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Baduanjin exercise for low back pain: A systematic review and meta-analysis

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ABSTRACT

Introduction: Low back pain (LBP) is one of the most common public health concerns worldwide. Baduanjin is very popular and widely practiced for the management of LBP. This study aims to systematically investigate the efficacy and safety of Baduanjin exercise for patients with LBP.

Methods: The PubMed, EMBASE, CENTRAL, Web of Science Core Collection, CBM, CNKI, WANFANG and VIP databases were searched from inception to August 2018 to identify potentially eligible studies. Risk of bias was assessed with the Cochrane collaboration's tool. All statistical analyses were conducted with the RevMan 5.3 software.

Results: Nine studies involving 519 patients were included in this systematic review. Our meta-analysis showed that Baduanjin was associated with a small improvement in pain relief compared with general exercise (MD = -0.50, 95% CI: -0.86 to -0.15, P = 0.005). One trial indicated that Baduanjin was superior to routine drug (ibuprofen) in alleviating pain, and the effect was moderate (MD = -1.04, 95% CI: -1.52 to -0.56, P < 0.0001). A descriptive analysis showed that Baduanjin plus other active treatments (such as massage, suspension, or routine drug plus general exercise) had small to moderate effects on low back pain relief compared with active treatments alone. One trial reported that Baduanjin decreased the Oswestry Disability Index (ODI) score compared with routine drug (MD = -4.92, 95% CI = -7.81 to -2.03, P = 0.0009). Another trial found the combination of Baduanjin and electrotherapy offered better improvement than electrotherapy on back-specific function (MD = -6.03, 95% CI = -8.45 to -3.61, P < 0.00001). Three trials suggested that Baduanjin alone or in combination with other treatments achieved greater effects on the Japanese Orthopaedic Association (JOA) score improvement than other treatments. No adverse event was identified in the only study reporting on safety data.

Conclusions: The present study indicated that Baduanjin is effective for LBP. However, evidence supporting the finding is limited due to the small sample size, potential methodological flaws and significant heterogeneity. More large-scale, well-designed RCTs are warranted.

1. Introduction

Low back pain (LBP) is one of the most common public health concerns worldwide.[1] The adjusted point prevalence of LBP is 11.9% globally.[2] Crude prevalence rates of LBP in high-, middle- and low-income countries are 32.9%, 25.4% and 16.7%, respectively.[2] LBP is the leading cause of disability worldwide.[3] The condition largely contributes to work absence, is closely associated with high incidence of depression and anxiety, and brings about other social and economic issues.[4]

Abbreviations: LBP, Low back pain; PRISMA, Preferred Reporting Items for Systematic reviews and Meta-Analyses; RCTs, randomized controlled trials; VAS, visual analogue scale; ODI, Oswestry Disability Index; JOA, Japanese Orthopaedic Association; SF-36, Short-Form 36; CENTRAL, Cochrane Central Register of Controlled Trials; CBM, Chinese Biomedical Literatures database; CNKI, China National Knowledge Infrastructure; WANFANG, Wanfang Digital Periodicals; VIP, Chinese Science and Technology Periodicals; ICTRP, World Health Organization International Clinical Trials Registry Platform; ChiCTR, Chinese Clinical Trial Registry; MD, mean difference; CI, confidence interval; SMD, standardized mean difference; RR, risk ratio; EG, experimental group; CG, control group; NR, Not reported; ADR, Adverse Drug Reaction; NSAIDs, non-steroid anti-inflammatory drugs

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Recently, exercise treatments such as Pilates, Yoga, Tai Chi, and Baduanjin are gaining increasing popularity among the public for LBP management. A 2015 Cochrane systematic review indicated that Pilates had a moderate effect for low back pain relief (MD = −14.05, 95% CI: −18.91 to −9.19) compared to minimal intervention.[5] A meta-analysis indicated that Tai Chi plus physical therapy or health care significantly reduced low back pain (SMD = -0.81, 95% CI: -1.11 to -0.52) compared with physical therapy or health care alone.[6] A 2017 clinical practice guideline from the American College of Physicians discussed the potential benefits of Pilates, Yoga and Tai Chi for LBP, but did not mention Baduanjin.[7]

Baduanjin exercise consists of eight simple, separate, delicate, and smooth movements.[8] Although the potential benefits of each movement may differ, Baduanjin exercise as a whole may promote the coordination of body and mind through breath, or qi regulation.[8] In China, Baduanjin is very popular and widely practiced for the management of LBP.[9] A narrative review indicated that Baduanjin improved LBP symptoms through enhancing the strength of the back and abdominal muscles and improving the physiological curvature of the spine.[10]

Previous systematic reviews mainly focus on the prophylactic and curative effects of Baduanjin on cardiovascular and cerebrovascular diseases.[11–13] To our knowledge, no systematic review or meta-analysis on the efficacy and safety of Baduanjin for LBP has been reported.

