Traditional Chinese Exercises for Chronic Diseases: Protocol for An Overview of Systematic Reviews and Meta-analyses

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Protocol

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Abstract

Background: In recent years, increasing systematic reviews and meta-analyses about traditional Chinese exercises on chronic disease have been conducted. The main aim of this overview will be to appraise and synthesize these results.

Methods A comprehensive review of the literature will be performed in the PubMed, Cochrane Database of Systematic Reviews, Embase, and Web of Science Core Collection, with the MeSH terms and keywords. Systematic reviews and meta-analyses of clinical trials evaluating the effectiveness of traditional Chinese exercises for patients with chronic disease will be included. Two independent authors will screen the titles and abstracts, and full-text articles will be identified. Relevant data will be extracted and tabulated. A Measurement Tool to Assess Systematic Reviews and the Grading of Recommendations Assessment, Development and Evaluation system will be used to assess the methodological quality and level of evidence of included reviews, respectively.

Discussion: The overview will identify both the scientific and clinical importance of traditional Chinese exercises, and these findings will provide practical implications for patients, clinicians, professionals, and policymakers.

Systematic review registration: PROSPERO CRD42021248444

Background

Chronic diseases are the leading causes of disability and death in developed and developing countries (1). The long-term physical loads can severely impact functional capacity, work disability, and reduced health-related quality of life (HRQoL) of the patients (2). According to the World Health Organization, more than 36 million deaths per year are attributable to chronic diseases and bear nearly 80% of the burden from diseases like cardiovascular disease, diabetes mellitus, cancer, chronic respiratory diseases, and mental illness in low- and middle-income countries (3). A global statistic reported that the cost of the five above diseases treatment to reach $47 trillion from 2011 to 2030 (4). Despite the increasing availability of effective conventional medical treatment, the medication compliance of the patient with chronic disease is greatly reduced (5, 6). Therefore, it is necessary to seek a low-cost, non-pharmacological, effective mode of therapy to improve the prognosis for patients.

It is well known that increase physical activities have significant health benefits and are associated with the prevention and treatment of chronic diseases (7-9). In recent years, with the popularity of “exercise is medicine”, traditional Chinese exercises (TCE), such as Tai Chi and Qigong et al., have become increasingly popular (10). Indeed, TCE is a kind of complementary therapy involving physical and psychological aspects. Growing systematic reviews and meta-analyses have examined the role of TCE in the treatment of chronic diseases (11, 12). However, there is still little overview and critically assessed based on the methodological issues and the robustness.

Objectives

This overview aims to evaluate and summarize the effects of TCE on cardiopulmonary fitness, muscle strength, muscle endurance, body composition, and HRQoL in patients with chronic disease.

Methods/design

The overview will follow the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement for improved reporting (13). The protocol for the overview was registered in the international prospective register of systematic reviews (PROSPERO registration number: CRD42021248444).

Literature Search

Relevant systematic reviews and meta-analyses will be obtained from the following database: PubMed, Cochrane Database of Systematic Reviews, Embase, and Web of Science Core Collection. The retrieval time spans from the establishment of the database to June 2021. Furthermore, a snowball searching for the reference of relevant meta-analyses will also be performed. Search terms will be included combinations of MeSH terms and text words, as described in Table 1. Article language will be restricted to English.

Eligibility criteria

The inclusion criteria are: (1) included patients diagnosed with chronic disease, e.g., cardiovascular disease, cancer, chronic obstructive pulmonary disease, diabetes mellitus, chronic kidney disease, Alzheimer disease, Parkinson disease, osteoarthritis, chronic liver disease,
chronic fatigue syndrome, fibromyalgia, et al.; (2) compared traditional Chinese exercise with usual/standard care; (3) systematic reviews with meta-analyses of intervention trials; (4) outcome-based on cardiopulmonary fitness, muscle strength, muscle endurance, body composition, and HRQoL. Systematic reviews with meta-analyses of observational studies will be excluded; conference abstracts, case reports, comments, and experimental animal studies will also be banned.

Selection process

Two independent authors will scrutinize the titles and abstracts from the search results. Then full-text articles will be read for a complete assessment and determination of inclusion or exclusion. If necessary, disagreements will be resolved through discussion to reach a consensus or involve a third reviewer.

