

# Efficacy of Warm Needle Moxibustion on Lumbar Disc Herniation: A Meta-Analysis

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## Abstract

**Background.** Clinical studies on the efficacy of warm needle moxibustion to treat lumbar disc herniation are increasing, while studies on the assessment of its efficacy are still lacking. **Objective.** To assess the clinical effect of warm needle moxibustion on lumbar disc herniation. **Methods.** We searched relevant trials that compared warm needle moxibustion with other methods for lumbar disc herniation from 9 databases. **Results.** Warm needle moxibustion showed statistical significance efficiency rate compared with acupuncture and manipulation but had a similar rate with nonsteroidal anti-inflammatory drugs (NSAIDs). It showed a statistically significant excellent rate when compared with acupuncture and manipulation but had a similar rate with NSAIDs. Regarding Japanese Orthopedic Association scores, it showed statistical significance with acupuncture and manipulation, but the rate was similar with Chinese medicine and NSAIDs. Regarding visual analog scale score, it demonstrated statistical significance when compared with acupuncture, manipulation, and NSAIDs but had a similar rate with Chinese medicine. **Conclusion.** Warm needle moxibustion is superior to acupuncture and manipulation in terms of efficiency rate, excellent rate, and controlling of pain for lumbar disc herniation, but it is similar when compared with NSAIDs and Chinese medicine.

## Keywords

moxibustion, intervertebral disc displacement, intervertebral disc displacement, meta-analysis

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Lumbar disc herniation is also known as a slipped, ruptured, or prolapsed disc. Whatever name is given, it all refers to the medical condition wherein the soft material in the middle of the lumbar disc takes so much pressure that it ruptures. When it occurred, one or more of the nerves in the spine are under pressure. The main symptom of lumbar disc herniation is low back pain and sciatica.<sup>1</sup> In China, about 80% of adults are suffering from low back and leg pain, and 20% of them are diagnosed with lumbar disc herniation.<sup>2</sup> In the United States, there are about 2 million people who are suffering from lumbar disc herniation each year.<sup>3</sup> According to statistics from the World Health Organization, lumbar disc herniation has become one of the most important causes of disability as expressed in disability-adjusted life years both in developed and developing countries.<sup>4</sup>

As a result of the significant financial and social burdens associated with lumbar disc herniation, many researches have focused on the identification of effective treatments. Complementary and alternative medicine is widely advocated to face the increasing demand for nonpharmacological approaches.<sup>5</sup> Acupuncture, as a mainstream complementary and alternative medicine therapy, has been widely used and accepted by people across the world. In 2002, the World Health Organization proposed 107 indications suitable for acupuncture intervention, in which low back pain and sciatica caused by lumbar disc

herniation were included.<sup>6</sup> Moxibustion is a modality of traditional acupuncture that involves burning moxa, the herb *Artemisia vulgaris*, on or above the skin at acupoints, warming them to achieve the effect of alleviating symptoms.<sup>7</sup> In China, moxibustion is usually used for the patients of cold pattern such as rheumatic arthritis,<sup>8</sup> joint pain,<sup>9,10</sup> diarrhea,<sup>11</sup> or cold numbness limbs. This technique can be conducted in a direct or indirect way depending on whether the moxa sticks are burnt on the skin or not. Warming needle moxibustion is such a kind of indirect way that combines acupuncture with moxibustion. It can be conducted as follows: a needle is inserted into an acupoint and on top of the needle moxa is attached and burned to provide heat via the needle. Warming needle moxibustion has become popular in recent years because of its significant clinical efficacy and safety. Randomized controlled trials are considered the best way to evaluate the efficacy of intervention

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measures,<sup>12</sup> and there are many relevant randomized controlled trials on warm needle moxibustion in the treatment of lumbar disc herniation. However, relevant evidence-based medical evaluation is insufficient. Therefore, the aim of this article is to examine the totality of evidence to evaluate the clinical efficiency of warm needle moxibustion in comparison with other treatments for patients who are suffering from lumbar disc herniation with randomized controlled trials.

## Method

### Inclusion Criteria and Exclusion Criteria

Studies were included according to the following criteria: (a) randomized controlled trials; (b) studies conducted in Chinese or English; (c) studies that compared warm needle moxibustion with acupuncture, manipulation, drugs, or other methods in the treatment of lumbar disc herniation; (d) lumbar disc herniation was established by combining the clinical assessment and imaging studies (computed tomography, X-ray, or magnetic resonance imaging)<sup>13</sup>; (e) clinical outcome measurement including the following: the efficient rate and excellent rate, visual analog scale scores (VAS scores), and Japanese Orthopedic Association (JOA) scores (maximum score: 29 points).<sup>14</sup>

Studies were excluded according to the following criteria: (a) duplicates of studies, (b) literature review, (c) case reports or expert opinions, and (d) data in literature are not clear.

