



Qigong or Tai Chi in Cancer Care: an Updated Systematic Review and Meta-analysis

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Abstract

Purpose of Review Qigong and Tai Chi are two increasingly popular mind-body interventions with the potential to address the multifaceted needs of cancer survivors. The aim of this updated review and meta-analysis was to quantitatively evaluate the treatment effects of Qigong/Tai Chi on cancer survivors since 2014.

Recent Findings There were statistically significant and clinically meaningful effects in favor of Qigong/Tai Chi interventions for symptoms of fatigue and sleep quality. There were positive trends, but not statistically significant effects, observed for anxiety, stress, depressive symptoms, and overall quality of life (QOL). Cancer-related cognitive impairment is a common complaint among cancer survivors that has received increasing attention in this area in recent years.

Summary Qigong/Tai Chi in cancer care shows great promise with short-term effects in treating many cancer-related symptoms. Further methodologically sound trials with longer follow-up periods and more active control conditions are required, before definitive conclusions can be recommended for cancer patients.

Keywords Integrative oncology · Qigong · Tai Chi · Fatigue · Sleep · Anxiety · Stress · Depression · Cognitive function · Quality of life (QOL)

Introduction

With early detection and advanced treatment of cancer, the 5-year relative survival rate of all cancer sites is 67%, resulting in an increasing number of cancer survivors [1]. As more cancer survivors live longer after curative treatment, long-term or late effects of cancer and its treatment, such as fatigue, sleep disturbance,

mood, neurocognitive function deficits, and quality of life, are more commonly seen in cancer survivors [2, 3].

The use of Qigong or Tai Chi has a much longer history—especially in cancer care [4]. Qigong and Tai Chi are two increasingly popular mind-body interventions with the potential to address the multifaceted needs of cancer survivors [3, 5]. Qigong, often used to enhance vital energy or life force, balances a patient's spiritual, emotional, mental, and physical health, and aims to reduce fatigue, anxiety, and depressive symptoms [6]. “Qigong practices are used to increase the qi, circulate it, use it to cleanse and heal the body, store it, or emit qi to help heal others” [6]. Tai Chi is also a form of ancient and traditional Chinese medicine that integrates movement (physical postures), meditation (focused attention), and controlled breathing to achieve a state of mental calm and relaxation [7]. Tai Chi aims to improve the health of cancer patients through increased mind-body awareness, and especially when incorporating Qigong practices can add a stronger meditative aspect to enhance physical and emotional balance [4, 6].

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Table 1 Characteristics of 12 included studies

