (CCTs) were also included to provide alternative evidence due to the limited number of RCTs in the field. Uncontrolled observational studies were excluded. For all included studies, the primary data from the sources were reviewed and analyzed.

Since some qigong studies were published in Chinese, we included relevant publications from both Chinese- and English-language databases (our team consisted of two researchers and three postgraduates from China). All of them were unfamiliar with languages from other Asian countries, such as Japanese and Korean. Two reviewers independently searched and screened the titles and abstracts of the English-language studies identified by the search against the eligibility criteria, and two reviewers independently searched and screened the Chinese-language studies. All available evidence of the health benefits of qigong exercise for cancer patients was considered. Specifically, the outcome measures for this review included indicators of physical health such as symptoms, measures of psychosocial health such as QOL, and biomedical outcomes. For each included study, data were extracted by one main researcher and then verified by another researcher. Any discrepancies were resolved by discussion. Selected articles were then retrieved in their entirety and assessed as to whether they fulfilled the inclusion criteria. The reference lists of all articles were also reviewed to identify other relevant studies that may have been overlooked when using the search strategy. Articles written in both English and Chinese were included in the search.

Inclusion and exclusion criteria

According to the theme and abstract of the present study, one researcher made a tentative selection of research papers that conformed to the specified standards. Using the study title and abstract, the two postgraduates decided whether to include an article based on the specified inclusion criteria. Excluded studies either were not relevant or did not meet at least one inclusion criterion. When the value of a study was uncertain, a third researcher was assigned to read the abstract and make a final decision. In the case of a difference of opinion among the authors, the opinion of the third researcher was crucial to determine whether to include the study in this report.

The inclusion criteria included all systematic reviews if they evaluated the effect of qigong on cancer patients with at least two CCTs. Studies were excluded if they included external qigong due to the focus on internal qigong in this systematic review, examined qigong together with other types of complementary medicine, or assessed mixed populations, such as healthy subjects and cancer patients.

Data extraction

Two reviewers independently conducted the literature search based on the inclusion criteria. Two other reviewers reviewed all the retrieved articles to evaluate their suitability for inclusion. Uncertainty was resolved through discussion with the corresponding reviewers. After the selection of studies, the reviewer extracted the following data from the chosen articles: author, publication year, country of origin, study design, participants, outcome measures, control intervention, main results, and adverse events. Discrepancies were resolved through discussion with a third reviewer. Important missing data regarding the study design and statistical analysis were obtained by contacting the original authors by email and telephone.

Outcome assessment

The primary outcome of interest was anxiety (measured by the Hospital Anxiety and Depression Scale, HADS); depression (measured by the Beck Depression Inventory, BDI; the Brief Symptom Inventory, BSI; and the Hospital Anxiety and Depression Scale, HADS); fatigue (measured by the Fatigue Symptom Inventory, FSI; the Functional Assessment of Chronic Illness Therapy sleep difficulty, FACIT; and the Brief Fatigue Inventory, BFI); sleep difficulty (measured by Pittsburgh Sleep Quality Index, PSQI); and QOL (measured by the Functional Assessment of Cancer Therapy-General, FACT-G). Differences in outcomes were determined based on the rating scale scores, which are expressed as the standard mean difference (SMD) with a 95% confidence interval (CI). Outcome measures were determined by the measure that served as the major outcome in the published articles. Studies were excluded if they did not use the identified assessment methods.

Assessment of risk of bias

In considering the heterogeneity of interventions and data, this review adopted the Cochrane risk of bias (RoB) assessment tool to evaluate the overall quality of the research. The assessment includes six perspectives: selection bias (selected by random sequence or allocation concealment), performance bias (blinding of participants and personnel), detection bias (blinding of outcome assessment), attrition bias (incomplete outcome data), reporting bias (comprehensive reporting) and other bias (Figure 1 and 2).