This study aims to systematically investigate the efficacy and safety of Baduanjin for patients with LBP.

2. Methods

This systematic review was developed following the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) statement.[14] This study has been registered on PROSPERO (CRD42018099138).

2.1. Inclusion and exclusion criteria

2.1.1. Types of studies

We included only parallel-group randomized controlled trials (RCTs). Quasi-randomized RCTs, cross-over trials and non-randomized trials were excluded.

2.1.2. Types of participants

Participants with a clinical diagnosis of LBP were included irrespective of age, sex, race, nationality, the type of LBP (specific or non-specific), and the phase of LBP (acute, subacute or chronic). Patients were diagnosed as having LBP based on past or current guidelines of LBP, or as defined by the investigators.[15]

2.1.3. Types of interventions

RCTs comparing Baduanjin alone or in combination with another treatment versus the other treatment alone were included in this study. Other treatments could be active control (pharmacologic or non-pharmacologic) or inactive control (no treatment, waiting-list or placebo). There were no restrictions on treatment frequency or duration.

2.1.4. Types of outcome measures

The primary outcome was pain intensity measured by the visual analogue scale (VAS) with a total score ranging from zero to ten. The score ‘zero’ represents ‘no pain’ and the score ‘ten’ represents ‘the most intense pain’.[16]

Secondary outcomes included back-specific function, quality of life, and adverse events. Measurement tools for back-specific function included the Oswestry Disability Index (ODI) and the Japanese Orthopaedic Association (JOA) score.[17] ODI is a scale of 0 to 100, with higher scores indicating poorer function. The JOA score ranges from 0 to 29, and a higher score indicates better function. Quality of life was evaluated by tools such as the Medical Outcomes Survey Short-Form 36 (SF-36).

2.2. Search strategy

Two review authors (DG and SL) independently searched PubMed, EMBASE, the Cochrane Central Register of Controlled Trials (CENTRAL), Web of Science Core Collection, the Chinese Biomedical Literatures database (CBM), China National Knowledge Infrastructure (CNKI), Wanfang Digital Periodicals (WANFANG) and the Chinese Science and Technology Periodicals (VIP) database from inception to August 2018 to identify potentially eligible studies.

The reference list of eligible RCTs and relevent reviews were checked to identify any additional studies. The World Health Organization International Clinical Trials Registry Platform (ICTRP), ClinicalTrials.gov and the Chinese Clinical Trial Registry (ChiCTR) were searched to identify ongoing or unpublished studies. Whenever necessary, we contacted the authors for additional information. No limitations were made on publication language or status. Conference abstracts were deleted. The search strategy for the PubMed database is provided in Additional file 1. The terms were searched using Mesh terms or Title/Abstract option from the advanced search builder in PubMed directly via https://www.ncbi.nlm.nih.gov/pubmed. The search terms were modified as necessary for other databases.

2.3. Selection of studies and data extraction

All citations identified from the electronic search were imported into the EndNote software. Duplicates were deleted. Two reviewers (JS and WZ) independently checked the title and abstract to remove irrelevant studies. Then the full-texts of the remaining articles were reviewed to identify potentially eligible studies. The selection process was summarized using a PRISMA flow diagram.[14]

The following information was extracted using a pre-determined form by two reviewers (JS and WZ) independently. Disagreements were resolved by consensus or consultation with a third review author (JW).

(1) Study details: title, first author, country of study, year of publication, design, inclusion and exclusion criteria, methods of randomization, allocation and blinding;
(2) Study population: age, sex, sample size, type of LBP and phase of LBP;
(3) Intervention characteristics: type, frequency and duration;
(4) Outcome measures: VAS, JOA score, ODI, SF-36 and adverse effects.

2.4. Assessment of risk of bias in included studies

The risk of bias of eligible studies was assessed by two reviewers (JS and HL) independently using the Cochrane collaboration’s tool.[18] This recommended tool includes seven important items: sequence generation, allocation concealment, blinding of participants and personnel, blinding of outcome assessment, incomplete outcome data, selective outcome reporting and other bias.

The risk of bias of each item was categorized as low, high, or unclear. The overall risk of bias for one study was graded as low if the risk of bias of each item was identified as low.[19] Otherwise, we classified the overall risk of bias as high.[19] Finally, a ‘risk of bias’ summary and a graph were generated to present the results.

