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The effects of qigong on neck pain: A systematic review

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A B S T R A C T

Background and purpose: Neck pain is a common musculoskeletal condition that affects a large portion of the population. It is not known if qigong affects neck pain. The purpose of this review is to systematically review the effects of qigong in subjects with neck pain.

Methods: A systematic review of literature indexed in the following databases: PubMed, Medline, CINAHL, Physiotherapy Evidence Database, and SportsDiscus, was conducted and methodologically graded using the Physiotherapy Evidence Database Scale (PEDro).

Results: Five studies satisfied criteria and were included in this review. The majority of included studies found that qigong had a significant effect on neck pain or disability (95% CI). Qigong was not generally more effective than exercise therapy groups.

Conclusion: The findings of this systematic review indicate that qigong might have a beneficial effect in some individuals with neck pain, although not necessarily more effective than therapeutic exercise.

1. Introduction

Neck pain (NP) is a debilitating neuro-musculoskeletal condition that affects 11–13% of workers worldwide with other statistics showing a reported prevalence of 60–70% of the general population [1–4]. Incidence of NP is generally higher in women although both genders experience NP [2,3,5,6]. Incidence of NP is most prevalent in the middle-age demographic: a demographic associated with high societal productivity [3,4,6,7]. NP has been associated with decreased societal productivity, especially amongst computer workers [4,6,7]. NP may also be linked with decreased psycho-social well-being [8].

NP can be treated by a variety of interventions. These interventions include: spinal manipulations, exercise, electrical stimulation, cognitive based therapy, massage, acupuncture, and pharmaceuticals, and can be provided by an array of health practitioners such as physical therapists, medical doctors, psychologists, chiropractors, acupuncturists, and massage therapists [3,6,9].

Research-demonstrated efficacy for these interventions in the treatment of NP is varied with a reasonable body of research indicating efficacy with a general combination of exercise, manual therapy or combined therapy [10,11]. Current available research focuses on young and middle age adults. There is a paucity of neck pain research in the geriatric population [11,12].

Exercise-based interventions are commonly used to treat NP and consists of a wide array of exercise methods that include isometric deep neck stabilizer training, stretching, endurance training, range of motion and mobilization-enhancing exercises, and proprioceptive training [11–13]. Research for exercise therapy demonstrates a range of efficacy and tolerance [11–13].

Qigong is a Chinese form of exercise-related activity that comes from the Traditional Chinese Medical (TCM) paradigm [14,15]. Like many forms of TCM, qigong training is based on the principle of harmonizing the opposite energies of Yin and Yang and regulating the balance of qi, “vital energy,” in the body to increase and maintain health and well-being [15,16]. There are a variety of qigong training methods. Most qigong forms use a combination of breathing exercises, gentle movement, visualization, and mental focus [15–17]. Qigong has been practiced in China for over 2000 years. Currently many people practice qigong for health as well as psycho-spiritual wellness [15,16,18]. Qigong is popular with the elderly as most qigong forms are gentle and can be practiced by the constitutionally weak or frail [12,15,16].

Research on qigong indicates that qigong can be effective as treatment or adjunct therapy for certain medical conditions. A placebo controlled clinical trial demonstrated that qigong was effective in decreasing pain in patients with late stage complex regional pain syndrome [19]. A systematic review and meta-analysis found qigong to control blood pressure better than no treatment in hypertensive individuals [20]. Another randomized controlled trial revealed that qigong therapy was not inferior to traditional exercise therapy in individuals with chronic low back pain [21].

Some studies demonstrate no clinical effect of qigong. A review that

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examined the effects of qigong on chronic pain indicated that there was not substantive enough research to warrant the claim that qigong was effective in decreasing pain [22]. A meta-analysis that examined the effects of Chinese movement exercise in individuals with Parkinson's Disease (PD) stated there was not enough evidence for or against the use of qigong plus medication in subjects with PD [23]. A systematic review examined the effects of qigong in oncology patients and concluded that there is currently not enough high quality evidence to recommend qigong for oncology patients [24].

Currently, to the best of our knowledge, there are no systematic reviews that examine the effects of qigong on NP. Because qigong is a well-tolerated intervention, patients with NP could benefit from this intervention if it also proved efficacious. The purpose of this systematic review is to examine the effects of qigong training in people with NP.