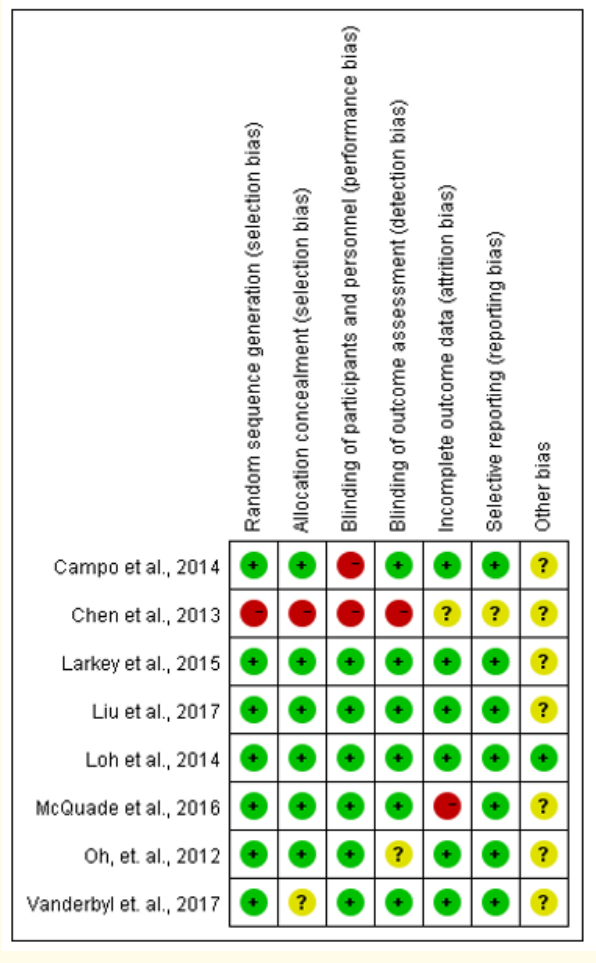

Figure 1: *Summary of the RoB assessment for the included studies.*

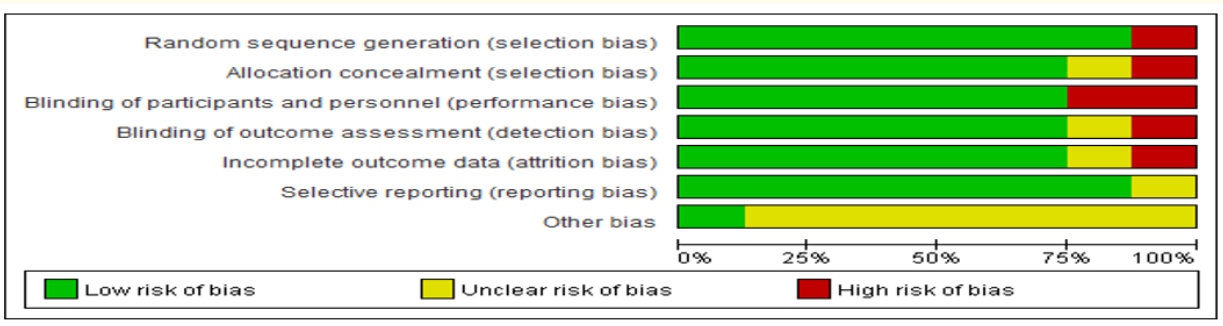

Figure 2: *Assessment of bias risk in the studies.*

Statistical analysis

Review Manager 5 meta-analysis software was utilized to generate pooled estimates of effect size for changes in the outcomes using a random effects model. Heterogeneity was assessed with the Q-test and further validated with the I2 formula for variability. I2 percentages of 25%, 50% and 75% reflected low, moderate, and high heterogeneity, respectively. Dichotomous variables are described using odds ratios (ORs), relative risks (RRs), and risk differences (RDs) and continuous variables are described using mean differences (MDs) and SMDs.

Results

As shown in figure 3, 1866 reports, including research articles and studies, were identified through a comprehensive literature search by the lead reviewer. From this set, 1641 reports were excluded because they did not satisfy the inclusion criteria. Specifically, 492 reports were not RCTs; 372 reports did not examine the impact of qigong on anxiety, depression, fatigue, sleep difficulty, and QOL; 67 reports did not address anxiety, depression, fatigue, sleep difficulty, and QOL; and 710 reports were excluded for other reasons, including being a duplication of another report. Two reviewers independently screened 334 abstracts and excluded 288 of them (120 studies did not focus on qigong; 33 studies did not investigate the outcomes anxiety, depression, fatigue, sleep difficulty, and QOL; 135 studies were not RCTs; and the remaining studies were excluded for other reasons, including being a qualitative synthesis). Of the remaining 46 trials, 8 were excluded because they were reviews; 10 were excluded for using demographic descriptions rather than outcomes; 9 were excluded for combining qigong with cointerventions for anxiety, depression, fatigue, sleep difficulty, and QOL and 8 were excluded because data could not be extracted for all elements required by the 2008 Cochrane Handbook. When ascertaining the eligibility of the included studies, the selection of the two reviewers yielded a kappa coefficient of 0.85, showing high consistency in the literature search. Table 1 summarizes the baseline anxiety, depression, fatigue, sleep difficulty, and QOL measures and the main outcome assessment tools. The seven trials were similar in terms of participant age and basic health condition.