2.5. Statistical analysis

Mean difference (MD) with 95% confidence interval (CI) was calculated for continuous outcomes if the outcome was measured using the same tool across different studies. Standardized mean difference (SMD) was calculated for continuous outcomes if different measurement tools for measuring the same outcome were used across studies. Risk ratio (RR) with 95% CI was used for dichotomous outcomes.

Table 1
The magnitude of effect on pain or function.

Effect size	Mean Difference	
	0–10 scale	0–100 scale
Small	0.5–1.0	5–10
Moderate	1.0–2.0	10–20
Large	> 2.0	> 20

Note: A 0–10 scale provides a range of scores from 0 to 10, and a 0–100 scale provides a range of scores from 0 to 100.

Pooled effects were estimated with meta-analysis if clinical heterogeneity was low. Statistical heterogeneity was evaluated using the Chi-squared test or I^2 statistics. If the P value from the Chi-squared test is above 0.10 or I^2 is below 50%, effect size was estimated with a fixed-effect model. Otherwise, the random-effect model was used to provide more conservative estimates of the intervention effects. The magnitude of effect on pain or function was defined as in Table 1.[7]

A funnel plot was used to assess publication bias when at least ten studies were included in a meta-analysis.[18] Subgroup analysis was conducted based on interventions and comparisons. All statistical analyses were conducted with RevMan 5.3 software. A two-sided 5% level indicates statistically significant difference. A narrative description was provided if meta-analysis was infeasible.

3. Results

3.1. Literature search

Our initial search yielded 316 potentially eligible citations. We deleted 45 duplicate records and removed 250 irrelevant studies by checking the title and abstract against the inclusion and exclusion criteria. After reading the full-texts of the remaining records, twelve articles were excluded. Finally, nine studies [20–28] were included in the review (Fig. 1).

3.2. Study characteristics

The characteristics of included studies were summarized in Tables 2a and 2b. The nine studies [20–28] involving 519 patients (262 in the experimental group and 257 in the control group) were published between 2005 and 2016 in China. Sample sizes ranged from 22 to 32 in the experimental group and from 18 to 32 in the control group.

The type of LBP varied across studies, including lumbar muscle strain (one RCT),[20] non-specific LBP (one RCT),[26] and discogenic LBP (four RCTs) [23,25,27,28] The type of LBP was not reported in the other three studies.[21,22,24] Five studies [20–22,24,26] recruited patients with chronic LBP whereas the phase of LBP was not specified in the other four studies.[23,25,27,28]

Experimental interventions include Baduanjin alone in three studies [23,24,28] and in combination with other treatments in the other six studies.[20–22,25–27] Comparator interventions include acupuncture plus moxibustion, electroacupuncture, electrotherapy, general exercise, suspension exercise, routine drug and massage. Treatment duration ranged from four weeks to six months. Treatment frequency was once a day in six studies [20–24,27] and twice a day in three studies.[25,26,28] Ding yong et al. [24] used ibuprofen as the routine drug in the control group. Xu hao et al. [27] used Celecoxib and Yaobitong capsule (a Chinese patent medicine) as routine drugs in the control group.

3.3. Assessment of risk of bias

The 'risk of bias' summary and graph are presented in Figs. 2 and 3. Three [20,23,26] of the nine trials assigned participants using a random number table. The randomization method was not reported in other studies. Attrition bias was low for all included studies. Because of insufficient information, the risk of biases associated with allocation concealment, blinding, reporting and other possible bias were unclear.

3.4. Visual analogue scale

A meta-analysis pooling data from all included studies was not performed as comparisons were various across studies. Instead, subgroup analyses were performed based on different comparisons. The results for VAS are presented in Fig. 4. Two trials [23,28] compared Baduanjin with general exercise for reducing pain intensity in patients with discogenic LBP. The frequency was once or twice a day. The duration ranged from twenty days to eight weeks. The pooled result showed that Baduanjin was associated with a small improvement in pain relief compared with general exercise (n = 127, MD = -0.50, 95% CI: -0.86 to -0.15, P = 0.005). One study [24] found Baduanjin once a day for twelve weeks was superior to routine drug (ibuprofen) for pain alleviation in patients with chronic LBP. The effect was moderate (n = 40, MD = -1.04, 95% CI: -1.52 to -0.56, P < 0.0001). Another study [27] reported that Baduanjin plus routine drugs (Celecoxib and Yaobitong capsule) and general exercise once a day for six weeks achieved small pain relief compared with routine drug and general exercise in patients with discogenic LBP (n = 60, MD = -0.54, 95% CI: -0.93 to -0.15, P = 0.007). One trial [26] found Baduanjin plus suspension twice a day for eight weeks resulted in a small improvement in pain relief compared with suspension alone in patients with non-specific chronic LBP (n = 60, MD = -0.75, 95% CI: -1.08 to -0.42, P < 0.0001).

