

**Effectiveness of Tai Chi in Patients with Type 2 Diabetes: an Overview of Systematic Reviews**

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**ADMINISTRATIVE INFORMATION****Support** - NSFC(No. 82374559, 8187335).**Review Stage at time of this submission** - Preliminary searches.**Conflicts of interest** - None declared.**INPLASY registration number:** INPLASY202470034**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 10 July 2024 and was last updated on 10 July 2024.**INTRODUCTION**

**Review question / Objective** Currently, more and more studies are focusing on the effect of Tai Chi exercise for type 2 diabetes mellitus(T2DM), and many researchers have systematically evaluated the clinical efficacy. However, their results are inconsistent, and the methodological quality needs to be further evaluated. We plan to comprehensively evaluate the methodological quality, risk of bias, quality of reporting, and certainty of evidence of systematic reviews or meta-analyses on Tai Chi for T2DM. In addition, we will explore the effects of Tai Chi on T2DM patients according to different Tai Chi styles and exercise intensities.

**Background** T2DM is a common metabolic disease caused by multiple factors. T2DM affects about 537 million people worldwide. It not only endangers the physical and mental health of individuals but also brings heavy economic burden to families and societies. Tai chi, as one of the traditional Chinese medicine exercises, is very popular among people at home and abroad.

According to the recommendations by the American Diabetes Association, Tai Chi has been suggested as an alternative exercise therapy for patients with T2DM, which can improve body functions, such as lowering blood glucose, blood lipids and blood pressure, and enhancing immunity. Some researchers found that Tai Chi exercise was beneficial for T2DM, while others concluded that there was no improvement of Tai Chi for patients with T2DM. Therefore, we will conduct the overview to comprehensively evaluate SRs of Tai Chi for T2DM, summarize the evidence, to provide some insights for clinicians and researchers and to guide future high-quality SRs.

**METHODS**

**Strategy of data synthesis** We will systematically search PubMed, Embase, Web of Science, The Cochrane Library, China National Knowledge Infrastructure (CNKI), Chinese Science and Technology Periodical Database (VIP), Chinese Biomedical Literature Database (CBM), and Wanfang Database. The search strategies will be constructed based on the following keywords: tai

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ji, tai chi, Type 2 Diabetes Mellitus, Type 2 Diabetes, Meta-Analysis, Systematic Review, etc. The languages are limited to Chinese and English.

**Eligibility criteria** Inclusion criteria: We will include systematic reviews or meta-analyses of randomized controlled trials on Tai Chi for T2DM. Patients with T2DM were diagnosed according to the recognized international diagnostic criteria, with no restriction on sex or age. The experimental group is Tai Chi (with no restriction on styles) or Tai Chi combined with other treatments (e.g. western medicine, usual care, etc.). The control group could be drugs, other exercises (e.g. walking, running, stretching, etc.), or other non-Tai Chi treatment.

Exclusion Criteria: (i) Repeated publications; (ii) Full text or data are unavailable by useful approaches; (iii) Conference abstracts, expert consensus, etc.; (iv) non-RCTs; (v) T2DM complicated with other diseases affecting the metabolism.

**Data extraction** All the retrieved records will be imported into EndnoteX9 and duplicates will be removed. Two reviewers will independently screen the title and abstract for candidates according to the eligibility criteria. Then, the full text of all potentially relevant studies will be downloaded. At the same time, bibliographic references will also be reviewed. After that, the two reviewers cross-checked the included studies, and a third reviewer will participate in case of disagreement. In addition, two independent reviewers will extract data with a pre-defined data extraction form, including the characteristics of studies, such as title, first author, published year, original studies, interventions, controls, sample size, outcome indicators, quality assessment entries and others. Finally, two reviewers will cross-check to ensure no errors, and disagreements will be resolved through team discussions.

**Outcome definitions** Main outcome(s) : (i) Glycemic index: fasting glucose, 2-hour postprandial glucose, glycated hemoglobin; (ii) Insulin resistance index: fasting insulin, homeostatic model assessment of insulin resistance; Additional outcome(s): (i) Lipid metabolism index: total cholesterol, triglycerides, high-density lipoprotein cholesterol, low-density lipoprotein; (ii) Body mass index; (iii) Quality of life; (iv) Balance ability; (v) Adverse effects.

**Strategy of data synthesis / Statistical analysis** We will perform qualitative analysis, and no data will be synthesized.

**Country(ies) involved** China.

**Other relevant information** None.

**Keywords** Tai Chi; Type 2 Diabetes Mellitus; Overview; methodological quality; reporting quality.

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