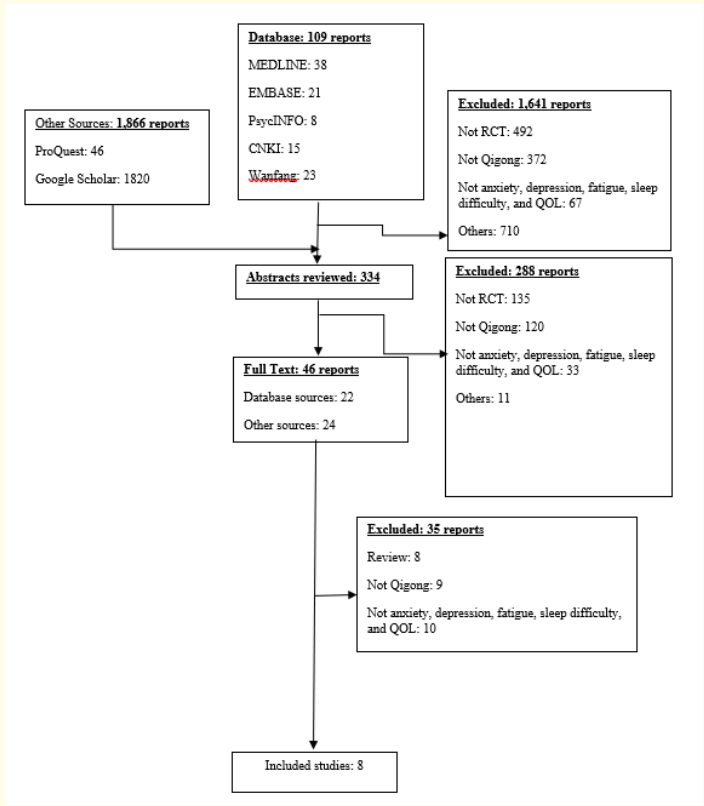

Figure 3: *Literature flow diagram.*

Author (date)	Country	Partici-pants' age (N)	Participants' disease	Intervention	Comparison	Main outcomes, tools, and assessment time	Design	Allocation concealment	Blinding	Incomplete data addressed	Free of selective report-ing
Larkey., *et al*. (2015)	USA	Age: 40-75 years (87)	Diagnosed with stage 0-III breast cancer	Qigong (QG) /Tai Chi Easy (TCE)	Control group	Fatigue (FSI), sleep quality (PSQI), and depression (BDI) at 3, 6 and 9 months.	RCT	Yes	Yes	Yes	Yes
Campo., *et al*. (2014)	USA	Age: 58-93 years (40)	Senior pros-tate cancer survivors	Qigong; Nonaerobic stretching exercise	Control group	Fatigue (FACIT) and distress (BSI-18) at 12 weeks.	RCT	Yes	Yes	Yes	Yes
Vander-byl., *et al*. (2017)	Canada	Age: ≥18 years (36)	Advanced stage non-small-cell lung (NSCLC), gastrointes-tinal (GI) cancer	Qigong (QG)/ standard exer-cise therapy	Control group	Anxiety and depression (HADS), QOL (FACT-G), function-al capacity (SFA), and symptom reduction (11-point Likert-type response scale) at 2, 4 and 6 weeks.	RCT	Yes	No	Yes	Yes
Oh., *et al*. (2012)	Australia	Age: 64.6 years (23)	Cancer pa-tients	MQ program (medical Qigong pro-gram)	Control group	QoL (FACT-G) and fatigue (FACT-Cog) at 10 weeks.	RCT	Yes	No	Yes	Yes
Liu., *et al*. (2017)	Hong Kong	Age: 21-80 years (79)	Breast cancer patients	Guolin Qi-gong (GLQG)	Control group	GLQG train-ing at 12, 24 and 48 weeks.	RCT	Yes	Yes	Yes	Yes
Chen., *et al*. (2013)	China	Age: 25-64 years (49)	Breast cancer patients	Qigong	Control group	Depression (CES-D), fatigue (BFI), sleep disturbance (PSQI), and QoL (FACT-G) at 1 and 3 months.	RCT	Yes	Yes	Yes	Yes
Loh., *et al*. (2014)	Malaysia	Age: 18-65 years (95)	Breast cancer patients	Kuala Lumpur Qigong trial	Control group	Fatigue (FACIT-F) and distress (DASS 21) at 8 weeks.	RCT	Yes	No	Yes	Yes
Mc-Quade., *et al*. (2016)	USA	Age: 62.2 (26)	Men with prostate cancer	Qigong / Tai Chi	Control group	Fatigue (BFI), health-related QoL (EPIC), and sleep disturbance (PSQI) at 1, 3 months.	RCT	Yes	No	Yes	Yes

Table 1: *Participant characteristics and study methods of included trials.*

Note: Control group indicates no other intervention except conventional therapy.

