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REVIEW ARTICLE

## Qigong for cancer treatment: A systematic review of controlled clinical trials

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### Abstract

Qigong is a mind-body integrative exercise or intervention from traditional Chinese medicine used to prevent and cure ailments, to improve health and energy levels through regular practice. The aim of this systematic review is to summarize and critically evaluate the effectiveness of qigong used as a stand-alone or additional therapy in cancer care. We have searched the literature using the following databases from their respective inceptions through November 2006: MEDLINE, AMED, British Nursing Index, CINAHL, EMBASE, PsycInfo, The Cochrane Library 2006, Issue 4, four Korean Medical Databases, Qigong and Energy Medicine Database from Qigong Institute and four Chinese Databases. Randomised and non-randomised clinical trials including patients with cancer or past experience of cancer receiving single or combined qigong interventions were included. All clinical endpoints were considered. The methodological quality of the trials was assessed using the Jadad score. Nine studies met our inclusion criteria (four were randomised trials and five were non-randomised studies). Eight of these trials tested internal qigong and one trial did not reported details. The methodological quality of these studies varies greatly and was generally poor. All trials related to palliative/supportive cancer care and none to qigong as a curative treatment. Two trials suggested effectiveness in prolonging life of cancer patients and one failed to do so. We conclude that the effectiveness of qigong in cancer care is not yet supported by the evidence from rigorous clinical trials.

Cancer is a leading cause of death globally [1]. The World Health Organization estimates that 84 million people will die in the next 10 years if action is not taken [1]. Most cancer patients experience multiple symptoms related to either the cancer itself or late treatment effects.[2] Cancer patients therefore often turn towards complementary or alternative therapies. The results of the 2002 National Health Interview Survey showed that rates of CAM used are especially high among USA patients with serious illness such as cancer [3]. Several surveys reported a prevalence range of CAM in cancer from 53 to 88% [4–6] and showed that CAM is usually combined with conventional treatments [6].

Qigong is a mind-body integrative exercise or intervention from traditional Chinese medicine used to prevent and cure ailments, to improve health and energy levels through regular practice [7]. Internal and external qigong can be distinguished. Internal qigong is self-directed and actively engages people in their own health and well-being. It is best

practiced daily to promote health maintenance and disease prevention. In external qigong a practitioner is involved in the treatment. Although neither qigong itself nor the mechanism of its effects is explicable within the paradigm of medical science, there is increased report of its effects on the human health. Several reviews claim that qigong offers therapeutic benefits for cancer patients [7–9]. However, these reviews are non-systematic and therefore open to bias. The aim of this systematic review is to summarize and critically evaluate the clinical trial evidence regarding the effectiveness of any type of qigong in cancer care.

### Methods

#### Data sources

Electronic databases were searched from their respective inceptions through November 2006 using following databases: MEDLINE, AMED, British

Nursing Index, CINAHL, EMBASE, PsycInfo, The Cochrane Library 2006, Issue 4, Korean Medical Databases (Korean Studies Information, DBPIA, Korea Institute of Science, Technology Information, Research Information Center for Health Database and Korean Medline), Qigong and Energy Medicine Database (Qigong Institute, Menlo Park, version 7.4) and Chinese Databases (China Academic Journal, Century Journal Project, China Doctor/Master Dissertation Full text DB, China Proceedings Conference Full text DB). The search terms used were: qigong or chi adj gong or chi adj kung or qi adj kung or jih adj gong or qi adj gong or Korean or Chinese letter for qigong and cancer. Several experts were contacted and asked to contribute any unpublished trials. In addition, the references of all located articles and our departmental files were hand-searched for further relevant articles.

Randomised clinical trials (RCTs) and non-randomised controlled clinical trials (CCTs) were included if they investigated patients with cancer or past experience of cancer who received single or combined qigong interventions as sole treatment or as adjuvant to conventional treatments. Outcomes had to be compared to other interventions or no treatment at all. No language restrictions were imposed.

All clinical endpoints were considered but the main outcome measures were effectiveness of qigong for treating symptoms in cancer patients and cancer survivors. Secondary outcome measures included survival rate and quality of life. Trials were excluded from this review if the outcomes were related only to immunological or other surrogate endpoints. All articles were read by two independent reviewers and data from the articles were validated and extracted according to pre-defined criteria listed in Table I. The methodological quality of all studies was independently assessed by the two reviewers using the Jadad score [10]. Taking into account that qigong practitioners cannot be blinded to the treatment, we used a modification of this scale. Discrepancies between reviewers were resolved by a third independent reviewer. Statistically significant results of each trial were documented (Table I).

## Results

The searches identified 162 potentially relevant articles, of which nine met our inclusion criteria (Figure 1). Eight of these trials tested internal qigong [11–18] and one trial did not report specifically on qigong form [19]. Four were RCTs and five others were CCTs. Key data are summarised in Table I.

