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# Effectiveness of qigong and tai chi in the quality of life of patients with cancer: protocol for an umbrella review

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## ABSTRACT

**Introduction** Qigong and tai chi (QTC) have been adopted by many patients with cancer as a complementary treatment with their conventional mainstream cancer management. Findings from current systematic reviews are inconsistent. Some research indicated that either qigong or tai chi interventions could enhance quality of life (QoL), and improve cancer-related symptoms such as fatigue, sleep disturbance and anxiety; while others argued that there was a lack of efficacy of QTC on QoL improvement. This umbrella review will analyse and synthesise the findings from published systematic reviews and meta-analyses regarding the effectiveness of QTC in the QoL of patients with cancer. Twenty-five databases will be searched from their respective inception to December 2021.

**Methods and analysis** We will conduct a search in 21 English and 4 Chinese databases to identify qualified systematic reviews and meta-analyses. Two reviewers will independently screen all the titles and abstracts, and determine whether the article meets the inclusion criteria. After the identified systematic reviews and/or meta-analyses are confirmed, important information from each article will be extracted to the characteristics table by two reviewers independently. Two reviewers will independently analyse the quality of the selected reviews based on the Assessment of Multiple Systematic Reviews guideline. Findings from the systematic reviews and/or meta-analyses will be summarised and reported.

**Ethics and dissemination** This review does not require ethics approval as the study is based on the published articles. The results drawn from the present review will be submitted to peer-reviewed journals for publication or presented at conferences.

**PROSPERO registration number** CRD42021253216.

## Strengths and limitations of this study

- This umbrella review will be based on the evaluation of evidence from the existing systematic reviews and meta-analyses.
- This proposed review will involve 21 English databases and 4 Chinese databases to ensure a comprehensive literature search.
- It will conduct a quality assessment on the included systematic reviews and meta-analyses.
- It will provide a comprehensive assessment, qualitatively and quantitatively, regarding the effectiveness of qigong and tai chi in the quality of life of patients with cancer.
- Only reviews published in English and Chinese will be included.

## BACKGROUND

Cancer has been recognised as a severe threat to regional, national and global development. The number of new cancer cases in the year 2020 was 19.29 million worldwide. The most common cancer types were breast (11.7%), lung (11.4%), colorectum (10%), prostate (7.3%), stomach (5.6%), liver (4.7%), cervix uteri (3.1%) and oesophagus (3.1%) cancer.[1] Based on patient-reported outcomes, patients with cancer may present with various symptoms such as nausea, vomiting, pain, fatigue, physical dysfunction, sleep disturbance, anxiety and depression.[2] These symptoms could be caused by cancer itself, and subsequent treatment such as surgery and chemotherapy, which have significantly impeded the quality of life (QoL) of patients with cancer.

Qigong and tai chi (QTC) are the meditative movement and mind–body exercises of eastern medicine, which originated from China more than 4000 years ago .[3] Qigong is considered to be able to strengthen or balance the subtle energy (Qi) circulation throughout a person's entire body; achieve the optimal harmonisation of the body, mind and spirit of a person; and thus improve overall health and prevent diseases.[4] Many randomised controlled trials (RCTs) have been carried out to investigate the clinical effects and safety of qigong on the QoL of patients with cancer, particularly the psychological and physiological aspects including bone density, cardiopulmonary effects, physical function, falls, balance and related risk factors, anxiety, depression, immunity and inflammation-related responses.[5 6]

Research conducted in the USA regarding the interference of chemotherapy on oncology patient's QoL indicated that 36% of patients suffering from acute chemotherapy-induced nausea and vomiting, and 59% of participants developed delayed chemotherapy-induced nausea and vomiting during the first chemotherapy cycle, which impacted on the patient's QoL significantly at cancer survivorship. Similar results were presented at chemotherapy cycles 2 and 3.[7]

During 2000–2010, a research project was conducted on peripheral neuropathy induced by chemotherapy on 191 Dutch ovarian cancer survivors. Among them, 67.5% reported feeling tingling and numbness in hands/feet or fingers/toes. Results from linear regression analysis showed that the increasing cycles of chemotherapy were associated with higher neuropathy scores, which lowered patients' overall QoL, with increased symptoms including pain, fatigue, insomnia, as well as physical, emotional and financial issues. The study found that the side effects of chemotherapy could persist long term after the treatment, and impact on the patient's QoL even 12 years on treatment.[8] Therefore, many cancer sufferers are seeking alternative approaches such as QTC to improve their QoL.[9]

Many RCTs have been carried out to investigate the clinical effects and safety of QTC on the QoL of patients with cancer.[5 6] Published systematic reviews (SRs) reported that QTC may have positive effects on improving the overall QoL of patients with cancer, such as physical functioning, fatigue, sleep quality and psychological symptoms[10 11]; whereas other SRs did not observe significant differences.[12] Thus, an umbrella review has become necessary.