### Search Strategy

The research was done independently by 2 authors (Li XH and Han YC), and disagreement was resolved by the corresponding author (Di Z). Electronic retrieval was used. The publication language was limited to English and Chinese. The databases were the Chinese Biological Medical Literature Database (CBM, 1979-2015.6), China National Knowledge Internet (CNKI, 1979-2015.6), Weipu Database (VIP, 1989-2015.6), and Wanfang Digital Journal (WF, 1998-2015.6). Online databases searched were PubMed (1966-2015.6), EMBASE (1980-2015.6), and the Cochrane Library (Issue 1-2015.6). Search terms in Chinese included “Wen Zhen Jiu,” “Wen Zhen,” “Zhen Bing Jiu,” “Shao Zhen Bing” (all translated to warming needle moxibustion), “Jiu” (moxibustion), “yao zhui jian pan tu chu” (intervertebral disc herniation), and “yao zhui jian pan yi wei” (intervertebral disc displacement). Search terms in English included “acupuncture and moxibustion,” “warm needle,” “warm acupuncture,” “warming needle moxibustion,” “intervertebral disc herniation,” “protrusion of lumbar intervertebral disc,” and “intervertebral disc displacement.” All the terms were searched with various combinations of the operators “AND,” “NOT,” and “OR.”

### Data Extraction and Quality Evaluation

Data from the included studies were extracted and summarized independently by 2 of the authors (Li XH and Han YC), and disagreement was resolved by the adjudicating senior author (Di Z). The following data were extracted from the trials: (a) the characteristics of the included articles: the type of studies design, follow-up period, interventions, sample size (Table 1); (b) the clinical outcome measurement: the efficient rate and excellent rate, VAS scores, and JOA scores.

The methodological quality of the included studies were evaluated by the Cochrane Risk of Bias Tool (version 5.1.0).<sup>15</sup> Each of the

research results would be judged explicitly by the following criteria: low (low risk of bias), high (high risk of bias), or unclear (uncertain risk of bias). Two authors (Li XH and Han YC) double checked the evaluation results by exchanging information with each other. The eligibility of the trials would be assessed by discussion to resolve disagreements on inclusion or not, or the decision would be made by the third decision maker (Di Z).

### Statistical Analysis

The statistical analysis was conducted with Review Manager 5 (version 5.3; Cochrane Collaboration 2014). The studies for inclusion were determined by inspection for heterogeneity;  $P < .1$  was taken as the inspection standard, and heterogeneity was quantified using the  $I^2$  statistic. When there was homogeneity among studies ( $P > .1$ ,  $I^2 < 50\%$ ), a fixed effect model was chosen for the meta-analysis. If there was heterogeneity among the trials ( $P < .1$ ,  $I^2 < 50\%$ ), the sources of heterogeneity was determined. If there was no clinical or methodological heterogeneity, a random effect model was used in the meta-analysis. The dichotomous data were summarized as relative risk (RR). The continuous data were reported as mean difference. Their effect sizes were expressed as 95% confidence intervals throughout, and  $P \leq .05$  would be thought a difference with statistical significance.

## Results

The clinical outcomes were assessed according to 4 indexes: the efficient rate, the excellent rate, VAS score, and JOA score. The efficiency of warm needle moxibustion can be classified into 4 class, according to a widely used diagnose standard in China.<sup>13</sup> The class of “excellent” can be defined as follows: the disappearing of leg and back pain, Lasegue test backing to negative, patient restored the original function, without recurrence after half year’s follow-up. The class “good” was defined as follows: the leg and back pain of patients almost relieved, the above-mentioned symptom did not aggravate after half year’s follow-up. The class “fair” clinical effects was concluded as follows: the symptom of leg and back pain reduce slightly. The “poor” outcomes were defined as follows: without any change of sign and symptom, before and after the treatment. The “excellent,” “good,” and “fair” classes were combined and regarded as efficient rate in our study.

The outcomes of relieving of pain was done according to JOA and VAS. JOA score is a pain score rating system made by the Japanese Orthopedic Association. A full JOA scores is 29 points, based on 3 subjective symptoms (9 points), 3 clinical signs (6 points), and 7 activities of daily living measures (14 points). Patients with a scores of 25 points or more were rated as “satisfactory,” with scores less than 25 points labeled as “unsatisfactory.”<sup>14</sup> In our study, we used the improved JOA scores (the difference between pretreatment and posttreatment scores) as an index. The pain VAS is self-completed by the respondent. The respondent is asked to place a line perpendicular to the VAS line at the point that represents their pain intensity (VAS: 0 = no pain at all; 10 = worst pain imaginable).