Author and year	Study type	Cancer type	Interventions	Outcome measures	Main results
Campo et al. [8]	RCT	40 prostate cancer patients, with a mean age of 72 years old	Qigong, 60 min/section, two times/week, 12 weeks	BSI, FACIT-F	Qigong has significantly reducing symptoms of fatigue ($p = 0.02$) and distress ($p < 0.05$), and Qigong is safe and feasible.
Chuang et al. [9]	RCT	96 patients with lymphoma, with a mean age of 60 years old	Qigong, 60 min/section, two times/week, 10 weeks	BFI, EORTC-QLQ, VSHSS	Qigong group exhibited decreased fatigue intensity from 5.49 (SD = 1.02) to 3.37 (SD = 1.39), and decreased fatigue interference from 5.53 (SD = 1.27) to 2.20 (SD = 1.93).
Larkey et al. [15]	RCT	101 breast cancer patients with a mean age of 59 years old	Qigong plus Tai Chi, 60 min/section, two times/week, 12 weeks	BDI, FSI, PSQI	Fatigue decreased significantly in the Qigong group compared to control at post-intervention ($p = 0.005$) and 3-month follow-up ($p = 0.024$), but not depression and sleep quality.
Larkey et al. [16]	RCT	101 breast cancer patients with a mean age of 59 years old	Qigong plus Tai Chi, 60 min/section, two times/week, 12 weeks	BMI, FACT-Cog, SF-36	Qigong plus Tai Chi groups demonstrated pre-to-post-intervention improvements in physical and mental health. For a subset of women enrolled later in the study, a significant reduction in BMI [-0.66 , ($p = 0.048$)] was found for Qigong/Tai Chi compared to sham Qigong.
Loh et al. [10]	RCT	197 breast cancer patients, no age reported	Qigong, 60 min/section, two times/week, 8 weeks	DASS, FACT-B, FACT-F	The Qigong group showed significant marginal improvement in quality of life scores compared to placebo ($p = 0.036$), compared to usual care ($p = 0.048$) on FACT-B.
McQuade et al. [17]	RCT	76 prostate cancer patients, with a mean age of 62 years old	Qigong plus Tai Chi, 60 min/section, three times/week, 6–8 weeks	BFI, EPIC, PSQI	Qigong plus Tai Chi group reported longer sleep duration at mid-radiotherapy (7.01 vs. 6.50 h in the wait-list group, $p = 0.05$), but this difference did not persist over time. There were no group differences in fatigue.
Myers et al. [11]	RCT	24 advanced cancer patients with a mean age of 66 years old	Medical Qigong, 60 min/section, two times/week, 6 weeks	FACT-G, HADS	Qigong participants reported the most reduction of distress ($p = 0.02$), and improvement in self-reported cognitive function ($p = 0.007$).
Oh et al. [12]	RCT	27 metastatic breast cancer patients with a mean age of 57 years old	Medical Qigong, 60 min/section, two times/week, 10 weeks	FACT-B, FACT-COG, FACT-F, PSS	Reporting medical Qigong is safe and feasible. Qigong only statistically reducing neuropathy symptoms ($p = 0.014$).
Thongtitham et al. [18]	RCT	30 breast cancer patients, no age reported	Qigong plus Tai Chi, 60 min/section, three times/week, 12 weeks	FACT-B, FSI	Tai Chi plus Qigong has large effect size (ES) for self-esteem (1.29), medium ES for fatigue (0.80), cortisol (0.75), and QOL (0.68), respectively.
Vanderbyl et al. [13]	RCT	19 lung and gastrointestinal cancer patients with a mean age of 65 years old	Qigong, 60 min/section, three times/week, 6 weeks	BPI, HADS, FACT-G	Compared with active control of strength training, Qigong has significant effects in improving physical well-being ($p = 0.04$), but has equivalent effects in aspects of psychological functions ($ps > 0.05$).
Yeh et al. [14]	RCT	108 lymphoma patients with a mean age of 60 years old	Qigong, 60 min/section, three times/day, 3 weeks	BSI, VSHSS	Qigong statistically reduced the severity of fatigue ($p < 0.001$) and improved the sleep quality ($p < 0.001$).
Zhang et al. [19]	RCT	96 lung cancer patients with a mean age of 63 years old	Tai Chi, 60 min/section, three times/week, 12 weeks	MFSI-SF	At 6 weeks, Tai Chi group had lower MFSI-SF general subscale scores (18.1 ± 4.6 vs. 20.4 ± 4.5 , $p < 0.05$) and physical subscale scores (17.5 ± 4.4 vs. 19.1 ± 4.5 , $p < 0.05$), and higher MFSI-SF vigor subscale scores (14.5 ± 3.3 vs. 11.6 ± 3.4 , $p < 0.05$), compared with the control group. At 12 weeks, the MFSI-SF subscale scores showed the same trends as at six weeks.

BFI Brief Fatigue Inventory, BMI body mass index, BPI Brief Pain Inventory, BSI Brief Symptom Inventory, DASS Depression and Anxiety Stress Scale, EORTC-QLQ European Organization for Research and Treatment of Cancer–Quality of Life Questionnaire, EPIC Expanded Prostate Cancer Index Composite, FACT-F Functional Assessment for Chronic Illness Therapy, FACT-B Functional Assessment for Cancer Therapy–Breast, FACT-Cog Functional Assessment of Cancer Therapy–Cognitive Function, FACT-F Functional Assessment for Cancer Therapy–Fatigue, FACT-G Functional Assessment for Cancer Therapy–General, FSI Fatigue Symptom Inventory, HADS Hospital Anxiety and Depression Scale, MFSI-SF Multidimensional Fatigue Symptom Inventory–Short Form, PSQI Pittsburgh Sleep Quality Index, PSS Perceived Stress Scale, SF-36 Short Form 36, RCT randomized controlled trial, VSHSS Verran and Snyder-Halpern Sleep Scale