Data extraction

The following data from each meta-analysis will be extracted and tabulated: publication details (author and year), diseases type, description of outcome measures, number of included studies and participants, risk of bias assessment, exercise-related adverse events, and outcome-specific standardized mean differences (SMDs) or mean differences (MDs) with corresponding 95% Confidence Intervals (CIs).

Methodological quality

The methodological quality of each included systematic review and meta-analyses will be evaluated using the A Measurement Tool to Assess Systematic Reviews (AMSTAR) tool (14). This scale includes a total of 11 items, each with a "yes" (1 point), "no" (0 points), "cannot answer" (0 points), or "not applicable" (0 points) (Table 2). According to the final score, 0–4 indicates low quality, 5–8 indicates moderate quality and 9–11 indicates high quality (15).

Quality of evidence

The overview will use the Grading of Recommendations Assessment, Development and Evaluation (GRADE) system to evaluate the quality of evidence of outcomes (16). The quality of evidence for each outcome will be classified as high, moderate, low, or very low based on the evaluation for study design, risk of bias, inconsistency, indirectness, and imprecision. See Table 3 for a further description of the GRADE system.

Data analysis

For each outcome, the data will be analyzed qualitatively based on the SMDs or MDs. The authors will extract data from original randomized control trials and process as instructed by the Cochrane Collaboration if data are insufficient. The level of heterogeneity will be evaluated with $Q^2$ statistic and $I^2$ metric ($\leq 25\%$ indicate low heterogeneity, $25\%<I^2\leq 50\%$ indicate mild heterogeneity, $50<I^2\leq 75\%$ moderate heterogeneity, $>75\%$ indicate high heterogeneity) (17).

Discussion

This overview will comprehensively summarize evidence from published systematic reviews and meta-analyses investigating the effects of TCE on health outcomes in patients with chronic disease to determine the appropriate prescription of TCE that can contribute to benefit for the treatment and recovery of the disease.

As the older adult population has increased, the concepts of healthy aging and chronic disease protection have become more critical. Regular exercise habits are essential for the prevention and amelioration of several chronic diseases (18–20). TCE is an important and often underappreciated aspect of physical activity (21). In the last years, TCE was extensively conducted in most countries; however, the researchers, health professionals, and healthcare decision-makers remained confused about the effectiveness and quality of TCE in many regions (22). The overview will identify both the scientific and clinical importance of TCE, and these findings will provide practical implications for patients, clinicians, professionals, and policymakers.

There may be some shortcomings. Firstly, the part low methodological quality of systematic reviews and meta-analyses may be included. It is possible to result in publication bias. Secondly, a language bias may exist because searches were limited to English articles. It is unclear
whether including other language articles would have influenced the results. Thirdly, most of the patients from the included articles will be from Asia; thus, ethnicity bias may exist, and the conclusion may not be the same in other races.

**Abbreviations**

HRQoL
Health-related quality of life; TCE: Traditional Chinese exercises; PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses; SMDs: standardized mean differences; MDs: mean differences; Cis: Confidence Intervals; AMSTAR: A Measurement Tool to Assess Systematic Reviews; GRADE: Grading of Recommendations Assessment, Development and Evaluation.

**Declarations**

**Acknowledgments**
Not applicable

**Authors’ contribution**
FZ and HCZ designed and drafted the protocol. HW, YB, and XZ participated in the design of the overview of systematic reviews. WQZ revised the manuscript. All authors read, provided feedback, and approved the final manuscript.

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**Availability of data and materials**
Not applicable