## OBJECTIVES

This study aims to synthesise the findings of the SRs and meta-analyses regarding the effectiveness of QTC in the QoL of patients with cancer in an umbrella review. It will address the following research questions: (1) Is QTC effective in improving the QoL of patients with cancer, such as strengthening physical fitness, reducing fatigue, improving sleep quality and enhancing their emotional well-being? (2) If there are any effects, are the results related to a specific type of cancer, type of QTC, QoL instrument or other variables?

## METHODS

This study is designed as an umbrella review of the published SRs and meta-analyses. This protocol is presented based on the statement of Preferred Reporting Items for Systematic Reviews and Meta-analysis Protocols (online supplemental file 1). The protocol has been registered with the Prospective Register of Systematic Reviews (PROSPERO) (CRD42021253216).

### Selection criteria

#### Types of studies

Papers that were published in English or Chinese language and classified as SRs and/or meta-analyses will be considered for inclusion.

#### Types of participants

This study will focus on adult patients (≥18 years old) who have been diagnosed with any types of cancer and any stages of cancer, and have been practising any type of QTC.

#### Types of interventions

Any type of QTC will be considered for inclusion if it was used as the intervention and its effects were investigated in the review. QTC may consist of moving meditation or gentle relaxation exercises such as Guolin Qigong, rather than practice focused on meditation and spiritual enlightenment.

#### Comparator(s)/control

The intervention in the control group can be active or inactive. Active control may include, but not limited to, sham qigong, routine care, other physical exercises or psychosocial support therapy; whereas inactive control may be described as waitlist, no treatment or blank control. The standard healthcare or routine care is allowed to be used in both groups.

#### Types of main outcome measures

The main outcome measures will be the QoL of patients with cancer, including both cancer-specific QoL and general QoL. Cancer-specific QoL measured by validated instruments will be included for meta-analyses, such as Functional Assessment of Cancer Therapy-General, Functional Assessment of Cancer Therapy-Breast, and European Organization for Research and Treatment of Cancer Quality of Life Questionnaire. General QoL will be analysed if it was assessed by a validated tool such as Short-Form Health Survey, WHO Quality of Life Brief Questionnaire or other scales.

#### Types of additional outcome measures

Additional outcome measures will include patient-reported physical-specific symptoms, such as fatigue and sleep. Data will be synthesised if fatigue was measured by such instruments as Brief Fatigue Inventory, Multidimensional Fatigue Symptom Inventory-Short Form, Fatigue Symptom Inventory, Functional Assessment of Chronic Illness Therapy-Fatigue, Piper Fatigue Scale and Multidimensional Fatigue Inventory; and sleep quality was assessed by Pittsburgh Sleep Quality Index, General Sleep Disturbance Scale or other scales. Patients' psychological-specific symptoms will be analysed if they were assessed by Depression Anxiety Stress Scale-21, Beck Depression Inventory, Center for Epidemiologic Studies Depression, Profile of Mood State or other scales. Safety data (ie, adverse events) of the QTC intervention will be descriptively reported.

### Search strategy

To identify the SRs and meta-analyses of QTC on the QoL of patients with cancer, we will search the following databases through university's library: AcuBriefs, Allied and Complementary Medicine, Cumulative Index of Nursing and Allied Health Literature, Cochrane Database of Systematic Reviews, Elton B Stephens Co Host, Excerpta Medica Database, Electronic Management Research Library Database, Education Resources Information Center, Indian Medical, Informit, Ingenta, Korean Medical, Latin American and Caribbean Health Sciences, metaRegister of Controlled Trials, ProQuest, Psychological Information Database, PubMed, Science Direct, Scopus, Wiley Online Library and the PROSPERO register. Considering that QTC originated from China, and is widely adopted in China, we will search four Chinese databases including China National Knowledge Infrastructure, Chinese BioMedical Literature Database, Wanfang Data and VIP Database for Chinese Technical Periodicals. The combination of the following terms and their synonyms will be used to search the abovementioned databases: Qigong, Qi gong, Tai Chi, Taichi; quality of life; cancer, tumor, oncology; systematic review and meta-analysis. Both Medical Subject Headings (MeSH) terms and free text will be used for literature retrieval. The corresponding Chinese characters will be used to search Chinese databases.