FSI: Fatigue Symptom Inventory; PSQI: Pittsburgh Sleep Quality Index; BDI: Beck Depression Inventory; BSI-18: Brief Symptom Inventory-18; FACIT-Fatigue: Functional Assessment of Chronic Illness Therapy-Fatigue; 6MWT: 6-min walk test; HADS: Hospital Anxiety and Depression Scale; FACT-G: Functional Assessment of Cancer Therapy-General; SFAF: Simmonds Functional Assessment; EORTC-CF: European Organization for Research and Treatment of Cancer; FACT-Cog: Functional Assessment of Cancer Therapy-Cognitive; CRP: C-reactive protein; GLQG training: Guolin Qigong training; CES-D: Center for Epidemiologic Studies Depression Scale; BFI: Brief Fatigue Inventory; PSQI: Pittsburgh Sleep Quality Index.

Study design and interventions

All included studies were RCTs published in peer-reviewed journals. Partial data from the included studies were deemed appropriate for use in the meta-analysis. These data were obtained either from statistical imputation or directly from the original authors. Each of these studies compared qigong exercise to different interventions and controls. A detailed description of the characteristics of the studies is reported in table 1. Each of the seven included studies compared qigong exercise to different interventions and controls as follows: Larkey., *et al.* [6] examined qigong and Tai Chi Easy. Campo., *et al.* [7] examined qigong and nonaerobic stretching exercise. Vanderby., *et al.* [8] examined qigong and standard exercise therapy. Oh., *et al.* [9], Liu., *et al.* [10], Chen., *et al.* [11] and Loh., *et al.* [12] examined qigong with a control group.

Types of participants

The characteristics of the included studies are summarized in table 1. These studies were conducted in four different countries and regions, namely, the USA (n = 3), Canada (n = 1), Australia (n = 1), Hong Kong (n = 1), and mainland China (n = 1). The sample sizes ranged from 36 to 95. Three studies used qigong alongside standard therapies (i.e. Tai Chi Easy, nonaerobic stretching exercises and standard exercise therapy). Three studies involved diagnoses of varying degrees of anxiety, five studies involved diagnoses of depression, five studies involved diagnoses of fatigue, two studies involved diagnoses of sleep difficulty, and four studies involved assessment of QOL.

Effect of qigong on anxiety, depression, fatigue, sleep difficultly and QOL

Figure 4 presents the meta-analysis results of the effects of qigong on the rating scores for anxiety symptoms. The pooled SMD calculated using the random effects model was 1.76 (95% CI 1.05 to 2.48, p < 0.000001), showing a significant difference between qigong and the control conditions.

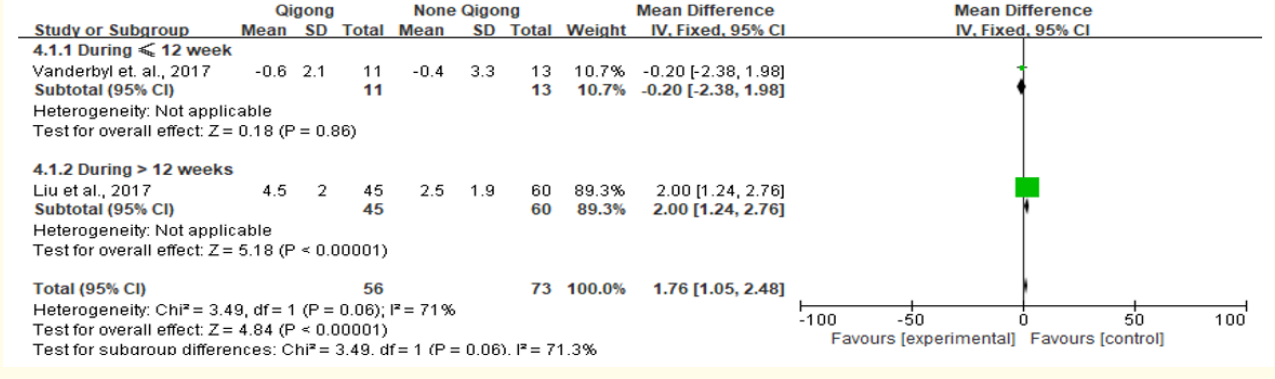

Figure 4: *Effect size of qigong versus control in decreasing anxiety rating scores.*

Figure 5 presents the meta-analysis results of the effects of qigong on the rating scores for depressive symptoms. The pooled SMD calculated using the random effects model was 3.42 (95% CI 1.85 to 5.00, p < 0.00001), showing a significant difference between qigong and the control conditions.