Another trial [25] showed Baduanjin plus massage twice a day for three months moderately decreased pain scores compared with massage in patients with discogenic LBP (n = 60, MD = -1.07, 95% CI: -1.48 to -0.66, P < 0.00001). One study [20] showed no statistically significant difference between Baduanjin in combination with 'acupuncture plus moxibustion' and 'acupuncture plus moxibustion' alone in pain relief in chronic LBP patients with lumbar muscle strain (n = 60, MD = -0.13, 95% CI: -0.47 to 0.21, P = 0.45). The frequency was once a day. The duration was four weeks. Similarly, another study [21] observed no clear difference in likelihood of achieving pain relief with Baduanjin plus electroacupuncture compared with electroacupuncture alone in patients with chronic LBP (n = 60, MD = -0.75, 95% CI: -1.97 to 0.47, P = 0.23). The frequency was once a day. The duration was one month.

3.5. Oswestry disability index

Descriptive analyses were provided because the included trials were too few to perform a meta-analysis within each subgroup. The results for ODI are presented in Fig. 5. One trial [24] reported that Baduanjin once a day for twelve weeks decreased ODI score compared with routine drug (ibuprofen) in patients with chronic LBP (n = 40, MD = -4.92, 95% CI: -7.81 to -2.03, P = 0.0009). Another trial [26] showed Baduanjin combined with suspension twice a day for eight weeks was superior to suspension alone in improving back-specific function in patients with non-specific chronic LBP (n = 60, MD = -4.42, 95% CI: -7.16 to -1.68, P = 0.002). However, both MDs were less than five scores, the minimal clinically important difference defined for a 0–100 scale (Table 1), indicating minor effect size.[7] One study [22] showed Baduanjin plus electrotherapy once a day for one month resulted in a small improvement in back-specific function compared with electrotherapy in patients with chronic LBP (n = 52, MD = −6.03, 95% CI: −8.45 to −3.61, P < 0.00001). Another study [20] observed no difference between Baduanjin combined with 'acupuncture plus moxibustion' and 'acupuncture plus moxibustion' alone in improving back-specific function in chronic LBP patients with lumbar muscle strain (n = 60, MD = -1.53, 95% CI: -4.25 to 1.19, P = 0.27). The frequency was once a day. The duration was four weeks.

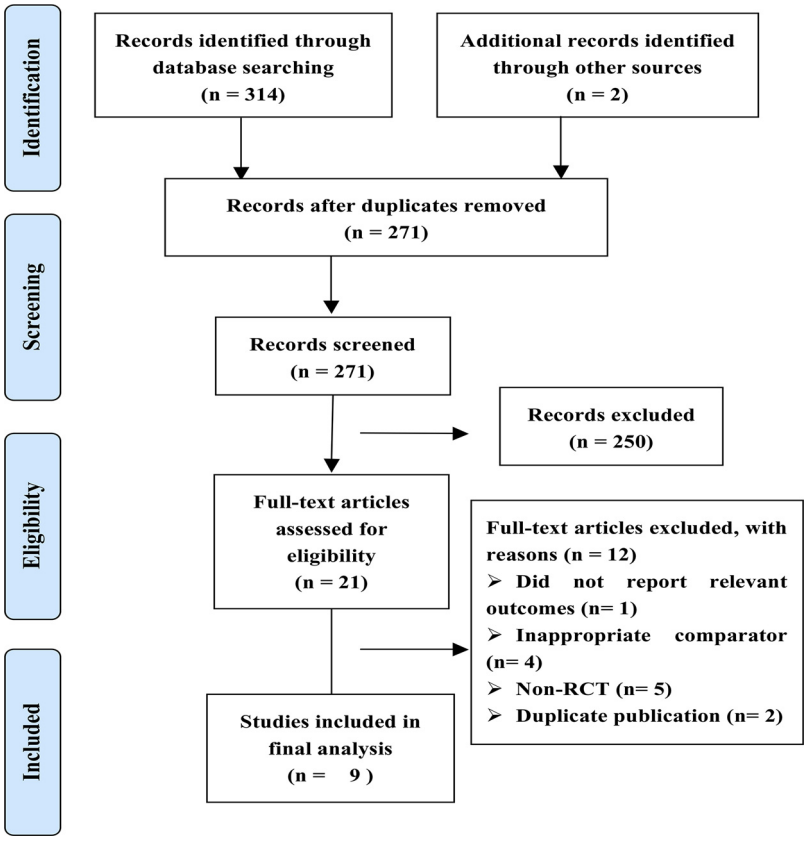

Fig. 1. Flow diagram for study retrieval and selection.