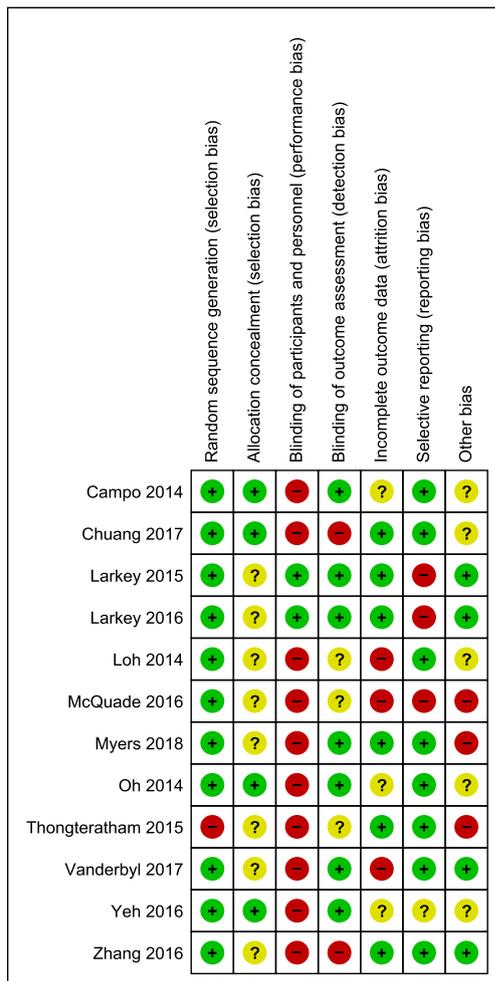


Fig. 1 Risk of bias summary on the 12 trials of Qigong/Tai Chi for cancer patients

Aims

An existing review of the effects of Qigong/Tai Chi in cancer care includes reports that have been published until 2013 [5•]. The aim of this updated review and meta-analysis was to quantitatively evaluate the treatment effects of Qigong/Tai Chi on cancer survivors after 2013.

Methods

Three databases (Medline, CINAHL, and the CAJ Full-text Database) were searched until September 30, 2018. Randomized controlled trials (RCTs) of Qigong/Tai Chi as a treatment intervention for cancer patients were considered for inclusion. Data synthesis used the Cochrane Collaboration Review Manager (RevMan 5.3; <https://community.cochrane.org/help/tools-and-software/revman-5>) to generate pooled estimates of effect size.

Results

A total of 915 subjects from 12 studies conducted since 2014 were included in this updated review (Table 1). The mean age of study participants ranged from 57 to 72 years old, and the sample sizes varied from 19 to 197. All included studies are randomized controlled trials. Of 12 RCTs, seven used Qigong [8–14]. Four studies used Qigong plus Tai Chi interventions [15–18] and one study [19] used Tai Chi as an intervention. The duration per session was 60 min; supervised training frequency ranged from three times per day to twice a week, and the total duration of the interventions varied from 3 to 12 weeks. Outcome measures and the main results of these studies are shown in Table 1. Each included trial assessed the risk of bias, and the risk of bias summary is shown in Fig. 1. Major sources of risk of bias were a lack of participant blinding, incomplete outcome data, and unclear allocation concealment, resulting in potential selection bias.

Compared with usual care, support groups, waitlist control or sham Qigong control, Qigong/Tai Chi, or Qigong plus Tai Chi interventions had positive effects on reducing the clinical symptoms of fatigue, sleep difficulties, anxiety, stress, and depressive symptoms, and improved overall quality of life. Of 12 RCTs, eight studies examined the effects of Qigong on fatigue in cancer patients. Figure 2 indicates that Qigong/Tai Chi had statistically significant effects on reducing fatigue symptoms, and the standardized mean difference (SMD) was