2. Methods

2.1. Search strategy

The two authors independently conducted systematic literature searches of the following databases: PubMed, Medline, CINAHL, Physiotherapy Evidence Database, and SportsDiscus. The searches were conducted solely of studies published within the timeframe of January 2000 to September 2017. The search terms were “qigong and neck pain,” “qigong and cervical pain,” and “qigong and neck pain and quality of life.”

2.2. Study selection

The two authors independently reviewed relevant titles and abstracts. Titles and abstracts were considered relevant if they indicated examination of the effect of qigong on subjects with mechanical neck pain. The authors also decided to include various stages of pain: acute, sub-acute and chronic, as long as the pain was mechanical pain and not derived from systemic illness, to allow broad inclusion of studies.

Given the broad nature of the term “qigong,” the authors did not specify a particular qigong intervention to be considered but accepted each individual study author's definition of the term. The authors of this systematic review chose not to include studies examining tai chi as an intervention because, although tai chi also focuses on relaxation and uses a variety of breathing and form work and also originates from China and is referenced in TCM, tai chi forms as used in contemporary public health culture tend to differ from qigong exercise in several ways: tai chi forms tend to include more stepping, whereas qigong exercises are generally relatively stationary; tai chi forms are made up of a continuous series of movements, each one leading seamlessly into the next, whereas qigong exercises often consist of a collection of single movements that the practitioner performs with pauses in between [25–27]. Tai chi forms are also often considered more complicated than qigong forms [25,27]. For these reasons, it was felt that focusing solely on qigong would decrease heterogeneity among the included studies.

2.3. Inclusion criteria

To be included in this systematic review, studies had to be randomized controlled trials (RCT) that investigated the effects of qigong on human subjects with mechanical neck pain who were 18 years of age or older. The studies had to be published in English and peer-reviewed journals, and to score a 4 or higher on the Physiotherapy Evidence Database (PEDro) Scale [28].

2.4. Exclusion criterion

Studies that examined the effects of qigong on subjects with systematic illnesses including cancer and progressive neurological diseases were excluded.

2.5. Data extraction themes

Extracted data included pain or quality of life outcome measures and impairment based outcome measures.

2.6. Methodological quality

The two authors independently rated all included studies using the PEDro Scale. In the event of scoring discrepancies, the lead author made final scoring decisions. The reliability of the PEDro scale has been found to be ‘fair’ to ‘good’ and has been found valid for measuring methodological quality of clinical trials [29,30].

The PEDro scale is used to assess the internal validity of clinical trials. The scale uses 11 criteria. For each met criterion a point is awarded. If the criterion is not met, a zero is awarded. Criteria 2–11 measure internal validity. A study's external validity is measured by criterion 1; however, given that the purpose of the PEDro scale is to measure a study's internal validity, PEDro guidelines state that the score awarded for criterion 1 should be dropped from the final score, so the final score is always out of 10. Criteria 10 and 11 articulate statistical measures and ensure that there is ‘sufficient statistical information to make the results interpretable.’ Stronger internal validity is indicated by a higher PEDro score [28–30].

3. Results

3.1. Study selection and characteristics

A total of one-hundred and thirty-three studies were considered for inclusion based on initial screening of titles and abstracts. Five articles met full inclusion criteria, after full text article review. Fig. 1 gives the literature search flow chart. All included articles were RCTs. The most common reasons for exclusion were studies not randomized, not published in peer-reviewed journals, not including a qigong intervention, or scoring less than 4 on the PEDro scale. Table 1 includes a summary of studies. After reviewing the included studies the authors decided not to perform a meta-analysis due to the small number of eligible studies and the heterogeneity of the included qi gong interventions.

Extracted data included outcome measures used to assess pain, quality of life, and other functional measures. Outcome measures included: visual analog scale (VAS), neck pain and disability scale (NPAD), Health Related Quality of Life Short-Form 36 scale (SF 36) and Short-Form 12 scale (SF-12), neck pain and disability scale via Von Korff's questions, neck disability index (NDI), and Patient Health Anxiety and Depression Scale (ADS). Extracted impairment based measures included: grip strength, and cervical range of motion (ROM). The number of adverse events were also extracted.