Sun and Zhao [16] conducted a CCT to assess the effectiveness of qigong on symptoms of cancer

patients. Patients were divided non-randomly into two parallel groups: qigong (2 hours daily for 3 months) combined with drugs ( $n=97$ , types of drug were not specified) and drug therapy only ( $n=30$ ). The outcome measures included physical strength, appetite, diarrhea, defecation, and body weight. At the end of the period, 82% of patients from the experimental group had improved physical strength, 63% improved appetite, and 33% were free of diarrhea or irregular defecation. The corresponding rates for the control group were 10%, 10%, and 6%. All these parameters yielded significant inter-group differences.

Zheng [19] tested the effects of qigong on survival rates of various late-stage cancer patients. One hundred patients were compared with patients in the same hospital who had other therapies but no qigong. This study did not mention the type of qigong (regimen) and neither were the interventions administered in the control group. The main outcome was survival rate and median survival time. One and 5 year survival rates were 83% and 17% for lung cancer patients (in the control group, they were 7% in 5 years) and 83% and 23% for stomach cancer patients (controls: 12% in 5 years). The median survival time favored the experimental group (20.7 vs. 3.5 months,  $p<0.01$ ).

Wang and co-workers [17] conducted an RCT to evaluate the effect of qigong in late stage cancer patients. Sixty one patients were divided randomly to receive chemotherapy only ( $n=29$ ) or chemotherapy plus qigong ( $n=32$ ). The main outcome measures were improvement in health and white blood cell (WBC) count. The experimental group experienced improved health and a stable WBC counts, whereas 12 of 30 patients in the control group reported worse health with more symptoms related to cancer, and all controls showed a decline in WBC count.

Fu and Wang [12] conducted an RCT to evaluate the short-term effects of a Chinese herbal mixture versus qigong therapy plus the herbal mixture among elderly patients with late-stage stomach cancer. Forty patients in whom the cancer was confirmed (x-ray, CT scan, biopsy, and/or ultra-sound) were recruited. Most of the patients (80%) were too old or too ill to have surgery. The patients were randomly assigned to the two treatment groups. After 3 months of treatment the majority of the patients reported improvement and 22–23% had measurable tumor reduction. However, there was no significant difference between the two treatment groups. Patients receiving qigong plus herbal group reported significantly less symptoms ( $p<0.05$ ) and more increase in the immune functioning ( $p<0.01$ ).

Fu [11] carried out an RCT to assess the effectiveness of combined qigong with herbal treatment

Table I. Summary of clinical studies of qigong for cancer treatment.

First author (year)	Study design, Quality score <sup>a</sup>	Patient condition, Sample size	Intervention (Regimen)	Control	Main outcome measures	Intergroup difference	Authors' conclusion
Sun (1988) [16]	CCT, 0	Advance stage of various cancer Stage III, IV 123	Qigong (2hr daily for 3 months), plus same drug treated on control	Drug (n.r.)	1) Strength 2) Appetite 3) Diarrhea or defecation	1)–3) Significant difference (no P value reported)	'Qigong is helpful to some extent to ameliorating the symptoms, improving appetite, strengthening constitute and increasing the ability of self-cure.'
Zheng (1990) [19]	CCT, 0	Various cancer (liver, lung and gastric) 100	Qigong (n.r.)	n.r.	1) Survival rate 2) Mean survival time	1) n.r. 2) P < 0.01	' n.r.'
Wang (1993) [17]	RCT, 1	Late stage cancer 62	Qigong (n.r.), plus chemotherapy	Chemotherapy	1) Health state	1) n.r.	'Qigong plus chemotherapy in the management of cancer has advantage of raising curative rate, extending the tumour-free of survival and better quality of their survival.'
Fu & Wang (1995) [12]	RCT, 1	Late stage stomach cancer 40	Qigong (n.r.) plus herbal medicine	Herbal medicine only	1) x-ray, CT or Ultra-sound to measure tumor size 2) symptoms checklist & quality of life index	1) NS 2) P < 0.05	'Qigong plus herbal treatment show better therapeutic result than herbal along in terms of symptom reduction and immune functions.'
Fu (1996) [11]	RCT, 1	Cardiac adenocarcinoma 186	Qigong (n.r.) , plus herbal treatment and surgery	(A) Surgery (B) chemotherapy, plus surgery (C) Herbal treatment, plus surgery	1) Survival rate 2) Mean survival time	1) Qigong vs A, P < 0.01 2) n.r.	'Qigong therapy and herbal treatment combination may suggest better treatment than stand alone chemotherapy or surgery after prognostic of cardiac adenocarcinoma'
Wang (2002) [18]	CCT, 0	Various cancer 211	Qigong (n.r.)	n.r.	1) Anxiety 2) Depression 3) Personality	1) P < 0.01 2), 3) NS	'The therapeutic effects of qigong rehabilitation in cancer patients might be related to the psychological factors.'
Hong (2003) [13]	CCT, 0	Advanced gastric cancer 24	Qigong (15–20 min, twice daily for 8weeks), plus same chemotherapy with the control received	Chemotherapy (5-FU+ Sunpla or Epirubicin)	1) Fatigue 2) Physical functioning (SF-36) 3) Index of nausea and vomiting	1) P < 0.05 at week 4, P < 0.01 at week 8 2) P < 0.01 at week 4 and 8 3) P < 0.05 at week 4	'Qigong was proved as an effective nursing intervention to reduce fatigue, difficulty of daily activities and some of symptoms of chemotherapy side effect as nausea, vomiting and stomatitis'
Lam (2004) [14]	RCT, 3	Hepatocellular carcinoma 58	Qigong (2hr, twice weekly for 6 weeks in class and 3.5–5 hr once daily for 24 weeks), plus TOCE	TOCE	1) Survival rate 2) Quality of life (SF-36)	1), 2) NS	'The treatment effect of qigong on the survival of patients receiving TOCE for unrespectable hepatocellular carcinoma was insignificant compared to the control group. Effect of qigong on quality of life was not significant either.'