**Table 1.** Characteristics of the Trials Included.

Included Study	Participants		Duration	Intervention		Outcome Measures
	Treated Group	Control Group		Treated Group	Control Group	
Cao <sup>20</sup> (2011)	32	30	30 days	Warm acupuncture	Acupuncture	Efficient rate; Cure rate
He <sup>28</sup> (2007)	39	39	15 days	Warm acupuncture	Acupuncture	Efficient rate; Cure rate
Huang <sup>25</sup> (2010)	48	48	20 days	Warm acupuncture	Acupuncture	Efficient rate; Cure rate
Wu <sup>21</sup> (2009)	93	92	20 days	Warm acupuncture	Acupuncture	Efficient rate; Cure rate; Visual analog scores
Lang <sup>19</sup> (2010)	30	30	14 days	Warm acupuncture	Acupuncture	Efficient rate; Cure rate; Visual analog scores
Li <sup>26</sup> (2013)	34	38	14 days	Warm acupuncture	Acupuncture	Efficient rate; Cure rate
Yang <sup>29</sup> (2014)	25	25	6 days	Warm acupuncture	Acupuncture	Visual analog scores; JOA score
Yin <sup>18</sup> (2008)	30	30	20 days	Warm acupuncture	Acupuncture	Visual analog scores
Sun <sup>23</sup> (2014)	35	35	15 days	Warm acupuncture	Manipulation	Efficient rate; Cure rate; Visual analog scores
Sun <sup>17</sup> (2012)	30	30	30 days	Warm acupuncture	Manipulation	Efficient rate; cure rate; Visual analog scores; JOA score
Zhao <sup>30</sup> (2008)	50	50	20 days	Warm acupuncture	Manipulation	Efficient rate; Cure rate
Fan <sup>22</sup> (2009)	45	37	20 days	Warm acupuncture	Manipulation	Efficient rate; Cure rate; Visual analog scores
Fang <sup>31</sup> (2014)	30	30	30 days	Warm acupuncture	Medicine	Visual analog scores; JOA score
Fang <sup>31</sup> (2014)	30	30	30 days	Warm acupuncture	NSAIDs	Visual analog scores; JOA score
Wen <sup>27</sup> (2011)	42	39	20 days	Warm acupuncture	NSAIDs	Efficient rate; Cure rate

Abbreviations: JOA score, Japanese Orthopedic Association score; NSAID, nonsteroidal anti-inflammatory drug.

## Search Results

At the primary search of electronic database searches, a total of 466 relevant studies were identified. After reviewing of the titles and abstracts, 417 studies were excluded for the following reasons: unrelated topic, working on animals, no control studies, case reports, review articles, or other forms of investigation. Subsequently, 30 studies were excluded due to failure to meet the inclusion criteria. A further 4 studies were excluded due to duplicate reports, or other intervention. Finally, 15 studies were included in the final analysis (Figure 1). Among the 15 studies, 7 studies were retrieved from CNKI, 7 studies from the Wanfang database, and 1 study<sup>16</sup> from PubMed. Twelve of the 15 articles were full-text articles, and 3 of the publications<sup>17-19</sup> were master's thesis. The agreement between the 2 reviewers (Li XH and Han YC) was 95% for study selection and 93% for quality assessment of trials.

## Demographic Characteristics and Quality Assessment

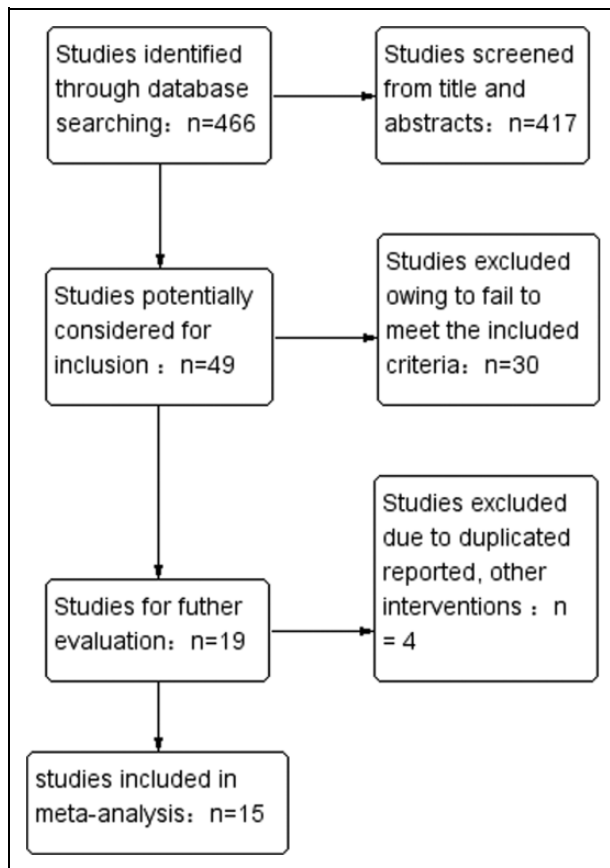
The characteristics of each selected study are provided in Table 1. Fifteen studies including 1146 cases (563 cases for the group of warm needle moxibustion and 583 cases for control group) fulfilled the predefined inclusion criteria and were included in the final analysis. All the 15 studies were published in Chinese. In terms of the method of randomization, among the 15 included studies, 2 trials<sup>20,21</sup> used the computer to produce the randomization sequence, 4 trials<sup>17,19,22,23</sup> used a random table method, 5 trials<sup>24-26</sup> mentioned randomization but without a description of the randomization method, and 2 trials<sup>17,27</sup> used a wrong random method. The side effects that

happened during the process of treatment are described in one study.<sup>21</sup> In general, the quality of the included studies was generally low to moderate (Figures 2 and 3).