525 subjects were included across all five studies. The average subject ages for the included studies are as follows: 76 ± 8 years–Von Trott et al. [12], 48 years–Skoglund et al. [31], 45.6 ± 10 years–-Rendant et al. [32], 44 years–Lansinger et al. [33], and 44 years–Lansinger et al. [34].

3.2. Methodological assessment

Each study was assessed for methodological quality separately by two different authors using the PEDro scale. Four studies [12,32–34] scored seven on the PEDro scale which indicates good methodological quality; one study scored four [31], which indicates fair methodological quality [29,30]. Table 2 highlights the PEDro scores.

All included studies (100%) met criteria 1–eligibility specification, 2–Randomized, 8–Between group statistical comparison between at least 85% of subjects, 10–between group statistical comparison for at least one key outcome, and 11–point measure and variability for at least one key outcome.

None of the studies (0%) met criteria 5–subject blinding, 6–blinding

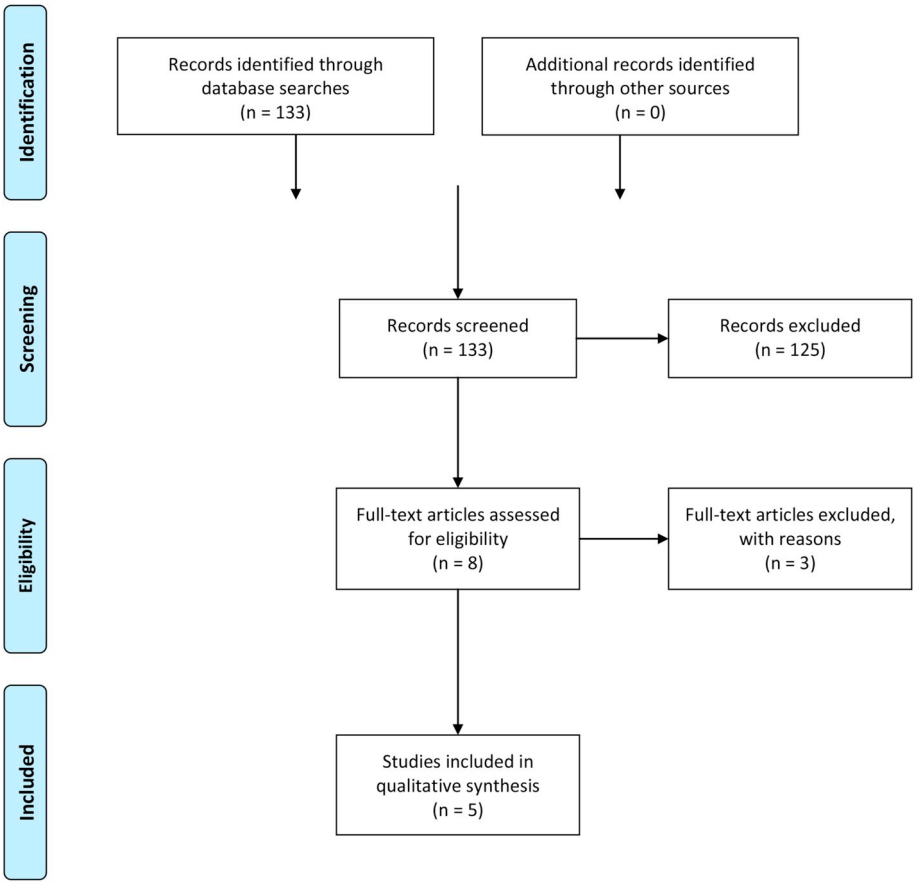

Fig. 1. Literature search flow chart. Adapted from: [41]

of therapists or persons delivering the intervention, or 7–blinding of assessors. It is difficult to blind subjects and therapists/those administering the intervention in studies of this nature because, due to the highly apparent variation in technique and appearance between qi gong and other treatment modalities, such as exercise therapy and no activity, both subjects and therapists are usually able to ascertain in which groups the subjects are.