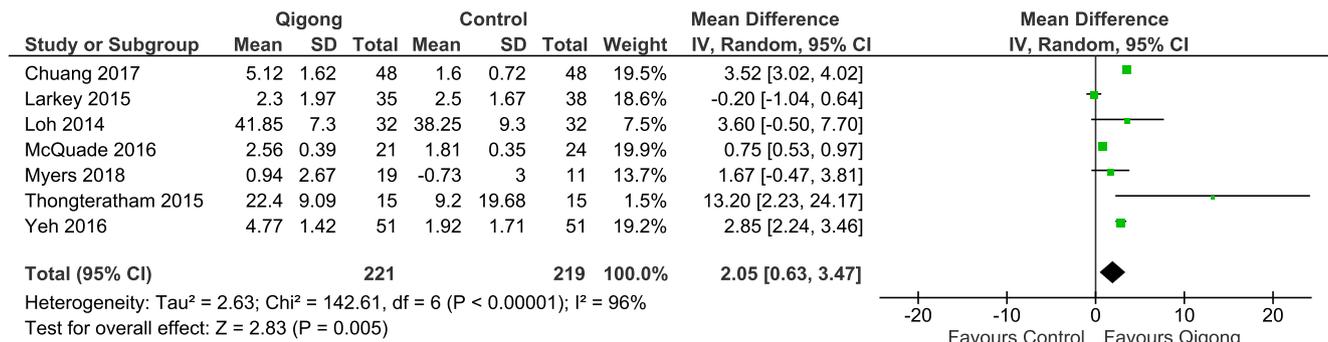


Fig. 2 Fatigue after Qigong intervention at follow-up (≤ 3 months)

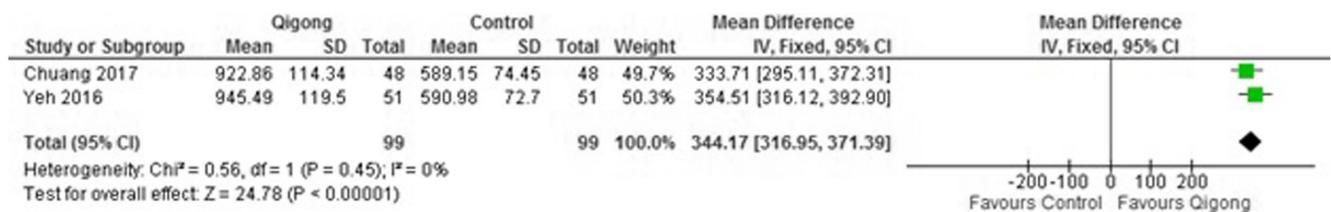


Fig. 3 Sleep quality at post-intervention

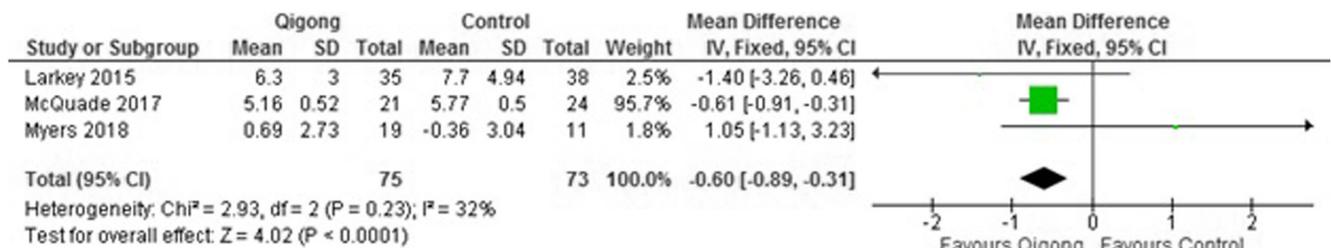


Fig. 4 Mean changes of sleep quality from baseline to 3-month follow-up

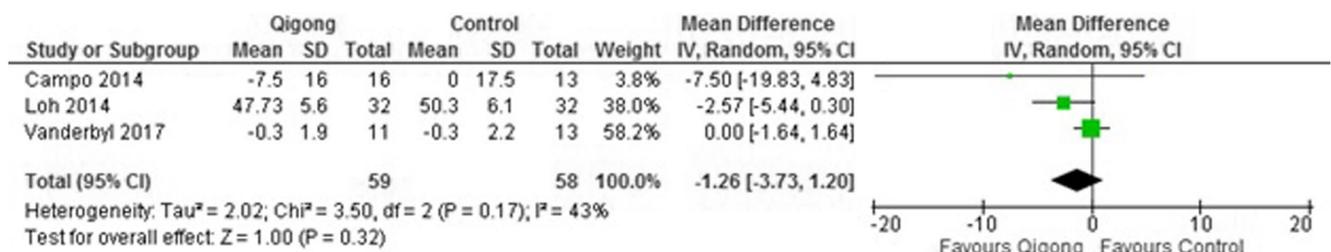


Fig. 5 Anxiety after Qigong intervention at follow-up (≤ 3 months)

2.08 (95% CI 0.77 to 3.47). Figures 3 and 4 show the weighted mean differences (WMD) of Qigong on sleep quality at post-intervention and the mean change from baseline to post-intervention (Z scores = 24.78 and 4.02, respectively; $p < 0.0001$). Figures 5, 6, 7, 8, and 9 show the effects of anxiety, stress, depressive symptoms, cognitive function, and quality of life in favor of the Qigong or Qigong plus Tai Chi group, but there were no statistically significant differences ($p = 0.32, 0.06, 0.29, 0.05, \text{ and } 0.17$, respectively).