## Clinical Outcome Analysis

**Efficient Rate.** Among these studies, there was a low statistical heterogeneity ( $I^2 = 47\%$ ,  $P = .04$ ), so a fixed-effect model was conducted in this analysis. The efficient rate in the warm needle moxibustion group suggested a significant difference when compared with that of acupuncture, manipulation, and nonsteroidal anti-inflammatory drugs (NSAIDs;  $RR = 1.18$ , 95% confidence interval [CI] [1.12, 1.24],  $P < .01$ ;  $I^2 = 47\%$ ). As illustrated in Figure 4, subgroup analysis was conducted. Warm needle moxibustion versus acupuncture: in 6 trials, the subgroup analysis showed a significant statistical difference ( $RR = 1.22$ , 95% CI [1.14, 1.30],  $P < .01$ ). Warm needle moxibustion versus manipulation: in 4 trials, the subgroup analysis suggested a significant statistical difference ( $RR = 1.15$ , 95% CI [1.05, 1.26],  $P < .01$ ). Warm needle moxibustion versus NSAIDs: in 1 trial,<sup>20</sup> the subgroup analysis showed no significant statistical difference ( $RR = 1.03$ , 95% CI [0.94, 1.12],  $P = .52$ ). Overall, we can concluded that warm needle moxibustion showed statistically significantly efficient rate when compared with acupuncture and manipulation but similar rate with NSAIDs.

**Excellent Rate.** A there was no statistical heterogeneity among these studies ( $I^2 = 0\%$ ,  $P = .69$ ), we used a fixed-effect model in the meta-analysis. The excellent rate of the warm needle moxibustion group suggested a significant difference when



**Figure 1.** Flow diagram detailing study inclusion.

compared with that of acupuncture, manipulation, and NSAIDs (RR = 1.55, 95% CI [1.34, 1.79],  $P < .01$ ;  $I^2 = 0\%$ ). As illustrated in Figure 5, subgroup analysis was carried out. Warm needle moxibustion versus acupuncture: in 6 trials, the subgroup analysis showed a significant statistical difference (RR = 1.53, 95% CI [1.28, 1.83],  $P < .01$ ). Warm needle moxibustion versus manipulation: in 4 trials,<sup>9,14,15,22</sup> the subgroup analysis showed a significant statistical difference (RR = 1.73, 95% CI [1.31, 1.28],  $P < .01$ ). Warm needle moxibustion versus NSAIDs: in 1 trial,<sup>27</sup> the subgroup analysis showed no significant statistical difference (RR = 1.24, 95% CI [0.81, 1.90],  $P = .33$ ). Thus, it is suggested that warm needle moxibustion showed statistical significance in excellent rate, comparing with acupuncture and manipulation, but had a similar rate with NSAIDs.

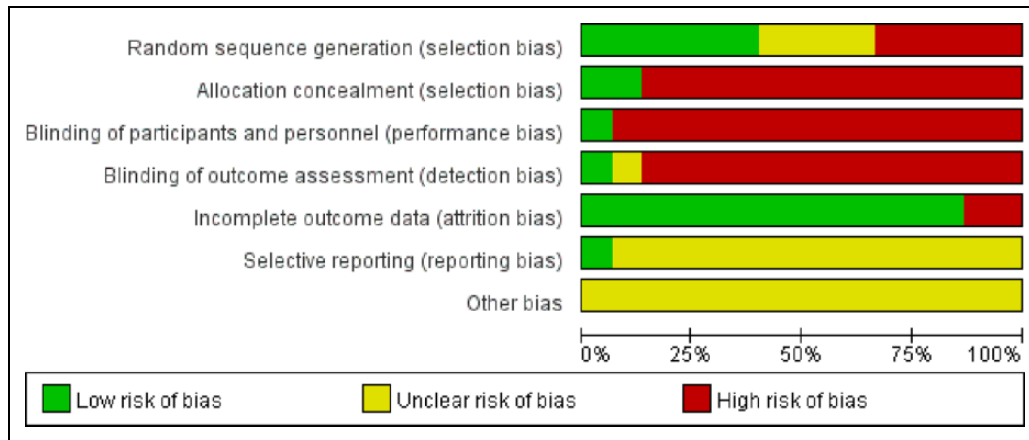
**JOA Scores.** In terms of the JOA scores, heterogeneity was detected among this analysis ( $I^2 = 71\%$ ,  $P = .02$ ); therefore, a random-effect model was performed in the meta-analysis. As illustrated in Figure 6, subgroup analysis was carried out. Warm needle moxibustion versus acupuncture: in 1 trial,<sup>29</sup> the subgroup analysis showed a significant statistical difference (mean difference = 1.30, 95% CI [1.21, 2.39],  $P < .01$ ). Warm needle moxibustion versus manipulation: in 1 trial,<sup>17</sup> the subgroup analysis showed a significant statistical difference (mean difference = 2.60, 95% CI [1.65, 4.55],  $P < .01$ ). Warm needle moxibustion versus NSAIDs: in 1 trial,<sup>31</sup> the subgroup analysis

	Random sequence generation (selection bias)	Allocation concealment (selection bias)	Blinding of participants and personnel (performance bias)	Blinding of outcome assessment (detection bias)	Incomplete outcome data (attrition bias)	Selective reporting (reporting bias)	Other bias
Cao Q 2011	+	-	-	-	-	?	?
Fang TY a 2014	-	-	-	-	+	?	?
Fang TY b 2014	-	-	-	-	+	?	?
Fan Y 2009	+	-	-	-	+	?	?
He XW 2007	-	-	-	-	+	?	?
Huang L 2010	?	-	-	?	+	?	?
Lang YY 2010	+	-	-	-	+	?	?
Li FB 2010	?	-	-	-	+	?	?
Sun H 2012	+	+	-	-	+	?	?
Sun HC 2014	+	-	-	-	+	?	?
Wen CF 2011	?	-	-	-	-	?	?
Wu YR 2009	+	+	+	+	+	+	?
yang HT 2014	-	-	-	-	+	?	?
Yin J 2008	-	-	-	-	+	?	?
Zhao XT 2008	?	-	-	-	+	?	?