3.3. Effects of qigong on neck pain

Von Trott et al. [12], discovered that at three months there was no significant difference in neck pain between the qigong and waiting list control groups (p = .099) or between qigong and exercise therapy groups (p = .697) with pain measured as average pain level in 7 days measured by VAS. Skoglund et al. [31], using Von Korf's validated questions to measure pain level, found no significant difference on neck pain with qigong training (95% CI). Rendant et al. [32], observed significantly decreased pain levels in the qigong group compared to the waiting list control group (p = .002), but no significant differences between the qigong and exercise group (p = .782) with pain levels measured by VAS. Lansinger et al. [33], did not find any significant differences in neck pain between qigong and exercise therapy using VAS as the pain outcome; however, both groups were found to demonstrate significant improvement (95% CI). Lansinger et al. [34], did find significant improvements for a qigong group compared to exercise control group, with 53% of the qigong group reporting improved pain levels at 12 months via VAS.

3.3.1. Effect of qigong on neck-related disability

Von Trott et al. [12], reported no significant difference in neck pain and disability as measured by the NPAD between qigong and a waiting list control group (p = .135) or between qigong and an exercise therapy group (p = .600). Skoglund et al. [31], observed a significant change in the qigong group for disability using Von Korf's validated questions compared to a wait list control group (95% CI). Rendant et al. [32], reported that the qigong group had significant improvements on the NPAD compared to a waiting list control group (p = .002) but not compared to the exercise group (p = .642). Lansinger et al. [34], observed no significant difference between the qigong and exercise group per the NDI (p = .501); however, both groups were found to demonstrate significant improvement (95% CI).

3.4. Effect of qigong on quality of life

Von Trott et al. [12], observed no statistical difference between qigong and control group (95% CI) or for qigong and exercise group (95% CI) for health related quality of life measured by the SF-36. This study also demonstrated no significant differences for anxiety and depression scores measured by the ADS between qigong and waiting list control (p = .62) or between qigong and exercise group (p = .64). Skoglund et al. [31], reported no significant differences between the qigong and waiting list control for quality of life measured by the SF-12 (95% CI) and EQ-5D (95% CI). Rendant et al. [32], reported that qigong demonstrated significant improvement over the control group for most sub-measures of the SF-36 but was statistically comparable to the exercise group via the SF-36. Lansinger et al. [33], reported that the qigong group had significantly improved SF-36 scores compared to normal population baseline (p < .001); however, no significant difference was observed between the qigong and exercise group.

Table 1
Summary of studies.

Author	Purpose	Subjects	Outcome Measures	Intervention	Results
Von Trott et al.	To evaluate the effectiveness of qigong compared with exercise therapy and no treatment on elderly subjects with chronic neck pain.	117 subjects 76 ± 8 years old (111 females, 6 males) with recurrent neck pain.	Average neck pain (Visual Analogue Scale); neck pain and disability (NPAD scale); quality of life (sf-36).	45 min lessons twice per week for 3 months. Qigong: Dantian method. Exercise therapy: a standardized program for computer-and workplace-related neck pain. Both provided by certified therapists.	No significant difference was found between the qigong and control group or compared between the qigong and exercise therapy groups for pain, disability or quality of life.
Skoglund et al.	To examine the effects of qigong on neck-shoulder pain and health-related quality of life in subjects working in an office environment.	37 subjects, mean age 48 years (29 females, 8 males) with mechanical neck pain.	Pain intensity neck and disability neck (Von Korff's questionnaire); health-related quality of life (EuroQol).	Qigong: by video instruction, 17–25 min sessions each work day for 6 weeks. Sessions included qigong movements and breathing exercises.	Neck disability was improved in the subjects after the qigong intervention (95% CI). No significant differences were found in any other outcome measures.
Rendant et al.	To evaluate whether qigong is more effective than no treatment and not inferior to exercise therapy in subjects with chronic neck pain.	123 subjects age 46 ± - 11 years (88% female) suffering from chronic neck pain for 3.2 (SD ± 1.6) years.	Average neck pain (Visual Analogue Scale); neck pain and disability (NPAD scale).	18 sessions over 6 months. Qigong: *Neiyanggong* method, 90 min sessions. Exercise therapy: exercises developed by specialists. All interventions carried out by qualified personnel.	Neck pain and disability were significantly improved in qigong vs. control($p = .001$, $p = .002$), no significant difference in qigong vs. exercise groups ($p = .782$,$p = .642$).
Lansinger et al., 2007	To compare the effectiveness of qigong and exercise therapy in subjects with long-term nonspecific neck pain.	122 subjects of mean age 44 years (70% female) with non-specific, long-term neck pain.	Average neck pain (Visual Analogue Scale); neck disability (Neck Disability Index); cervical rotational range of motion.	10-12, 1 h-long sessions 1–2 times per week over 3 months. Qigong: Biyun Medical Qigong. Exercise therapy: individually-adjusted training program. Both provided by qualified. physiotherapists	Both groups demonstrated improvement in neck pain and disability in the long-term follow-ups (95% CI).No significant difference was found in any outcome measure between the qigong and exercise therapy groups.
Lansinger et al., 2013	To evaluate health-related quality of life in subjects with long-term, non-specific neck pain before and after treatment with qigong versus exercise therapy.	122 subjects of mean age 43.8 years (70% female) who had suffered from non-specific neck pain for at least 3 months.	Health-related quality of life (SF-36).	10-12, 1 h-long sessions 1–2 times per week over 3 months. Qigong: Biyun Medical Qigong. Exercise therapy: one-on-one coaching consisting of individually-tailored programs. Both provided by physiotherapists with long experience in the modality.	No significant differences were found between groups in any SF-36 sub-scales after intervention or at the 12-month follow up (95% CI). However, both groups were found significantly improved most SF-36 sub-scales.