### Screening and selection

After a thorough search of the selected biomedical journal databases, all the hits from each database will be imported to EndNote. Two reviewers (JX and HL) will then independently go through all the titles and abstracts, and determine whether the article is meeting the inclusion criteria. If a decision cannot be made, the full text of the selected articles will be downloaded. Then the two reviewers will further independently analyse and evaluate each of the full-text articles based on the inclusion criteria. If there is any disagreement, they will discuss or consult a third senior reviewer (AWHY) to reach a consensus.

### Data extraction

After the SRs and/or meta-analyses are identified, data from each included SR will be extracted to the characteristics table by the two reviewers (JX and HL) independently. For each included SR and/or meta-analysis, the data to be extracted will include characteristics of the article (article title, authors, published year, published language), participants (sample size and type and stage of cancer), intervention (type of QTC, duration, frequency, and session length of QTC for both treatment and control groups), outcome measure (eg, QoL instrument), original authors' conclusions, setting (hospital, community clinic or private clinic), country/region and funding sources. When there are missing data or the information is unclear, the corresponding authors of the included articles will be contacted in an attempt to retrieve the critical information.

### Quality assessment

Two reviewers (JX and HL) will independently assess the methodological quality of included reviews based on the Assessment of Multiple Systematic Reviews (AMSTAR) guideline.[13] The AMSTAR 2 tool will be adopted, including 16 items to evaluate the following: (1) population, intervention, comparator group, outcome; (2) protocol; (3) selection of the study designs; (4) search strategy; (5) study selection in duplicate; (6) data extraction in duplicate; (7) list of excluded studies; (8) included studies in detail; (9) satisfactory technique for risk of bias (RoB); (10) sources of funding of included studies; (11) appropriate methods for meta-analyses; (12) the potential impact of RoB; (13) RoB in individual studies when discussing the results; (14) heterogeneity; (15) publication bias and (16) conflict of interest.[14]

### Strategy for data synthesis

A combination of narrative and quantitative methods will be used for data synthesis. The information related to the type of QTC, number of RCTs, type of cancer, number of participants, QoL instruments, adverse events and AMSTAR results will be descriptively summarised and reported. For QoL measures (eg, fatigue and sleep), data will be synthesised when data from the same outcome are available from three or more included studies. Mean difference (MD) will be applied when the same scale was used to measure the outcomes, whereas standardised MD will be used when the outcomes were measured by different scales. All the results will be presented with a 95% CI. The random-effects model will be used to minimise the potential heterogeneity when the $I^2$ value is over 50%.

### Analysis of subgroups or subsets

Subgroup analysis will be conducted regarding the method of QTC intervention, QoL physical and psychological factors, comparisons, cancer types and QoL instruments, when applicable.

### Patient and public involvement

No patient involved.

## DISCUSSION

In recent years, the cancer survivor rate has been increasing, and the 5-year prevalence was 50.55 million worldwide in 2020.[15] Thus, it is critical to improve the QoL of patients with cancer and reduce the cancer-related symptoms caused by the diseases and conventional treatment physically and psychologically.

QTC have been a popular practice by patients with cancer for self-management.[16] SRs and meta-analyses conducted regarding the effectiveness of QTC in the QoL of patients with cancer may improve precision and increase power from individual RCTs. Contradictory results from the published reviews have urged us to perform an umbrella review.

This proposed review will include 21 English and 4 Chinese databases from multiple regions to enable a comprehensive literature search. Due to the language barrier, our search strategy will only be limited to English and Chinese languages. SRs and meta-analyses published in other languages will be missed out inevitably.

This umbrella review will be conducted strictly following the methodology specified in the Cochrane Handbook for Systematic Reviews of Interventions.[17] Data analyses will be challenging as it is expected to include reviews with different quality RCTs, variety of interventions (types of QTC, duration, frequency) and various cancer types. The heterogeneity of the included studies will trigger the difficulty in interpreting the data. Subgroup analyses will be performed as per cancer types and cancer stages as well as comparisons of interventions to address this potential high heterogeneity if the number of included studies is sufficient. These analyses will assist the interpretation of implications for clinical practice.

It is also worth noting that the selection of an appropriate instrument for evaluating the QoL of patients with cancer is critical as there are diverse QoL assessment tools developed for a wide range of clinical conditions.[18] This umbrella review will summarise all the QoL instruments used in the included reviews and identify the most frequently used tools for investigating QTC's effects on the QoL of patients with cancer.

In the research domain of QTC for QoL in patients with cancer, this is the first umbrella review of SRs and meta-analyses to increase the understanding of QTC and its relationship to QoL. At present, clinical guidelines for cancer management do not include QTC. The findings from this present review may support the evidence-based practice of QTC for cancer care. In addition, this research may generate evidence for insurance companies and health funds to consider rebates for QTC training.

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