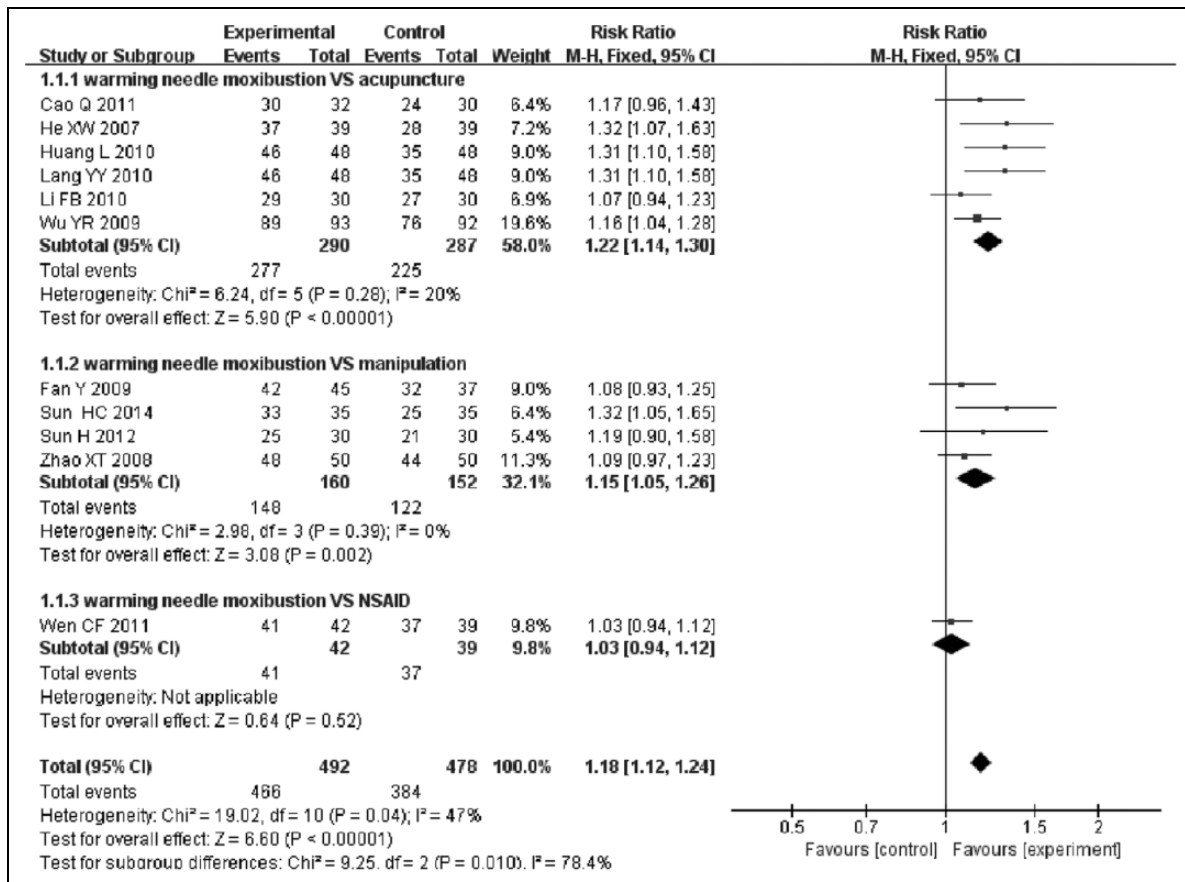
**Figure 2.** Analysis of the risk of bias of included trials.

showed no significant statistical difference (mean difference = 1.00, 95% CI [-0.81, 1.81],  $P = .28$ ). Warm needle moxibustion versus Chinese medicine: in 1 trial,<sup>21</sup> the subgroup analysis showed no significant statistical difference (mean difference = 1.13, 95% CI [-0.64, 1.90],  $P = .21$ ). In general, we can conclude that warm needle moxibustion achieved a more favorable effect on relieving of pain when compared with acupuncture and manipulation, but with no statistical significance for Chinese medicine and NSAIDs.