Table 2
Physiotherapy evidence database scale scores.

Study:	Von Trott et al.	Skoglund et al.	Rendant et al.	Lansinger et al., 2007	Lansinger et al., 2013
Criterion:					
1: Eligibility criteria specified	Y	Y	Y	Y	Y
2: Subjects randomly allocated	Y	Y	Y	Y	Y
3: Concealed allocation	Y	N	Y	Y	Y
4: Baseline prognostic indicators similar between groups	Y	N	Y	Y	Y
5: Blinding of subjects	N	N	N	N	N
6: Blinding of therapists	N	N	N	N	N
7: Blinding of assessors of ≥1 key outcome	N	N	N	N	N
8: Measures included of ≥1 key outcome in > 85% subjects allocated	Y	Y	Y	Y	Y
9: Analysis by "intention to treat"	Y	N	Y	Y	Y
10: Between-group stat comparisons reported for ≥1 key outcome	Y	Y	Y	Y	Y
11: Point measures and measures of variability for ≥1 key outcome	Y	Y	Y	Y	Y
Total:	7	4	7	7	7

Key: Y = Yes.
N = No.

3.5. Effect of qigong on impairment based measures

Lansinger et al. reported a significant increase in cervical rotation range of motion in the qigong group ($p = .028$) compared to baseline [34], but no significant changes were seen for grip strength ($p = .859$) or other impairment measures.

3.6. Adverse events

Von Trott et al. [12], reported adverse events in 4 subjects in the qigong group and 4 subjects in exercise group. The adverse events in both qigong and exercise groups were similar: nausea, muscle pain and muscle tension. Rendant et al. reported that adverse events were reported by 19 qigong subjects and 16 exercise therapy subjects [32]. Reported adverse events of the qigong group were: muscle soreness, myogelosis, vertigo, headache, twinge in the neck, urinary urgency, and dizziness. Reported adverse events in the exercise group were: muscle soreness, myogelosis, headache, vertigo, change of mood, tinnitus. Neither of these studies stated whether adverse events were expected. The other three included studies did not explicitly report adverse events, nor did they provide explanation for why this information was omitted.

4. Discussion

The most interesting point of the present systematic review was that in four of five included studies, qigong had a significant effect on neck related disability or pain. Four of five studies demonstrated improved neck related disability [31–34], and three of five studies demonstrated decreased neck pain [32–34]. These beneficial effects were achieved through a variety of qigong systems and qigong training dosages. In the four studies that demonstrated improved disability, three different qigong systems were represented: the Heart of Qigong system, practiced via video 17-25 minutes each work day for 6 weeks, the Neiyanggong Qigong system, practiced in 18 sessions each lasting 90 min over a 6 month period, and the Biyun Medical Qigong system, practiced in 10–12 session of 1 h in length over a 3 month period. The three studies that demonstrated significantly decreased neck pain used either the Neiyanggong Qigong system, practiced in 18 sessions each lasting 90 min over a 6 month period, or the Biyun Medical Qigong system, practiced in 10–12 session of 1 h in length over a 3 month period.