3.6. JOA score

Three studies [25,27,28] involving different comparisons reported JOA score. A descriptive analysis of Baduanjin for JOA score is presented in Fig. 6. In one trial,[25] Baduanjin plus massage twice a day for three months showed significant superiority to the massage alone in increasing JOA score in patients with discogenic LBP (n = 60, MD = 1.70, 95% CI: 0.97–2.43, P < 0.00001). Another trial [27] observed a combination of Baduanjin, routine drugs (Celecoxib and Yaobitong capsule) and general exercise once a day for six months yielded better improvement in JOA score than routine drug plus general exercise in patients with discogenic LBP (n = 60, MD = 2.86, 95% CI: 2.11–3.61, P < 0.00001). A third study [28] found that Baduanjin twice a day for twenty days.elicited a greater increase in JOA score compared with general exercise in patients with discogenic LBP (n = 63, MD = 2.62, 95% CI: 0.78–4.46, P = 0.005).

3.7. Quality of life

One trial [22] found Baduanjin plus electrotherapy once a day for one month was more effective than electrotherapy for improving SF-36 scores in patients with chronic LBP (n = 52, MD = 53.02, 95% CI: 16.06–89.98, P = 0.005).

3.8. Adverse events

Only one study [20] comparing Baduanjin combined with 'acupuncture plus moxibustion' and 'acupuncture plus moxibustion' alone in chronic LBP patients with lumbar muscle strain reported safety data. No adverse event was observed.

3.9. Assessment of reporting bias

We did not draw a funnel plot to assess reporting bias because only one meta-analysis including less than ten studies was performed.

Table 2a
Characteristics of included 9 trials.

Study ID	Study	Sample size(EG/CG)	age in EG	age in CG	Type of LBP	Phase of LBP
1	Zhang baojuan 2005[20]	30/30	23-58	23-59	Lumbar muscle strain	Chronic
2	Gu tingting 2010[21]	30/30	NR	NR	NR	Chronic
3	Wu xia 2012[22]	26/26	55.92 ± 9.25	56.46 ± 9.13	NR	Chronic
4	Pang hui 2013[23]	32/32	46.33 ± 9.46	47.25 ± 8.43	Discogenic	NR
5	Ding yong 2014[24]	22/18	61.05 ± 4.66	60.89 ± 4.92	NR	Chronic
6	Shang qiangqiang 2014[25]	30/30	NR	NR	Discogenic	NR
7	Li li 2015[26]	30/30	45.77 ± 2.11	54.80 ± 21.17	Non-specific	Chronic
8	Xu hao 2015[27]	30/30	48.33 ± 11.25	47.87 ± 10.20	Discogenic	NR
9	Wang zhenguo 2016[28]	32/31	42.04 ± 6.06	41.57 ± 7.23	Discogenic	NR

EG: experimental group; CG: control group; LBP: low back pain; NR: Not reported.

Table 2b
Characteristics of included 9 trials (continued).

Study ID	Treatment	Control	Treatment Frequency	Treatment duration	Efficacy outcome	Safety outcome
1	Baduanjin + acupuncture and moxibustion	acupuncture and moxibustion	Once a day	Four weeks	VAS + ODI	ADR
2	Baduanjin + electroacupuncture	electroacupuncture	Once a day	One month	VAS	NR
3	Baduanjin + electrotherapy	Electrotherapy	Once a day	One month	ODI + SF-36	NR
4	Baduanjin	general exercise	Once a day	Eight weeks	VAS + JOA	NR
5	Baduanjin	Routine drug	Once a day	Twelve weeks	VAS + ODI	NR
6	Baduanjin + massage	Massage	Twice a day	Three months	VAS + JOA	NR
7	Baduanjin + suspension exercise	suspension exercise	Twice a day	Eight weeks	VAS + ODI	NR
8	Baduanjin + routine drug + general exercise	Routine drug + general exercise	Once a day	Six months	VAS + JOA	NR
9	Baduanjin	general exercise	Twice a day	Twenty days	VAS + JOA	NR

EG: experimental group; CG: control group; VAS: Visual Analogue Scale; JOA: Japanese Orthopaedic Association; ODI: Oswestry Disability Index; SF-36: Short-Form 36; ADR: Adverse Drug Reaction; NR: Not reported.