**VAS Scores.** Nine trials in this analysis used the VAS as the outcome measurement. Among the findings, there appears



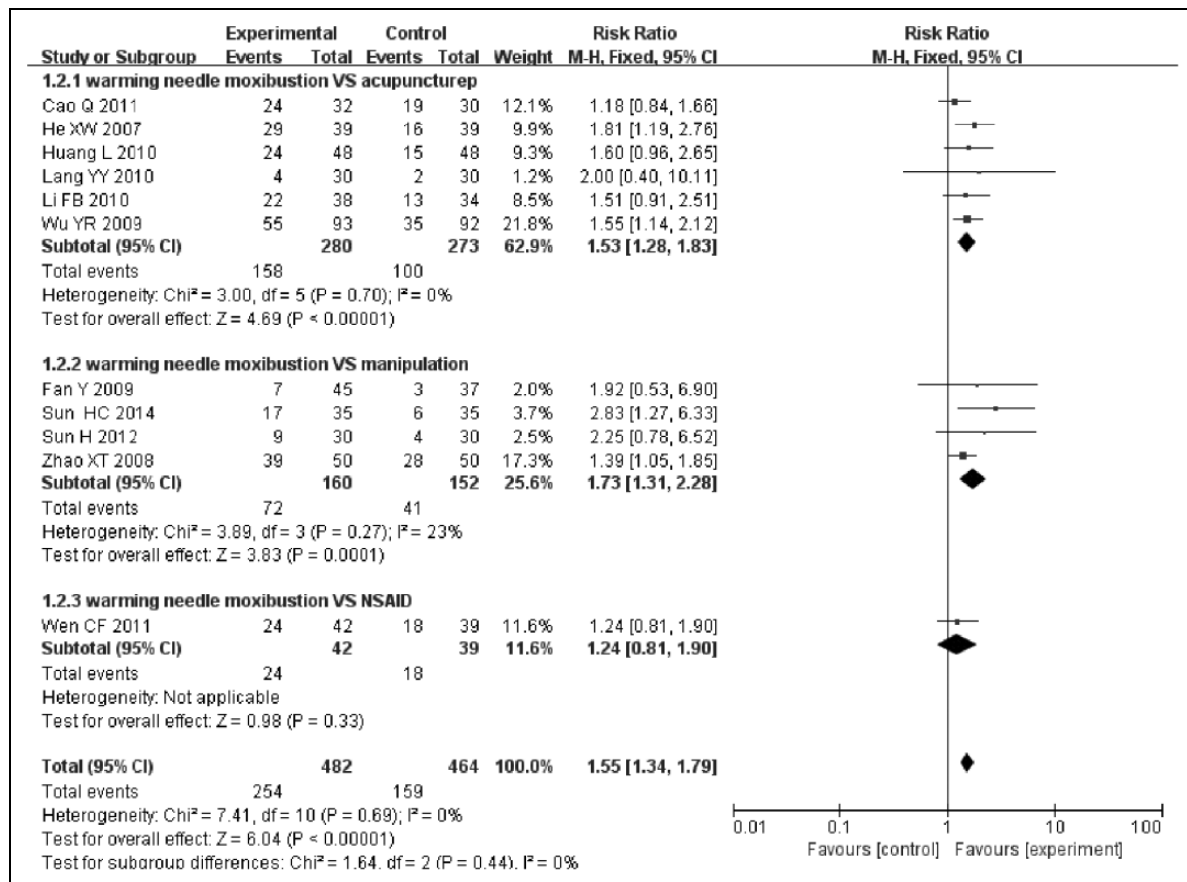
**Figure 3.** Summary of the risk of bias of trials included.



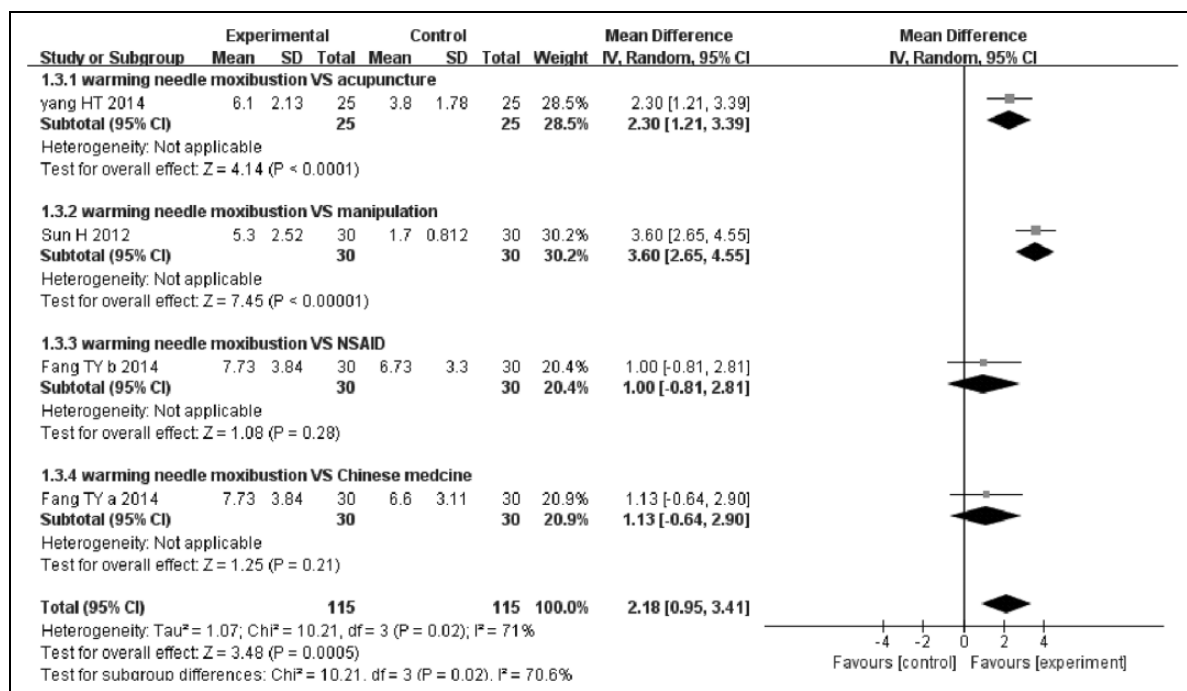
**Figure 4.** Subgroup analysis of the effectiveness rate.  
Abbreviations: CI, confidence interval; SD, standard deviation.