**Ethics approval and consent to participate**
Not applicable

**Consent for publication**
Not applicable

**Competing interests**
The authors declare that they have no competing interests.

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Tables

| Table 1 Search strategy for PubMed |  |
|-----------------------------------|--|
| **#** | **Search strategy** |
| **1** | (“Chronic Disease” [MeSH Terms] OR “Chronic Disease”[Title/Abstract] OR “Chronic Ill”[Title/Abstract] OR “Cardiovascular Diseases”[MeSH Terms] OR “Cardiovascular Diseases”[Title/Abstract] OR “Neoplasms” [MeSH Terms] OR “Neoplas*”[Title/Abstract] OR “Tumor”[Title/Abstract] OR “Cancer”[Title/Abstract] OR “Pulmonary Disease, Chronic Obstructive” [MeSH Terms] OR “Chronic Obstructive Lung Disease”[Title/Abstract] OR “Chronic Obstructive Pulmonary Disease”[Title/Abstract] OR “COPD”[Title/Abstract] OR “Asthma”[Title/Abstract] OR “Diabetes Mellitus” [MeSH Terms] OR “Diabetes”[Title/Abstract] OR “Renal Insufficiency, Chronic”[Mesh Terms] OR “Chronic Renal Insufficiency*”[Title/Abstract] OR “Chronic Kidney Disease”[Title/Abstract] OR “Chronic Renal Disease”[Title/Abstract] OR “Alzheimer Disease” [MeSH Terms] OR “Alzheimer*”[Title/Abstract] OR “Osteoarthritis”[MeSH Terms] OR “Osteoarthri*”[Title/Abstract] OR “Arthritis”[Title/Abstract] OR “Parkinson Disease” [MeSH Terms] OR “Parkinson”[Title/Abstract] OR “Parkinsonism”[Title/Abstract] OR “Schizophrenia”[MeSH Terms] OR “Schizophreni*”[Title/Abstract] OR “Stroke”[MeSH Terms] OR “End Stage Liver Disease”[Title/Abstract] OR “Chronic Liver Disease”[Title/Abstract] OR “Dementia”[MeSH Terms] OR “Dementia”[Title/Abstract] OR “Fatigue Syndrome, Chronic”[MeSH Terms] OR “Chronic Fatigue Syndrome”[Title/Abstract] OR “Fibromyalgia”[MeSH Terms] OR “Fibromyalgia”[Title/Abstract]) |
| **2** | AND (“Traditional Chinese Exercise”[Title/Abstract] OR “T’ai Ji”[MeSH Terms] OR “Tai Ji”[Title/Abstract] OR “Tai Chi”[Title/Abstract] OR “Tai Chi Quan”[Title/Abstract] OR “Taiji”[Title/Abstract] OR “Tai Ji Quan”[Title/Abstract] OR “T’ai Chi”[Title/Abstract] OR “Tai Chi Chuan”[Title/Abstract] OR “Qigong”[Title/Abstract] OR “Yijinjing”[Title/Abstract] OR “Wuqixi”[Title/Abstract] OR “Baduanjin”[Title/Abstract] OR “Liuizjue”[Title/Abstract]) |
| **3** | AND (“Systematic Review”[Publication Type] OR “Systematic Reviews as Topic”[MeSH Terms] OR “meta analysis”[Publication Type] OR “Meta-Analysis as Topic”[MeSH Terms] OR “Systematic Review”[Title/Abstract] OR “System review”[Title/Abstract] OR “Data Pooling”[Title/Abstract] OR “Meta”[Title/Abstract]) |

Table 2 The AMSTAR checklist
| Item | Instructions |
|------|--------------|
| 1    | Was an ‘a priori’ design provided? |
| 2    | Was there duplicate study selection and data extraction? |
| 3    | Was a comprehensive literature search performed? |
| 4    | Was the status of publication (i.e., gray literature) used as an inclusion criterion? |
| 5    | Was a list of studies (included and excluded) provided? |
| 6    | Were the characteristics of the included studies provided? |
| 7    | Was the scientific quality of the included studies assessed and documented? |
| 8    | Was the scientific quality of the included studies used appropriately in formulating conclusions? |
| 9    | Were the methods used to combine the findings of studies appropriate? |
| 10   | Was the likelihood of publication bias assessed? |
| 11   | Was the conflict of interest stated? |

### Table 3 GRADE Assessment

| GRADE Recommendation | Interpretation |
|----------------------|----------------|
| High quality         | We are very confident that the true effect lies close to that of the estimate of the effect. |
| Moderate quality     | We are moderately confident in the effect estimate; the true effect is likely to be close to the estimate of effect, nevertheless, there is a possibility that it is substantially different. |
| Low quality          | Our confidence in the effect estimate is limited; the true effect may be substantially different from the estimate of the effect. |
| Very low quality     | We have very little confidence in the effect estimate; the real effect is likely to be substantially different from the estimate of effect. |

GRADE, Grading of Recommendations Assessment, Development and Evaluation

### Supplementary Files

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- PRISMAPchecklist.doc