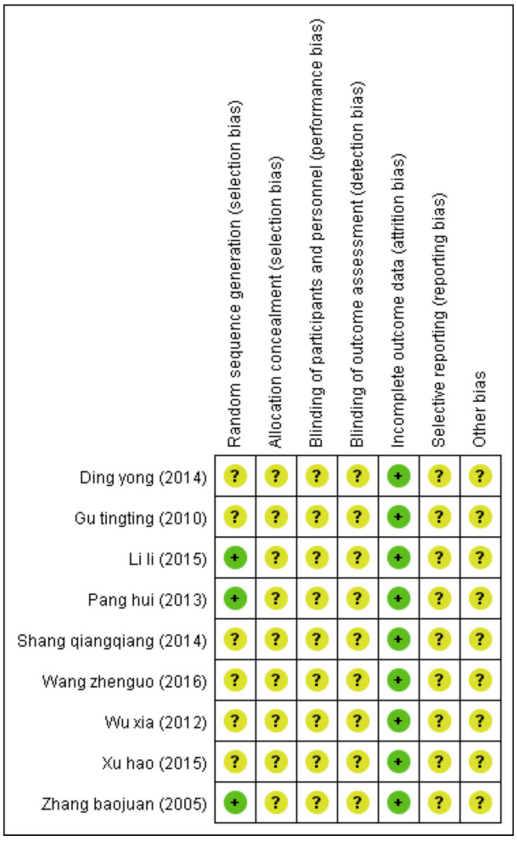

Fig. 2. Risk of bias summay.

4. Discussion

4.1. Summary of findings

This study systematically evaluated the efficacy of Baduanjin for LBP. In summary, no large effects on pain or back-specific function were identified. Our findings were consistent with the results of previous studies. In the latest clinical practice guideline developed by the American College of Physicians, neither of the recommended interventions had large effects on LBP.[7] A systematic review concluded that exercise therapy was slightly effective in easing pain and improving function in adults with LBP.[29]

The efficacy of conventional treatment for discogenic LBP is not satisfactory.[30] The present meta-analysis suggested that Baduanjin is more effective than general exercise for reducing pain in patients with discogenic LBP, although the effect size is small. Therefore, Baduanjin could be considered as an alternative treatment for pain relief in patients with discogenic LBP.

A review has summarised low-quality evidence indicating that non-steroid anti-inflammatory drugs (NSAIDs) were more effective than placebo for pain relief in chronic LBP patients,[31] and strong evidence showing that exercise therapy was effective.[32] In this study, a trial [24] found Baduanjin had a moderate effect for pain relief compared with ibuprofen (NSAIDs) in patients with chronic LBP. However, this finding is not conclusive and further studies are warranted because of the high overall risk of bias and small sample size.

A descriptive analysis showed that Baduanjin plus active treatments (such as massage, suspension, and routine drug plus general exercise) had small to moderate effects on pain reduction compared with active treatments alone.[25–27] In one study [22] comparing electrotherapy to the combination of Baduanjin and electrotherapy, the latter offered a small but statistically significant improvement on back-specific function. Another two trials [25,27] showed that Baduanjin in combination with other treatments achieved better effects on JOA score improvement

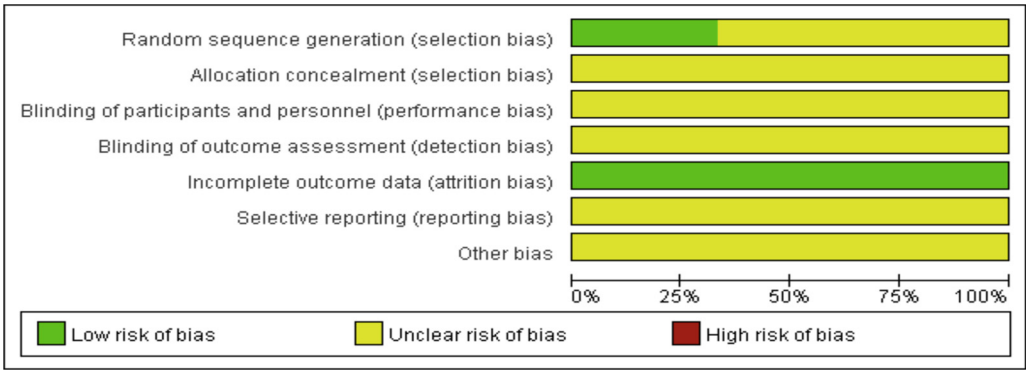

Fig. 3. Risk of bias graph.