heterogeneity ( $I^2 = 63\%$ ,  $P = .005$ ), so a random-effect model was used in the meta-analysis. As illustrated in Figure 7, subgroup analysis was carried out. Warm needle moxibustion versus acupuncture: in 4 trials,<sup>18,19,21,29</sup> the subgroup analysis showed a significant statistical difference (mean difference = 0.57, 95% CI [0.34, 0.81],  $P < .01$ ). Warm needle moxibustion versus manipulation: in 3 trials,<sup>17,22,23</sup> the

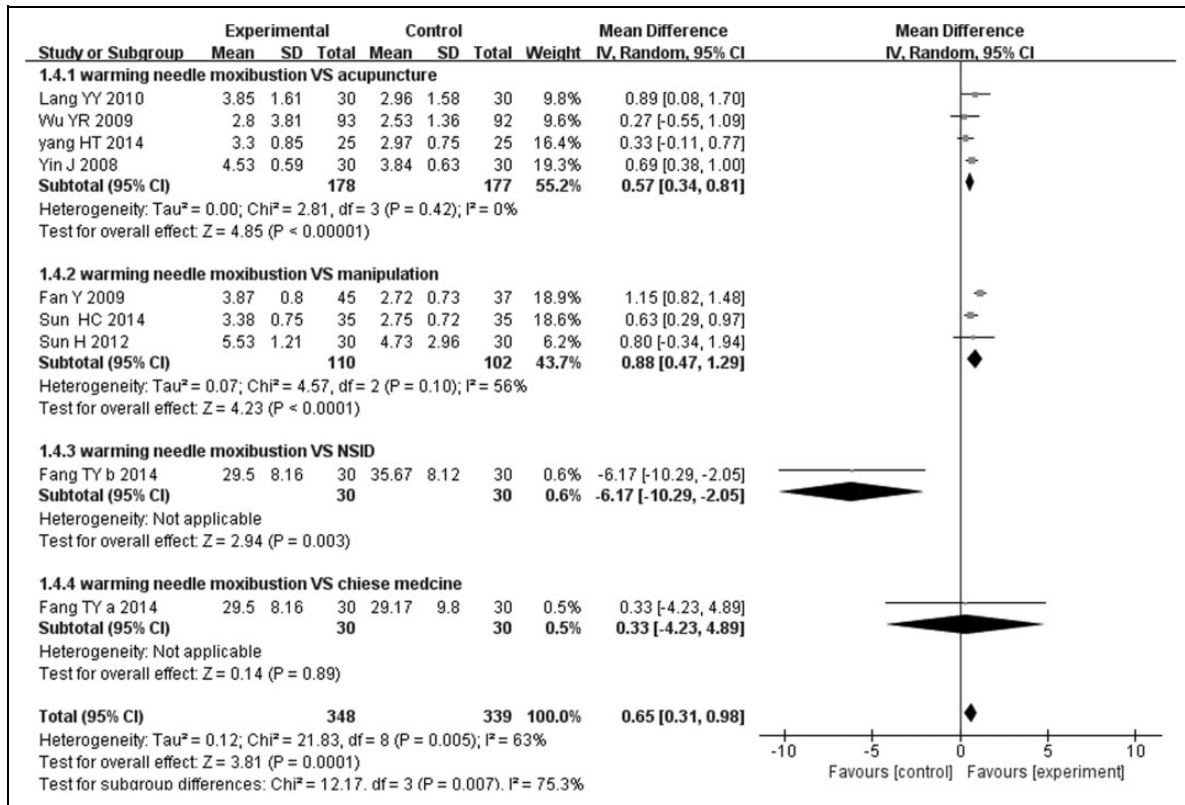
subgroup analysis showed a significant statistical difference (mean difference = 0.88, 95% CI [0.47, 1.29],  $P < .01$ ). Warm needle moxibustion versus NSAIDs: in 1 trial,<sup>31</sup> the subgroup analysis showed NSAIDs have a better effect on relief of pain (mean difference = -6.17, 95% CI [-10.29, -1.05],  $P < .01$ ). Warm needle moxibustion versus Chinese medicine: in 1 trial,<sup>31</sup> the subgroup analysis showed no significant statistical difference



**Figure 5.** Subgroup analysis of the excellence rate.  
Abbreviations: CI, confidence interval; SD, standard deviation.



**Figure 6.** Subgroup analysis of the JOA score.  
Abbreviations: CI, confidence interval; SD, standard deviation; JOA score, Japanese Orthopedic Association score.



**Figure 7.** Subgroup analysis of the VAS score.

Abbreviations: CI, confidence interval; SD, standard deviation; VAS, visual analog scale score.

