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Evidence Map Analysis of Traditional Chinese Medicine Manipulation Interventions for Post-stroke Limb Numbness

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Abstract: *This study aimed to systematically evaluate the current research status of Traditional Chinese Medicine (TCM) manipulation for the treatment of post-stroke limb numbness using an evidence mapping approach. Electronic searches were conducted in eight Chinese and English databases from their inception to June 1, 2025, to identify randomized controlled trials (RCTs) examining TCM manipulation for limb dysfunction after stroke, and the methodological quality of the included studies was assessed using the Cochrane Risk of Bias tool (RoB 2.0). A total of 37 RCTs were included, involving seven types of outcome indicators and fourteen TCM manipulation techniques. Most studies suggested that TCM manipulation was effective in improving limb numbness and motor function after stroke, with certain techniques, such as the pressing method, showing consistently positive effects across multiple outcome indicators; however, the overall methodological quality of the included studies was generally low. Overall, TCM manipulation appears to have a beneficial effect on improving limb numbness and related functional outcomes after stroke, but the limited quality of the existing evidence underscores the need for further well-designed, standardized clinical trials and exploration of combined intervention strategies.*

Keywords: *Stroke; Limb numbness; Traditional Chinese Medicine Manipulation; Evidence map*

1. Introduction

Stroke is one of the leading causes of disability and mortality among adults in China, with an estimated 60% to 80% of survivors experiencing varying degrees of functional impairment[1]. Limb numbness is a common clinical manifestation, with an incidence rate of up to 65%[2]. If left untreated or inadequately managed, this condition may lead to a range of complications, including falls[3] and depression. Current Western medical approaches primarily rely on pharmacological interventions and rehabilitation training; however, these methods are often associated with limited efficacy. In traditional Chinese medicine (TCM), limb numbness is categorized under“meridian affliction”(zhong jing luo) or“numbness syndrome”(bi mu), and is attributed to qi and blood deficiency, blood stasis, or the invasion of external pathogens. Treatment emphasizes unblocking the meridians, with non-invasive and readily applicable manual therapies being extensively utilized in clinical practice[4]. However, the existing evidence remains fragmented and of heterogeneous quality, with a notable lack of systematic reviews synthesizing this evidence.

The evidence map is a relatively novel approach for synthesizing research evidence. It involves the systematic collection, in-depth analysis, and comprehensive evaluation of existing evidence within a specific research domain. Findings are typically presented in tabular or visual formats to clearly illustrate the overall landscape of the field and identify current knowledge gaps[5]. This study aims to systematically collate and review clinical research on TCM manipulation for the management of post-stroke limb numbness, both domestically and internationally.

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2. Methods

2.1. Data Sources and Literature Search Strategy

The data were sourced from four Chinese (CNKI, Wanfang, VIP, CBM) and four English (PubMed, Web of Science, Cochrane, Embase) databases, searched from inception to June 1, 2025. The strategy combined subject terms with keywords related to stroke (e.g., "limb numbness") and manual therapy (e.g., "tuina"), supplemented by manual searches. Based on the PICOS framework, we included RCTs involving stroke patients receiving manual therapy versus conventional rehabilitation/placebo, with outcomes including sensory function and neurological assessments. Studies with unavailable full text or incomplete data were excluded. Two researchers independently conducted the screening: duplicates were removed using EndNote X9, followed by title/abstract screening and full-text review. Discrepancies were resolved by a third party. Subsequently, they extracted data on authors, publication year, sample size, interventions, and outcomes into a pre-designed Excel sheet to ensure consistency.

2.2. Data Analysis, Quality Assessment, and Evidence Mapping

The results and conclusions of the included studies were classified into five types[6]: beneficial, possibly beneficial, harmful, no effect, and uncertain. The risk of bias in the included randomized controlled trials (RCTs) was evaluated using the RoB 2.0 tool[7], which assesses six domains: randomization process, deviations from intended interventions, missing outcome data, measurement of the outcome, selection of the reported result, and overall bias. Any disagreements were resolved by a third researcher. Additionally, an evidence map was generated using the Pymeta.com tool to visually represent the key features of the studies. The bubble plot displayed the different intervention methods, with the bubble size indicating the evaluation scores and the color distinguishing the intervention categories. The X-axis represented the outcome indicators, and the Y-axis showed the results of RoB 2.0 quality assessment.