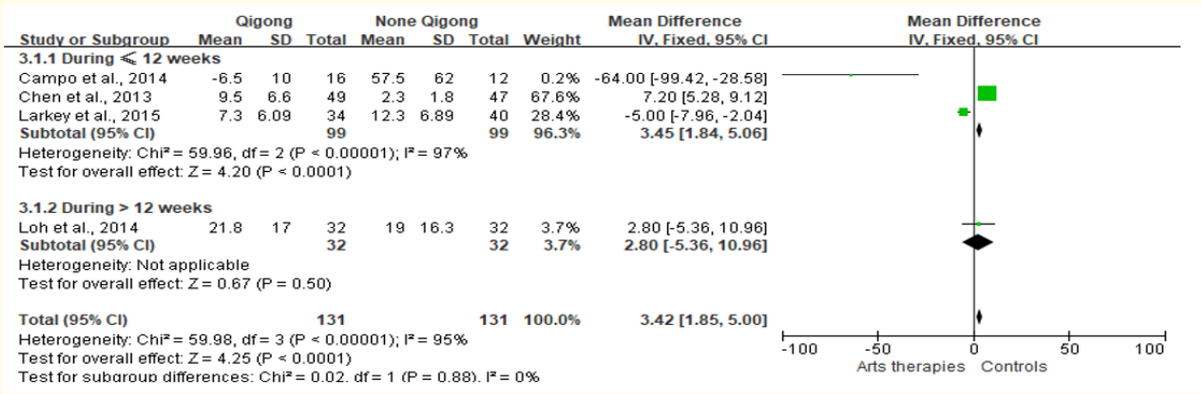

Figure 5: *Effect size of qigong versus control in decreasing depression rating scores.*

Figure 6 presents the meta-analysis results of the effects of qigong on the rating scores corresponding to fatigue. The pooled SMD calculated using the random effects model was 0.56 (95% CI 0.37 to 0.75, p < 0.00001), indicating a significant difference between qigong and the control conditions.

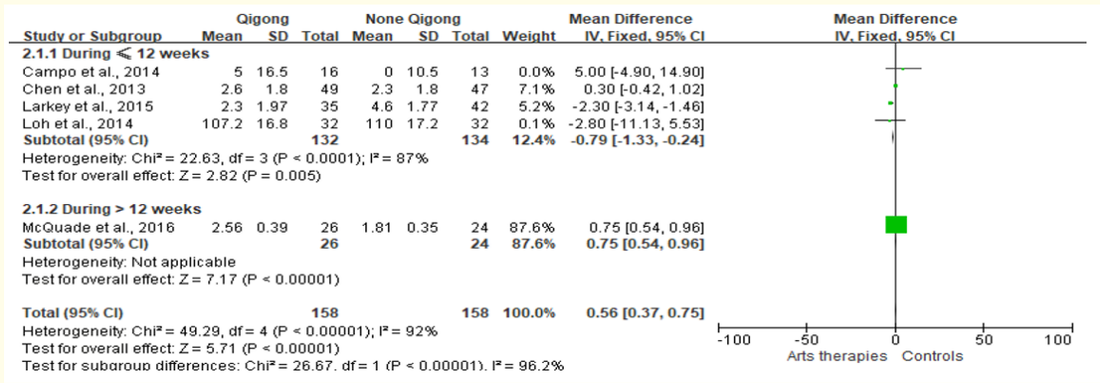

Figure 6: *Effect size of qigong versus control in decreasing fatigue rating scores.*

Figure 7 presents the meta-analysis results of the effects of qigong on the rating scores corresponding to sleep difficulty. The pooled SMD calculated using the random effects model was 1.00 (95% CI 0.70 to 1.30, p < 0.00001), indicating a significant difference between qigong and the control conditions.

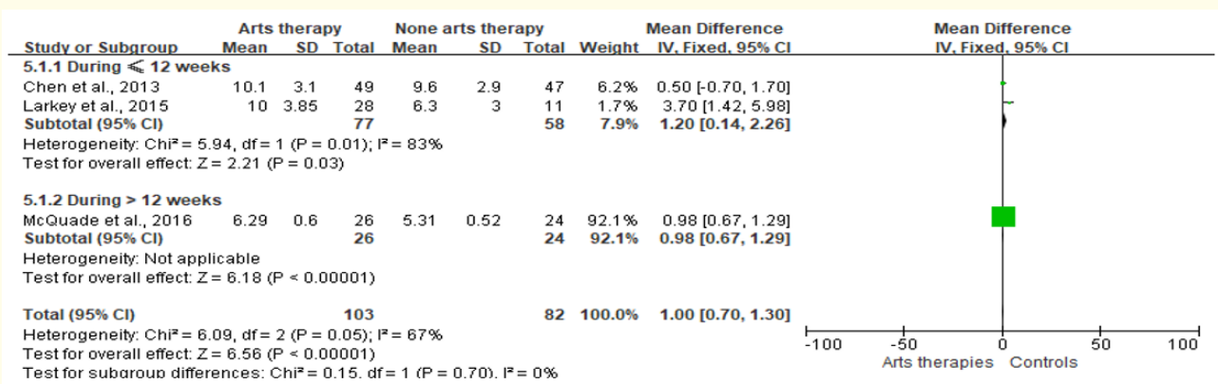

Figure 7: *Effect size of qigong versus control in decreasing sleep difficulty rating scores.*

Figure 8 presents the meta-analysis results of the effects of qigong on the rating scores corresponding to QOL. The pooled SMD calculated using the random effects model was 8.77 (95% CI 4.88 to 12.65, p < 0.00001), indicating a significant difference between qigong and the control conditions.