(mean difference = 0.33, 95% CI [-4.23, 4.89],  $P = .89$ ). In terms of VAS scores, warm needle moxibustion showed a better effect on relieving of pain when compared with acupuncture and manipulation, but with no statistical significance for Chinese medicine.

Relief from pain was still one of main targets in the treatment of lumbar disc herniation. VAS and JOA scores are common indexes used in the assessment of hurt relief treatment. In this meta-analysis, we can see that warm needle moxibustion had a remarkable effect on relieving of pain when compared with manipulation and acupuncture.

## Discussion

This meta-analysis summarized the evidence from 15 trials consisting of 1146 cases (563 cases for the group of warm needle moxibustion and 583 cases for control group) with regard to the advantages of warm needle moxibustion in the treatment of lumbar disc herniation. To acquire a more accuracy assessment on efficient rate and excellent rate in this meta-analysis, we chose the trials using the same evaluation criterion. Regarding efficient rate and excellent rate, the group of warm needle moxibustion was superior to that of acupuncture and manipulation. In terms of JOA and VAS scores, warm needle moxibustion showed a more favorable effect on relieving of pain than acupuncture and manipulation.

Taking the above-mentioned findings into consideration, warm needle moxibustion, as a method that combines acupuncture with moxibustion, has achieved a favorable effect in the treatment lumbar disc herniation. How does this combination method work so effectively? Generally speaking, the effect of warm needle moxibustion can be divided into an acupuncture part and a moxibustion part. In general, the therapeutic effects of acupuncture are thus brought about through its regulatory actions on various systems, so that it can be regarded as a nonspecific therapy with a broad spectrum of indications.<sup>6</sup> In terms of Western scientific principles, it is uncertain how acupuncture may help lumbar disc herniation and the leg pain and back pain caused by lumbar disc herniation. It is hypothesized that acupuncture works through the gate control theory of pain, in which the sensory input is inhibited in the central nervous system by inputting of the needle. Another theory suggests that the presence of the needle stimulates vascular and immunomodulatory factors such as mediators of inflammation. Elevated levels of adrenocorticotrophic hormone after acupuncture seem to support this theory.<sup>28</sup>

In terms of moxibustion, the mechanisms of action of moxibustion therapy are still largely unknown. Some authors held that it may enhance the effect of curing disease by producing some factors to certain points or areas on the surface of the body through regulation of the function of meridians and visceral organs. The following factors are likely to be included:



temperature, infrared radiation, smoke, odor, and the type of moxa.<sup>32</sup> Many authors advocated that moxibustion might have an effect of anti-inflammation.<sup>17-19</sup> Yang and Huang<sup>29,33</sup> reported that when the moxibustion was burned, it can produce a kind of infrared ray that can both furnish the energy for cells' metabolism and the immunity function and provide viable energy for those energy-lacking cells. Zhong<sup>34</sup> held that the warmth and light produced in the process of burning the moxibustion can enhance the cell's ability to phagocytosis, improve blood circulation, reduce nerve excitability, and eliminate inflammation surrounding the nerves.

What is more, little side effects were reported during the treatment among those original articles included in this study. Therefore, warm needle moxibustion, as an effective method for the treatment of lumbar disc herniation, might be introduced into the clinic practice with great advantages due to its little side effects.

There are several limitations in this meta-analysis. First, in general, the samples are not enough and the quality of our included studies is not high. Of the 15 studies, 5 trials mentioned randomization but without a description of the randomization method; 2 trials<sup>16,18</sup> used an incorrect random method; only 1 trial<sup>21</sup> described the implementation of allocation concealment. These might have caused selection bias. All the trials included in our study were published in Chinese, which might have caused publication bias. Second, there are some limitations in terms of outcome assessment index such as VAS and efficient rate, for it is largely dependent on the subjectivity of patients. Third, there is a variable length of follow-up among the studies. In short, the low quality of the trials might lead to clinical heterogeneity and bias of the results. Care is needed in the evaluation of these results in clinical practice.

## Conclusions

In short, this analysis demonstrates that warm needle moxibustion is superior in efficient rate and excellent rate in the treatment of lumbar disc herniation, when compared with acupuncture and manipulation. Warm needle moxibustion has a better effect on relieving of pain, when compared with acupuncture and manipulation but with a similar effect for NSAIDs and Chinese medicine. Given the varied nature of the methodological quality of the randomized controlled trials, we suggest the usage of warm needle moxibustion could be considered as an adjunct to routine practice in the treatment of lumbar disc herniation, whereas future efforts could focus on improving the methodological and reporting quality of the trials. Additionally, longer term follow-up is needed in future research to examine the lasting effect of warming needle moxibustion.

## Authors' Note

Xinhua Li and Yingchao Han contributed equally to this study and are co-first authors.

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## Author Contributions

Xinhua Li and Yingchao Han contributed to conception and design, or acquisition of data, or analysis and interpretation of data; Jian Cui and Ping yuan drafted the article or revised it critically for important intellectual content; Lijun Li and Zhi Di contributed to revise, review the research manuscript, and final approval of the version to be published.

## Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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## Ethical Approval

As this article is a review study, ethical approval was not required.

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