Another important finding is that in the four studies that compared qigong to a traditional exercise regimen, there was no significant difference between the qigong or exercise groups. Three of these studies found significant and comparable benefit in decreasing neck-related disability and/or decreasing neck pain with either qigong or exercise. This is significant because it demonstrates that individuals with neck pain might benefit from either qigong or exercise, allowing for more intervention choices.

It is not known why qigong and exercise therapy had similar benefits in subjects with neck pain. Traditional exercise has been found beneficial in individuals with neck pain [35], and it is possible the movement aspect of qigong might have stimulated similar neuromuscular effects.

In the two studies that chronicled adverse events, both qigong and exercise had comparable adverse event profiles [12,32]. Neither qigong nor exercise was deemed statistically more tolerable. This also broadens potential interventions for subjects with neck pain.

Four of the five studies included patients with chronic neck pain [12,32–34]. Three of these studies found reduced neck-related disability and reduced neck pain in these subjects [32–34]. This is significant because chronic pain can alter pain processing and exacerbate pain levels and lead to associated decreased disability [36,37].

Qigong seemed to benefit a middle age or younger population compared to an elderly population. The four studies that showed significant changes in either disability or neck pain all had subjects with a mean age in the mid-40s [31–34]. The study that demonstrated no significant changes with qigong or exercise therapy, Von Trott et al., had a mean age of 76 ± 8 years [12]. It is possible that elderly subjects suffer from more complex, age-related neuro-musculoskeletal compromise or simply require a different qigong system or dosage. Established, research-based exercise protocols indicate that elderly patients have different exercise needs and may require different exercise prescriptions than younger individuals [38]. Qigong, at least the method employed in this study, simply might not benefit these individuals. One interesting phenomenon in Von Trott et al.'s study was that twenty nine percent of the subjects in the qigong group allotted to continue with their qigong training, even at their own expense, indicating that some aspect of this particular qigong training appealed to this population.

In the present systematic review, qigong demonstrated significant benefit on neck-related disability and/or neck pain in middle age populations, although it was not found more effective than traditional exercise. Other systematic reviews have examined the role of qigong in various musculoskeletal disorders with varied results. Yuan et al., in a systematic review, examined the effects of various TCM modalities on neck and back pain and indicated that qigong showed fair effects for neck and back pain [39]. However, the authors of this review stated that they were unable to infer definite conclusions and more research is needed to determine efficacy. Lee et al., in a systematic review examined the effects of qigong in subjects with general chronic pain and concluded that there "is not convincing enough evidence to suggest that qigong is an effective modality for pain management" [22]. Lauche et al., in a systematic review and meta-analysis, studied the effects of qigong on subjects with fibromyalgia, concluded that low quality

evidence revealed short term improvement for quality of life and pain reduction, although qigong was not found superior to other treatments [40].

There are various differences between these reviews that might account for the differing results. First, though all of the reviews examine musculoskeletal dysfunctions, each focuses on a different pathology, and certain pathologies might be more or less amenable to qigong. Additionally, many different qigong systems and training dosages are represented across the reviews, and some qigong systems and training dosage might be more optimal in certain patient populations than another.

The following are limitations of this review: only a small number of studies were included in the review and a meta-analysis was not performed due to the small number of studies. Several qigong systems were used amongst the included studies; this heterogeneity makes it difficult to compare studies, though it enhances generalizability of the review. Appropriate studies could have been missed, which puts this review at risk for retrieval bias. Finally, because one author made the final decision of which studies to include, there is a risk of extractor bias.

5. Conclusion

The findings of this systematic review indicate that qigong might have a beneficial effect in some individuals with neck pain. However, the studies had small populations and little uniformity between qigong interventions. In addition, in many reviewed studies the qigong interventions did not show greater benefits than exercise therapy and the adverse events profiles were similar between qigong and exercise therapy. Qigong might not be effective at reducing neck pain and disability in geriatric populations. Randomized trials with larger populations and comparisons between specific systems of qigong are needed to better ascertain efficacy of qigong interventions in subjects with neck pain.

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Declaration of interest

None.

Author contributions

- conceiving study, collecting and analyzing data, writing, editing, revising.
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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ctcp.2018.10.013.

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