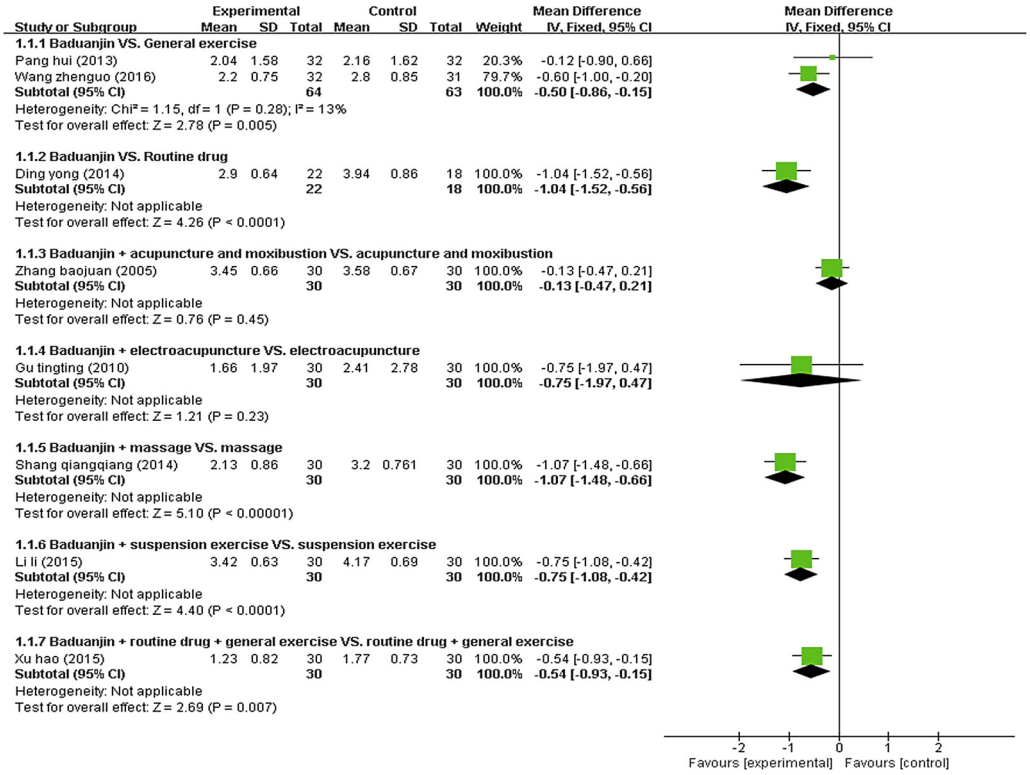

Fig. 4. Impact of Baduanjin versus other treatments on VAS.

compared with other treatments. LBP is multifactorial in nature, thus no single exercise programme is optimal for all LBP patients.[33] It may partly explain why combining Baduanjin with other treatments brought more benefits.

4.2. Limitations

There are several limitations in this review. First, the sample size was small (less than 100) and the overall risk of bias was high for each included study. Second, the majority of data were not pooled using a meta-analysis due to the insufficient trials included in each subgroup. Third, active controls rather than inactive controls (such as blank, waiting list or placebo) were used in the included RCTs. As a result, no original data exists for us to test the comparative effectiveness of Baduanjin versus inactive controls for LBP. Moreover, no specific statement was made regarding the appropriateness of the active control to the intervention. Fourth, no information was provided regarding the qualifications of the instructor in all included studies. Finally, safety analysis of Baduanjin for LBP was not possible owing to a lack of original reports.

5. Conclusion

Findings of the present study suggest that Baduanjin is effective for LBP. However, the evidence collected may not be sufficiently robust given small sample size, significant heterogeneity and potential methodological flaws. More large-scale, well-designed RCTs are warranted.

Conflicts of interest

The authors have declared no conflicts of interest.