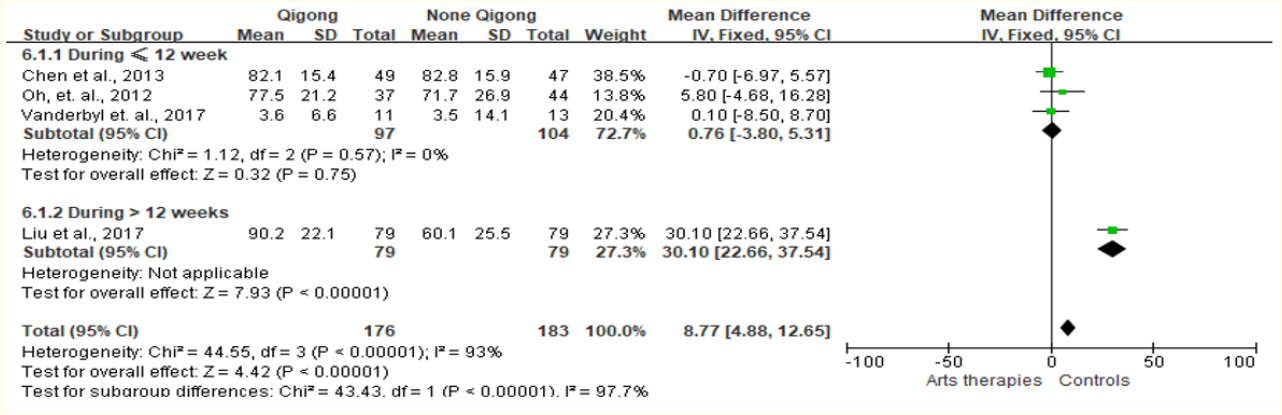

Figure 8: *Effect size of qigong versus control in decreasing quality of life rating scores.*

Campo., *et al.* [7], Chen., *et al.* [11] and Larkey., *et al.* [6] compared qigong with a control condition for a period of more than 12 weeks (Figure 5). The SMD was 3.45 (95% CI 1.84 to 5.06, p < 0.00001), suggesting a small effect on self-reported depression that favored qigong. However, the result was not statistically significant (p = 0.000), and there was no significant heterogeneity between the studies.

Loh., *et al.* [12] compared qigong with a control condition in terms of decreasing depressive symptoms over a period less than 12 weeks (Figure 9). The SMD was 3.42 (95% CI 1.85 to 5.00) and favored qigong, but the difference was not statistically significant at 12 weeks (p < 0.00001). There was no significant heterogeneity between the studies.

Sensitivity analyses

Sensitivity analyses, or assessments of the effects of individual studies on the pooled variables, were conducted by excluding studies assumed to have large effects on meta-analysis results because of the participants' baseline health. After excluding the Loh., *et al.* [12] study from the analysis, the SMD was 3.45 (95% CI 1.84 to 5.06), suggesting a small effect on depressive symptoms favoring qigong at a statistically significant level (P = 0.001). No significant heterogeneity between studies was observed, showing that the effect size of qigong was larger than the control conditions in terms of decreasing depressive symptoms in cancer patients (Figure 9).

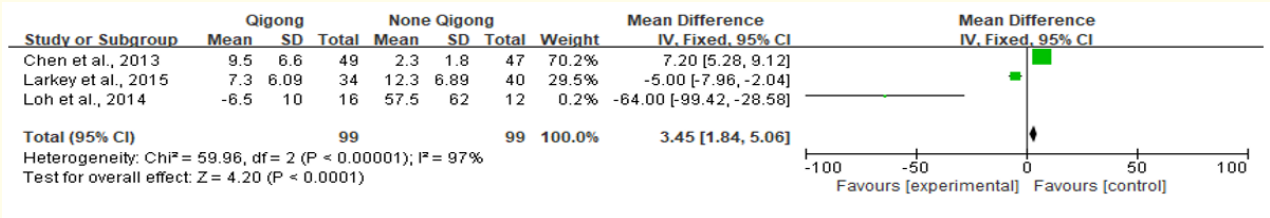

Figure 9: *Sensitivity analysis: Effect size of qigong versus control in decreasing anxiety rating scores.*