Discussion

Integrative oncology addresses the holistic cancer experience by viewing the individual as a whole and recognizing the mind-body connection [20]. Qigong is a system of mind-body exercises that integrate physical postures of movement,

focused attention of meditation, and controlled breathing to restore and potentiate the whole person [21]. A previous meta-analysis included RCTs published before 2014 and concluded that Qigong/Tai Chi had positive effects on fatigue, immune function, and cortisol levels of cancer patients, with clinically meaningful and statistically significant benefits on cancer-specific QOL following Qigong intervention [5].

Findings of this updated meta-analysis indicate there were statistically significant and clinically meaningful effects in favor of Qigong/Tai Chi interventions for symptoms of fatigue and sleep quality. There were positive trends, but not statistically significant effects, observed for anxiety, stress, depressive symptoms, and overall QOL. Cancer-related cognitive impairment, a common complaint among cancer survivors, has received increasing attention in recent years [2]. There were three trials that examined the effects of Qigong interventions on cancer patients

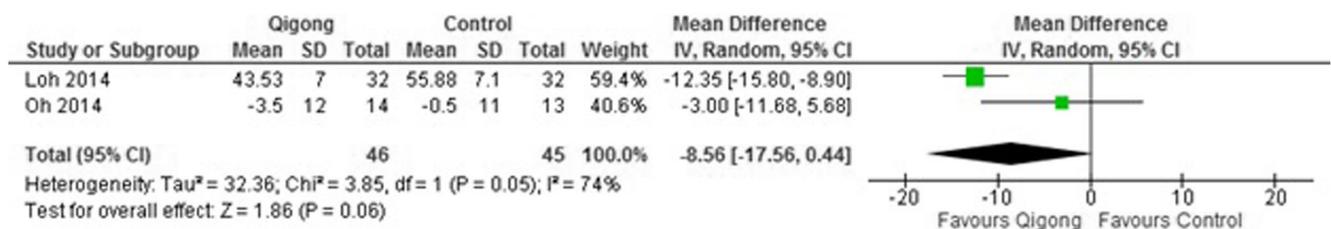


Fig. 6 Stress after Qigong intervention at follow-up (≤ 3 months)

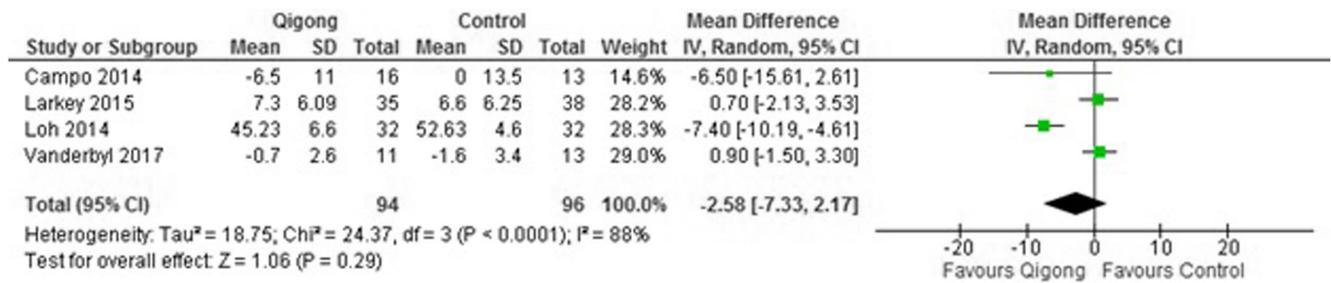


Fig. 7 Depression after Qigong intervention at follow-up (≤3 months)