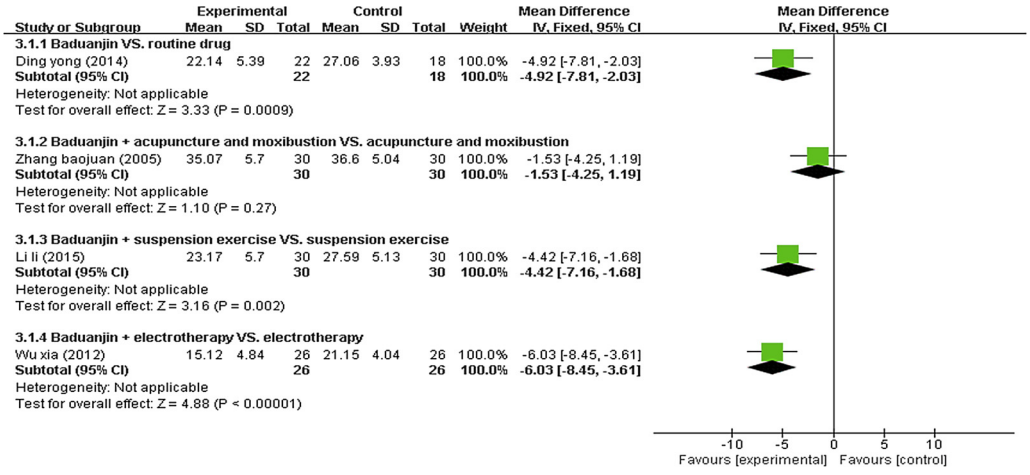

Fig. 5. Impact of Baduanjin versus other treatments on ODI.

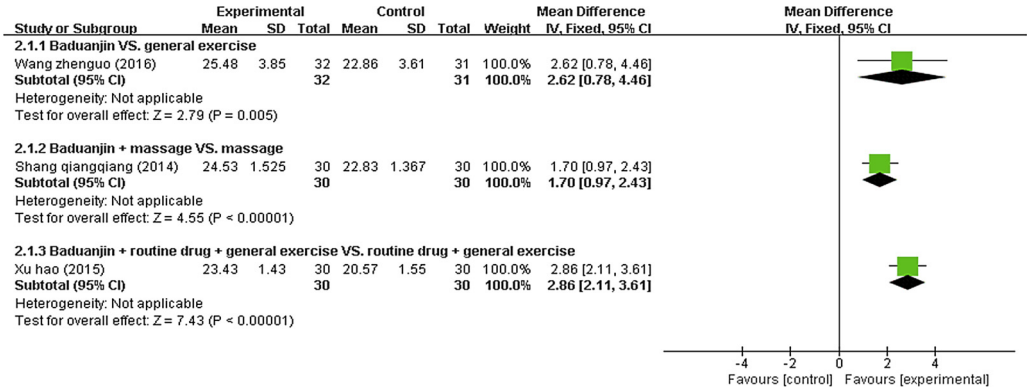

Fig. 6. Impact of Baduanjin versus other treatments on JOA score.

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Authors' contributions

HL, JW, JZ and JS conceived the study. HL and JZ designed the protocol. JS designed the search strategy. DG, SL, JS, WZ and HL conducted the article searches, selection of studies, data extraction and assessment of risk of bias. JZ performed the statistical analysis. HL, JS, DG, SL, WZ, JW and JZ drafted the manuscript. HL, JS, DG, SL, WZ, JW and JZ reviewed and revised the manuscript. All authors have read and approved the final version of the manuscript.

Additional file 1 The search strategy for the Pubmed database

1 exp low back pain/
2 exp back pain/
3 ("low back pain" OR "back pain" OR backache OR lumbago OR "spin* pain" OR "back ache" OR "lumbar pain").ti/ab
4 back disorder*.ti/ab
5 dorsalgia.ti/ab
6 ((back or lumb*) AND (pain or radicul* or polyradicul*)).ti/ab
7 coccyx.ti/ab
8 coccydynia.ti/ab
9 Sciatic*.ti/ab
10 exp sciatic neuropathy/
11 spondylosis.ti/ab
12 lumbago.ti/ab
13 Spinal Stenosis/
14 ((spine or spinal or lumb*) and stenosis)).ti/ab
15 ((disc* or disk*) AND degenerat*)).ti/ab
16 ((disc* or disk*)AND prolapse*)).ti/ab
17 ((disc* or disk*) AND herniat*)).ti/ab
18 Intervertebral Disc/
19 exp Intervertebral Disk Displacement/
20 or/1-19
21 Qigong/
22 (baduanjin OR 'baduan jin' OR 'ba duan jin' OR 'eight section brocades' OR 'eight brocades' OR 'eight trigrams boxing' OR 'eight-treasured exercises' OR 'eight pieces of brocade' OR 'qigong' OR Ch'i Kung OR 'qi gong').ti/ab
23 exp Exercise/
24 exp Exercise Movement Techniques/
25 exp Exercise Therapy/
26 exercise$.tw.
27 Or/21-26
28 randomized controlled trial.pt.
29 controlled clinical trial.pt.
30 randomized.ab.
31 placebo.ab,ti.
32 randomly.ab,ti.
33 trial.ab,ti.
34 groups.ab,ti.
35 or/28-34
36 (animals not (humans and animals)).sh.
37 35 not 36
38 20 and 27 and 37

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