Discussion

Seven randomized control trials with cancer patients (total number = 1,866) were examined to assess the impact of qigong interventions on reducing symptoms of anxiety, depression, fatigue, sleep difficulty and QOL. Our review confidently supports qigong as a highly effective intervention for anxiety, depression, fatigue, sleep difficulty and QOL. Previous reviews combined different comparison interventions and induced greater heterogeneity than tolerated in this analysis. We also found qigong effective. Wide variations were observed in participants' demographics, quality of the methodology, designated outcomes, duration of the intervention, time spent practicing qigong, and sample size. However, all seven studies reported on? which made them suitable for analyses. Heterogeneity in comparing interventions and participant health condition was resolved through subgroup analyses and sensitivity analyses. Subgroup analyses were used to investigate the effect of participants' health condition on the effectiveness of qigong for decreasing cancer-related symptoms. In this respect, qigong was found to be more effective at decreasing cancer-related symptoms among cancer patients who received qigong for 12 weeks than among control participants. In terms of the sensitivity analysis, the results changed when? study was deleted from the pooled analysis to explore the stability of the final results. This change implies that qigong has a greater effect than no qigong in terms of decreasing the related symptoms in cancer patients.

Of the seven analyzed studies, two studies were considered high in quality because each fulfilled more than three quality assessment criteria. The remaining studies were rated as moderate in quality because they satisfied fewer than two quality assessment criteria for internal validity. Some quality problems included insufficient power, detection bias induced by self-reporting, no intention-to-treat (ITT) analysis and no reported treatment fidelity.

Among these studies, some collected only baseline data on psychological variables and did not measure anxiety, depression, fatigue, sleep difficulty and QOL symptoms as outcomes. These studies were therefore excluded from the present review. When comparing qigong with a control condition in assessing decreases in anxiety, depression, fatigue, sleep difficulty and QOL symptoms among participants, the results favored qigong but did not show significant differences between the two conditions. This finding underscores the necessity for additional research on the effects of qigong on anxiety, depression, fatigue, sleep difficulty and QOL symptoms [13,14].

Implications of the findings

Incorporating qigong within the hospital or clinical environment where cancer patients are being treated can be very beneficial. Many clinics and hospitals conduct chemotherapy and radiation regularly, and cancer patients spend many hours waiting for and receiving treatments. This time would offer ideal opportunities for patients and even family members to participate in qigong programs. Such programs could be designed for individuals, families, or even groups. Cancer is an overwhelming experience not only for the patient but also for anyone who supports them, including friends or family. Having a qigong teacher on site and available for patients and supporters would be helpful. Even after the treatment is completed, the patient and supporters would benefit from assistance from a community-centered group in helping them cope with their new reality. Cancer support groups centered on an activity tend to help patients and supporters engage in new activities and distract them from negativity.

Other ways to combat anxiety, depression, fatigue, sleep difficulty and QOL, including the use of mindfulness practices and positive psychotherapy, have been examined by studies. These practices and therapies are also helpful in improving patients' QOL.

Conclusion

The strengths of the present systematic review include the use of a systematic and transparent literature search and standardized inclusion and study evaluation criteria. To our knowledge, the present study is the first systematic review to review the effectiveness of qigong in terms of reducing anxiety, depression, fatigue, sleep difficulty, and QOL symptoms among cancer patients.

Based on the results, we can conclude that qigong is effective in decreasing cancer-related symptoms. The results from the subgroup analysis further suggest that qigong is slightly more effective than control conditions in decreasing these symptoms among cancer patients, although the difference is not statistically significant.

Given the unique characteristics of qigong, it might be a preferable form of therapy for cancer patients because it features minimal risk. However, we could not confirm these benefits in the present study. The findings should be interpreted with caution given the limited set of studies included in the present meta-analysis. Future trials should strive to improve quality and reporting. The use of concealed allocation and blinded assessors is important to reduce bias. Attention should also be given to the timing of the assessment, the duration of the intervention to maximize benefits and the styles of qigong examined. Care providers should determine whether qigong is an appropriate intervention based on the resources, abilities and needs of their clients. Due to differences in both culture and policy across patients and care providers, further confirmation of the present study's findings is required to ascertain whether or how the conclusions can be extended.

Qigong may have potential as a rehabilitation intervention for cancer survivors to improve their functional capacity. Due to the limited number of RCTs in the field and the methodological problems and high risk of bias in the included studies, it is still too early to conclude the efficacy and effectiveness of qigong exercise as a form of health practice adopted by cancer patients during their curative, palliative, and rehabilitative phases of the cancer journey. Since qigong exercise is preferred and widely practiced among patients with various cancers in China and Asia, further well-designed large-scale placebo-controlled, randomized studies with validated outcome measures are particularly needed.