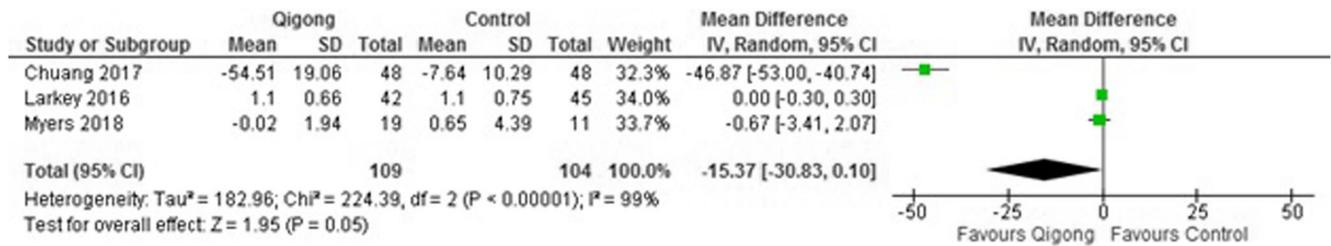


Fig. 8 Cognitive function after Qigong intervention at follow-up (≤3 months)

[9, 11, 16]. Patients reported an improvement in cognitive function, but the pooled effects on cancer patients’ cognitive function show a non-significant trend in favor of Qigong intervention. Mechanistic explorations of how Qigong is effective at reducing cancer-related symptoms may include “(1) psychoneuroimmunology, which is the study of mind-body interactions and their influence on the immune system [22]; (2) the relaxation response effect [23]; and (3) the effects of epigenetics, including biological, environmental, emotional, lifestyle, and belief factors that influence genetic expression [24].”

Assessing the risk of bias in the included trials was limited to key design features, such as randomization, blinding, and selective outcome reporting. Future studies should report features specifically relevant to Qigong studies, including intervention details and the validity of Qigong training protocols. According to the findings of this review, there are advances in methodological development applying sham Qigong as a control for blinding participants [15, 16], which could allow clinical trials to better evaluate Qigong-specific effects in cancer care. In addition, the total duration of the interventions varied from 3 to 12 weeks. In addition, with variations in session

frequency, future research should assess the appropriate Qigong dosage for cancer patients in terms of session frequency, session intensity, and total number of sessions. Finally, this review pooled results that included patients with all types of cancer, and limited recommendations on the benefits of Qigong/Tai Chi for specific cancer populations.

Conclusion

This review provides updated evidence on the short-term effectiveness of Qigong/Tai Chi in ameliorating fatigue, sleep quality, anxiety, stress, depressive symptoms, cognitive function, and overall quality of life in cancer patients. While the pooled effects of these study outcomes were all in favor of Qigong/Tai Chi intervention, there were statistically significant effects observed on symptoms of fatigue and sleep quality. Further methodologically sound trials with longer follow-up periods and more active control conditions are required before definitive conclusions can be recommended for cancer patients.

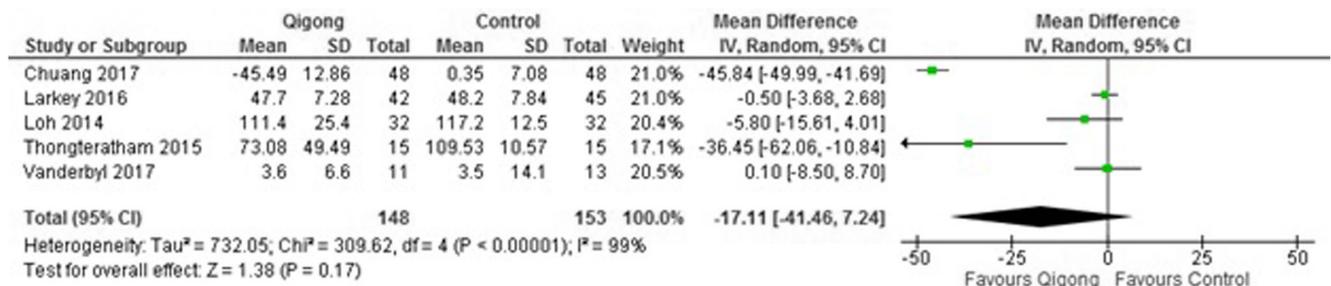


Fig. 9 Overall quality of life after Qigong intervention at follow-up (≤3 months)

Compliance with Ethical Standards

Conflict of Interest Yingchun Zeng, Xiaohua Xie, and Andy S.K. Cheng declare that they have no conflict of interest.

Human and Animal Rights and Informed Consent This article does not contain any studies with human or animal subjects performed by any of the authors.

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