Table I (Continued)

First author (year)	Study design, Quality score <sup>a</sup>	Patient condition, Sample size	Intervention (Regimen)	Control	Main outcome measures	Intergroup difference	Authors' conclusion
Lee (2006) [15]	CCT, 0	Breast cancer 67	Qigong (15–60 min, once daily for 21 days), plus chemotherapy (n.r.)	Chemotherapy (n.r.)	1) Symptom distress 2) Psychological distress	1) P < 0.01 after intervention 2) NS	'Qigong had the effect of attenuating the symptom distress and probably some part of the psychological distress of chemotherapy patients'

n.r.: not reported ; TOCE: Transcatheter arterial chemoembolisation; NS: no significance; RCT: randomized clinical trial; CCT: controlled clinical trial; CT: computed tomography.

<sup>a</sup>Quality score (Jadad): maximum 5 points.

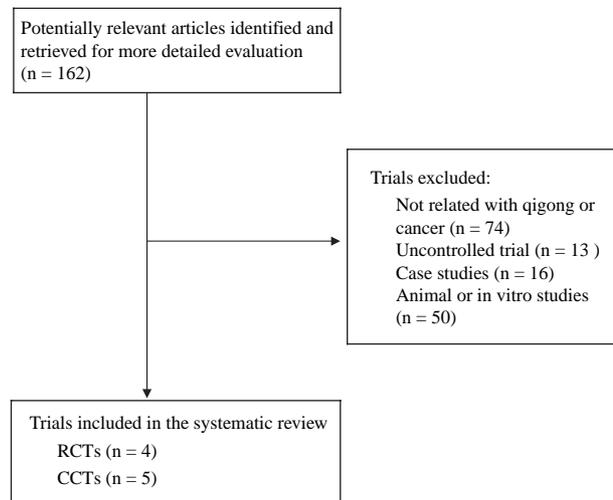


Figure 1. Flowchart of trial selection process. RCT: randomized clinical trial; CCT: controlled clinical trial.

for survival rate in 186 post-surgery patients of cardiac adenocarcinoma (155 men and 31 women; mean age =  $59.8 \pm 8.8$  years). Patients were randomised to four groups: surgery only (control; n = 48), chemotherapy only (etoposide, doxorubicin and cisplatin: EAP, n = 42), herbal therapy only (not specified, n = 46), and qigong combined with herbal treatment (n = 50). The main outcomes were survival rate and median survival period. The survival rate were 80.1%, 36.5%, and 20.8% for the control group at 1, 3, and 5 years respectively; 85.7%, 45.2%, and 25.1% for chemotherapy group; 84.5%, 43.5%, and 26.1% for herbal group; 86.0%, 64.0%, and 36.0% for qigong combined with herbal treatment. There were significant differences between the qigong combined with herbal treatment and the control group ( $p < 0.01$ ). The median survival period was 30 months for the control group, 36 and 36.5 months for chemotherapy and herbal groups, and 48 months for qigong combined with herb group.

Wang and Ye [18] investigated the therapeutic effects of qigong on psychological symptoms during rehabilitation of cancer patients. They recruited 104 cancer patients from a qigong rehabilitation unit as the experimental group, and 107 cancer patients from a regular cancer clinic with similar demographic distribution and types of cancer. They evaluated all patients with the Eysenck Personality Questionnaire, Zung's Self-evaluate Anxiety Scale and Depression Scale, before and 3 months after the treatment. Patients who chose going to qigong rehabilitation were more likely to be extrovert, and have lower anxiety and depression levels at baseline than controls. Compared to the controls more patients in the qigong group reported relief of anxiety and depression.