3. Results

3.1. Literature Screening and Results

In this study, a total of 2975 records were retrieved from Chinese and English databases. After removing duplicates using software and manual checks, 2074 records were retained. Following a title and abstract screening, 1807 articles were excluded. The full text of 267 articles was assessed for eligibility, of which 230 were excluded. Finally, 37 randomized controlled trials (RCTs) were included.

3.2. Basic Characteristics of the Literature

A total of 37 randomized controlled trials were included, covering the period from 2015 to 2025. Based on the intervention type, the studies were categorized into two groups: single intervention and combined intervention. These studies primarily assessed seven outcome indicators and fourteen intervention techniques, as detailed in Table 1.

3.3. Quality Evaluation Results

Assessment using the Cochrane Risk of Bias tool revealed an overall medium-low quality among the 37 RCTs. The domains of outcome measurement, randomization, and deviations from intended interventions exhibited high risk in a considerable proportion of studies. In contrast, other biases, such as selective of the reported result, were less prevalent (2.7%, 1/37).The specific compliance rates for each domain were as follows: randomization process, 27.0% (10/37); allocation concealment, 10.8% (4/37); and missing outcome data, 29.7% (11/37) ,as detailed in Figure 1.

3.4. Evidence Map

The 37 RCTs assessed seven primary outcomes, including efficacy evaluation, neurological deficit score, activities of daily living score, sensory function score, TCM syndrome score, limb numbness score, and quality of life.Interventions involved 14 manual techniques (e.g., pressing, kneading). Among these, pressing demonstrated superior efficacy in overall evaluation, neurological deficit, daily

ISSN 2618-1584 Vol. 7, Issue 6: 109-116, DOI: 10.25236/FMSR.2025.070614

living activities, and TCM syndrome scores, though its effect on sensory function was limited. Kneading technique also showed significant benefits across multiple outcomes and appeared to synergistically improve neurological and functional recovery, as detailed in Figure 2.

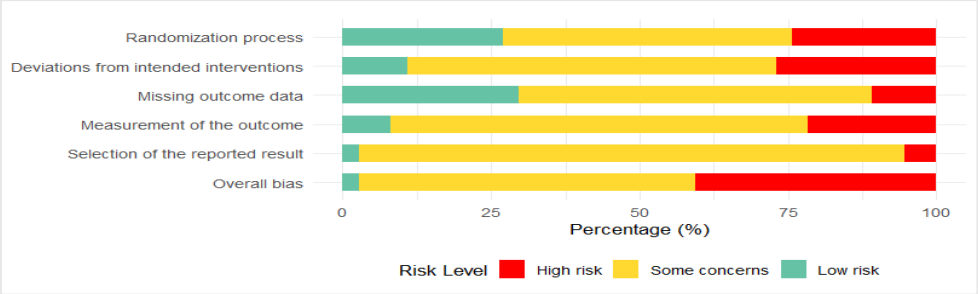

Figure 1: Risk of Bias Assessment Results for Included RCTs

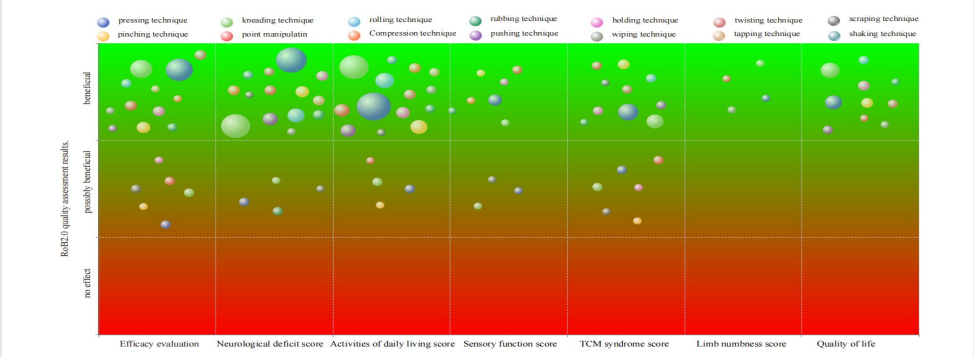

Figure 2: Evidence Map of TCM Manipulation Therapy for Limb Numbness after Stroke

