

# INPLASY

## Effectiveness and Safety of Tuina Massage Therapy for Paediatric Fever: A Systematic Review and Meta-Analysis of Randomised Controlled Trials

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### ADMINISTRATIVE INFORMATION

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**Review Stage at time of this submission** - Completed but not published.

**Conflicts of interest** - None declared.

**INPLASY registration number:** INPLASY202470041

**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 11 July 2024 and was last updated on 11 July 2024.

### INTRODUCTION

**Review question / Objective** This study aimed to analyse systematically the efficacy and safety of Tuina massage therapy for paediatric fever.

**Condition being studied** A comprehensive search was conducted in the PubMed, Embase, Cochrane Central Register of Controlled Trials and China National Knowledge Infrastructure databases, retrieving randomised controlled trials (RCTs) up to November 2023. Significant heterogeneity was defined as  $p \geq 50\%$ , and statistical significance was set at  $p < 0.05$ . Fifteen trials involving 1,661 paediatric patients were included, comparing tepid water massage and traditional Chinese Tuina massage.

### METHODS

**Participant or population** 1) children aged  $<18$  years with fever symptoms; 2) intervention group

receiving tepid water massage or traditional Chinese Tuina massage; 3) control group receiving antipyretic drugs, other medications or placebos; 4) at least one treatment outcome related to fever, including absolute temperature reduction, antipyretic treatment effectiveness or adverse reactions; and 5) only randomised controlled trials (RCTs) were included.

**Intervention** None.

**Comparator** Tepid water massage, traditional Chinese Tuina massage, Tepid water massage combined with antipyretic medication, traditional Chinese Tuina massage with antipyretic medication.

**Study designs to be included** Randomised controlled trials.

**Eligibility criteria** Fifteen trials involving 1,661 paediatric patients were included.

**Information sources** Comprehensive search was conducted in the PubMed, Embase, Cochrane Central Register of Controlled Trials and China National Knowledge Infrastructure databases, retrieving randomised controlled trials (RCTs) up to November 2023.

**Main outcome(s)** Massage alone did not significantly differ from antipyretic medication (risk ratio [RR]: 1.21, 95% CI: 0.41–3.54;  $p < 0.0001$ ;  $I^2 = 84\%$ ), but combining massage with antipyretic medication improved efficacy (RR: 0.38, 95% CI: 0.20–0.71;  $p = 0.003$ ;  $I^2 = 47\%$ ). Subgroup analysis showed tepid water massage alone was not significantly effective (RR = 4.86, 95% CI: 0.71–33.41), whereas traditional Chinese Tuina massage significantly reduced paediatric fever (RR = 0.41, 95% CI: 0.26–0.65). Tepid water massage combined with antipyretic medication lacked significance (RR = 0.46, 95% CI: 0.22–0.94), whereas traditional Chinese Tuina massage with antipyretic medication was more effective (RR = 0.22, 95% CI: 0.08–0.61).

**Quality assessment / Risk of bias analysis** This study conducted a systematic review and meta-analysis following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines recommended by the Cochrane Collaboration. Searches were performed in four electronic databases – PubMed, Embase, the Cochrane Central Register of Controlled Trials and the China National Knowledge Infrastructure (CNKI) – from their inception until November 2023. The language was limited to English or Chinese. Moreover, the search strategy combined MeSH/Emtree terms and free-text terms, with relevant keywords, such as fever, children, massage, tepid and sponge, in titles and abstracts. Additionally, this study manually searched reference lists of relevant studies, reviews and meta-analyses to expand the search scope. Grey literature, theses and dissertations were also searched to ensure a thorough examination of all relevant studies. Literature records were exported to EndNote X9.3.3 software (Clarivate Analytics, London, United Kingdom), and automated deduplication was followed by manual deduplication. Furthermore, two researchers independently conducted electronic record and publication screening based on predefined inclusion and exclusion criteria. In cases of discrepancies, mutual discussion and full-text reading were employed to resolve them, with final decisions made by a senior researcher if consensus could not be reached (see the supplementary material).

**Strategy of data synthesis** This study used the RevMan 5.4 software (Nordic Cochrane Centre, Cochrane Collaboration, Copenhagen, Denmark) for meta-analysis. For continuous variables, the standardised mean difference (SMD) and the 95% confidence interval (CI) were used as statistical analysis indicators. For categorical variables, the risk ratio (RR) was selected as a statistical analysis indicator. To assess the heterogeneity between the study results, Cochran's Q test and the  $I^2$  statistic were used. When statistical heterogeneity between the results was low ( $p > 0.1$  or  $I^2 < 50\%$ ), a fixed-effects model was used for the analysis. When statistical heterogeneity was present ( $p \leq 0.1$  or  $I^2 \geq 50\%$ ), a random-effects model was used for meta-analysis, and the significance level was set at  $\alpha = 0.05$ . To assess the potential for publication bias, a funnel plot was drawn. Moreover, sensitivity analysis was conducted to evaluate the impact of individual studies on the overall effect, observing changes in effect size after excluding individual studies. Additionally, subgroup analysis was performed to separately explore the therapeutic effects of tepid water massage and traditional Chinese Tuina massage on paediatric fever. This detailed analysis contributed to a deeper understanding of the efficacy of different intervention methods, providing a more comprehensive perspective for interpreting study results.

**Subgroup analysis** To analyse the efficacy of tepid water massage and Chinese Tuina massage separately, this study conducted a subgroup analysis of treatment effectiveness, as shown in Table 3. Compared with the use of antipyretic drugs alone, the efficacy of tepid water massage did not reach statistical significance (RR = 4.86, 95% CI: 0.71–33.41), whereas Chinese Tuina massage significantly reduced the proportion of febrile children (RR = 0.41, 95% CI: 0.26–0.65). Similarly, the combined use of tepid water massage and antipyretic drugs did not reach statistical significance (RR = 0.46, 95% CI: 0.22–0.94), whereas Chinese Tuina massage combined with antipyretic drugs achieved better efficacy (RR = 0.22, 95% CI: 0.08–0.61).

**Sensitivity analysis** A sensitivity analysis of the summary results was performed. After excluding one study at a time, the results did not change significantly, suggesting that the impact of individual studies on the overall results was limited. However, heterogeneity between studies remained relatively high. Regarding the outcomes of temperature reduction and efficacy, both were rated as having moderate certainty of evidence,

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considering the inconsistency of results across different studies.

**Country(ies) involved** China.

**Keywords** Children; fever; Tuina massage; meta-analysis.

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