Limitations of the Study

We are cognizant of the limitations of our search results. First, we have relied heavily on published studies, particularly those that could be accessed electronically. Although reviews comparing qigong with other interventions for anxiety, depression, fatigue, sleep difficulty and QOL were identified during the search process, none of the reviews used the rigorous meta-analysis methodology of the Cochrane Handbook to examine the effect size of qigong for reducing anxiety, depression, fatigue, sleep difficulty and QOL in cancer patients. Second, the present review is limited in terms of its applicability and generalizability due to the small number of participants. Generalizability refers to both implications for specific practice and indications for further research. Because of the small sample size, this study review has a low effect size in terms of its generalizability for practice, but its results are preferable to no evidence in guiding future research and practice. Third, the results suggest that more research is required to examine the true effects of qigong on anxiety, depression, fatigue, sleep difficulty and QOL. Fourth, the current study was not a worldwide study because it included only journal articles published in English and Chinese. It would be helpful to go beyond just a Chinese population and focus on the benefits of qigong for all.

Our overview has several limitations. Although our search strategy seemed thorough, we cannot completely exclude the possibility that relevant articles were missed. It is also possible that evaluating systematic reviews rather than clinical trials may not capture the relevant details of the primary studies. Furthermore, the fact that the systematic reviews were conducted using primary data of poor quality is a major limitation of this study. Collectively, these drawbacks render our verdict about qigong exercise less robust than we had hoped.

Funding

The authors declare that there are no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Conflicts of Interest

The authors state that there are no conflicts of interest with regard to this research.

Ethics Approval

This article does not contain any studies with human participants or animals performed by any of the authors.

Bibliography

1. McGuire S. "World cancer report 2014". Geneva, Switzerland: World Health Organization, international agency for research on cancer, WHO Press (2015).

2. Peabody FW. "The care of the patient". *JAMA* 313.18 (2015): 1868-1868.

3. Berretta M., *et al*. "Use of Complementary and Alternative Medicine (CAM) in cancer patients: An Italian multicenter survey". *Oncotarget* 8.15 (2017): 24401.

4. Sheu MT., *et al*. "Efficacy of antioxidants as a complementary and alternative medicine (CAM) in combination with the chemotherapeutic agent doxorubicin". *Integrative Cancer Therapies* 14.2 (2015): 184-195.

5. Chen W., *et al*. "Cancer statistics in China, 2015". *CA: A Cancer Journal for Clinicians* 66.2 (2016): 115-132.

6. Larkey LK., *et al*. "Randomized controlled trial of Qigong/Tai Chi Easy on cancer-related fatigue in breast cancer survivors". *Annals of Behavioral Medicine* 49.2 (2014): 165-176.

7. Campo RA., *et al*. "Levels of fatigue and distress in senior prostate cancer survivors enrolled in a 12-week randomized controlled trial of Qigong". *Journal of Cancer Survivorship* 8.1 (2014): 60-69.

8. Vanderbyl BL., *et al*. "A comparison of the effects of medical Qigong and standard exercise therapy on symptoms and quality of life in patients with advanced cancer". *Supportive Care in Cancer* 25.6 (2017): 1749-1758.

9. Oh B., *et al*. "Effect of medical Qigong on cognitive function, quality of life, and a biomarker of inflammation in cancer patients: a randomized controlled trial". *Supportive Care in Cancer* 20.6 (2012): 1235-1242.

10. Liu W., *et al*. "Improved sleep after Qigong exercise in breast cancer survivors: A pilot study". *Asia-Pacific Journal of Oncology Nursing* 2.4 (2015): 232-239.

11. Chen Z., *et al*. "Qigong improves quality of life in women undergoing radiotherapy for breast cancer: results of a randomized controlled trial". *Cancer* 119.9 (2013): 1690-1698.

12. Loh SY., *et al*. "The Kuala Lumpur Qigong trial for women in the Cancer Survivorship phase-efficacy of a three-arm RCT to improve QOL". *Asian Pacific Journal of Cancer Prevention* 15.19 (2014): 8127-8134.

13. Fong SS., *et al*. "Effects of a 6-month Tai Chi Qigong program on arterial hemodynamics and functional aerobic capacity in survivors of nasopharyngeal cancer". *Journal of Cancer Survivorship* 8.4 (2014): 618-626.

14. McQuade JL., *et al*. "Qigong/tai chi for sleep and fatigue in prostate cancer patients undergoing radiotherapy: a randomized controlled trial". *Psycho-Oncology* 26.11 (2017): 1936-1943.

Volume 2 Issue 5 May 2020