Table 1: Basic Characteristics of Included Literatures

Included Literature	Sample Size	Intervention Method	Intervention Manipulation	Study Conclusion	Outcome indicators
Jiang Meixiang , 2023[8]	60	Acupoint application combined with acupoint massage (combined intervention)	①⑥	Beneficial	①②③④
Zhou Jiacheng, 2016[9]	48	Traditional Chinese medicine topical application combined with acupoint pressing (combined intervention)	①④⑦	Beneficial	③④
Yu Jianfeng, 2018[10]	165	Traditional Chinese medicine treatment combined with acupoint massage (combined intervention)	①⑦	Beneficial	①②③
Pan Fengqin, 2022[11]	88	Acupuncture combined with acupoint massage (combined intervention)	①②③⑤⑧	Beneficial	③⑤
Lin Shuhuang, 2024 [12]	72	Acupuncture combined with Tuina (combined intervention)	②③⑤⑩	Beneficial	①②③⑦
Jia Xiaonan, 2022 [13]	107	Acupuncture combined with Tuina (combined intervention)	①②③④	Beneficial	①②③⑤
Ma Jianyun et al, 2020[14]	60	Acupuncture combined with meridian Tuina (combined intervention)	①②⑧⑨	Beneficial	②③

ISSN 2618-1584 Vol. 7, Issue 6: 109-116, DOI: 10.25236/FMSR.2025.070614

Zhao Peng et al, 2024 [15]	120	Timed acupoint massage (single intervention)	①⑥	Beneficial	②⑦
Zhou Yuan et al, 2023[16]	120	Timed acupoint massage (single intervention)	①②	Beneficial	②③
Wu Suqing et al, 2021[17]	440	Acupuncture combined with acupoint massage (combined intervention)	①②③⑨	Beneficial	①③④⑦
Gong Fan et al, 2015 [18]	200	Medical stick percussion therapy (combined intervention)	⑬	Beneficial	①②③
Fu Fei, 2024[19]	200	Meridian moxibustion combined with Tuina (combined intervention)	①②③④	Beneficial	①⑤
Ni Bingjun, 2023[20]	92	Acupoint massage (single intervention)	①⑩⑨	Beneficial	①③⑤
Zhou Chunxiu et al, 2022[21]	68	Acupoint massage (single intervention)	⑧, ②	Beneficial	②③⑦
Yang Xiaoyun et al, 2022[22]	80	Acupoint massage (single intervention)	⑤	Beneficial	②③
Geng Rongxian et al, 2020[23]	80	Acupoint massage (single intervention)	①②	Possibly beneficial	③④
Wang Weixiu et al, 2017[24]	80	Acupoint massage (single intervention)	①⑥	Possibly beneficial	②
Chen Yuan et al, 2023 [25]	102	Acupoint massage (single intervention)	①⑥	Beneficial	②
Li Zikang et al, 2020 [26]	80	Tuina combined with traditional Chinese medicine treatment (combined intervention)	①②④⑨	Possibly beneficial	①⑤
Xu Sheng et al, 2025 [27]	80	Acupuncture combined with meridian Gua Sha (combined intervention)	①⑥	Possibly beneficial	①②④
Fang Jiémíao, 2018 [28]	70	Shujing Tuina (single intervention)	⑪	Beneficial	②③
Hu Qing et al, 2016 [29]	60	Shujing Tuina (single intervention)	①④⑤⑧⑫⑭	Beneficial	②③
Liu Juhua, 2024[30]	80	Acupuncture combined with Tuina (combined intervention)	②⑤⑧	Beneficial	①②③⑤⑦
Wan Qing et al, 2023[31]	76	Meridian Gua Sha (single intervention)	①②⑤⑩	Possibly beneficial	①⑤
Miao Zengxin et al, 2021[32]	90	Jin San Needles combined with acupoint massage (combined intervention)	⑪	Beneficial	①③⑤
Liang Qianying et al, 2024 [33]	86	Traditional Chinese medicine combined with acupoint Tuina	①⑥	Possibly beneficial	①③⑤