Hong [13] evaluated the efficacy of qigong on adverse events of chemotherapy in advanced stomach cancer patients. Twenty four patients were non-randomly divided into two groups receiving qigong with chemotherapy (5-FU plus Sunpla or Epirubicin) or chemotherapy only. The main outcome was the level of fatigue as measured by Piper fatigue scale. The difficulty of daily activities was assessed according to the Physical functioning subscale of Medical Outcome Study-36. The frequencies of nausea, vomiting for the last 12 hours were evaluated with an index ranging from 0 (none) to 5 (for more than 7 times). Fatigue was lower in qigong group compare to controls. There were also significant differences between the two groups in the level of difficulty for daily activities, nausea, vomiting and somatitis.

Lam [14] investigated the effect of qigong combined with transcatheter arterial chemoembolisation (TOCE) on survival rate and quality of life in patients with hepatocellular carcinoma. Patients were randomised into two groups receiving qigong combined with TOCE and TOCE only. Qigong exercise lasted 2 hours per session, and were performed twice weekly for 6 weeks in class and 3.5–5 hours daily for 24 weeks at home. The main outcome measured were survival rates and quality of life, measured with SF-36. The survival rate was 52.6% for qigong group and 29.0% for controls. The median survival time was not provided for the qigong group (overall survival rate was higher than 50%) and 242 days for the control group. The differences between the intervention and the control group are not statistically significant for either survival rate or quality of life.

Lee and co-workers [15] conducted a CCT to evaluate the effect of qigong on symptoms and psychological distress of 67 breast cancer patients receiving chemotherapy. Patients were divided into one group having qigong with chemotherapy and one having chemotherapy only. Primary outcome measures were symptom distress (measured with McCorkle and Young's symptom distress scale) and psychological distress (measured with symptom checklist-90-revision; SCL-90-R). The results showed significant differences between the groups for the symptoms distress after 21 days but not in 5, 8, 15 days. No significant differences between the intervention and control groups were noted for psychological distress.

## Discussion

Perhaps the most important finding of this systematic review is that the value of qigong for cancer patients has not been adequately investigated as

there was no large-scale RCT study in the literature. The methodological quality of the existing studies is often poor. Of course, it is a methodologically challenging to design rigorous trials of qigong. Uncontrolled studies are open to bias with high risk of false-positive results. In CCTs, the nature of the control intervention deserves consideration. A "placebo" for qigong does probably not exist. In the present set of studies absence of adequate statistical, variability of therapeutic protocols and poor quality of reporting are frequent methodological problems.

Among the nine studies we included, only four were randomized [11,12,14,17]. The rest of the studies [13,15,16,18,19] were therefore open to selection bias and false positive findings. Four studies were proceeding papers without adequate reporting of essential details. [11,16,17,19] Two were unpublished thesis [13,14] and one was published in a book [12], which had not gone through formal peer review. One RCT failed to show an effect of qigong on survival rate and quality of life in hepatocellular carcinoma patients when compared with TOCE [14]. This trial lacked detail in reporting of methodological features such as carcinoma staging and co-interventions. Another RCT suggested some survival advantages in cardiac adenocarcinoma patients receiving qigong [11]. Its methodology was, however, not clearly described. The third RCT showed significant symptom reductions and an increase in immune function [12]. It was published in a book, which had not gone through the process of formal peer review. The fourth RCT reported that qigong had favorable effects on health status and WBC count [17]. Unfortunately, it was also published only as an abstract, lacking essential details.

Assuming that qigong is potentially beneficial option for cancer patients, possible mechanism may be of interest. These may include improvement of immune function, which may enhance the immune deficiency experienced by most of cancer patients [8]. Others have postulated that qigong improve microcirculatory function including changes in blood viscosity, elasticity as well as platelet function [8]. A third proposed mechanisms is an increment of pain threshold combined with a relaxation effects [8]. If these theories were confirmed, they might explain how qigong leads to clinical improvements in patients.

Limitations of our systematic review and indeed systematic review in general, pertain to the potential incompleteness of the evidence reviewed. We aimed to identify all RCTs and CCTs on the topic. The distorting effects on systematic reviews and meta-analyses arising from publication bias and location bias are well documented [20–23]. In this review there were no restrictions in terms of publication

language and a large number of different databases were searched. We are therefore confident that our search strategy has located all relevant data. However, a degree of uncertainty remains. Further limitations of our systematic review are the often poor quality of the primary data and poor reporting of results were highly heterogeneous in virtually every respect. To establish the role of qigong in the management of cancer patients, adequately designed trials are required.

In conclusion, the notion that internal qigong is an effective therapy for cancer treatment is not based on data from rigorous clinical trials. Further research should attempt to answer the many open questions related to qigong.

### Conflicts of interest

None declared.

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