ISSN 2618-1584 Vol. 7, Issue 6: 109-116, DOI: 10.25236/FMSR.2025.070614

		(combined intervention)			
Yang Li et al, 2023 [34]	60	Gua Sha combined with Shenshen Acupuncture (combined intervention)	①②③④	Beneficial	②③⑤
Li Shaowen, 2017[35]	60	Acupoint therapy (single intervention)	⑪	Beneficial	②
Mao Xianyu et al, 2016[36]	60	Acupoint therapy (single intervention)	④⑦⑬	Beneficial	③④
Man Huijing et al, 2024[37]	200	Electroacupuncture combined with acupoint massage (combined intervention)	①④	Beneficial	①②⑤⑦
Li Dongmei et al, 2024[38]	80	Hand and Foot Twelve Needles combined with Tuina (combined intervention)	①②⑧⑨	Beneficial	①③⑥⑦
Zhang Zhihong, 2020 [39]	100	Acupuncture combined with Tuina (combined intervention)	①②④⑫	Beneficial	①②
Wang Guoxiang et al, 2021 [40]	60	Medical stick acupoint massage (single intervention)	①②	Beneficial	②③
Chen Tao, 2016[41]	96	Acupoint massage (single intervention)	①②⑬	Possibly beneficial	②
Kong Panpan, 2019[42]	76	Acupuncture combined with acupoint massage (combined intervention)	①②⑥	Beneficial	②③⑦
GUO, S et al,2025[43]	83	Traditional Chinese medicine combined with acupoint massage (combined intervention)	①②③⑨	Beneficial	①②⑤
Xiaojing Luo et al, 2024[44]	60	Acupuncture combined with Tuina (combined intervention)	①②	Beneficial	②③

Intervention Manipulation:①pressing technique②kneading technique③pinching technique④point manipulation⑤rolling technique⑥rubbing technique⑦Compression technique⑧pushing technique⑨holding technique⑩twisting technique⑪scraping technique⑫wiping technique⑬tapping technique⑭shaking technique.
Outcome indicators:①Efficacy Evaluation ②Neurological Deficit ③Activities of Daily Living Score ④Sensory Function Score ⑤Traditional Chinese Medicine (TCM) Syndrome Score ⑥Numbness Score ⑦Quality of Life

4. Discussion

4.1. Methodological Quality Analysis of Included Literature

This study conducted a methodological quality assessment of 37 randomized controlled trials (RCTs), revealing that the overall quality of the studies was low, with key criteria not being adequately met, which may affect the reliability of the conclusions. Only 27.0% of studies described appropriate random sequence generation methods. Additionally, only 29.7% of studies obtained complete outcome data, so data collection processes should be optimized to minimize missing data. Furthermore, only 8.1% of studies used appropriate outcome measurement methods. Only 2.7% of studies avoided selective reporting and exhibited low overall bias. Future studies should strictly follow reporting guidelines to minimize bias risks.

ISSN 2618-1584 Vol. 7, Issue 6: 109-116, DOI: 10.25236/FMSR.2025.070614

4.2. Analysis of the Therapeutic Effect of TCM Manipulation on Post-stroke Limb Ataxia

Based on the evidence map generated from the RoB2.0 quality assessment, certain manual TCM techniques demonstrated distinct effect patterns across outcome indicators. Pressing technique and kneading techniques showed prominent effects across multiple domains, including therapeutic evaluation, neurological deficit, and activities of daily living scores. The widespread distribution and larger bubble sizes for these techniques suggest frequent application and multidimensional efficacy, though their impact on sensory function remained limited. Pinching technique exhibited positive outcomes in numbness and TCM syndrome scores, indicating its utility in alleviating symptom-driven limb ataxia. Point technique displayed a particular advantage in sensory function recovery. Rubbing technique contributed actively to therapeutic evaluation, neurological function, and TCM syndrome regulation. In summary, the differential advantages of pressing, tapping, kneading, pinching, point, and rubbing techniques across outcome indicators offer an evidence-based reference for optimizing clinical manual therapy strategies.

4.3. Advantages and Limitations of the Study

The evidence map integrates RCTs of traditional Chinese medicine manipulation in the treatment of limb numbness after stroke, and uses bubble plots to visualize the key evidence patterns of interventions, results, and conclusions. Although this study provides valuable insights for clinical practice, there are some limitations. First, the intervention evidence lacks precision ; current research does not fully guide the selection or optimization of manual techniques based on the patient 's recovery stage or symptom characteristics. Secondly, the included trials usually have small sample size and large heterogeneity among participants, which may reduce the reliability of estimating the effect of intervention.

5. Conclusion

This study employed evidence mapping to demonstrate that TCM manual therapy shows potential effects in managing post-stroke limb numbness. However, the methodological quality of the included literature was generally low. Future research should prioritize rigorously designed studies to establish a more reliable evidence base for TCM manual interventions in this condition.

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